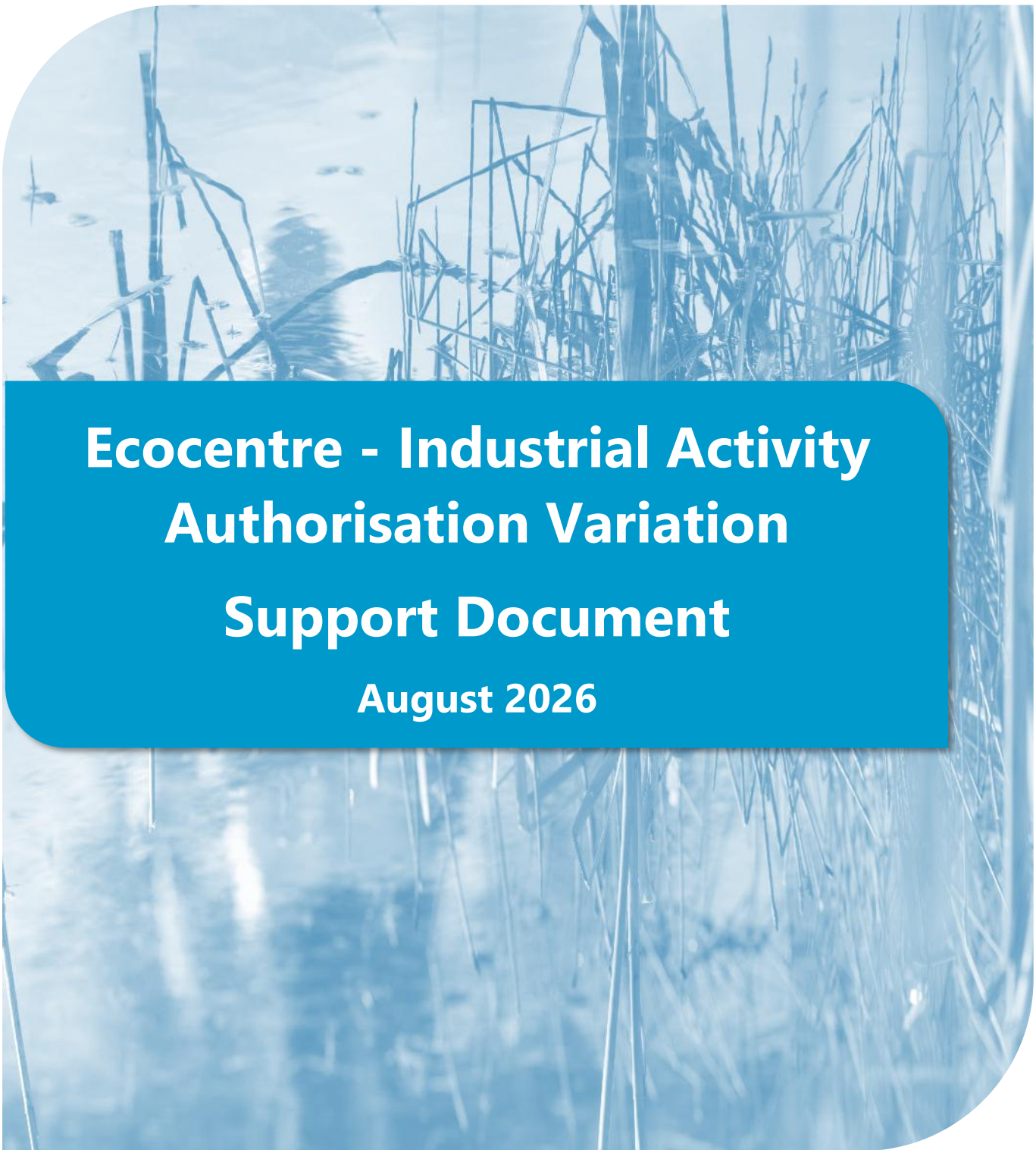




Ecocentre - Industrial Activity Authorisation Variation Support Document

August 2026

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Appendix C – Site Layout Plan

Appendix D - Emulsion Flow Process

Appendix E– Centrifuge Operating Manual

Appendix F1 and F2 – Preliminary containment calculations and site layout and sections for proposed bund walls

Appendix G - Photo of the plate on the site of the boiler

Appendix H1 and H2 – Safety Data Sheets

Appendix I – BAT Assessment for Application

Appendix J – ISO accreditation certificates

Version No.	Description	Date	Author/ Reviewer
1	First Version for submission to SEPA	04/08/2026	██████████

1 NON- TECHNICAL SUMMARY

1.1 CURRENT OPERATIONS

Augean North Sea Services Ltd (ANSS) currently operate a 3-phase decanter centrifuge at the Blackdog site (Yard B, Blackdog Industrial Estate, Aberdeen, AB23 8BT) where it is operated under the authorisation PPC/A/1003212. The unit processes drilling slops generated from offshore and onshore drilling operations and separates them into solids, oil and water phases.

ANSS also operate the Eco Centre site located on Damhead Way, Dales Industrial Estate, Peterhead, AB42 3GY under the authorisation PPC/A/1035666. The site is also licensed to accept drilling waste streams where they are treated to allow safer disposal/recovery/recycling of the resultant waste streams.

1.2 SUMMARY OF PROPOSED CHANGES TO PERMIT

Due to a number of factors at the Blackdog site, i.e. limited space, ageing infrastructure, increased environmental sensitivity and reduced flexibility for long term growth, the decision has been made to relocate the 3-phase decanter centrifuge, along with all associated auxiliary equipment (including 2 x 80,000 litre tanks and 3 x 40,000 litre tanks) to the Eco Centre site in Peterhead (approx. 24 miles away).

The move will include the following equipment:

- 3-phase decanter centrifuge (complete unit)
- Steam boiler (rated thermal input of ~1.5MWth)
- Feed pumps and auxiliary pumps
- Control panels (MCC/PLC)
- Associated tanks (2 x 80,000 litre and 3 x 40,000 litre), pipework, manifolds, and valves
- Support skid or frame
- Feed and discharge hoses/couplings
- Chemical dosing units
- Associated electrical connections and cabling

The entirety of this infrastructure is referred to as the Emulsion Unit/Process.

Several benefits to the move have been identified. These include:

- The consolidation of the company's regional drilling waste processing operations
- Improved operational reliability and efficiency
- Modernised drainage, bunding and containment at the Eco Centre
- Enhanced environmental monitoring capability
- Better access to equipment for maintenance and for offloading of slops materials

- Reducing the number of internal transfers of drilling slops

These benefits will reduce the risk of emissions and spills from the activity that could adversely impact the environment and will reduce compliance risk at the Blackdog site.

Currently the most relevant activities covered by the authorisation at Condition 1.1.3 held at the Ecocentre (PPC/A/1035666) include:

- *(1.1.3.1) The recovery of oil from oil-based mud cuttings ("OBMC") being an activity falling within paragraph (a) of Part A of Section 5.4 of Schedule 1 of the Regulations.*
- *(1.1.3.2) The disposal of waste oils (other than by incineration or landfill) in plant with a capacity exceeding 10 tonnes per day being an activity falling within paragraph (b) of Part A of Section 5.3 of Schedule 1 of the Regulations.*

As a result of the above the proposed activity involving the Emulsion Unit at the Eco-centre is already allowed under the current authorisation.

The Stationary Technical Unit (STU) listed at Condition 1.1.4.2 of the permit includes "A physical/thermal separation process for the treatment of low solids, high water content oil contaminated liquids ("Oily Slops"), with a throughput of 4 tonnes per hour, and consisting of one decanting centrifuge, one flocculating unit, a three-phase separator and an adsorption filtration unit".

This STU refers to an existing centrifuge already on site. To allow the new emulsion unit additional STUs will be required on the permit.

The new plant/infrastructure being installed at the site will require the installation of a steam boiler (to be relocated from the Blackdog site). This boiler is rated to have a thermal input of 1.5MWth.

As this boiler will be new to the site and has a rated thermal input of between 1MW and 50MW, it falls under Schedule 27 Part 1 Paragraph 2 of the Environmental Authorisations (Scotland) Regulations. As a result, the existing authorisation needs to be varied to include conditions specific to this activity.

The new plant will also result in an increase in the number of tanks on site.

1.3 TYPE OF VARIATION

This application has been deemed to be a standard variation.

The type of variation will depend upon the details of the proposed change and what technical assessment may be required.

From a review of the SEPA Guidance on the Environmental Regulation (Scotland) Charging Scheme (Nov 2025, Version 6) it is clear that a variation will be treated as a standard variation unless it is clearly an administrative or substantial variation.

An administrative variation relates to purely administrative changes to an authorisation that do not require any technical assessment.

A substantial variation is where an application requires a similar level of technical assessment as would be required for a new authorisation. This could include the addition of new activities that will likely result in increases to environmental risk on a significant scale, or an application to significantly increase the geographical extent of an authorised activity.

The variation falls between what is required for an administrative and substantial variation and is in fact similar to one of the examples provided within the Charging Guidance – *“An application for the addition of an activity to an authorisation, of a type already covered by the authorisation which is relatively small scale and has only a minimal impact on the environment.”*

As set out in SEPA’s Charging Scheme, standard variation applications are charged at 30% of the total of the application charges applicable to the activity types which are the subject of the application.

1.4 ENVIRONMENTAL RISK

To minimize risk and comply with regulations and guidance, measures will be taken to ensure that appropriate mitigation is in place, and that Best Available Techniques (BAT) are implemented where necessary.

The proposed changes will mainly affect the site’s current emissions to air.

The new activity on site will allow the operator to manage drilling waste more effectively and to ensure that wherever possible waste is being recovered, reused and recycled before disposal is considered. As a result, the overall impact from these waste types on the environment will be reduced.

There is no proposal to accept any additional waste types to site, increase the overall throughput of waste at the site or increase the size of the permitted area.

All waste accepted onto site are stored in accordance with the site operating procedures. All areas where waste is stored and treated on site are surfaced with impermeable concrete and have a sealed drainage system. Treatment areas and liquid storage areas related to this new activity will be fully bunded in accordance with the relevant guidance (CIRIA).

The waste centrifuge activity is not considered to be odorous or noisy. The activity when undertaken at the Blackdog site did not have a history of complaints relating to odour or noise. It is therefore not considered to be a risk.

It is proposed that the main centrifuge unit will be installed within the envelope of the current building at the Ecocentre site. As a result, this shielding will reduce the risk of any noise or odour from the activity (should they occur) affecting any nearby receptors.

The boiler itself is currently housed within a shipping container, and the plan is to move this whole container from the Blackdog site to the Ecocentre site. This container will be situated on the impermeable surface outside of the building and will use a stack to assist with the dispersion of any air emissions. Low sulphur DERV (Diesel Engine Road Vehicle) fuel will be used, thereby lowering SO₂ emissions.

The site is in an industrial area with many different industrial processes operating nearby that generate noise, and the industrial estate has busy internal roads that can generate significant local noise through vehicle movements.

1.5 MANAGING THE ACTIVITIES

An ISO 14001 accredited Environmental Management System (EMS) is in place for the site and will be amended to take account of the changes proposed with this variation.

As the activity is not new to the company, existing expertise in the operation and maintenance of the centrifuge unit, boiler and other associated infrastructure already exists and will be utilized wherever necessary.

1.6 LOCAL RECEPTORS

Based on information presented on the "Scotland's environment" online map viewer there are no Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA), Special Areas of Conservation (SAC) or Ramsar sites at or immediately adjacent to the site.

The closest is the Buchan Ness to Collieston Coast SPA approximately 1 km to the southeast of the site and designated as such due to the variety of seabirds present. Much of the SPA is also deemed a SAC and SSSI.

The closest local residential receptors are approximately 200m to the north-east.

The prevailing wind in Peterhead is generally from the Southeast.

2 INTRODUCTION

2.1 BACKGROUND

Augean North Sea Services Ltd (ANSS) specialises in managing hard to handle waste. ANSS particularly focus on providing comprehensive waste management solutions for the UK's oil and gas sector, including offshore drilling waste, NORM disposal, decommissioning and industrial services. ANSS operates out of a number of sites in Northeast Scotland and from Great Yarmouth in England.

ANSS is now part of the Augean Group which has an extensive UK waste treatment, transfer and disposal infrastructure that focusses on delivering best environmental outcomes. Augean service the renewable energy, infrastructure & construction, nuclear & radioactive, processing & manufacturing and oil & gas sectors.

ANSS require a variation to the Authorisation/ permit issued to the Ecocentre site located on Damhead Way, Dales Industrial Estate, Peterhead, AB42 3GY - PPC/A/1035666.

This is the main supporting document for that application, and its purpose is to respond to several of the questions within the variation application forms.

2.2 SITE DESCRIPTION AND SETTING

2.2.1 Description

The site is located within an industrial estate surrounded generally by a mix of agricultural, industrial and commercial land use to the south and west, the town of Peterhead to the North and the North Sea coast to the east.

The permitted operations at the site currently comprise of the recovery of oil from oil-based mud cuttings (OBMC), the disposal of waste oils in plant with a capacity exceeding 10 tonnes per day and the burning of recovered oil from the thermal desorption process. The site comprises a Thermo-Mechanical Cuttings Cleaner (TCC) which is used in the thermal desorption treatment process and recovered oil is used as a fuel within a compression ignition engine which powers the TCC and treats odorous waste gases from the TCC process.

In addition to the activities covered by authorization PPC/A/1035666, the site also operates under another authorisation (EAS/P/4000036), which permits the site to accept and treat low level radioactive wastes in the form of NORM. The variation covered by this application will not affect this authorisation.

The permitted boundary for the site as outlined by authorisation PPC/A/1035666 is shown in Figure 2-1 below. There are no plans to extend the current permitted boundary. The current emission points are also shown on the plan.

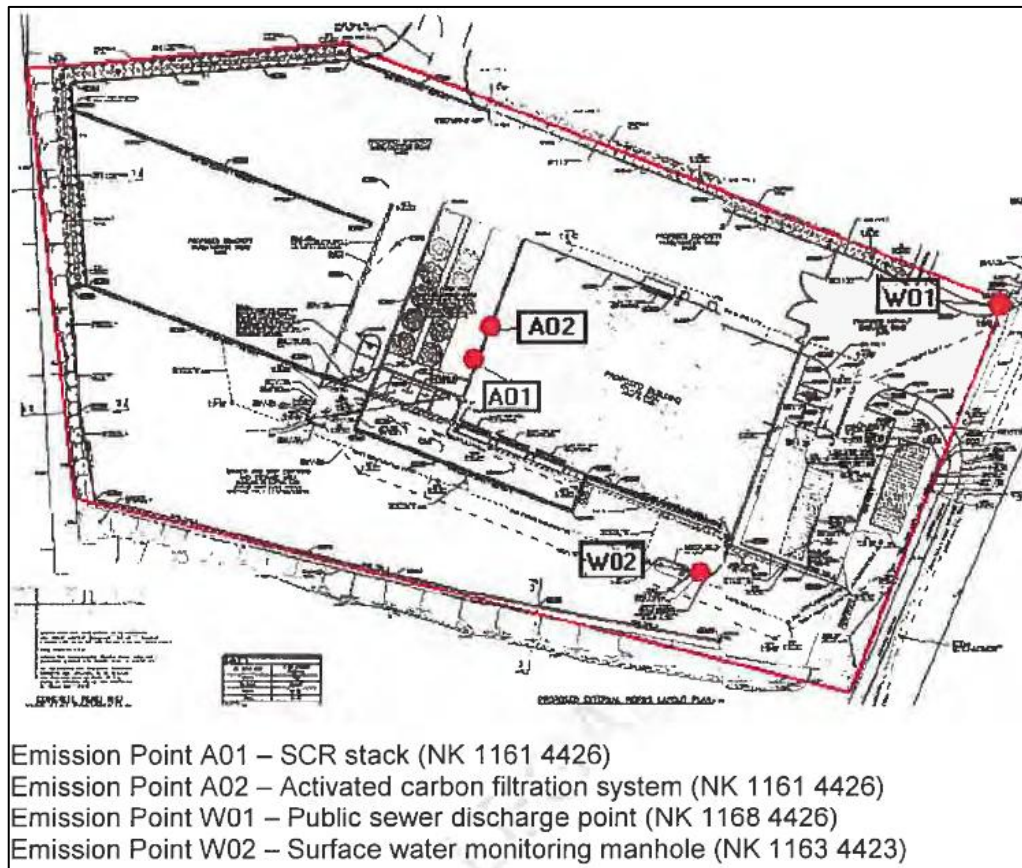


Table 1 Plan showing permitted boundary (taken from permit), along with current emission points.

2.2.2 Geology

The majority of the site is underlain by superficial deposits of the Hatton Till Formation which comprise clay, sand and gravel. The north-western edge of the site is underlain by Alluvium. The superficial deposits at the site are underlain by the Peterhead Pluton comprising granite.

2.2.3 Hydrogeology

The superficial deposits underlying the site may be water bearing depending on the relative proportions of sand, gravel and clay present. It is likely that groundwater flow within the superficial deposits at the site is towards the north-east consistent with the general topographic gradient and towards and in the direction of flow of an unnamed drain located approximately 70m north-west of the site at its closest point and which flows generally from west to east. The unnamed drain is culverted underneath Damhead Way

bounding the site to the east and discharges to the North Sea approximately 900m east of the site.

Based on the BGS groundwater vulnerability map of Scotland 1:625,000 scale (1995), the Peterhead Pluton is classified as a Low Productivity Aquifer. Low Productivity Aquifers have negligible permeability and are generally regarded as containing insignificant quantities of groundwater. The superficial deposits are not classified. It is considered likely that any groundwater which may be present in the Hatton Till Formation and alluvium is perched on top of the Peterhead Pluton.

2.2.4 Hydrology

The nearest surface watercourse to the site is the unnamed drain which is described in Section 2.2.3 above.

2.2.5 Designated Sites

Based on information presented on the "Scotland's environment" online map viewer there are no Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA), Special Areas of Conservation (SAC) or Ramsar sites at or immediately adjacent to the site.

The closest is the Buchan Ness to Collieston Coast SPA approximately 1 km to the southeast of the site and designated as such due to the variety of seabirds present. Much of the SPA is also deemed a SAC and SSSI. It has been designated as a SAC for its high-quality vegetated cliffs. It protects rare northeast Scottish habitats including maritime heath, grassland and crevice communities supporting species like Scots lovage and roseroot. It spans a 15km stretch of coastline from Peterhead to Collieston. It has been designated as a SSSI (Bullers of Buchan Coast SSSI) due to the presence of seabirds, the cliffs and the coastal geomorphology.

A Habitats Impact Assessment Screening Assessment¹ has been completed based on the use of DERV fuel containing ultra-low sulphur (which is regarded as no sulphur in the Screening Assessment). It reported that there were no interest sites within the screening distance of 0.75 km and that no further assessment was required.

The report is included as **Appendix A**.

¹ <https://connect-apps.ceh.ac.uk/SEPAtool/>

2.3 CURRENT NEED FOR VARIATION

We are seeking to vary the authorisation to allow for additional Stationary Technical Units and an additional emission point to air deriving from the soon to be introduced treatment of oil-based drilling slop wastes generated from offshore and onshore drilling operations within a 3-phase decanter centrifuge, and the associated boiler.

This treatment is currently carried out at our Blackdog site under authorisation PPC/A/1003212, and the proposal is to relocate this activity from our Blackdog site to the Eco-centre site in Peterhead.

The reason for relocating this activity to Peterhead is to:

1. Consolidate drilling waste processing operations at one site operated by ANSS.
2. Improve operational reliability and efficiency.
3. Align processing activities with upgraded environmental infrastructure.
4. Reduce compliance risks at our Blackdog site.
5. Enhance site resilience and capacity at our Peterhead site.

The Eco-centre site in Peterhead benefits from modernised drainage, bunding and containment systems when compared to the Blackdog site. In addition the emulsion unit should be easily integrated into the existing process infrastructure. Overall this will increase overall efficiency across the ANSS sites by consolidating waste treatment activities to the one site and reduce any potential risk of impact to the environment, not just from the sites but also from the reduced internal transfers that are currently needed.

In order to operate the 3-phase decanter centrifuge it will be necessary to install a boiler at the site. The 1.5 MW boiler will be used as ancillary plant to provide process heat for the centrifuge operation. The boiler supports waste treatment activities by maintaining the required operating conditions for mechanical separation.

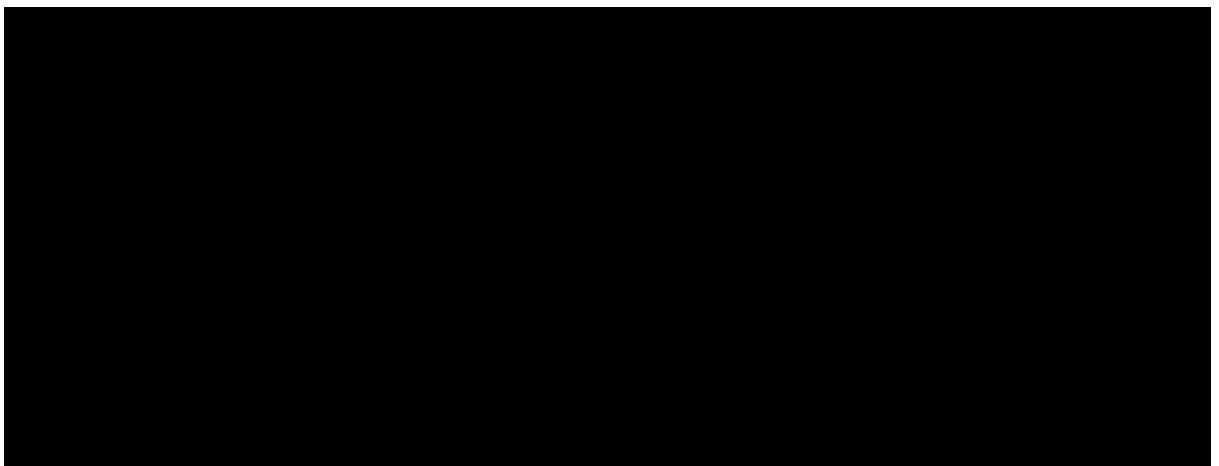
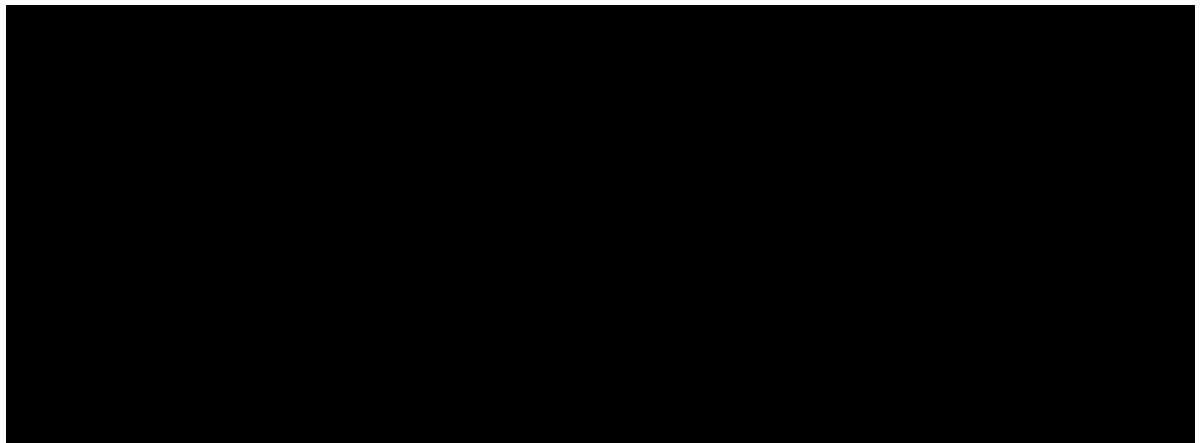
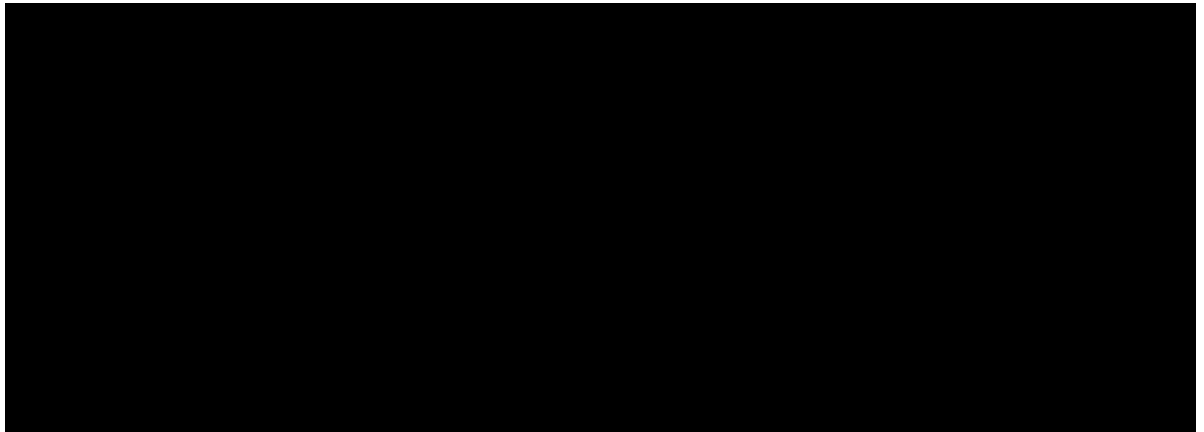
As the boiler is to be relocated to Peterhead it will be considered "new" in permitting terms, even though it is technically older (date of manufacture is April 2010).

As a result the boiler falls under the scope of the Medium Combustion Plant Directive (MCPD), as implemented by Schedule 27 Part 1 Paragraph 2 of the Environmental Authorisations (Scotland) Regulations (i.e. b/w 1MW and 50MW) and therefore the activity needs to have a permit/authorisation.

ANSS propose to vary the existing authorisation to include the additional Stationary Technical Units associated with the proposed treatment, and an additional emission point to air associated with the installation of the oil-fired boiler.

2.4 TECHNICAL COMPETENCE

The activities outlined in this variation will be overseen by site staff with the required technical competence. Details are provided below



2.5 FINANCIAL PROVISION

SEPA requires that financial provision is sufficient to meet all obligations of the authorised person/operator and adequately cover the costs of closure and environmental liability risks.

The amount of financial provision required is based on the maximum quantity of waste that can be kept and stored at the site at any one time, and the haulage costs associated with their removal. The following table 2 summarises how much this should be. This has been calculated using SEPA guidance WAS-G-EASR-002 (*Financial Provision for Waste Management Activities (Non-landfill)*). The quantities provided below are based upon the site's current capacity, and not the maximum storage permitted by the current permit.

Material	Quantity (T)	Indicative cost per tonne for clearance and transport (£)	Total cost per Material (£)
Oil Based Muds - OBM (Hazardous)	4300	160	688,000
Oily Slops (Hazardous)	500 (600m3)	90	45,000
Rehydrated Solids Inert (Non-Hazardous)	100	25	2,500
Oily Slops Water (Hazardous)	201 (201m3)	90	18,090
Skimmed Fluid (Hazardous)	12 (17.5m3)	700	8,400
Recovered Water (Non-Hazardous)	100 (100m3)	150	15,000
Hazardous Waste	1	550	550
General Waste	1	45	45
Total			777,585

Table 2. Table shows calculation of financial provision

The table shows that the amount of financial provision required for the site is £777,585.

3 TECHNICAL DESCRIPTION OF CHANGES

3.1 PROPOSED CHANGES

3.1.1 Summary

The proposed installation comprises of the following:

- 3-phase decanter centrifuge
- Oil fired steam boiler, along with the associated flue
- Two feed/storage tanks (2 × 90,000 litres)
- Three processing tanks (3 × 40,000 litres)
- Product storage tanks (oil, water, solids)
- Transfer pumps and fixed pipework
- Chemical dosing unit
- Control panel and automation system

In addition to the above, the installation will also include support frames for the tanks and other equipment, associated electrical connections and cabling. A fully bunded area will be constructed to house the tanks.

An updated Site Layout showing the proposed location of the main items of plant is provided at **Appendix C**.

The expected throughput of the new treatment plant is expected to be similar to the existing STU within the authorisation. These being:

- no more than 4 tonnes per hour;
- no more than 40 tonnes per day; and
- no more than 30,000 tonnes per year.,

3.1.2 Overall Process

The following is a very brief summary of the process.

- a. Waste is received and stored in enclosed tanks
- b. Material is transferred via sealed pipework to the centrifuge feed system
- c. Chemical dosing (if required) optimises phase separation
- d. The centrifuge separates the material into:
 - i. Recovered oil
 - ii. Aqueous phase
 - iii. Solid cake
- e. Outputs are transferred to dedicated storage prior to discharge to sewer and/or off-site management

The system is fully enclosed, minimising fugitive emissions. The process is further explained within the Emulsion Flow Process (Doc No. NS_BDG_P.01), a copy of which is provided at **Appendix D**. This Process Flow was prepared for Blackdog but will apply to the proposed operations at Eco-centre. It will be updated following approval of this application and prior to commencement of operations at Eco-centre.

The installation includes a dedicated 1.5 MW (thermal input) boiler which provides process heat to support operation of the centrifuge system used within the waste treatment process. The boiler is fired on ultra-low sulphur DERV fuel and operates as ancillary plant to the main treatment activities.

The boiler supplies steam to the centrifuge system in order to maintain the required operating temperature and viscosity of incoming waste materials, thereby improving the efficiency of mechanical separation. Heating of the feed material assists in the separation of solids, water and oil phases within the centrifuge and supports consistent process performance.

The boiler will be operated only when the centrifuge process is in use and is controlled through automated temperature and operational control systems designed to optimise energy use and maintain safe operating conditions. Combustion gases from the boiler will be discharged via a dedicated emission point to atmosphere.

3.2 INFRASTRUCTURE

The centrifuge, boiler and associated equipment are being relocated from ANSS's Blackdog site where it is currently operational.

Although the plant is not new, it:

- Remains fit for purpose
- Achieves effective separation performance
- Is installed within a system that meets current BAT standards.

The proposed site infrastructure associated with the centrifuge treatment process comprises a three-phase centrifuge system, bulk storage tanks, process pipework, ancillary treatment equipment, utilities and associated emissions control infrastructure. The infrastructure has been designed to support the safe storage, transfer and treatment of liquid and sludge waste streams whilst minimising the potential for emissions to air, land and water.

3.2.1 Three Phase Centrifuge System

The installation includes a three-phase centrifuge used for the mechanical separation of incoming waste materials into oil, aqueous and solid fractions. The centrifuge forms the primary treatment component of the process and is designed to facilitate efficient recovery and segregation of constituent materials.

A copy of the Operating Instructions, which includes technical data, for the centrifuge is provided at **Appendix E**.

The centrifuge separates the waste stream into:

- an oil phase for recovery or onward transfer;
- an aqueous phase for further treatment or disposal; and
- a solid fraction for appropriate off-site management or recovery/disposal.

The centrifuge system includes associated:

- feed pumps;
- transfer pumps;
- pipework;
- automated controls;
- instrumentation;
- dosing systems (where required for demulsifiers or treatment chemicals);
- containment measures; and
- emergency shut-off systems.

The centrifuge and associated infrastructure are located on impermeable surfacing with sealed drainage to minimise the risk of fugitive emissions and contamination.

Alternative Technologies Considered

The 3-phase centrifuge is already owned and operated by Augean. This application is basically to allow the plant to be relocated to the Eco Centre site. However, a brief assessment of alternative treatment technologies has been undertaken to ensure that it is the most appropriate solution and that it is in accordance with the principles of Best Available Techniques (BAT).

The direct disposal of drilling slops without treatment has been considered. This solution would require minimal on-site processing and there would be no process related emissions associated with it. However, it does not facilitate the recovery of potentially valuable oil resources, it increases transportation requirements, relies upon third party treatment or disposal facilities and is inconsistent with waste hierarchy principles and

circular economy objectives. This option therefore does not maximise waste recovery and does not represent BAT for the management of recoverable oil-based wastes.

Passive settlement and gravity separation systems are also possible. They are a relatively simple technology and have low energy requirements. However, they are not as efficient at separating the waste, require large tank volumes and significant retention times and can lead to increased potential for VOC and odour emissions. Although technically feasible, gravity separation is less efficient than centrifugation and may increase the duration and extent of emissions from stored material.

Mechanical dewatering technologies were considered. This is established technology and can be effective at dewatering solids. However, the technology has limited ability in separating oils and additional processing stages may be required. There would also be increased material handling requirements. Overall dewatering systems do not provide the same level of oil recovery or process efficiency as a three-phase centrifuge.

Finally the use of thermal treatment technologies was reviewed. This technology can result in a high degree of contaminant removal and is good at recovering hydrocarbons. However, it requires significant energy consumption, there are higher capital and operating costs, additional emissions to air and greater infrastructure and operational complexity.

The three-phase centrifuge was therefore considered to be the best option as it provides efficient separation of oil, water and solids, short processing residence times and reduced storage requirements when compared with passive separation systems. The centrifuge system is also sealed and as a result does not have any direct emissions to air. The technology also maximises recovery of oil, which reduces contaminant concentrations within the aqueous phase and minimises pollutant loading to the sewer system whilst avoiding the increased environmental impacts associated with more complex treatment systems.

3.2.2 Bulk Storage Tanks

The installation will include two large 90,000 litre above-ground (horizontal) storage tanks used for the storage of incoming and processed waste materials associated with the centrifuge process.

In addition there will also be three 40,000 litre (vertical) processing tanks.

The tanks will be used for:

- temporary storage of incoming feedstock;
- process balancing;

- settlement and conditioning;
- storage of separated oil or aqueous fractions; and/or
- storage prior to onward transfer.

The tanks will be fitted with appropriate:

- level monitoring systems;
- overfill prevention measures;
- high-level alarms;
- isolation valves;
- venting arrangements; and
- inspection and maintenance provisions.

Tank storage areas are provided with secondary containment designed to contain spills and leaks in accordance with the relevant principles of CIRIA C736 (Containment Systems for the Prevention of Pollution) and other relevant guidance. This includes consideration of:

- Stored material characteristics
- Tank capacities
- Rainfall
- Compatibility of construction materials
- Inspection and maintenance requirements

Proposed specifications for the bunded areas are provided in the plans at **Appendix F1 and F2**. Please note that detailed design drawings will be prepared at the detailed design stage of the project.

The bund walls will be constructed of reinforced concrete with any joints in the walls and base sealed by incorporating water stops within the joints and also sealing the joints with polysulphide sealant at the surface. The bund base will be a reinforced concrete slab. The slab will drain to a sump in the northwest corner where the site will then be able to pump surface water from. The overall volume of the bund is currently proposed to be 195m³, which would be in excess of 110% of the largest tank and in excess of 25% of the overall tank volumes.

Transfer operations are undertaken via hard-piped systems or controlled transfer points designed to minimise the potential for spills, leaks and fugitive emissions.

3.3.3 Boiler

The installation includes a dedicated 1.5 MW oil-fired boiler operating as directly associated plant to the centrifuge treatment activities. The boiler provides process heat to

support operation of the centrifuge system by maintaining a suitable operating temperature and viscosity within the treatment process. The boiler supplies steam to the process. The boiler is currently housed within a container and the whole unit will be relocated to the Ecocentre site. This large container will be located to the west of the proposed bund (see **Appendix C**). The boiler will be fired on DERV

The boiler system includes:

- bundled fuel storage and supply infrastructure;
- combustion controls;
- temperature monitoring systems;
- safety shut-off systems;
- circulation pumps and associated pipework; and
- a dedicated emission stack for discharge of combustion gases to atmosphere.

The boiler is operated only when required for treatment activities and will be subjected to planned preventative maintenance and operational monitoring.

A photo of the plate on the site of the boiler (**Appendix G**) states that the boiler has a rated output of 2000kg/hr F & A 100 C. This has been calculated to be the equivalent of a rated thermal input of 1.5MWth (based on an efficiency of 85%).

Technical Description of Boiler

Plant No. – O2

Boiler Type - Byworth Boiler – MX2000-83

Date of Manufacture – April 2010

Rated thermal input – estimated to be 1.5MWth

Fuel type – oil – will use ultra-low sulphur DERV fuel

Operating hours – potentially up to 12 hours per day (though likely not to be every day).

Approximately 3,500 hours per year

Stack height and diameter – see Section 3.3.4

Expected Start Date of Operation – proposed start September 2026 (or as soon as granted permission by SEPA to do so)

Alternative Technologies Considered

Natural gas was considered as it would generally offer lower combustion emissions when compared to liquid fuel fired systems (i.e. DERV). However, a gas connection is not available at the installation and extending the network would require third-party infrastructure works and a substantially longer delivery programme; it is therefore not currently practicable for this installation.

The use of electric heating was also considered as an alternative. The advantages of this option being no direct emissions to air and reduced on site fuel storage requirements. However, significant electrical infrastructure upgrades would be required both on and offsite to accommodate the process heat demands. The required upgrades were therefore no considered proportionate or practicable for the proposed activity. This is an option that may be reconsidered as part of larger site wide improvements in the future.

The final option briefly considered was a biomass boiler. Whilst there could be a potential reduction in greenhouse gas emissions (depending upon fuel source), there would likely be increased emissions of particulate matter and combustion by-products. In addition the increased operational complexity and maintenance requirements of this system means that it was not considered appropriate.

The DERV fired boiler is considered the most appropriate and practicable option for providing reliable process heat to the centrifuge system.

3.3.4 Stack

It is understood that the current boiler stack is not high enough. In order to comply with guidance the stack will be extended to ensure that it extends 3m above the roof ridge of the container. Details on the stack are provided below.

NGR – NK 1158 4428

Inner Diameter – 320mm

Height above boiler – 3,600mm

Height above ground – 6,750mm

Height above roof – 3,000mm

3.3.5 Pipework and Transfer Infrastructure

Liquids/sludges are transferred throughout the installation via a dedicated pipework system and pumping arrangement designed to minimise emissions and loss of containment.

Pipework and transfer systems include:

- hard-piped transfer lines where practicable;
- flexible connections with appropriate inspection and replacement procedures;
- isolation valves;
- leak prevention measures;
- secondary containment where necessary; and

- designated transfer areas located on impermeable surfacing.

3.3.6 Drainage and Containment

All operational areas associated with waste storage, handling and treatment on site are located on impermeable surfacing with sealed drainage systems designed to contain and manage potentially contaminated run-off.

The drainage system directs potentially contaminated runoff to tanks on site where it is assessed prior to appropriate disposal.

Secondary containment is provided for tanks, chemical storage and other areas where loss of containment could occur.

Clean runoff from roofs and other areas on site where no waste is managed is kept separate from the potentially contaminated runoff. Clean runoff is harvested wherever feasible for use on site.

3.3.7 Emissions Control and Environmental Protection Measures

Infrastructure associated with the treatment process has been designed to minimise fugitive emissions, including emissions to air, land and water.

Environmental protection measures include:

- enclosed or controlled transfer systems where practicable;
- preventative maintenance programmes;
- routine inspection of tanks, pipework and plant;
- spill response procedures;
- odour and emissions management measures;
- operational monitoring and record keeping; and
- appropriate housekeeping practices.

Combustion emissions from the boiler are discharged via a dedicated emission point to atmosphere.

3.3 WASTE TYPES TO BE ACCEPTED

The waste to be accepted will mostly comprise of oil-based drilling slops (mixtures of oil, water, and solids). These will mostly be classified as EWC code 01 05 05*

The current permit lists the following EWC codes as being permitted for the oil slops process.

European Waste Catalogue (EWC) Code	Description
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS
01 05	drilling muds and other drilling wastes
01 05 04	freshwater drilling muds and wastes
01 05 05*	oil-containing drilling muds and wastes
01 05 06*	drilling muds and other drilling wastes containing hazardous substances
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 99	wastes not otherwise specified
13	OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)
13 04	bilge oils
13 04 01*	bilge oils from inland navigation
13 04 02*	bilge oils from jetty sewers
13 04 03*	bilge oils from other navigation
13 05	oil/water separator contents
13 05 01*	solids from grit chambers and oil/water separators
13 05 02*	sludges from oil/water separators
13 05 03*	interceptor sludges
13 05 06*	oil from oil/water separators
13 05 07*	oily water from oil/water separators
13 05 08*	mixtures of wastes from grit chambers and oil/water separators
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 07	wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)
16 07 08	wastes containing oil

Table 3. Permitted Waste Types

No changes are required to the above list.

3.4 RAW MATERIALS

The following raw materials will be used within the emulsion unit:

Product Name	Purpose	Hazard Statements
D 85 L	Surfactant (reduces surface tension between two materials, they help substances to disperse or emulsify)	H315 – Caused skin irritation H318 – Causes serious eye damage H351 – Suspected of causing cancer H336 – May cause drowsiness or dizziness H304 – May be fatal if swallowed and enter airways H441 – Toxic to aquatic life with long lasting effects
RO SC D4227	Demulsifier (used to break emulsions)	H319 – Causes serious eye irritation Waste is classified as hazardous

Table 4. List of Raw Materials

Safety Data Sheets for the above are provided at **Appendix H1 and H2**.

DERV fuel (also known as white diesel and road diesel) will be used to fire the proposed boiler. It will be stored in a designated storage tank on an impermeable surface. DERV fuel is considered to contain ultra-low levels of sulphur, typically <10mg/kg sulphur. This leads to lower SO₂ emissions, reduced acid deposition/corrosion and less sulphate particulate formation. The DERV fuel used on site will comply with the BS EN 590 standard. The standard defines the required:

- Sulphur content (max 10 ppm)
- Cetane number (min. 51)
- Density @ 15 °C (820 – 845 kg/m³)
- Viscosity
- Flash point (>55 °C)
- Water content (max 200 mg/kg)
- Lubricity
- Biodiesel (FAME) content (up to 7%)
- Cold weather performance

EN 590 is the recognised diesel fuel specification across the UK and Europe.

3.5 STATIONARY TECHNICAL UNITS AND DIRECTLY ASSOCIATED ACTIVITIES

A Stationary Technical Unit (STU) is defined as functionally self-contained plant, machinery, structure, or group of interconnected components that can carry out a listed PPC activity on its own and is fixed in location (i.e. not mobile). These comprise of the core plant where the Schedule 1 activities occur.

The Directly Associated Activities (DAAs) relate to other activities carried out on the same site which have a technical connection with the activities carried out on site and which could have an effect on pollution.

The below table 5 lists the current STUs listed in the permit along with suggested additional proposed STUs.

STU's as listed in permit issued 28/10/2010
A thermal desorption process (thermo-mechanical cuttings cleaner (TCC)) for the treatment of oil-based mud cuttings ("OBMC), with a throughput of 10 tonnes per hour, and consisting of feed pump and shaker unit, process mill and drive unit, cyclone, oil and water condensers and oil/water separator.
A physical/thermal separation process for the treatment of low solids, high water content oil contaminated liquids ("oily slops"), with a throughput of 4 tonnes per hour, and consisting of one decanting centrifuge, one flocculating unit, a three-phase separator and an adsorption filtration unit.
A compression ignition engine with a net rated thermal input of 2.03MW used to power the TCC and treat the odorous waste gases from the TCC process.
Additional STU's to be listed in proposed permit (proposed description)
A physical/thermal/chemical separation process for the treatment of oil contaminated liquids ("oily slops") with a throughput of 4 tonnes per hour and consisting of a 3-phase decanter centrifuge system. May include the use of emulsion breaker and flocculation chemicals
A boiler with a net rated thermal input of 1.5 WW used to supply steam to the centrifuge system in order to maintain the required operating temperature and viscosity of incoming waste materials, thereby improving the efficiency of mechanical separation

Table 5. List of STUs (current and proposed)

The below table 6 lists the current DAAs listed in the permit along with suggested additional proposed DAAs.

DAA's as listed in permit issued 28/10/2010
One selective catalytic reduction (SCR) unit for the treatment of waste gas emissions from the compression-ignition engine.
An activated carbon filtration system for the treatment of odorous waste gases.
A filtration system for the removal of particulates from waste gases prior to treatment in the activated carbon filtration system.
The receipt storage and transfer of OBMC and Oily slops, more particularly described below: a. One external storage yard for containers and skips containing OBMC and rehydrated solids b. One external storage area consisting of bulk liquid storage tanks for incoming oily slops, fluid skimmed from OBMC, recovered oil from the TCC process, recovered oil from the oily slops process, recovered water, treated water from the oil slops process and rainwater c. Six internal storage containers and one receiving pit for OBMC d. Two internal storage tanks for the storage of oily slops e. Two internal storage tanks for the storage of recovered oil and recovered water from the oil slops process; and f. One external storage area for the storage of cleaned containers and skips.
The storage of raw materials
The cleaning of OBMC and oily slops contaminated containers and skips
The rehydration of recovered solids from the thermal desorption process
Vehicle operations for the delivery, on-site and off-site movement of wastes, recovered oil, water and solids whilst within the permitted installation.
The discharge of effluent to Public Sewer
The surface water treatment systems and surface water discharge to public sewer via an interceptor
The site laboratories and office facilities
Additional DAA's to be listed in proposed permit (proposed description)
3 x 40,000 litre external processing tanks
2 x 90,000 litre external bulk storage tanks

Table 6. List of DAA's (current and proposed)

3.6 NATURE OF EMISSION POINT TO AIR

The new emission point from the boiler will be referred to as Emission Point A03 and can be described as the "Boiler Flue". The NGR for this emission point is NK 1158 4428 and an updated Site Plan has been provided to replace the one at Condition 1.2 of the existing authorisation. (see **Appendix C**). The discharge will be via a stack located on the roof of a container used to house the boiler. This boiler (within the container) will be located next to the proposed bunded area to the west of the main building on site.

New tanks on site will have passive vent systems. These vents will be connected to the existing system on site that directs all passive emissions from tanks on site to a Granulated Activated Carbon (GAC) system prior to discharging at Emission Point A02. There will therefore be no new emission points resulting from the additional tanks on site.

3.6.1 Summary of Existing and Proposed Emission Points

The following air emissions inventory has been prepared. It identifies all point source emission to air, the pollutants emitted, the source of the emissions and the measures employed to minimise releases.

	Emission Point	A01	A02	A03*
Source of Emission	Source	Selective Catalytic Reduction (SCR) Stack	Activated carbon filtration system	Boiler Flue (proposed)
	Stack height (m)	14	N/A	4.4
	NGR	NK 1161 4426	NK 1161 4426	NK 1158 4428
Monitoring Details	Sampling Location	In stack	In duct before and after carbon bed	In stack
	Frequency	See Table 6.5 of permit	See Table 6.5 of permit	See below**
Limits for Parameters from Emission Source	Carbon Monoxide	150mg/m3	N/A	Will be monitored operationally rather than formal ELV
	Particulate Matter	5mg/m3	N/A	Usually no ELV for gas oil/light fuel oil
	Oxides of Nitrogen	150mg/m3		200mg/Nm3

	(expressed as NO ₂)			
	Sulphur Dioxide	66mg/m ³	N/A	Usually controlled via fuel specification rather than ELV for gas oil
	Temperature	Monitoring required	N/A	N/A
	Smoke	Ringelmann Shade 1	N/A	Ringelmann Shade 1
	Odour		Monitoring required	
	Ammonia	5mg/m ³	N/A	N/A
	Volatile Organic Compound (VOC)	20mg/m ³	20mg/m ³	20mg/m ³
	Hydrogen Sulphide	Monitoring required	N/A	N/A
<i>* Based on use of DERV fuel (diesel)</i> <i>**we currently anticipate that periodic emission monitoring from Emission Point A03 will be undertaken every 3 years (<20 MWth typical), though will also monitor more frequently if found to be higher risk.</i>				

Table 7. Summary of Existing and Proposed Emissions

The principal pollutants associated with boiler combustion are:

- Nitrogen Oxides (NO_x) from fuel combustion
- Carbon Monoxide (CO) from fuel combustion
- Sulphur Dioxide (SO₂) due to presence in fuels
- Particulate Matter due to fuel combustion
- VOCs due to incomplete fuel combustion

Due to the small scale of the combustion plant, use of clean fuel and effective dispersion via the stack, emissions are not expected to have a significant impact on local air quality.

The boiler will operate for a maximum of 12 hours per day. It will be fired on ultra-low sulphur DERV fuel and will be operated in accordance with the requirements of the relevant regulations.

Emissions to air will be minimised through the use of modern combustion controls, preventative maintenance, optimisation of combustion efficiency and the use of ultra-low sulphur fuel. Combustion gases will be discharged via a dedicated stack designed to provide adequate dispersion for the scale of boiler.

The boiler will comply with applicable emission limit values for new medium combustion plant, including an NO_x emission limit value of 200 mg/Nm³ at reference conditions of 3% oxygen, dry gas, 273.15 K and 101.3 kPa

3.7 NATURE OF EMISSION POINT TO SEWER

The centrifuge separates oil, water and solids from the incoming oily wastes. The treated aqueous phase will discharge to sewer under the existing trade effluent consent. Potential contaminants include:

- Residual oil and grease
- COD
- Suspended solids
- Metals
- AOX/halogenated compounds where present in incoming waste streams

All emissions to sewer from the site are via a discharge point that is authorised by a Trade Effluent Consent issued by Scottish Water (Registration No. 12927A/3/D). The most recent version of this consent was issued on 14th June 2021. The consent imposes a range of limits on volume, rate, discharge period, temperature, pH and other substances. Those limits are summarised below in Table 8.

Description/Substance	Limit
Maximum volume in 24 hours	50 m ³
Maximum flow rate	3 l/s
Maximum temperature	40°C
pH	pH 5 – pH 11
Biochemical Oxygen Demand (Settled)	5,000 mg/l
Biochemical Oxygen Demand Load (Settled)	160 kg/day
Chemical Oxygen Demand (Settled)	10,000 mg/l
Suspended solids (total)	1,000 mg/l
Suspended solids load (Total)	40 kg/day
Hydrocarbons (Total)	200 mg/l

Chloride (Total)	20,000 mg/l
Chloride Load	800 kg/day
Respiration Inhibition (EC50) dilution factor	2 DF
Settled COD: Settled BOD ratio	5
Copper (Total)	2 mg/l
Zinc (Total)	2 mg/l

Table 8. Trade Effluent Consent Limits

The sample point for this discharge is located at NK 11608 44241 and the discharge to sewer is located along Damhead Way at NK 11698 44263.

The existing permit (PPC/A/1035666) also requires that monitoring be carried out on emissions to sewer of the parameters set out in Table 9 below. No limits have been set within the permit.

However, a Monitoring Plan for the Systematic Assessment of Emissions to Sewer (Doc. Ref. NS-PR-2214-00) has been prepared, based on the current activities at site, that outlines the monitoring plan for the emissions to sewer. This Plan and the following Assessment will be updated once the Emulsion Unit has been installed. A copy of the Monitoring Plan can be provided upon request.

BAT-AELs are listed in Table 9 below.

There are two sets of BAT- AELs that could potentially apply. According to the BREF for Waste Treatment², the treatment of water based liquid wastes is done to maximise the amount of recyclable material that can be separated so that a minimum amount of auxiliary materials can be used. This can include separating out oils to be used as fuel. During the process water is separated and processed for discharge to sewerage systems or water bodies. The BAT-AEL limits for treatment of water based liquid wastes apply as long as the waste input to be treated consists of aqueous liquids or sludge with a relatively high-water content (> 80 w/w-%). If this does not apply, then the BAT-AELs for the re-refining of waste will apply. The majority of the waste accepted will be subject to treatment of water based liquid wastes. However, BAT-AELs have been provided for both treatment methods

The below BAT-AELs may not apply if the downstream wastewater treatment plant abates the pollutants concerned and will only apply when the substance concerned is identified as relevant in a wastewater inventory.

² https://bureau-industrial-transformation.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf

All emissions are tested regularly both by the site and by Scottish Water to ensure that they comply with the parameters set out within the consent and the permit.

Existing monitoring data and process performance information indicate that discharge concentrations will remain within trade effluent consent limits and below the limits set by BAT (BAT-AELs).

Determinand	BAT-AELs for treatment of water based liquid wastes*	BAT-AELs for re-refining of waste oil
Hydrocarbon Oil Index (HOI)	10 mg/l	10 mg/l
Free Cyanide (CN ⁻)	0.1 mg/l	-
Adsorbable organically bound halogens (AOX)	1 mg/l	-
Arsenic (expressed as As)	0.1 mg/l	0.05 mg/l
Cadmium (expressed as Cd)	0.1 mg/l	0.05 mg/l
Chromium (expressed as Cr)	0.3 mg/l	0.15 mg/l
Hexavalent chromium (expressed as Cr (VI))	0.1 mg/l	-
Copper (expressed as Cu)	0.5 mg/l	0.5 mg/l
Lead (expressed as Pb)	0.3 mg/l	0.1 mg/l
Nickel (expressed as Ni)	1 mg/l	0.5 mg/l
Mercury (expressed as Hg)	10 ug/l	5 ug/l
Zinc (expressed as Zn)	2 mg/l	1 mg/l
*Applies where incoming waste consists of aqueous liquids or sludge with a relatively high-water content (>80 w/w-%)		

Table 9. BAT-AELs for indirect discharges to a receiving water body

The BAT AELs only apply where the substance concerned is identified as relevant in the wastewater inventory.

An updated wastewater inventory will be provided within the Systematic Assessment of Emissions to Sewer, which will be updated following installation of the emulsion unit. The assessment will be updated to reflect any changes in the waste accepted and to determine the likelihood that any of the substances listed in Table 9 will be present. The assessment will also determine and justify the most appropriate limits to be applied (i.e. trade effluent consent limit or BAT-AELs).

3.8 RECORD KEEPING

For a new 1.5 MW oil-fired boiler operating as directly associated plant on a Scottish Part A installation, there is a requirement for record keeping consistent with the various regulations, manufacturers recommendations and BAT.

Typical records expected include the following.

- *Operational Records*
A log of boiler operation shall be maintained including operating hours, fuel consumption, operational issues and periods of maintenance or malfunction.
- *Fuel Records*
Details would be kept on fuel specifications (along with Safety Data Sheets), delivery records, sulphur content.
- *Maintenance Records*
Records will be maintained that detail any planned maintenance events, servicing, inspections, replacements, calibration of controls and sensors, cleaning events, repairs and replacements, and any engineering reports/service sheets.
- *Emissions Monitoring Records*
This will include all monitoring required by the permit and any other monitoring undertaken on the boiler emissions. This is likely to include stack monitoring reports, NO_x monitoring results, any CO, SO₂ and particulate monitoring, evidence of any relevant certifications.
- *Inspection Records*
The site will be required to undertake and record inspections at the site and will therefore need to retain evidence of regular visual inspections of the plant and stack, any audit reports concerning the boiler and more detailed leak/integrity checks.
- *Incident and Complaint Records*
Records of any abnormal emissions, visible smoke incidents, odour, malfunction etc should be recorded along with any complaints received from all parties. A record of any corrective actions taken should also be retained, along with any notifications made to SEPA.
- *Training Records*
Records of any training records demonstrating the competency of operators to operate the boiler should be retained.

4 ENERGY CONSUMPTION AND GENERATION BY SOURCE AND END USE

4.1 OVERVIEW

The proposed installation includes a new 1.5 MW thermal input DERV-fired boiler providing thermal energy to an emulsion treatment unit used for the treatment of waste oily slops. The boiler will supply process heat required to reduce the viscosity of the waste, promote separation of oil and water phases and improve the efficiency of downstream treatment operations.

The installation has been designed to provide heat solely for the treatment process. No electricity or heat will be exported from the site, and no on-site renewable energy generation is currently proposed as part of this permit variation.

4.2 ENERGY SOURCES

The principal energy sources associated with the proposed activity are:

- DERV (Diesel) – fuel for the 1.5MW process boiler providing thermal energy to the emulsion treatment unit.
- Grid Electricity - operation of ancillary equipment including feed pumps, transfer pumps, agitators, control systems, instrumentation and lighting associated with the treatment process.

4.3 PROPOSED ENERGY CONSUMPTION

Final energy consumption will depend upon annual throughput, operating hours and demand. The boiler will operate only when process heating is required and will not operate continuously at full output. Heat demand will vary according to the volume, composition and temperature of incoming waste. Seasonal ambient conditions may also have an effect.

Based on the proposed operating regime of approximately 3,500 hours per annum, the estimated energy demand is summarised in table 10 below.

Energy Source	Annual Consumption	Annual Energy Input	End Use
DERV	~486,000 litres	5,250MWh	Process heating via 1.5MW boiler
Grid Electricity	To be confirmed	To be confirmed	Pumps, mixers, instrumentation, controls and other ancillary equipment

Table 10. Annual Energy Consumption

Assuming a boiler thermal efficiency of approximately 85%, the useful thermal energy available to the treatment process is estimated to be approximately 4,462.5 MWh per annum, with approximately 787.5 MWh per annum representing unavoidable combustion and distribution losses.

4.4 END USE OF ENERGY

Thermal energy generated by the boiler will be used exclusively for process heating. The anticipated distribution of energy use is shown in table 11 below.

End Use	Energy Type	Annual Energy Requirements	Purpose
Emulsion treatment unit	Thermal	4,462.5 MWh	Heating waste oily slops to optimise oil-water separation and treatment efficiency
Feed and transfer pumps	Electrical	-	Transfer of waste between storage, treatment and discharge stages
Agitators and mixers	Electrical	-	Mixing of waste streams and treatment chemicals where required
Instrumentation and Control Systems	Electrical	-	Monitoring and automatic control of the treatment process
Site Services	Electrical	-	Lighting, control panels and ancillary equipment associated with the installation

Table 11. Energy Distribution by End Use

No energy will be used for heating spaces or for other non-process purposes.

4.5 ENERGY EFFICIENCY MEASURES

The proposed installation has been designed in accordance with BAT to minimise energy consumption. Energy efficiency measures include:

- Use of a relatively high efficiency boiler.
- Boiler operations will be controlled automatically in response to process heat demand, preventing any unnecessary fuel consumption.
- Insulation will be used on the boiler, hot water pipework and associated valves to reduce heat loss.

- Pipe runs will be as short as feasibly possible, especially between the boiler and emulsion unit, in order to reduce heat loss.
- Regular preventative maintenance will be undertaken to maintain boiler and emulsion unit efficiency.
- Plant will be routinely inspected and calibrated (i.e. burners and combustion controls).
- Processes will be analysed to minimise treatment times wherever possible and to avoid excessive heating.
- Fuel consumption will be monitored to identify any trends and opportunities for further efficiency improvements

4.6 ENERGY GENERATION

The proposed activity is not designed to generate electricity. No energy will be exported offsite.

4.7 MONITORING AND RECORD KEEPING

As outlined in other parts of this application. records will be retained to show:

- DERV consumption
- Boiler operating hours
- Process throughput
- Routine boiler maintenance
- Fuel efficiency and combustion performance checks
- Annual energy consumption and review of opportunities for continuous improvement

Energy performance will be reviewed periodically as part of the site's EMS to ensure fuel consumption remains consistent with operational requirements and that opportunities to improve energy efficiency are identified and implemented where reasonably practicable.

4.8 ENERGY OPTIMISATION

Estimated performance indicators based on some of the assumptions made within this application are outlined in Table 12 below.

Performance Indicator	Value
Annual throughput	30,000 tonnes
Estimated DERV consumption	486,000 litres per year
Estimated CO ₂ emissions	1,303 tonnes CO ₂ /year
Useful thermal energy	4,462.5 MWh/year

Estimated thermal energy consumption	148.8 kWh per tonne of waste treated
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Table 12. Performance Indicators

Following commissioning of the emulsion unit and boiler, operational data will be reviewed to establish a more accurate energy consumption (kWh per tonne of waste treated). This information will be used to optimise operating parameters, minimise fuel consumption and demonstrate continual improvement in accordance with BAT and SEPA requirements

5 ENVIRONMENTAL RISKS

The environmental risks associated with the proposed installation have been assessed using a source–pathway–receptor methodology consistent with SEPA guidance and the principles of the H1 Environmental Risk Assessment methodology.

The assessment considers:

- Fugitive emissions to air (odour/VOCs) from storage tanks
- Emissions to air from the 1.5 MW thermal input boiler
- Emissions to sewer from the centrifuge treatment process
- Spillage or leakage from tanks, pumps, and pipework
- Noise from centrifuge operation
- Generation of aqueous effluent
- Handling of recovered wastes and residues

5.1 EMISSIONS TO AIR

There will be a single new emission to air from the proposed new activity relating to the boiler.

The proposed boiler will operate as a Medium Combustion Plant (MCP) and will be designed, operated and maintained to achieve applicable emission limit values.

The boiler will:

- Use compliant fuel oil (DERV or an alternative low sulphur fuel).
- Be equipped with low-NO_x combustion technology.
- Discharge via a dedicated stack designed to ensure adequate dispersion.
- Be subject to periodic monitoring and maintenance.

Given the relatively small thermal input (1.5 MW), expected operating hours and emission rates, pollutant concentrations at sensitive receptors are anticipated to be significantly below applicable air quality standards, Environmental Assessment Levels (EALs) and Environmental Quality Standards (EQSs).

All other emissions to air will remain the same on site as are currently outlined within the permit.

The additional tank vents will be integrated into the current abatement system for other tanks on site (these discharge from existing emission point A02).

Following completion of the Proximity Screening Tool (see **Appendix A**) any relevant receptors have been screened out and as a result no further assessment of impact to ecological receptors is required.

5.2 EMISSIONS TO WATER

There are no emissions to water from the site directly to controlled waters.

The drainage systems are periodically inspected and cleaned (interceptors etc) to ensure the structural integrity and performance of the system is maintained.

5.3 EMISSIONS TO SEWER

The centrifuge separates oil, water and solids from the incoming oily wastes. The treated aqueous phase will discharge to sewer under the existing trade effluent consent.

The discharge to sewer will comply with the relevant trade effluent consent limits and/or the relevant BAT-AELs associated with indirect discharges to a receiving water body.

Prior to discharge, the treated aqueous phase will be directed to a bulk storage tank. Samples will be collected and undergo basic tests to determine if the effluent is suitable for discharge. Once confirmation of suitability has been received, the effluent will be discharged in batches (i.e. each batch will be sampled and tested). This monitoring of the trade effluent quality will assist in verifying treatment performance.

If the trade effluent is found to be unsuitable for discharging to sewer it will either be treated again or will be disposed of offsite at a suitably licensed facility.

5.4 EMISSION TO LAND

There will be no direct disposal of waste to land.

All areas where waste is stored and treated within the permitted boundary is laid with impermeable concrete and has sealed drainage. Any areas outside the waste storage and treatment areas are protected due to either the fall of the ground or by strategically located drains and raised kerbs to prevent any uncontrolled runoff.

All liquid chemicals and wastes will also be stored within suitable containers and tanks that are in fully bunded areas. Secondary containment is designed in accordance with CIRIA C736.

Spill response procedures are in place and staff receive regular training on what to do in the event of a spill or other accident.

There will be no pathways direct to ground for any accidental spillages of waste.

All impermeable surfaces, bunds and drainage systems are routinely inspected and repaired as necessary.

These measures minimise the risk of accidental releases reaching groundwater or surface water receptors.

5.5 NOISE AND VIBRATIONS

The addition of the proposed activity will not result in any significant increase in noise and vibrations at the site.

The centrifuge system will be located within the main building which will ensure that it is shielded from potential nearby receptors. Similarly the boiler is housed within a container which provides similar shielding.

The site currently operates in accordance with a Noise Management Plan. Upon installation of the proposed emulsion unit this Noise Management Plan will be reviewed and updated to reflect the changes on site and outline any new noise mitigation measures that may be required.

5.6 ODOUR

Due to the nature of the waste being accepted at the site, the location of the activity and the enclosed nature of the system, odour is not expected to be an issue.

The site current operates in accordance with an Odour Management Plan. Upon installation of the emulsion unit the site's current Odour Management Plan will be reviewed and updated to reflect the changes on site and to outline any additional measures that may be required.

5.7 PESTS

Due to the nature of the waste to be accepted, no impact from pests is envisaged. If pests are identified on site, then a pest contractor will be commissioned to take action.

5.8 LITTER

Litter is unlikely to arise from the proposed new waste types.

The site is well maintained by regular house-keeping measures. Daily walkovers are undertaken to ensure that all housekeeping issues are identified and dealt with. The walkovers also include the identification of litter both on and in the immediate vicinity offsite. Any observed litter, especially if it has arisen from site, is removed immediately.

5.9 DUST

Due to the nature of the wastes accepted at site there will be no increased risk of dust and particulates affecting the locality.

5.10 VANDALISM

The site is located within a secure gated compound. The site is monitored with CCTV. The boiler itself is located within a lockable container.

As a result the risk of vandalism is minimised.

5.11 FIRE

Due to the nature of the new activity the risk of fire on site will not increase.

6 BAT ASSESSMENT

The BAT (Best Available Techniques) Assessment will demonstrate how the site will ensure compliance with current BAT standards as defined in relevant guidance, including the **Waste Treatment BREF**, for the installation and operation of a 3-phase decanter centrifuge system, a 1.5MW thermal input boiler and associated infrastructure at the Eco Centre site

As has already been outlined, the 3-phase decanter centrifuge system will treat oil-based drilling slops arising from onshore and offshore activities, separating them into oil, aqueous, and solid phases for recovery and disposal. The process is primarily physical separation and does not involve thermal treatment, biological degradation, or chemical reactions that would generate significant volatile emissions. This is supported by the 1.5 MW oil-fired boiler and associated infrastructure that have been designed to provide efficient process heat for the centrifuge treatment activities whilst minimising environmental impacts

A detailed BAT Assessment is provided at **Appendix I**.

A summary of some of the measures that will be taken to ensure BAT is met is provided below.

6.1 EMULSION UNIT

6.1.1 Environmental Management

The requirement is for the implementation of an effective Environmental Management System (EMS)

As is outlined in Section 6 of this report, the site operates under a documented EMS that is certified to ISO14001 standards.

Procedures are in place for:

- Waste pre-acceptance and acceptance
- Waste handling and storage
- Waste tracking
- Maintenance and inspection
- Incident management
- Training and competence

Site specific procedures will be prepared for the proposed treatment activity. These will initially be based on the procedures that are already in place at Blackdog and will be amended and updated for the Eco Centre site prior to any treatment commencing.

Also detailed within the documented EMS are procedures around monitoring and control. These procedures set out how routine inspection of tanks, pipework and bunds will be undertaken, how monitoring of effluents will be completed to ensure compliance with applicable consents, maintenance programs and routine site checks.

6.1.2 Waste Acceptance and Handling

Established pre-acceptance and acceptance procedures are already in place for the drilling slops to be accepted under this variation. These procedures will ensure that the composition of the wastes is fully understood and that they are compatible with other wastes that might be stored/treated with at the site.

The drilling slops will be stored within dedicated labelled tanks.

The above measures will ensure that waste is handled safely and securely and that any risk from cross-contamination or uncontrolled reactions are minimised.

6.1.3 Containment and Fugitive Emissions

The process will be fully enclosed and kept separate from other treatment activities on site.

The centrifuge, tanks and all associated infrastructure will be sited on an impermeable surface with a sealed drainage system. The centrifuge unit will be located within a bunded area and suitable bunding will also be provided for tanks and any chemical storage.

Transfer of wastes and chemicals from tanks to the centrifuge will be via enclosed pipes.

The design of all bunds on site is compliant with CIRIA guidance.

The above measures will prevent any emissions to land and minimize any fugitive emission. Therefore, ensuring that the site is compliant with BAT.

6.1.4 Emissions to Air

The centrifuge process itself is enclosed and does not give rise to direct air emissions.

The potential emissions to air are therefore limited to:

- Tank breathing losses via passive atmospheric vents from the storage and process tanks.
- Minor fugitive emissions during transfer operations.

The storage tanks are vented to account for filling and emptying operations, and changes in pressure and temperature.

Oil based drilling slops are characterized by a usually high oil and solids content, relatively low vapour pressure when compared to solvent based wastes and limited presence of highly volatile organic compounds (VOCs). As a result, the potential for significant VOC emissions is low.

The storage tanks will be connected to the current venting system which directs any emissions to Emission Point A02. This will ensure that emissions pass through an existing activated carbon filtration system.

This emission point is subject to regular monitoring as outlined within the sites permit.

6.1.5 Emissions to Water

The treated aqueous phase will be either discharged to sewer under the existing trade effluent consent, or if deemed unsuitable, tankered off-site to a suitably authorized facility (likely to be our site in Greenbank, Tullos where it will be discharged to sewer).

All emissions to sewer are stored in a tank where it is sampled and tested prior to discharge.

The clean and dirty (potentially contaminated) drainage systems are segregated. Emissions to water are all controlled and compliant.

6.1.6 Odour

Odour potential will typically be associated with hydrocarbon odours. The source of these odours will be limited to tank vents and waste handling.

The centrifuge will be located within the existing building on site. This, along with ensuring that the equipment is properly maintained and enclosed will ensure that any risk of odour to nearby receptors is minimized.

There will be no open handling of the wastes or exposed steps to the process.

Routine site inspections are already undertaken on site to detect any abnormal odours. These inspections will be amended to ensure that the new process is included.

The site's current Odour Management Plan will be reviewed and updated upon installation of the Emulsion Unit.

Therefore, the overall odour risk is assessed as low due to the characteristics of the accepted waste, the enclosed system and due to the main treatment being undertaken within a building.

6.1.7 Noise and Vibration

The centrifuge will be located within the existing building on site. This, along with ensuring that the equipment is properly maintained to reduce noise and vibration will ensure that any risk of noise to nearby receptors is minimized. The existing Noise Management Plan will be updated.

A Noise and Vibration Systematic Assessment was prepared and submitted to SEPA in January 2026 for the current operations on site. This document will be updated prior to commencement of operations at the site.

6.1.8 Energy Efficiency

This has been achieved through the use of an efficient 3-phase decanter centrifuge that will only be operated when required. In addition, the use of automated controls will optimize the operation.

6.1.9 Chemical Use

The use of chemicals (e.g., flocculants) will be controlled with doses calculated to ensure efficient treatment and to reduce waste. All chemicals will be stored within a bunded area.

6.1.10 Waste Generation and Management

The outputs from the treatment process will comprise of:

- Oil fraction which will be either reused as fuel on site or sent offsite for reuse.
- Aqueous phase which will be either discharged to sewer or sent offsite following sampling to ensure the most appropriate option is followed.
- Solid cake which will be sent for disposal at landfill.

All outputs will be stored in appropriate containers and tanks and will be removed from site only by licensed contractors.

6.1.11 Conclusion

The proposed installation of the 3-phase decanter centrifuge system for the treatment of oil-based drilling slops represents the application of Best Available Techniques.

The system is enclosed and designed to prevent emissions, control discharges to sewer, minimise the generation of waste and maximise compliance with the waste hierarchy. The

proposed activity will also operate under an established Environmental Management System using procedures that have been shown to work due to their use on the Blackdog site. The redeployment of staff from Blackdog to Eco Centre who are already fully trained in the use of the centrifuge system will also be of significant benefit.

As a result, the relocation of the plant does not adversely affect compliance with BAT. The installation is designed, operated, and managed in accordance with Best Available Techniques, with appropriate controls in place to prevent or minimise emissions to air, water, and land. The activity will not give rise to significant pollution and is consistent with the requirements of the Scottish Environment Protection Agency.

6.2 BOILER

6.2.1 Environmental Management

The boiler will be operated under the site's ISO 14001 accredited Environmental Management System (EMS). The site therefore has procedures for:

- operation and shutdown;
- preventative maintenance;
- fuel management;
- inspection and monitoring;
- incident response; and
- record keeping.

Operational controls and automated safety systems will be implemented to ensure efficient and stable combustion conditions are maintained.

The boiler will only operate when required for treatment activities in order to minimise fuel consumption and emissions.

6.2.2 Energy Efficiency

The boiler has been selected to provide thermal input proportionate to operational requirements associated with the centrifuge process.

Energy efficiency measures include:

- automated combustion controls;
- temperature regulation systems;
- operation only during treatment activities;
- routine maintenance;
- insulated pipework and associated infrastructure; and
- optimisation of process heating requirements.

The use of a dedicated boiler improves process efficiency by maintaining optimum centrifuge operating conditions and reducing process instability.

6.2.3 Emission to Air

Emissions to air from the boiler primarily consist of:

- oxides of nitrogen (NO_x);
- carbon monoxide (CO);
- combustion gases;
- particulates; and
- sulphur dioxide (SO₂), dependent on fuel composition.

It is intended that emissions will be minimised through the:

- use of ultra-low sulphur fuels;
- preventative maintenance;
- refining the combustion process;
- appropriate operating temperatures; and
- only operating the burner when required.

Combustion gases will be discharged via a dedicated stack that will provide appropriate dispersion of emissions.

6.2.4 Monitoring and Maintenance

The boiler will be regularly maintained and inspected in accordance with manufacturer recommendations and permit requirements.

Records will be maintained and retained on site that outline:

- operating hours;
- fuel usage;
- maintenance activities;
- inspections;
- breakdowns;
- abnormal operating conditions; and
- emissions monitoring where required.

Periodic emissions monitoring will be undertaken as required by the permit and Medium Combustion Plant requirements.

6.2.5 Pollution Prevention and Loss of Containment

Fuel storage and associated infrastructure will be located within suitable containment systems designed in accordance with the relevant principles of CIRIA C736 (*Containment Systems for the Prevention of Pollution*)

Associated pipework, pumps and transfer systems will be subject to routine inspection and maintenance to minimise the potential for leaks and spills.

The boiler will be located within a lockable container which will have an impermeable surface with sealed drainage systems where appropriate.

6.2.6 Conclusion

The proposed 1.5 MW oil-fired boiler and associated infrastructure have been designed to provide efficient process heat for the centrifuge treatment activities whilst minimising environmental impacts.

The combination of:

- appropriate plant selection;
- energy efficiency measures;
- ultra-low sulphur fuel use;
- combustion optimisation;
- emissions controls;
- preventative maintenance;
- containment infrastructure; and
- operational management measures

is considered to represent Best Available Techniques for the scale and nature of the proposed activity.

7 MANAGEMENT SYSTEM

7.1 ACCREDITATION

Augean North Sea Services Ltd's Management System has achieved certification from BSI (UKAS Accredited Certification Body) for:

- ISO 9001:2015 Quality Management;
- ISO 14001:2015 Environmental Management;
- ISO 45001: 2018 Occupational Health and Safety.

Copies of the ISO certificates can be found in **Appendix J**.

7.2 SUMMARY

No changes to the structure of the management system are proposed as a result of this variation.

Existing procedures are already in place for the treatment activity undertaken at our Blackdog site. These procedures will be adapted and updated so that they apply to the activities when they are undertaken at our Eco-centre site in Peterhead.

7.3 PLANNED MAINTENANCE PROGRAMME

Planned programmes of inspection, maintenance and testing are already in place at the site and will be adapted to include the new treatment activity and infrastructure. These will ensure the integrity of the equipment and the infrastructure at the Eco-centre site. The existing measures used at Blackdog to monitor the condition of the equipment will be adapted for use at the Eco-centre site.

8 COMMISSIONING PLAN

8.1 OBJECTIVE

The objective of the commissioning programme is to ensure that the installation is constructed, operated and maintained in accordance with the permit requirements, Best Available Techniques (BAT), and the approved management system before routine operations commence.

Commissioning activities will be completed in a phased manner to verify the integrity and performance of all process equipment, containment infrastructure and environmental protection measures.

8.2 STAGE 1 – PRE-OPERATIONAL VERIFICATION

Prior to the introduction of waste materials to the newly installed plant the following inspections and checks will be completed:

1. All plant and equipment to have been installed in accordance with approved design specifications.
2. Storage tanks, pipework, pumps and associated process equipment to be inspected.
3. Bund capacities and secondary containment systems to be verified.
4. Impermeable surfacing and drainage infrastructure to be inspected.
5. Confirmation that all drainage routes are properly connected.
6. Ensure that emergency shut-off systems are operational.
7. Spill response equipment must be readily available.
8. Any operator training must be completed.
9. Completion of maintenance schedules and inspection procedures.
10. All monitoring equipment installed and calibrated where required.

Any defects identified during inspection will be rectified before the next stage.

8.3 STAGE 2 – MECHANICAL AND DRY COMMISSIONING

The installation will undergo dry commissioning using water and non-waste materials to ensure:

1. Pump operation and flow rates are as expected.
2. Pipework integrity is good.

3. Tank level controls and alarms are operational.
4. Centrifuge mechanical performance is as expected.
5. Boiler operation and safety systems perform as expected.
6. Drainage system performs as planned.
7. Emergency shutdown systems operate as expected.

Any operational issues identified will be addressed before introducing waste feedstocks.

8.4 STAGE 3 – WET COMMISSIONING

Wet commissioning will be undertaken using representative waste streams introduced progressively at controlled throughput rates. The following will be monitored:

1. Centrifuge throughput.
2. Oil recovery efficiency.
3. Solids separation efficiency.
4. Process stability.
5. Trade effluent quality.
6. Equipment reliability.
7. Fugitive emissions.
8. Noise and odour performance.

At this stage the operating parameters can be adjusted to optimize treatment.

8.5 STAGE 4 – INITIAL OPERATIONAL PHASE

Following successful commissioning, the installation will operate under normal operating conditions for a defined period of time. Data collected during this period will then be reviewed to confirm that:

1. The installation is operating as designed.
2. Environmental protection measures are effective.
3. Trade effluent quality remains within the defined limits.
4. BAT performance requirements are being achieved.
5. There are no unexpected impacts to the environment or human health

Following this phase a commissioning report can be prepared summarizing the checks and performance data. The report will be retained on site.

8.6 VALIDATION TESTS

8.6.1 Centrifuge Treatment Process

Validation testing will be undertaken to demonstrate the effective treatment of oily waste streams and the protection of the receiving sewerage system.

Representative samples will be collected of the waste both pre-treatment and post-treatment, and it will be analysed for the following relevant parameters:

- Oil and grease.
- Total petroleum hydrocarbons.
- Chemical Oxygen Demand (COD).
- Suspended solids.
- Metals.
- AOX/halogenated compounds.
- Other parameters set out by the trade effluent consent.

The results of this analysis will be compared against the existing trade effluent consent requirements, BAT-AELs for indirect emission to water bodies and historical performance data (i.e. existing).

The testing should show that the treatment process achieves stable and effective pollutant reduction.

8.6.2 Boiler

The boiler will be commissioned and tested in accordance with manufacturer specifications and applicable Medium Combustion Plant requirements.

Emissions Monitoring will be undertaken for:

- Nitrogen oxides (Nox)
- Carbon Monoxide (CO)
- Sulphur dioxide (SO₂)
- Particulates

Testing should confirm compliance with the applicable emission limits and permit requirements.

8.7 COMPLETION OF COMMISSIONING PHASE

Routine operations will only commence once all commissioning activities have been completed. These commissioning activities should demonstrate that the process equipment and environmental protection measures are functioning correctly, air and sewer emissions remain within the permitted/consented limits and no significant risk to the environment or human health has been identified.

The results of the commissioning programme will be documented and can be made available to SEPA should it be required.

Appendix A

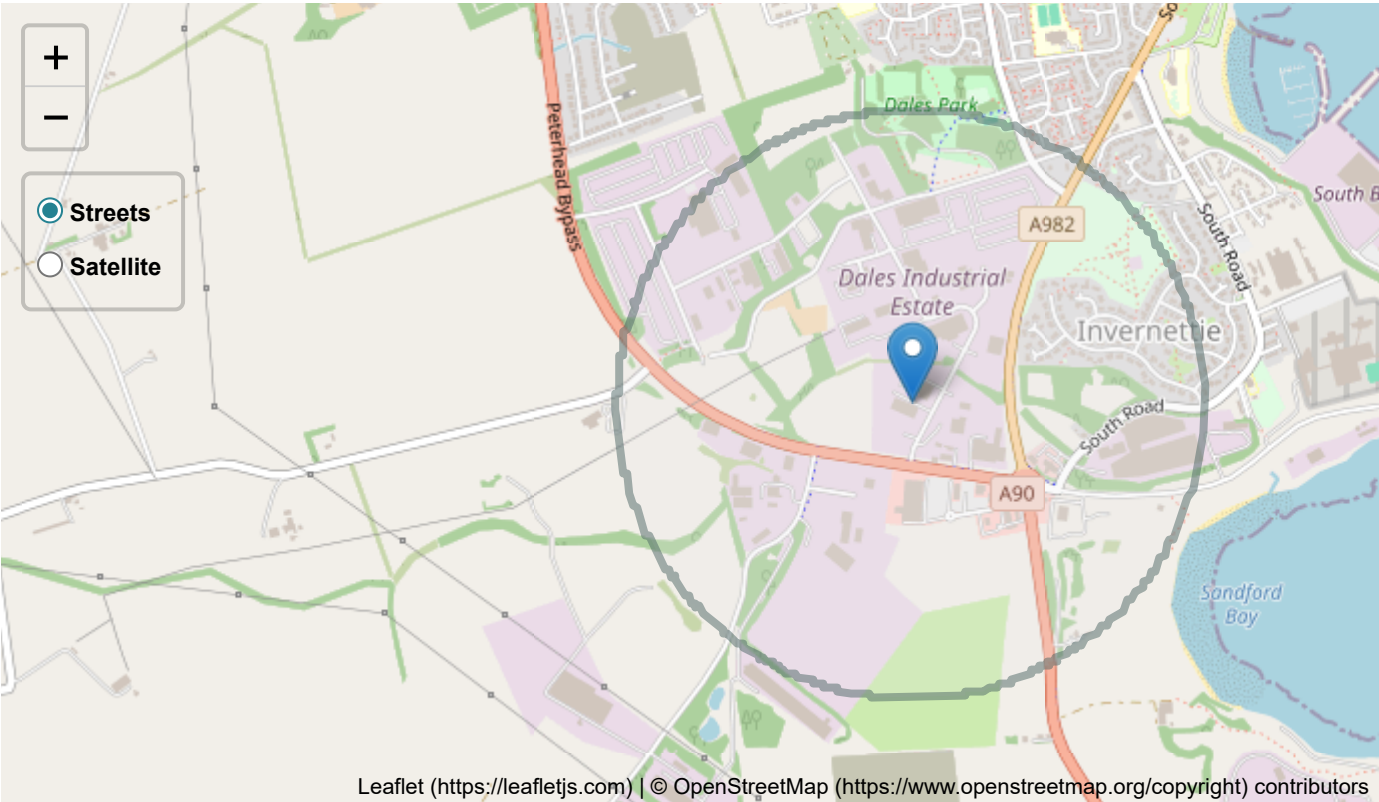
MCP Screening Tool Report

Report generated on 2026-05-26 08:13:30.382813

Operating Company Information

name	ANSS
Northing/Latitude	844264
Easting/Longitude	411638
thermal capacity MWth	1-2
fuel type	Fuels with no SO2 ELVs

Map overview



Interest Sites and ecological receptors found

The search found 0 sites with 0 relevant ecological receptors within the 0.75 Km radius.

Appendix B

Units achieved by



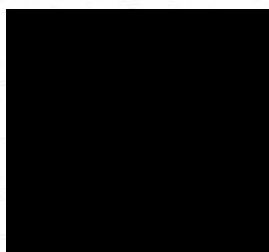
Units gained:

Level

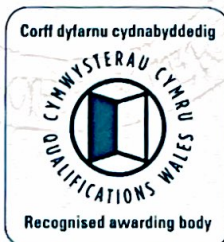
A/508/0756	Maintain health and safety in the waste resource management industry	L4
F/508/0757	Manage the environmental impact of work activities	L4
F/508/0760	Manage the movement, sorting and storage of waste	L4
R/508/0861	Control work activities on a waste management facility	L4
K/508/0882	Identify and implement improvements to waste management operations	L4
M/508/0883	Control maintenance and other engineering operations	L4
T/508/0884	Procedural Compliance	L4
A/508/0885	Manage and maintain systems for responding to emergencies	L4
F/508/0886	Manage the reception of hazardous waste	L4
M/508/0978	Manage transfer and disposal from hazardous waste treatment and recovery operations	L4

Verification date: 04/11/2024

Authorised:



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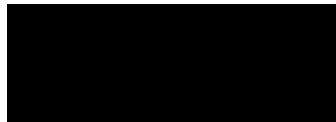


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CIWM



Units gained:

H/508/0993	Manage site operations for the treatment of hazardous waste
Y/508/0974	Manage an inspection visit at your site from regulatory bodies

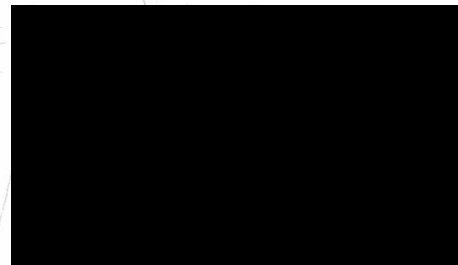
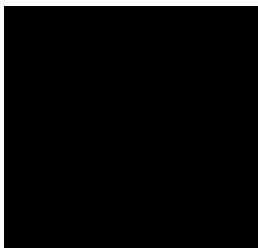
Level

L4

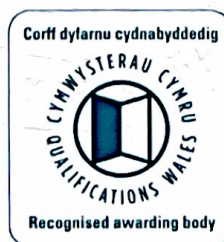
L4

Verification date: 04/11/2024

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Operator Competence Certificate

Title:

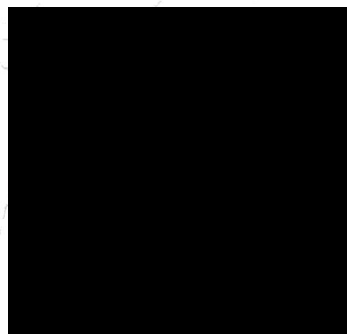
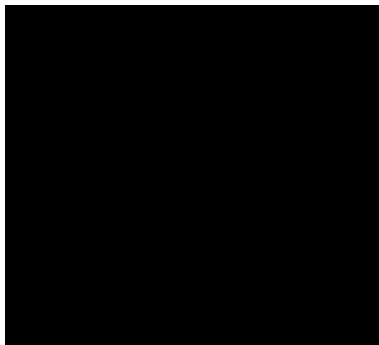
Physical and Chemical Treatment of Hazardous Waste

This Certificate is awarded to



Verification date: 04/11/2024

Authorised:



CIWM Chief Executive Officer



The Chartered Institution
of Wastes Management

This certificate is awarded by the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.



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CIWM

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

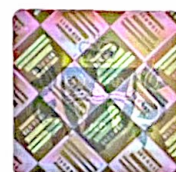
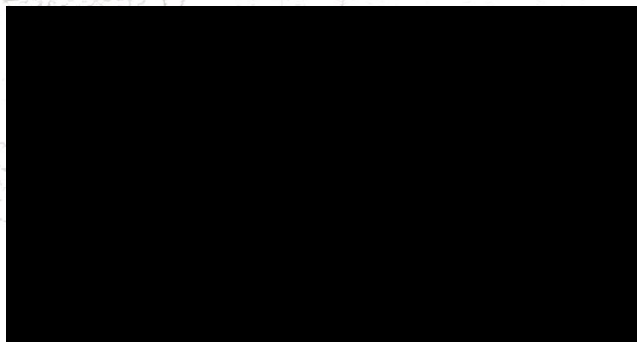


*Has demonstrated the standard of technical competence required for the
management of a facility of the type set out below*

Facility Type

Level 4 in Waste Management Operations -
Managing Treatment Hazardous Waste (4TMH)

Authorising Signatures:



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CIWM

Qualification Title:

CIWM (WAMITAB) Level 4 High Risk Operator Competence
for Managing Transfer of Hazardous Waste

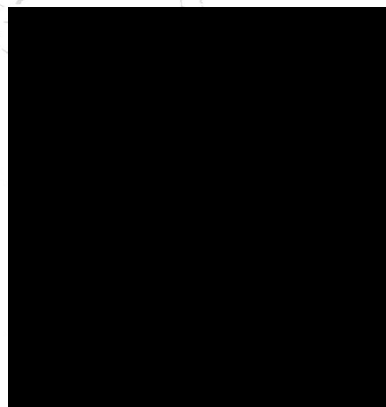
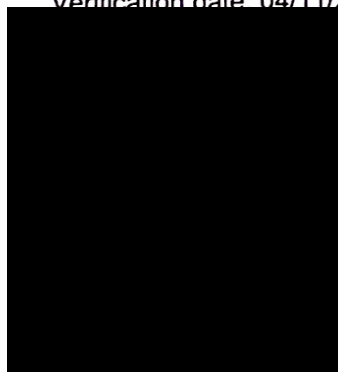
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601/8504/1

This Certificate is awarded to



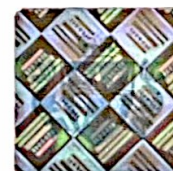
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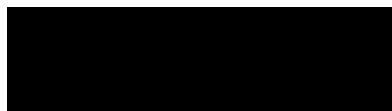


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Units achieved by

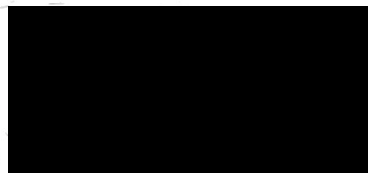
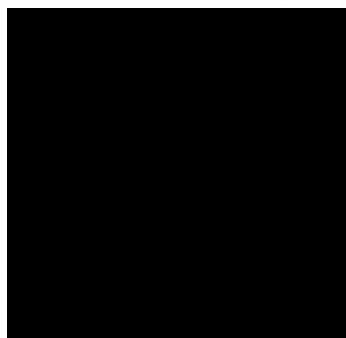


Units gained:

Level

A/508/0756	Maintain health and safety in the waste resource management industry *
F/508/0757	Manage the environmental impact of work activities *
F/508/0760	Manage the movement, sorting and storage of waste *
R/508/0861	Control work activities on a waste management facility *
K/508/0882	Identify and implement improvements to waste management operations *
M/508/0883	Control maintenance and other engineering operations *
T/508/0884	Procedural Compliance *
A/508/0885	Manage and maintain systems for responding to emergencies *
F/508/0886	Manage the reception of hazardous waste *
Y/508/0974	Manage an inspection visit at your site from regulatory bodies *

Verification date: 04/11/2024



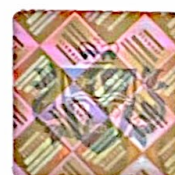
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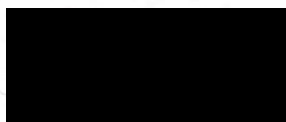


gea
Regulation

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Level

Units gained:

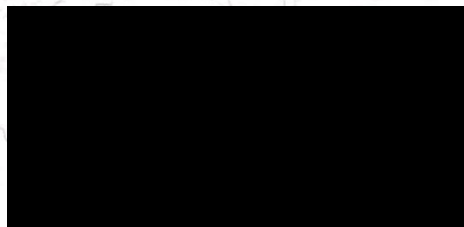
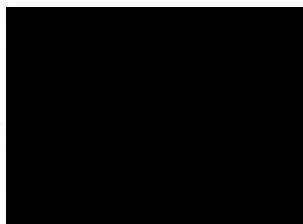
J/508/0758 Organise the transportation of loads on a waste management facility
F/508/0984 Manage transfer and disposal from hazardous waste transfer and recovery operations

L4

L5

Verification date: 04/11/2024

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CIWM

Operator Competence Certificate

Title:

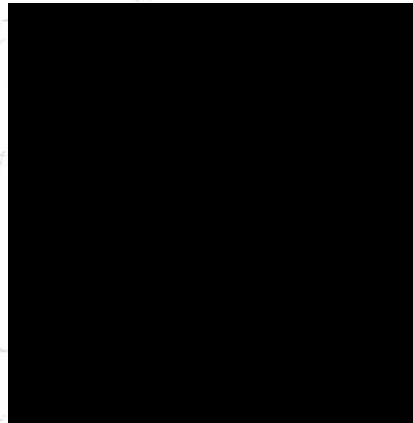
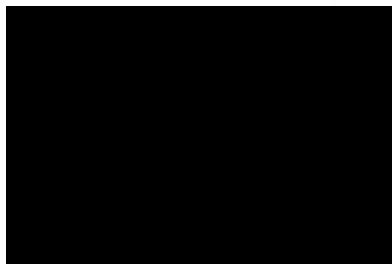
Transfer of Hazardous Waste

This Certificate is awarded to



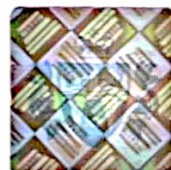
Verification date: 04/11/2024

Authorised:



The Chartered Institution
of Wastes Management

This certificate is awarded by the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.



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CIWM

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that



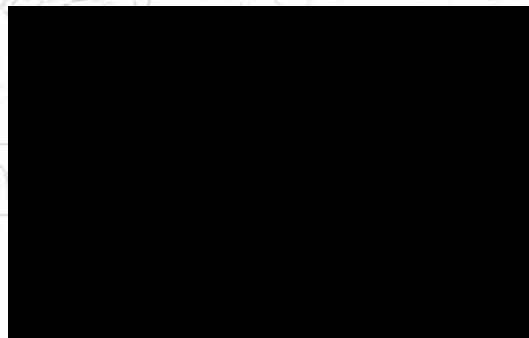
*Has demonstrated the standard of technical competence required for the
management of a facility of the type set out below*

Facility Type

Level 4 in Waste Management Operations -

Managing Transfer Hazardous Waste (4TSH)

Authorising Signatures:



Scan code on reverse to authenticate that this is a genuine paper

Qualification Title:

CIWM (WAMITAB) Level 4 High Risk Operator Competence
for Managing Physical and Chemical Treatment of Hazardous
Waste

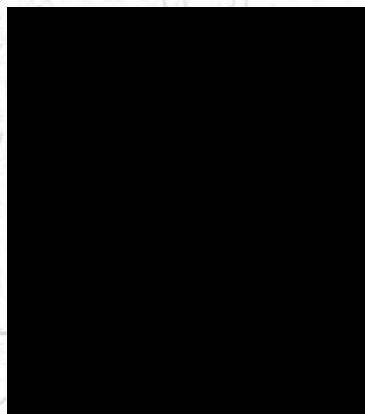
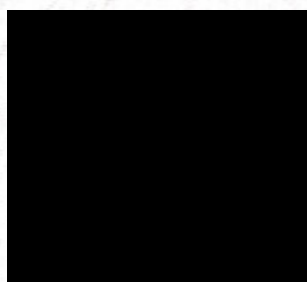
Qualification Accreditation Number:

601/8502/8

This Certificate is awarded to

Verification date: 06/01/2025

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CIWM

Units achieved by

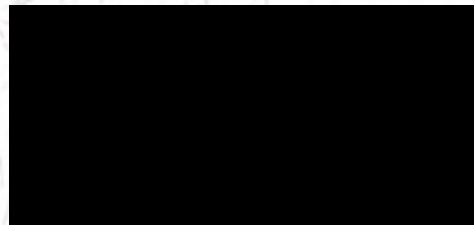
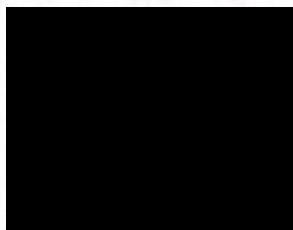


Units gained:

		Level
A/508/0756	Maintain health and safety in the waste resource management industry	L4
F/508/0757	Manage the environmental impact of work activities	L4
F/508/0760	Manage the movement, sorting and storage of waste	L4
R/508/0861	Control work activities on a waste management facility	L4
K/508/0882	Identify and implement improvements to waste management operations	L4
M/508/0883	Control maintenance and other engineering operations	L4
T/508/0884	Procedural Compliance	L4
A/508/0885	Manage and maintain systems for responding to emergencies	L4
F/508/0886	Manage the reception of hazardous waste	L4
M/508/0978	Manage transfer and disposal from hazardous waste treatment and recovery operations	L4

Verification date: 06/01/2025

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Units gained:

H/508/0993	Manage site operations for the treatment of hazardous waste
Y/508/0974	Manage an inspection visit at your site from regulatory bodies

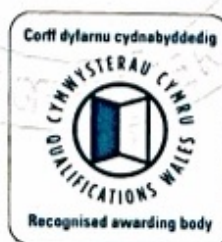
Level

L4

L4

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Operator Competence Certificate

Title:

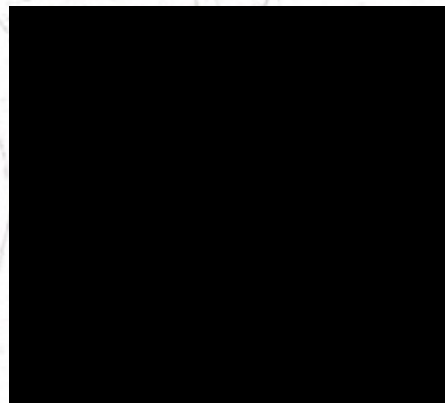
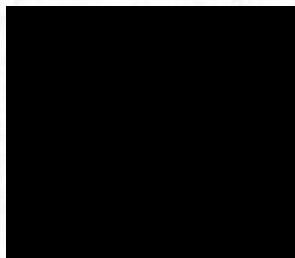
Physical and Chemical Treatment of Hazardous Waste

This Certificate is awarded to



Verification date: 06/01/2025

Authorised:



The Chartered Institution
of Wastes Management

This certificate is awarded by the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.



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CIWM

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

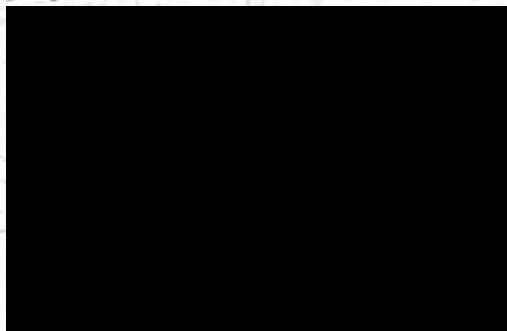


*Has demonstrated the standard of technical competence required for the
management of a facility of the type set out below*

Facility Type

Level 4 in Waste Management Operations -
Managing Treatment Hazardous Waste (4TMH)

Authorising Signatures:



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CIWM

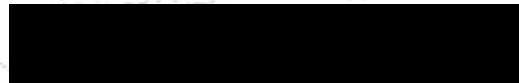
Qualification Title:

CIWM (WAMITAB) Level 4 High Risk Operator Competence
for Managing Transfer of Hazardous Waste

Qualification Accreditation Number:

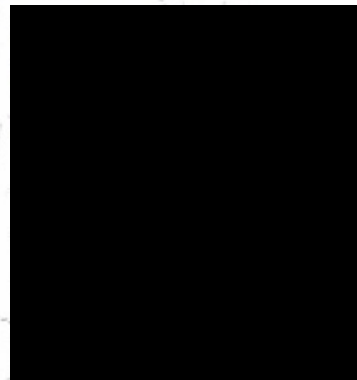
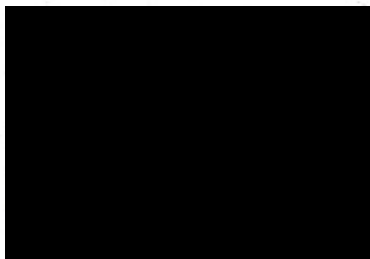
601/8504/1

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Units achieved by



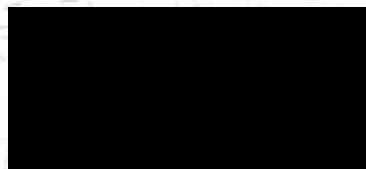
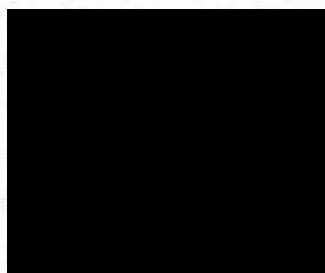
Units gained:

Level

A/508/0756	Maintain health and safety in the waste resource management industry *
F/508/0757	Manage the environmental impact of work activities *
F/508/0760	Manage the movement, sorting and storage of waste *
R/508/0861	Control work activities on a waste management facility *
K/508/0882	Identify and implement improvements to waste management operations *
M/508/0883	Control maintenance and other engineering operations *
T/508/0884	Procedural Compliance *
A/508/0885	Manage and maintain systems for responding to emergencies *
F/508/0886	Manage the reception of hazardous waste *
Y/508/0974	Manage an inspection visit at your site from regulatory bodies *

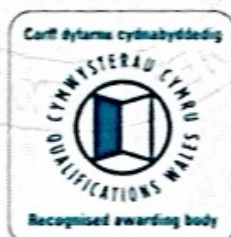
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*Unit/s marked with an asterisk have been achieved previously

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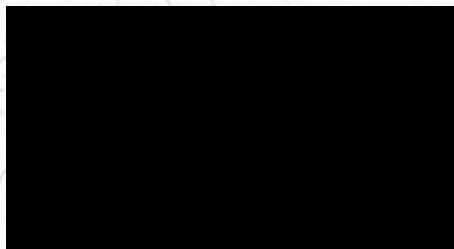
Units gained:

J/508/0758	Organise the transportation of loads on a waste management facility
F/508/0984	Manage transfer and disposal from hazardous waste transfer and recovery operations

Level

L4
L5

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Operator Competence Certificate

Title:

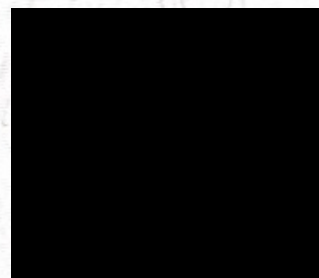
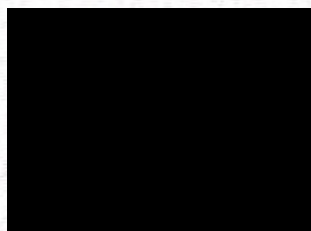
Transfer of Hazardous Waste

This Certificate is awarded to



Verification date: 06/01/2025

Authorised:



CIWM Chief Executive Officer



The Chartered Institution
of Wastes Management

This certificate is awarded by the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.



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CIWM

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

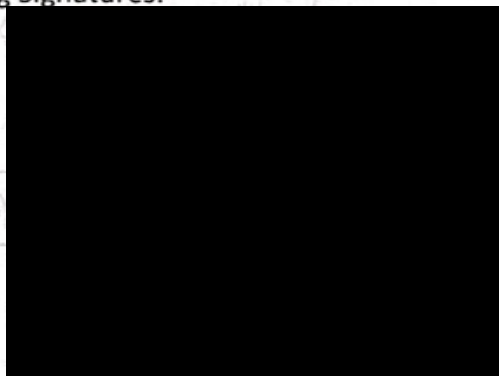


*Has demonstrated the standard of technical competence required for the
management of a facility of the type set out below*

Facility Type

Level 4 in Waste Management Operations -
Managing Transfer Hazardous Waste (4TSH)

Authorising Signatures:



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Appendix C

Site Plan
1.500

The drawing shows a plan view of a proposed concrete structure. A scale bar at the top indicates distances from 0 to 1500m. A north arrow is located in the upper right corner. The structure is a long, narrow wall with a series of rectangular openings. The drawing is labeled 'Layout as proposed 1100' and 'New concrete'.

[illegible]

Layout as proposed
1.100

Appendix D

		Emulsion Flow Process - Blackdog			
Document No: NS_BDG_P.01		Version No.	1	Page number:	Page 1 of 1
Creation Date:	22/08/2018	Last Review:	21/09/2023	Next review date:	21/09/2026

1. PURPOSE & SCOPE:

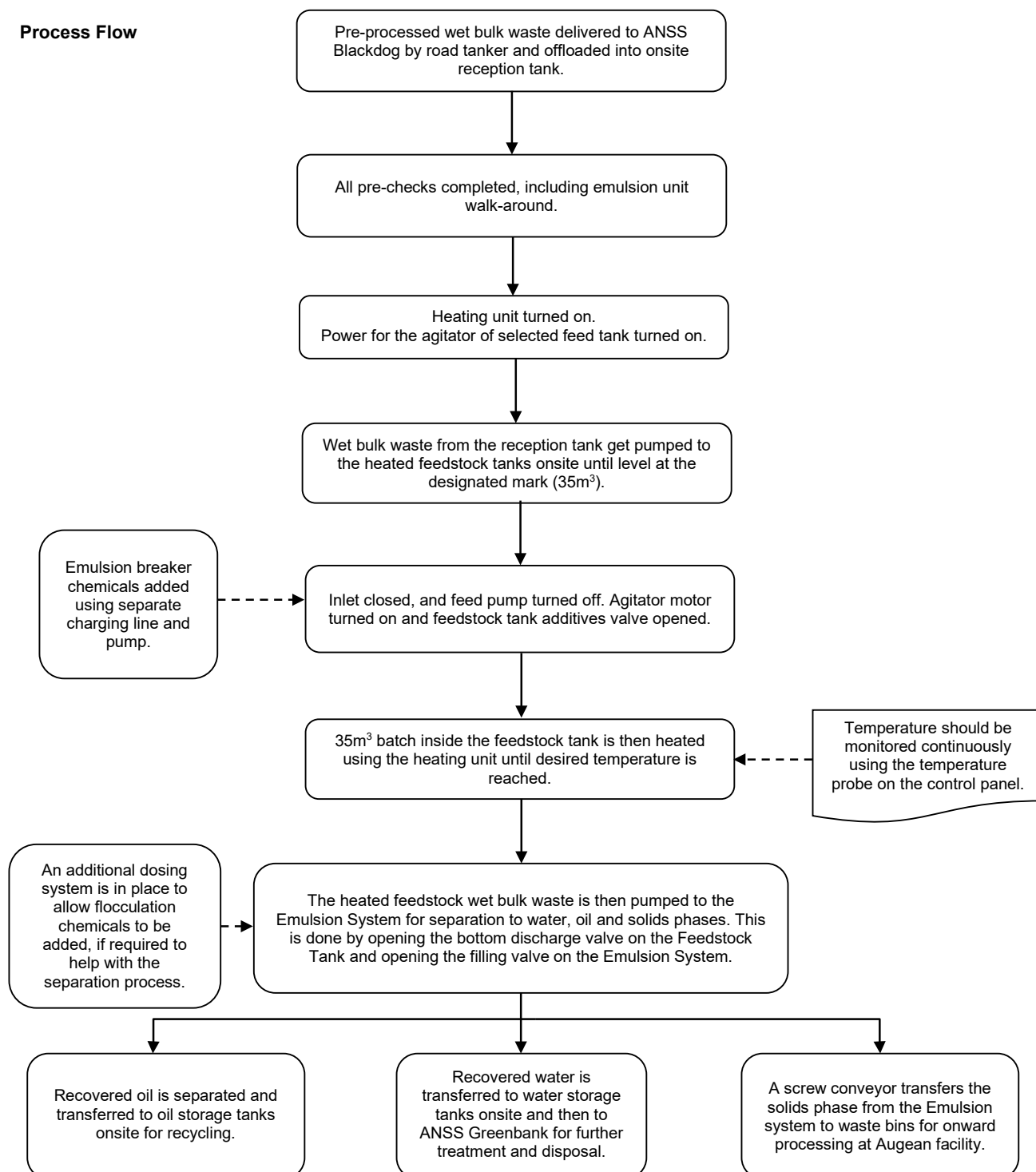
This Augean North Sea Services (ANSS) procedure is to describe the process for wet bulk waste delivery into ANSS Blackdog and its processing by a 3-phase separation emulsion system.

2. PROCEDURE:

See the flow diagram (Figure 1) below which describes the process for wet bulk waste delivery into the ANSS Blackdog site and it's processing into the separation emulsion system.

Figure 1

Process Flow



Appendix E

Three-phase Centrifuge for solid-liquid separation

DecaOil DO54-423DB

**Vapor proof design
with hydraulic-drive
and adjustable tubes**



Operating Instructions DO540025-51-00E

Keep this operating instructions for use in future!

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Reprint, also in parts, is only permitted with our express consent.

The data in these installation instructions have been checked concerning its correctness with very special care. Nevertheless, no liability can be assumed for possibly faulty or incomplete data.

Subject to technical modifications!

HILLER GmbH
Schwalbenholzstrasse 2
D - 84137 Vilsbiburg

tel: +49 (0)8741/48-0
fax: +49 (0)8741/48-139

mail: info@hillerzentri.de
web: www.hillerzentri.de

EU-Declaration of conformity

with reference to the Machine Directive 2006/42/EC, Appendix II 1 A,
the Low Voltage Directive 2006/95/EC
and the Explosion Protection Directive 94/9/EC, Appendix X

We hereby declare that the machine described below conforms to the fundamental health and safety requirements of EC Machine Directive 2006/42/EC. The technical documentation has been created in accordance with Appendix VII A.

Description of the machine:

Machine designation	: Solid bowl scroll centrifuge
Machine type	: DecaOil DO54-423DB
Machine number	: H5472
Year of manufacture	: 2014
Feed material	: Mud
max. spec. density of the feed material	: 1,30 kg/dm ³
min./max. product temperature	: 0/100°C
max. operating speed	: 3200 1/min

This machine has been designed and manufactured in conformity with the following harmonised standards:

DIN EN ISO 12100:2011, DIN EN 12547:2014, DIN EN ISO 13849-1:2016,
DIN EN 1127-1:2011, DIN EN 13463-1:2009, DIN EN 13463-5:2011, DIN EN 13463-6:2005,
DIN EN 15198:2007, DIN EN 60079-14:2014, ISO 1813:2014

The marking of the device contains the following information:

  II 2G cb IIB T4

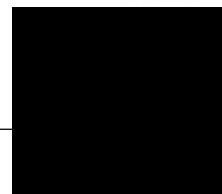
The technical file is deposited at **Hiller GmbH**.

For ancillary products intended for attachment to the machine described above, a declaration of conformity or installation must be present and the assembly work must be carried out in conformity with the requirements. The commissioning of the machine described above is forbidden unless these points have been established.

This declaration shall no longer be valid in the event of improper usage and modifications being made to the machine that have not been discussed with the manufacturer.

Vilsbiburg, 2017-09-25

Signature: Managing Director, 



The person authorised to compile the technical file is the manufacturing company.

HILLER GmbH, Schwalbenholzstraße 2, D-84137 Vilsbiburg, Germany

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1. Foreword



Dear Customer These operating instructions are intended to make usage of the HILLER centrifuge (also referred to as the "machine" hereafter) easier and help you to make best use its intended range of applications.



Important!

- Read the operating instructions (in particular chapter 2 "Safety").
- The assembly, operating, servicing and maintenance conditions specified in these operating instructions must be strictly followed.
- The operating instructions must be made available to authorised personnel.
- Keep the operating instructions near the machine.
- Observe and apply the information in other operating instructions (hydraulic pump unit, hydromotor, control units, etc.).

The illustrations and information in these operating instructions are subject to technical changes required to improve the machine.

The illustrations included in these operating instructions are for information only and no liability is accepted.

The operating instructions are not subject to change management.

1.1 Copyright

The legal owner of the copyright for these operating instructions is HILLER.

The operating instructions contain regulations and descriptions of a technical nature, which may not be reproduced, distributed or reused as a whole or in part or shared with others for the purposes of competition.

2. Safety

2.1 Hazards of this machine



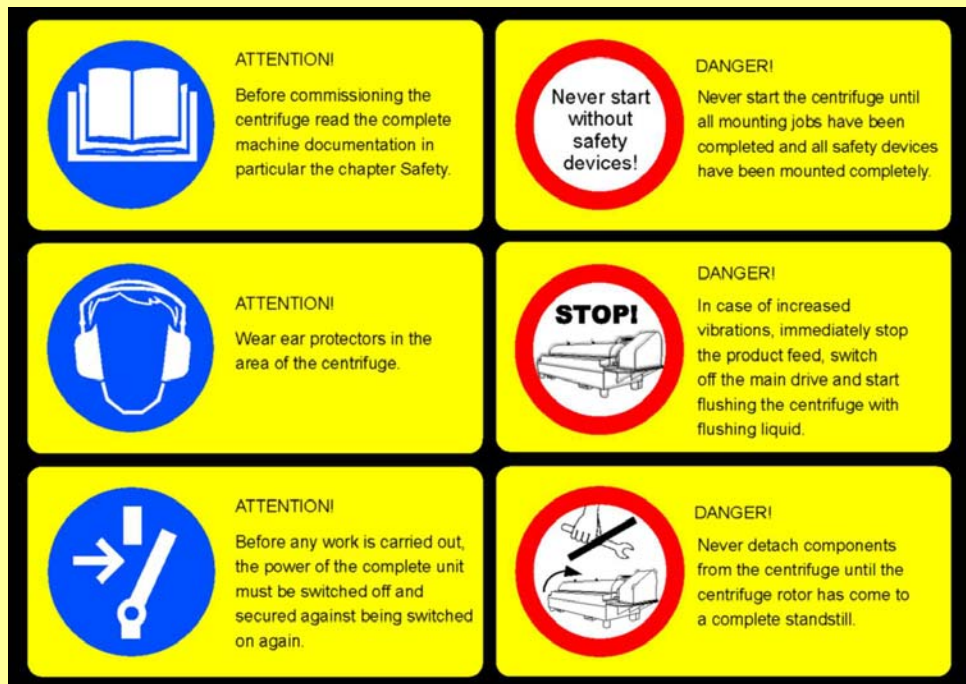
Warning!

- The centrifuge has been subjected to a safety inspection and to safety acceptance.
- It is imperative that you read the operating instruction! It concerns your safety.
- Ignoring these operating instructions, or the safety guide lines, can lead to serious injuries to persons and to damages at the centrifuge which are outside the responsibilities of HILLER.
- Together with these operating instructions, the generally valid safety regulations and the regulations for the prevention of accidents must be complied with.

2.2 Notes on safety

2.2.1 at the machine

At the centrifuge a safety label is find on each side of the base frame. It is imperative that you attend this safety label and keep them in well readable form.



2.2.2 in the operating instructions

The following symbols are used in these operating instruction:



Warning!

Describes a possibly hazardous situation. When ignoring this note, death or serious injuries can occur.



Caution!

Describes a possibly hazardous situation. When ignoring this note, slight injuries can occur.



Important!

Describes tips on applications and other useful information.



Warning!

Designates a situation that takes affect to the explosion safety of the machine. Failure to comply can result in death or serious injuries.

2.3 Designated application

The HILLER solid-bowl scroll centrifuge is designated exclusively for separation of solid-liquid suspensions contractually specified. Any usage other than the one described here will be deemed as not according to designation.



- Materials containing long fibres, elongated objects and fibrous fabrics can become entangled and must be prevented from entering the machine. To exclude unsuitable grain sizes and foreign media, the feed material must be sieved, crushed and homogenised possibly with a Mazerator to guarantee an evenly-distributed layer of solids in the centrifuge bowl.
- Never operate the HILLER centrifuge with suspension with higher density, higher temperature, different composition, inadmissible speed etc. than contractually agreed.
- Independent re-builds or modifications of the machine are prohibited for safety reasons.
- The operator must evaluate whether the feed material or the individual phases may become statically charged and can form an effective ignition source. Where appropriate, more stringent protective measures must be taken.
- It is intended to set up the centrifuge within a range of the zone 2. The customer declares also zone 2 for the inside of the decanter (housing).
- The flash point of oil sludge is at least (15+5) ° C above the max. feed temperature of the sludge task.
- The sludge temperature must be monitored by operator and has to be limited so that the maximum temperature usually not will be exceeded, and if so, only rarely and briefly.
- Foreign objects > 5 mm must be excluded by the operator in the intended use.

- The operator must ensure that system parts connected to the centrifuge cannot cause a source of ignition and do not interact any explosions on the centrifuge.
- The following sources of ignition be evaluated by the operator:
- Interference currents / lightning / electrom. waves / ionizing radiation / ultrasound / adiabatic compression / exothermic reactions

2.3.1 Operating data

rotor diameter:		540 mm
rotor speed:	min/Normal/max	2000 / 3000 / 3200 1/min
differential speed:	min/Normal/max	2 / 10 / 21 1/min
feed rate:	min/Normal/max	10 / 15 / 20 m³/h
feed temperature:	min/Normal/max	10 / 50-80 / 100 °C

2.3.2 Operational mode

The centrifuge is driven continuously. Starting and deceleration as well as regular maintenance require less than 1.000 h/a.

2.3.3 Substances

There are processed oil sludges.

2.3.4 Atmosphere

The following site conditions apply:

altitude:	< 1000 m above sea level
pressure:	0,8 to 1,1 bar
temperature:	-15 to +40 °C

2.3.5 STK-product

It is expected explosive gases of group IIB.

2.3.6 Auxiliary supplies

The used auxiliary supplies (hydraulic oil, grease) exhibit an ignition temperature lying around at least 50 °C over the evaluated surface temperature (flash point > 200°C base oil).



Important!

The operating, maintenance and servicing conditions specified in these operating instructions must be strictly complied with.

For damage resulting from non-compliance solely the operator will be liable.

2.4 General safety notes

The centrifuge is after the state of the art and the recognized safety rules constructed. Nevertheless hazard for body and lives of the user or third parties can arise during their use and impairment of the centrifuge or at other real values become arise. The centrifuge is to be used only

- for the designated application and
- in with regard to safeguarding perfect state.

Disturbances which the safety can damage are to be eliminated immediately.



2.5 Explosion protection of the machine

- Concerning their mechanical and electrical components this centrifuge is built according to the directive for explosion prevention 94/9/EG and ATEX 95 (100a) respectively.
- The technical documentation according to Directive 94/9/EC, Annex VIII, No. 3 is deposited at Hiller GmbH.
- The Hiller GmbH refers to the intended use of the centrifuge and the operators obligation to Explosion Directive 1999/92/EC or operation safety regulation.

The protection concept of the centrifuge is based on the avoidance of ignition sources by safe design, ignition source and use of safe components and devices.

This protection concept presupposes that the operator of the centrifuge

- ensures the smooth operation of the centrifuge by monitoring, maintenance and repair,
- implements, documents and examines the ignition prevention systems as described,
- uses only specified and safe parts.

2.6 Guarantee and adhesion

Fundamentally our „Conditions for supplies and capacities“ are valid. These are available to the operator at latest since contract conclusion. Warranty and adhesion claims with injuries to persons and property damages are impossible if they were caused by one or several of the following points:

- not according to designation.
- inappropriate assembling, commissioning, operation and maintenance of the centrifuge.
- operation the centrifuge near defective safety devices or calm properly, not operative safety devices and enclosures.

- arbitrary structural changes at the centrifuge
- arbitrary changing of the rotation speed, capacity or suspension density.
- defective monitoring of machine elements which are subject to extreme wear.
- inappropriately practised repairs.
- catastrophes through foreign body action and force majeure.

2.7 Mechanical hazard sources



Danger!

The body or limbs coming into contact with the rotor during operation or with objects of any kind, results in serious injuries or death. The rotating parts should not come into contact with tools through existing design or ventilation gaps and openings. Fit chutes underneath the centrifuge and solids discharge! The chutes must ensure a safety distance to prevent the rotor coming into contact with limbs, in compliance with DIN EN ISO 13857.



Warning!

When relieving the clogged machine, it may be necessary that the direction of rotation of the scroll needs to be changed temporarily. There is a danger that the scroll flights fold, the machine takes great damage and becomes unusable.

- Never arbitrarily change the direction of rotation of the scroll! Contact the Hiller service and relieve the centrifuge exactly as directed.
- After relieving the machine change the direction of rotation of the scroll again.



Danger!

Excessive rotor speeds destroy the machine. Danger of death due to parts being thrown out or flying out. The machine must not be operated at non-permissibly high operating or bowl speeds. To do this, the measurement value of the bowl speed sensor must be monitored by a speed sensor in the control cabinet. This should be given according to Performance Level c in line with DIN EN ISO 13849-1 "Safety of machines - Safety-related control components". For more information, see the separate speed monitor instructions in the technical machine documentation.

The limitation of the bowl speed has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1".

The ignition protection system needs to limit bowl speed safely to less than or equal 3.200 1/min.

See separate instructions of the speed controller in the technical machine documentation.

- In the case of controlling the centrifuge main drive by frequency converter, this must be locked that operation speed under any circumstances cannot be tuned over the max. permissible operation speed. The programming of the frequency converter must be protected through a password which may be made accessible to authorized persons exclusively.



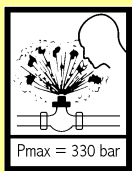
- All setting values of the frequency inverter at commissioning are to be recorded.
- Before carrying out any work at the centrifuge, switch off the complete machine system (hydraulic and centrifuge) and secure against reconnection (switch off power).
- Never detach a part or a protection cover (e.g. v-belt guard) from the centrifuge before complete standstill of the rotor. This can be controlled at the control notches in the covering between feed-sided pillow block frame and housing. The time to complete standstill of the centrifuge is 20-45 minutes.
- Never start the centrifuge and/or make it ready for starting prior the complete termination of all erection jobs and prior to fitting of all guards and connecting of all monitoring devices.
- The centrifuge is mounted on an elevated platform, the user will have to install a service platform equipped with a guard rail. Make sure the requested safe-guards against falling have been fitted to landings.
- The centrifuge must not be operated in case the vibration velocities given in section „7.1 Vibrations“ are exceeded.
- The limitation of centrifuges vibrations has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1". The ignition protection system needs to limit vibrations safely to less than or equal 19 mm/s.
- The centrifuge must not be operated with inadmissible hot bearings to prevent the ignition of an explosive atmosphere.
- The bearing temperature limit has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1". The ignition protection system needs to limit temperatures safely to less than or equal 115 °C.
- Make absolutely sure that clothes and rags are kept away from rotating parts.
- Sight checks at regular intervals, whether there is damage due to corrosion and/or wear.
- Never carry out welding jobs on rotating parts or heat up rotor parts with an open flame.
- The centrifuge is dynamically balanced. Therefore, care must be taken that the rotor parts are not mixed up, if several machines of the same type belong to a plant.
- Never open the handhole lids while the machine is operating.
- The rotating parts must not be osculated with means by available design or ventilation clefts and openings.

2.8 Electrical sources of hazards



Warning!

- All work at the electric connections of current carrying components (electric motors, switching units, etc.) must be carried out by electricians (according to definition DIN VDE 0105 and ICE 364 with knowledge of explosion protection according to DIN EN 60069-14:2009 and EN 60079-17:2008).
- It is essential that before any work at the electric unit is carried out, the power to the complete unit is disconnected and secured against reconnection.
- The installed electrical components are certified for explosion protection zone 2 in association with the prescribed intrinsically safe current supplies, separation barriers or switch amplifiers.
- The centrifuge must be grounded in accordance with DIN EN 60079-14:2005. The resistance to ground to prevent inadmissible static charges must be $\leq 10^6$ ohms. To ensure the potential compensation, the vibration dampers are bridged with grounding cables and the belt protection cover is connected with separate grounding cables.



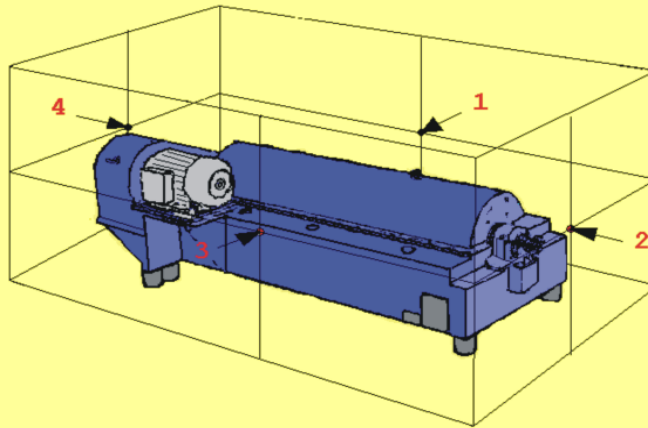
2.9 Hazard sources of the hydraulic system

- The hydraulic system works with hot oil (<70°C); danger of burning!
- Let the oil cooler before carrying out any work at the hydraulic circuit.
- Metallic surfaces can be very hot.
- High pressure (<330 bars) are present in the complete hydraulic system.
- Hydraulic oil can spurt out of faulty components. Danger of burning and poisoning!
- Never release any components of the hydraulic system before the centrifuge rotor is complete standstill.
- If mineral oils are absorbed by the skin due to high pressure, consult a doctor immediately. Emergency info. (Shell) Tel: +49 40 6324-5111.

2.10 Sound pressure level - emissions

In accordance with the third ordinance implementing the German Equipment Safety Law of January 18, 1991 instead of the emission value related to the working place, the maximum sound pressure level of all measured pressure levels and the relevant test point are specified. That test point has been fixed at a distance of one meter from the machine surface and 1.6 meters above the shop floor (enclosed sketch refers).

The values given below for the maximum sound pressure level are based on measurement carried out during the trial run at our test centre..



Maximum sound pressure level (noise emission value):

$L_{p_{max}} = 87 \text{ dB(A)}$, Measuring point 1-4

The noise measurement has been carried out in accordance with DIN 45635-01-KL3. The above values are valid for „non-load operation“ of the centrifuge.

2.11 Workplaces

- The workplace is located at the control cabinet.
- If the centrifuge will be installed on a high platform, the user has to install a maintenance platform which is to be provided with a guard rail. For the scaffolds, platforms etc., there are to be considered the prescribed safety devices against fall.
- If, for technical reasons, the installation of a maintenance platform cannot be realized, the maintenance and repair work are to be executed on a mobile scaffold; but in such a case there is to be observed that the installation of this mobile scaffold is to be realized keeping a distance of 1,2 m around the centrifuge.
- Do not step onto the machine.

2.12 Authorised operators



- Only authorised specialist persons are allowed to work with the HILLER centrifuge.
- The minimum age is 18 years.
- The operator is responsible for third parties in the work area.
- The responsibility for the different activities at the machine must be defined clearly and must be complied with. Undefined responsibilities are a safety risk.
- The plant operator must
 - make the operating instructions available to the operator and
 - ensure that the operator has read them and that he understands them.

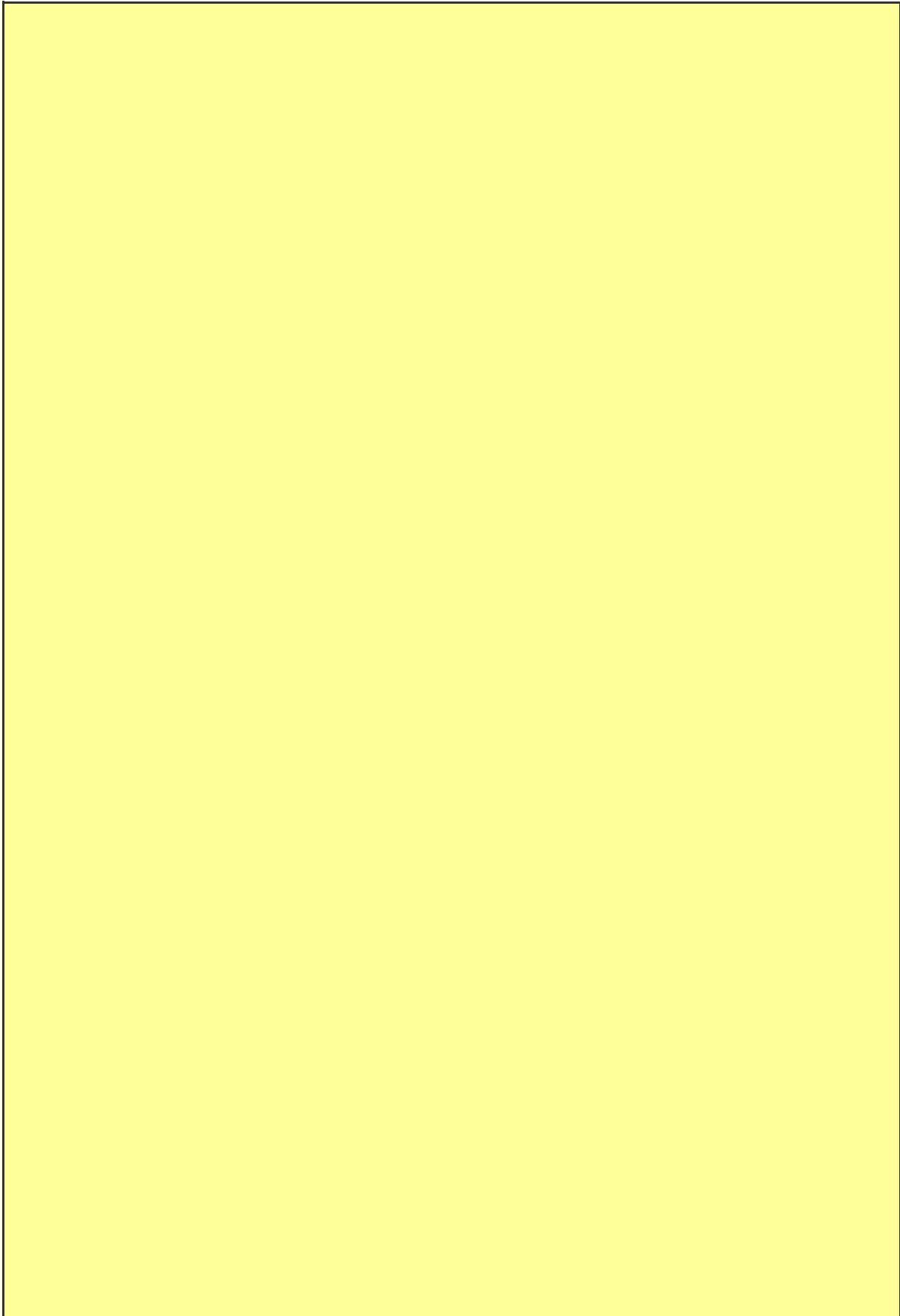
2.13 Personal protective equipment

Wear ear protectors, protective gloves and safety shoes when working at the centrifuge.

2.14 Behaviour in an emergency



- In an emergency, press the red emergency-OFF button for centrifuge and hydraulic control unit immediately.
- The emergency-OFF button is fitted to the control cabinet.
- Suitable fire fighting agents are foam, powder, carbon dioxide, sand or earth.
- Absorb or enclosed escaped substances (e.g. hydraulic oil) with sand, earth or absorbent materials, shovel into a marked container and dispose according to official regulations.



3. Technical data

3.1 Type plate (example)

 HILLER separation & process		HILLER GmbH Schwalbenholzstraße 2 D-84137 Vilsbiburg Tel. +49 (0) 8741 / 48-0 www.hillerezenti.de		
Denomination	Decanting centrifuge			
Type	DP573/11212/SD	Max. operating speed	3500	1/min
Year of construction	2015	Inside bowl diameter	450	mm
Maschine-no.	H5610	Bowl wall thickness	11	mm
Bowl material	1.4470	Max. operating pressure	0	bar
Total weight	4650	Min./Max. product temperature	0/50	°C
Permissible density	1,3			kg/dm³

3.2 Technical data

Machine type		DecaOil DO54-423DB
Sound pressure level		see "2.10 Sound pressure level - Emissions"
Dimensions	L x W x H	3666 x 1632 x 1324 mm
Total weight	without sand filling	4720 kg
	with sand and bowl filling	5840 kg
Heaviest component parts	Foundation with lower housing section	3550 kg (with sand filling)
	Rotor with hydromotor	1590 kg
Minimum force for hoisting gear (for assembly/disassembly of the rotor)		2000 kg
Machine data	max. bowl speed	3200 rpm
	max. operating speed	3200 rpm
	Permissible density of the feed suspension	1.30 kg/dm³
	Internal bowl diameter	544 mm
	Bowl wall thickness	14,5 mm
	Bowl material	1.4470
	max. operating temperature	100°C
	max. operating pressure	80 mbar

Drive unit (see separate instructions in the machine documentation)	Bowl drive (main drive)	Electric motor, 45 kW, 3000 U/min, 225S/M, B3, 400/690V / 50Hz, EEx de IIB T4
	Scroll drive	Hydromotor F32JD/55 Ex with hydraulic unit PAR 22046 Ex
Differential speed regulation	manually on hydraulic unit	see separate instructions in the machine documentation
Lubrication (see chapter "10.4 Lubrication service" and separate list of lubrication points)	Main bearing	Lubricating nipple
	Scroll bearing	Lubricating nipple
	Electric motor	see manufacturer's information
	Hydraulic unit	see manufacturer's information
Safety devices	Vibration monitoring	Vibration monitor ESW-Mini/Ex, For connecting and setting see manufacturer's documentation in the machine documentation.
	Overspeed monitoring	Speed monitor ÜDS1 see separate instructions in the machine documentation.
		Speed sensor, NAMUR - 2-conductor technology for recording the bowl speed
	Main bearing temperature monitoring	Resistance thermometer PTX each fitted on the top pillow block housing sections. max. main bearing temperature 105°C For connections, see manufacturer's documentation in the machine documentation.
Ambient conditions	Temperature	+10°C to + 40°C
	Air humidity	20% to 70%
Weather protection	Outdoor operation	Protection against rain, snow, sunlight and especially temperatures under 10°C.

4. Transport

4.1 Safety instructions

Warning!

- Machine must only be moved using a crane or forklift.
- Do not drop the machine; fragile!
- Do not walk under suspended loads.
- Riding on crane or forklift prohibited.



4.2 Delivery

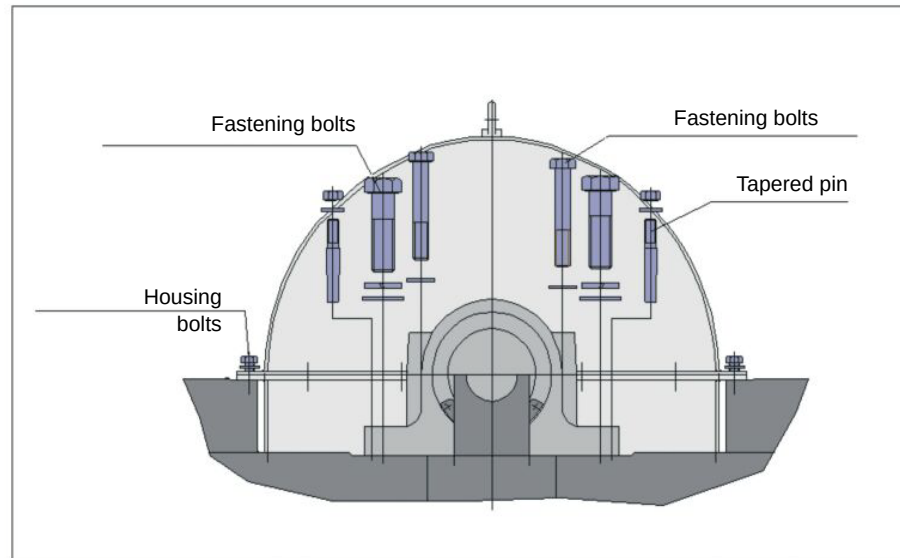


Warning!

- Transport damage must be reported immediately in writing.
- The delivery must be checked for completeness on receipt; the box contents are listed on the packing lists.
- Each centrifuge unit should be inspected after delivery and any faults reported immediately.
- If the centrifuge has been transported while disassembled into assembly units, the subsequent installation at the operator's site must be carried out by HILLER customer services to maintain the warranty.
- The centrifuge must only be suspended at the points indicated.
- If the centrifuge is not installed immediately after delivery, it must be carefully stored in a protected location and protected against dust and humidity.
- When stored outdoors, the centrifuge must be completely covered in tear-resistant film.

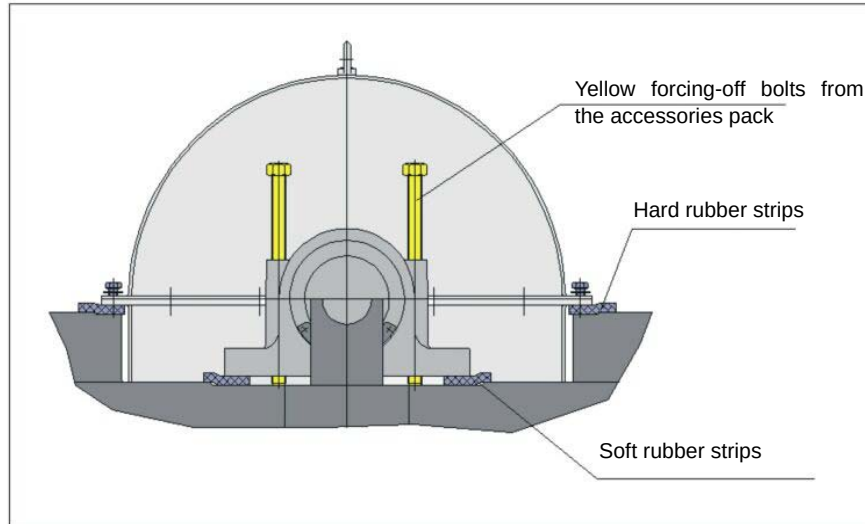
4.3 Fitting the transport safety retainer

To avoid damage during transport, the centrifuge rotor bearings must be drained. The following steps must be carried out before transport.



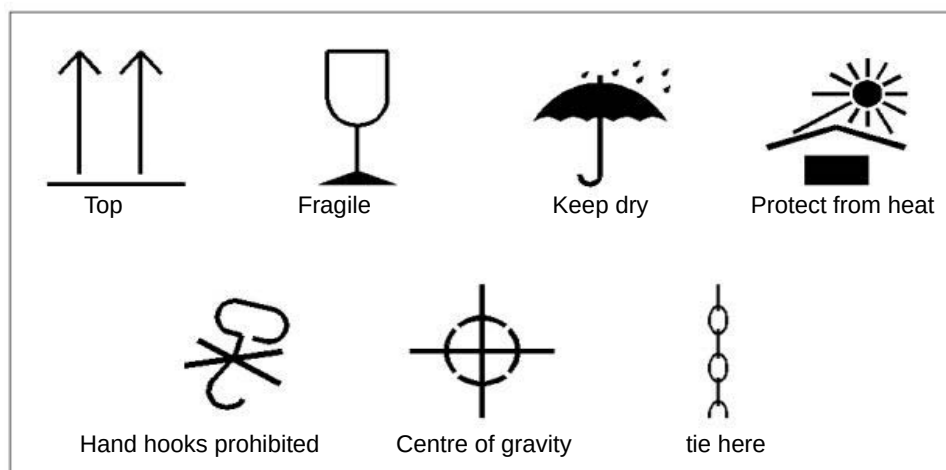
- Unfasten the fastening bolts between the pillow block housing base and foundation.
- Unfasten the four tapered pins on the pillow block housing and place in the accessories pack with the nuts and washers.
- Seal the conical holes using the yellow protective caps supplied.
- Unfasten the housing bolts from the housing slots. The housing bolts remain screwed onto the housing faces.
- Unfasten the fastening bolts on the pillow block housing lower sections and top sections and place with the washers.
- Screw the four yellow forcing-off bolts supplied (accessories pack) into the pillow block housing top sections and lower sections (in the place of the fastening bolts). Do this to raise the housing or the pillow block housing evenly by min. 5 mm.
- Move the four soft rubber strips (accessories pack) under the pillow block housing, and also move the six hard rubber strips (accessories pack) between the foundation and the housing slot flange. (See diagram below.)

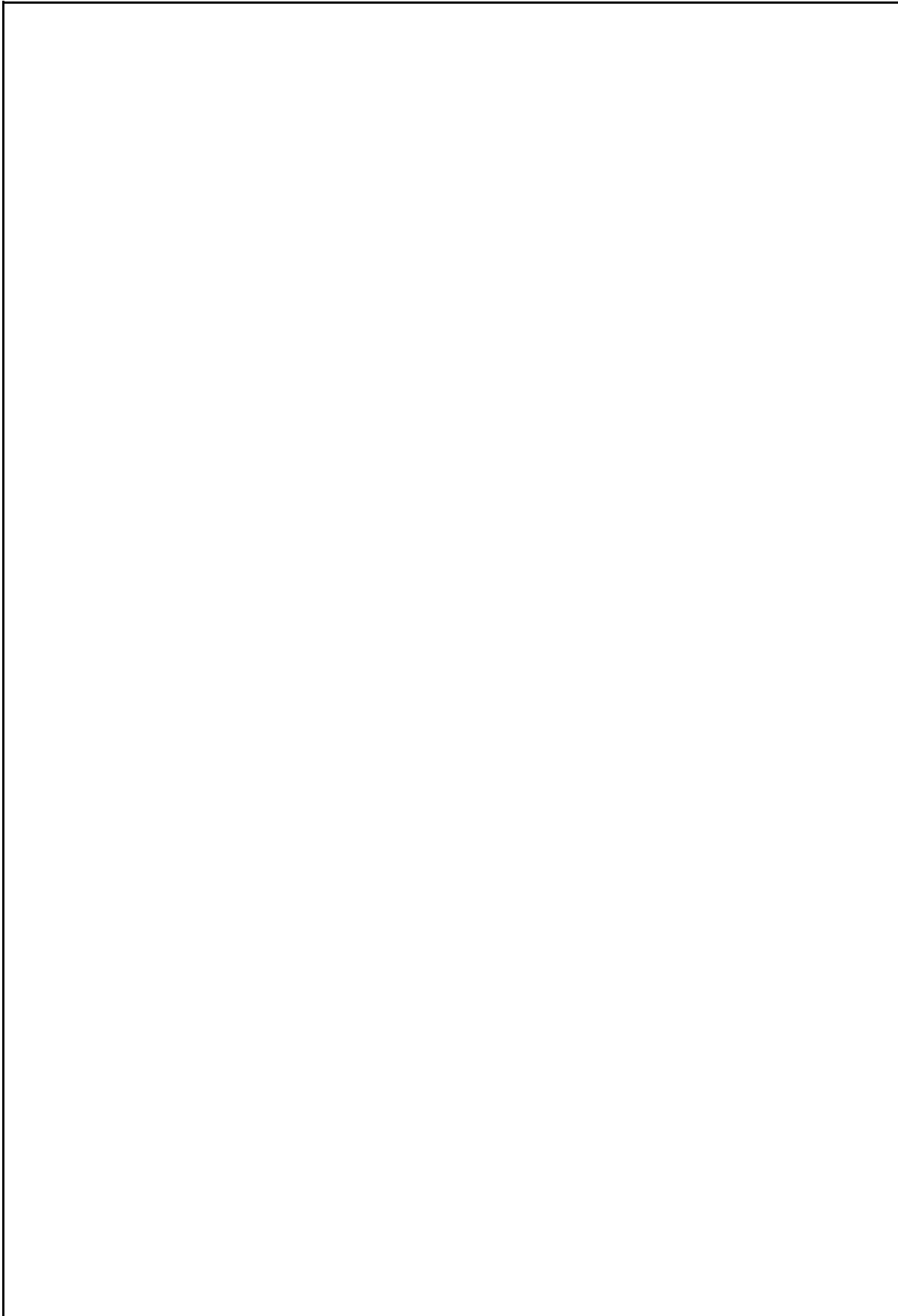
- Unscrew the yellow forcing-off bolts back out again, lowering the pillow block housing and the housing down to the foundation. Place the forcing-off bolts back into the accessories pack.



- Tighten the housing bolts handtight on the housing slot side.
- Also tighten the fastening bolts handtight between the pillow block housing top section and lower section as well as the fastening bolts between the pillow block base and foundation.

4.4 Symbols on the packaging





5. Setup

5.1 Conditions



- Due to the mass of the centrifuge and the rotor, it must be expected that falling parts arise ignitable sparks. Installation should take place only if it is certain that no explosive atmosphere is present.
- Otherwise, the operator has to fulfill his obligations under Directive 1999/92/EC or BetrSichV and to initiate appropriate protective measures.
- If the centrifuge has been delivered in individual assemblies, the subsequent assembly at the operator's site must be carried out by HILLER customer services to maintain the warranty.
- For outdoor operation, observe the conditions given in "3.2 Technical data".
- The foundation must be level, and suitable for the total weight of the centrifuge and the dynamic loads.
- The centrifuge should be installed in accordance with the setup plan.



Caution!

The entire centrifuge must only be suspended as discribed in chapter 5.2.



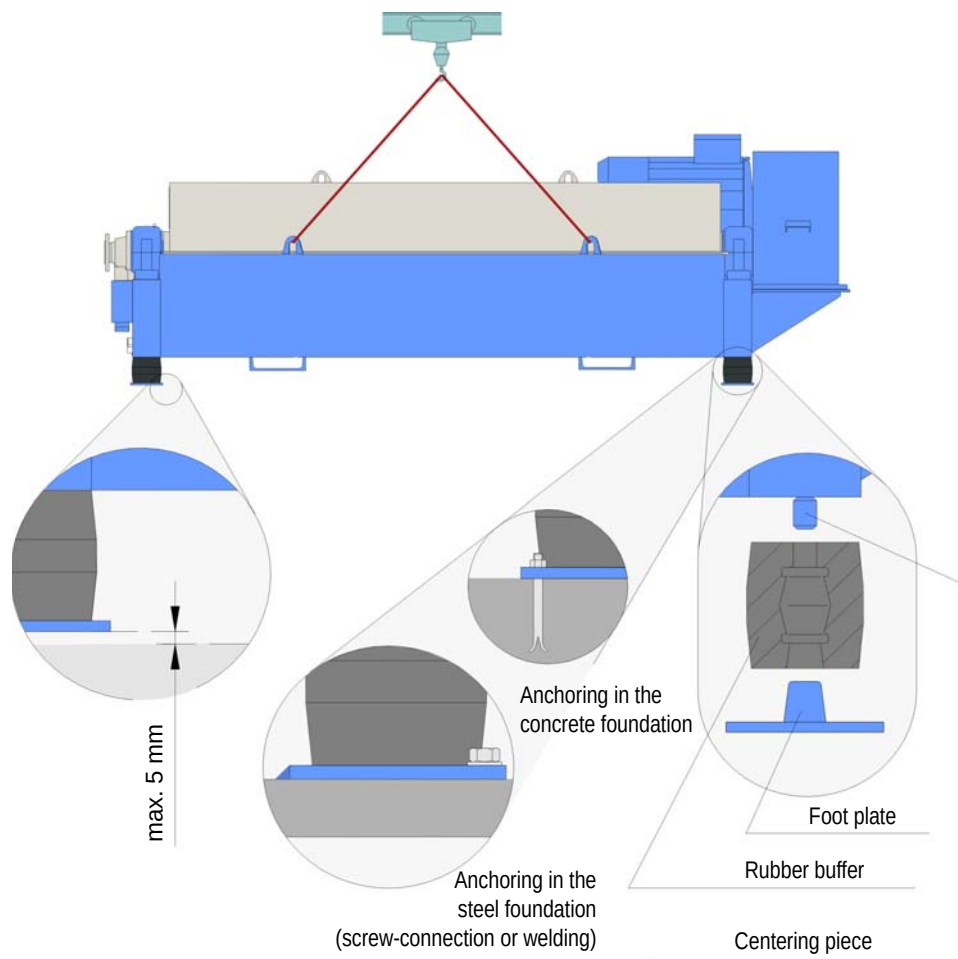
- Space must be allowed for disassembly work (hydromotor, inlet pipe ...).
- The V-belt pulleys have anti-rust protection applied before delivery which needs to be removed completely before fitting the V-belts.
- Check the belt tension!
- All pipe and chute connections, as well as electrical connections, must have a flexible design.
- All dimensions and weight specifications for the centrifuge can be found on the setup plan.
- The dimensions of the site must be compared in advance with the dimensions specified on the setup plan.



Caution!

The difference in levels between the 4 foot plates onto which the centrifuge is fastened using hollow rubber springs, must be max. 5 mm (See diagram on next page).

5.2 Setup

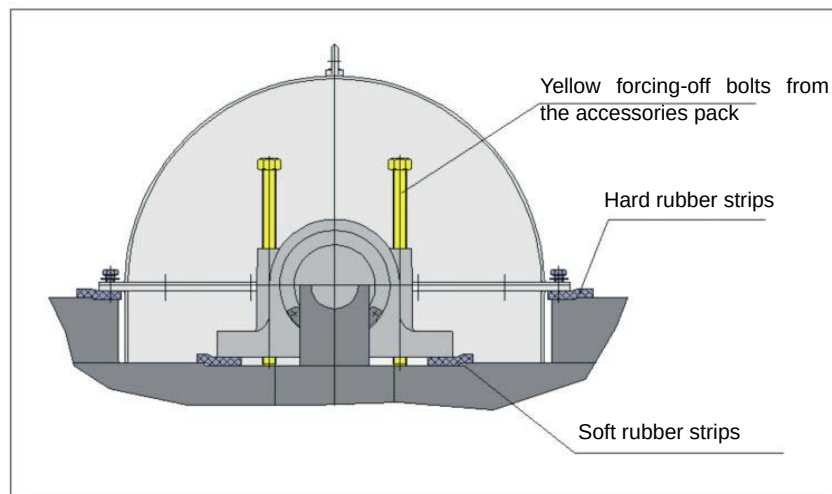


- To transport the centrifuge, attach ropes through the four lifting lugs on the foundation, lift the centrifuge, and move to the setup site. Once there, lower to approx. 25 cm above the ground.
- Place the hollow rubber springs (supplied loose) onto the centering piece on the underside of the foundation.
- Place the foot plates (supplied loose) with the centering pin onto the concrete or steel foundation and move to the centre underneath the hollow rubber springs.
- Lower the centrifuge further and position onto the hollow rubber springs. Check that the centering pin is fully engaged in the hole in the hollow rubber springs.
- When setting up on a steel foundation, screw or weld down the foot plates. When installing onto a concrete foundation, anchor each foot plate into the concrete using anchor bolts. (See setup plan).

5.3 Removing the transport safety retainer

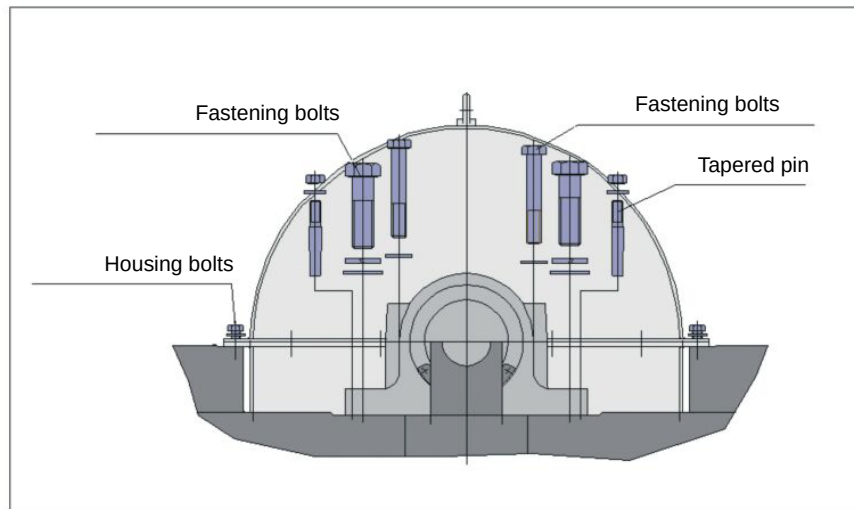
To avoid damage to the bearings during transport, the centrifuge is delivered with the rotor bearings disengaged. The housing and the pillow block housing are raised by approx. 2 mm using rubber strips. Before commissioning the centrifuge, the transport safety retainer must be removed in accordance with the following diagram.

- Unfasten the housing bolts from the housing slots. The housing bolts remain screwed onto the housing faces.
- Remove the bolts between the top pillow block housing sections and bottom sections as well as the bolts on the base of the pillow block housing.



- By screwing the four yellow forcing-off bolts supplied (accessories pack) into the pillow block housing (instead of the bolts), lift the housing or the pillow block housing evenly.
- Remove the rubber strips underneath the pillow block housings and the rubber strips underneath the housing slots.
- Clean the contact surfaces on the pillow block housings and on the foundation and apply light lubrication.
- Unscrew the forcing-off bolts and lower the pillow block housing or the housing down to the foundation.
- Screw the top pillow block housing section and bottom section back together again.
- Fasten the housing slots onto the foundation using bolts.
- Using the four tapered pins from the accessories pack, fix the pillow block housing onto the foundation. Screw onto the foundation using the relevant nuts, washers and lock washers.

- Use the fastening bolts to screw the pillow block housing onto the foundation.



5.4 Connecting the hydraulik hoses (scroll drive)



Caution!

Respect the colour marking (white/red) at the hydraulic pump unit, hoses and rotary transmission to ensure the correct rotation of the scroll conveyor.

Additionally the oil reflow line is marked with „T“ and the pressure flow line with „P“.

- The small leakage hose must be connected to the appropriate screw connections at the hydraulic pump unit and the rotary transmission.
- Conduct both high pressure oil return flow- and oil pressure flow line from the bottom through the holes in the foundation and connect to the rotary transmission.
- Lift the hoses and so check that they are fitted with strain relief at the rotary transmission.

5.5 Tightening the V-belt

- Remove the belt guard.
- Check the belt alignment between the belt pulleys. If necessary, adjust the belt alignment by adjusting the electric motor.
- Fit the V-belts onto the belt pulley.
- Unfasten the fastening nuts on the drive displacement.
- By turning the tension screw, the drive displacement is shifted and the V-belt is tightened.
- Once the necessary belt tension (see "10.7 V-belt tension") has been reached, tighten the tension screw with the lock nut.
- Tighten the fastening nuts to fix the drive transfer.
- Re-fit the belt guard.

5.6 Connections

- All connections to the decanter must be carried out mechanically decoupled via compensators. Further informations you will find in the basic informations on installing HILLER decanters.
- The required connections can be found in the setup plan in the technical machine documentation under "Diagrams and tables".
- Rinsing fluid and washing fluid must be available.



Caution!

All direct connections to the centrifuge must be flexible (bellows, compensators) to avoid damage to the centrifuge and to the cable system if any imbalance occurs. For more information, see the "Basic information on installing solid bowl scroll centrifuges" in the technical machine documentation.

After the correct setup of the centrifuge, the various connections can be assembled.

Direct connections:

- Intake and feed suspensions
- Rinsing and washing connections
- Flocculation tool
- Centrate drain outlet on the centrate chute
- Solid outlet on the solids chute
- Electric supply leads
- Oil supply and return lines (scroll drive hydraulics)



Note!

The flange on the upper housing section is used as the vent stack connection (pressureless).



Danger of explosion!

If the vent stack is equipped with an extraction by suction, the risk persists that fines will deposit between the rotor and the inner housing walls and become a source of ignition.

- Seal the flange opening with a blank flange and tighten securely.
- Do not install an extraction by suction!



Danger!

If no additional installation work is carried out on the vent stack connection, there is an access option via the flange opening. There is a risk of touching the rotor and being drawn in.

- Seal the flange opening with a blank flange and tighten securely.

5.7 Electrical connection



Warning!

For the electrical installation, observe the interlocks for safety and for the operating safety of the centrifuge, which are described in the "Interlock chart". The interlock chart with descriptions will have been provided with the "Installation documentation".



Caution!

Switching contacts must respond.

The electrical installation must be carried out only by a qualified electrician in accordance with the relevant guidelines and regulations.



The centrifuge must be grounded in accordance with DIN EN 60079-14:2009. The resistance to ground to prevent inadmissible static charges must be $\leq 10^6$ ohms. To ensure the potential compensation, the vibration dampers are bridged with grounding cables and the belt protection cover is connected with separate grounding cables.

5.7.1 Connecting the electric motor

- Connect the electrics on the electric motor for bowl drive in accordance with manufacturer instructions in the "Technical machine documentation".
- Connect the electric motor so that the centrifuge is driven in the direction shown by the arrow.
- Check the permissible voltage on the type plate.
- Connect the additional equipment PTC temperature sensors (thermistors).

5.7.2 Connecting the vibration monitoring system

All measuring ranges and limit values are set using the DIP switches on the machine.



This is carried out at the factory by HILLER. The vibration monitoring system must not be opened after this point!

For technical construction and connection plans, see manufacturer documentation in the machine documentation.

5.7.3 Connecting the resistance thermometer PTX

For temperature monitoring of the main bearing there is a resistance thermometer PTX on each of the pillow block housings.

Setting of the PTX to a maximum main bearing temperature of 115°C.

For technical construction and connection diagrams, see manufacturer documentation in the machine documentation.

6. Commissioning

6.1 Preparation work

- Set up the machine in according with the "5. Setup" chapter.



Caution!

Remove all transport safety retainers before starting up!

- Lubricate the machine thoroughly, see "10.4 Lubrication service". The most important lubrication points are the scroll bearing and the main bearing.
- All electrical components – electric motor, vibration monitor, speed monitor, bearing temperature sensor (optional), as well as the electric components of the scroll drive – must be correctly connected. For more information, see the relevant manufacturer's instructions in the machine documentation.



Ensure that there is an earthing connection. This must be connected to the centrifuge. There must be no signs of corrosion on the connection.

- Ensure the unhindered removal of solids and centrate, i.e. ensure that any flaps or slide controllers fitted at the customer's site are open.

6.2 Electrical interlock



Danger!

Excessive rotor speeds destroy the machine. Danger of death due to parts being thrown out or flying out. The machine must not be operated at non-permissibly high operating or bowl speeds. The limitation of the bowl speed has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1". The ignition protection system needs to limit bowl speed safely. For more information, see the separate speed monitor instructions in the technical machine documentation.

The limitation of centrifuges vibrations has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1". The ignition protection system needs to limit vibrations safely.

The bearing temperature limit has to be documented and tested as ignition protection system according to DIN EN 13463-6:2005 in the ignition protection level of "IPL 1". The ignition protection system needs to limit temperatures safely.

- When controlling the main centrifuge drive using a frequency converter (FC), it must be locked to ensure that it is not possible to set operating speeds higher than the max. permissible operating speed. The FC programming must be password-protected, and must only be made accessible to authorised persons.

- All setting values for the frequency converter must be logged during the commissioning process!
- Electrical interlock of the switch-on and switch-off operations should be carried out in accordance with the interlock chart. When the electrical wiring is carried out in accordance with these interlock chart, it is not necessary to open and close the feed valve manually. (Functions linked to the drive motor!)
- Check start-up with ammeter.
- Note the machine start-up current to check the correct start-up process.
- Perform functional test on ALL alarm switching points on ALL safety systems fitted (e.g. temperature sensor, speed sensor, vibration sensor) and log alarm switching point settings.

6.3 Test run

- Switch on the main drive and accelerate to operating speed.
- If unusual noises and vibrations occur, follow the steps described in the "7. Operation" chapter. If this does not help, please contact our service department. (Tel. +49 (0) 08741/48-111 or +49 (0) 08741/48-126)
- The centrifuge should run for 4 hours at nominal speed without any changes occurring.
- The bearing temperature on the surface of the pillow block housing must not exceed 95°C.

6.4 Commissioning with water/operating fluid

- Before the start of an absolutely empty bowl (initial start-up, starting after disassembling, starting after a long standstill), the centrifuge must be loaded with water or a non-flammable working fluid to prevent rarely possible friction sparks.
- Fluid may escape in the process during solids removal. This no longer occurs when the feed volume is reduced and when solids are subsequently transported in front of the helixes.
- Downstream units such as dryers, open conveyor belts, etc. that convey away any water occurring in the solids shaft. Or isolate the solids shaft so that the fluid can flow away in another direction.
- Check that pipelines are correctly sealed, that the pumps and control valves are functioning correctly and check that the rinsing connections are ready for operation.
- Check the electrical function of the system.

6.5 Commissioning with feed suspension

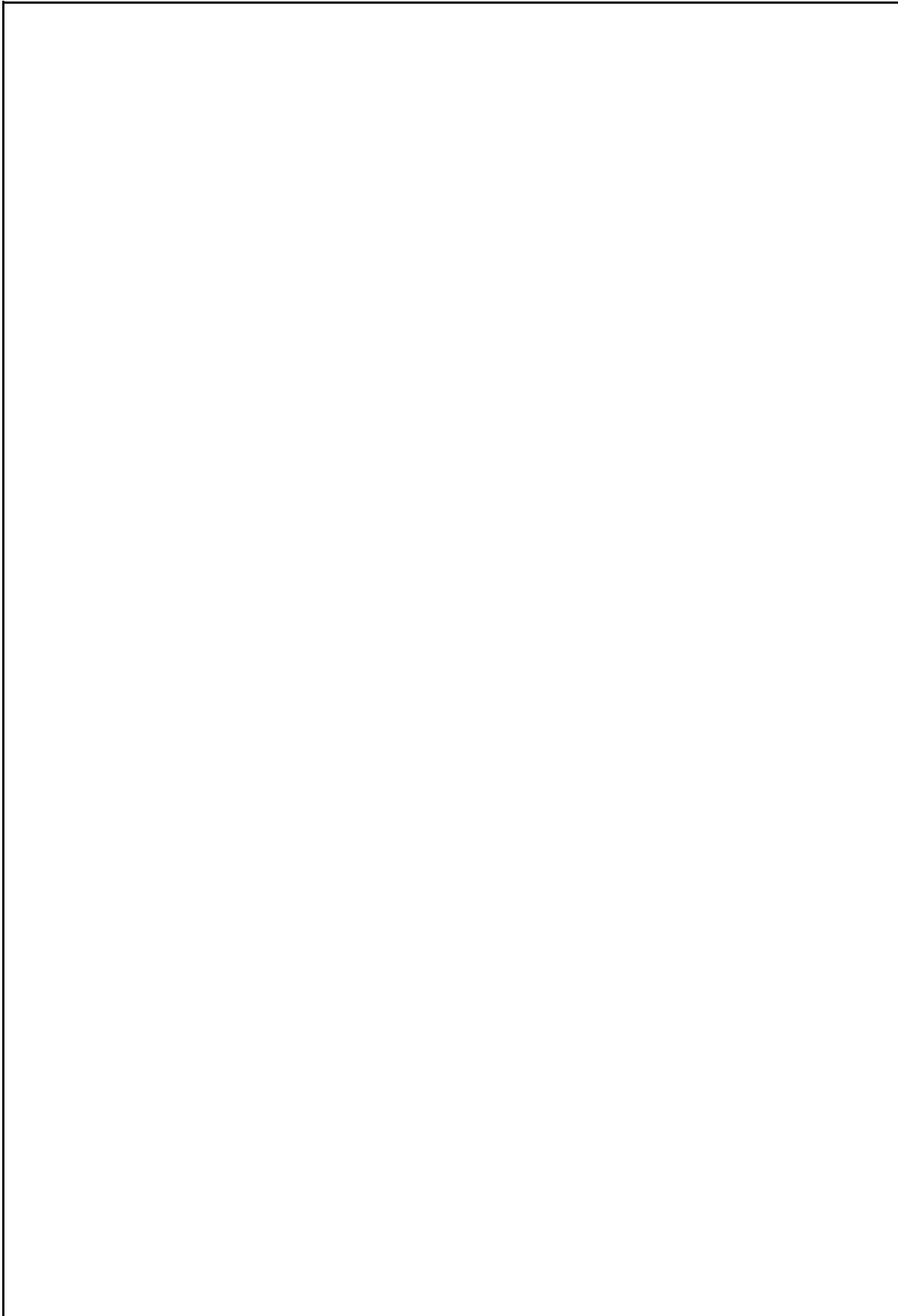
- Switch on the centrifuge and accelerate to operating speed.
- Clear the path from the collection container.
- Start up the feed pump with a small quantity. If the pump cannot be controlled (e.g. a centrifugal pump), use a throttle valve to set a small amount initially.
- A stable bed of solids forms in the centrifuge between the scroll and the bowl wall.



Note!

Due to the bed of solids, the friction resistance on the bowl wall is greater than on the scroll helixes meaning that the solids can then be transported. If too much feed suspension is added to begin with, the half-finished bed of solids will be too slippery and the scroll will be unable to transport the solids correctly. This results in what are known as "rotary faults" and thus creates a blockage.

- If the first well-dehydrated solid occurs after the relevant amount of time with clear centrate coming from the machine, or the first clear, solid-free oil centrate for three-phase centrifuges, the feed quantity can slowly be increased up to the nominal output.
- The operating status which is then set should be left for 1 to 2 hours. Only then can the separation results be assessed correctly.
- If the machine does not stabilise after a sufficient amount of time, the settings will need to be optimised further.
- The commissioning work is normally carried out by our service engineers. This ensures that the machine is set up in the optimum way and the warranty conditions are met.

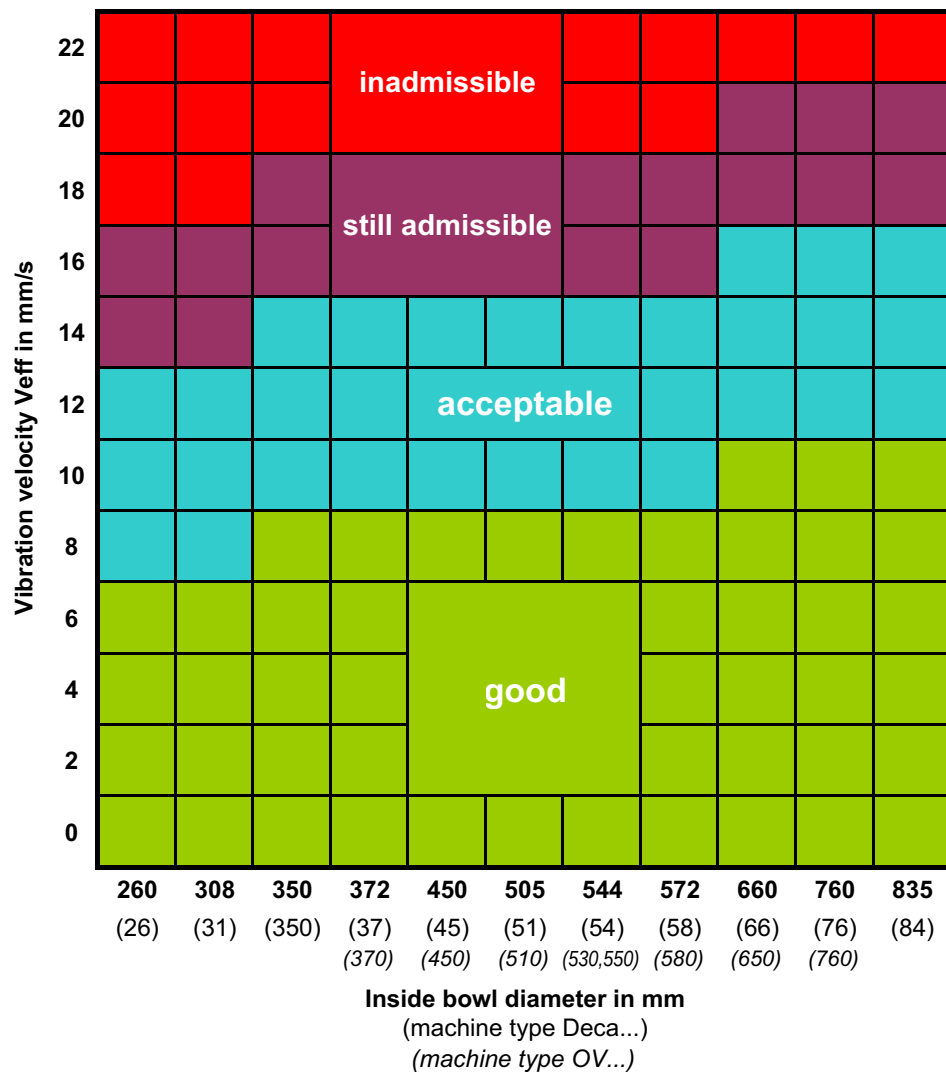


7. Operation

7.1 Vibrations

- During operation, solids deposits and wear due to abrasive media on the bowl and the screw conveyor, as well as wear of bearings and seals may cause vibration. The vibrations are assessed in terms of „effective vibrations velocity“ in mm/s.
- The operating behaviour of the centrifuge is assessed in accordance with the vibration velocities specified in the following graph:

Admissible vibrations velocities for centrifuges

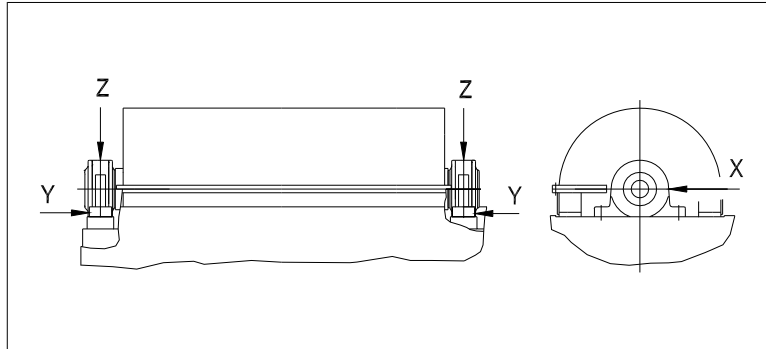




Warning!

The user will be liable for personal injury and damage if the centrifuge is operated at inadmissible vibration velocities.

According to the application measurements are made at the bowl pillow block housings, i.e. at rotor level, in each case „vertically“ (Z), „radially“ (X) and „axially“ (Y) in accordance with figure below.



7.2 Stopping the centrifuge

The centrifuge is stopped in the following sequence:

- Stop supply of feed suspension.
- Stop supply of flocculant/polymer.
- Open the flushing valve upstream of the pumps.
- Shut off the main motor. At first, do not stop the supply of flushing water. The speed gradually drops and even difficult solids are washed out as the centrifuge force reduces. During the rundown period the solids chute can also be flushed. The centrifugal force holds the flushing liquid against the bowl wall during the flushings procedure.



Caution!

The scroll differential drive (hydraulics) must remain in operation until the centrifuge comes to a halt, as mechanical damage could otherwise occur to the hydraulic rotary transmission.

- Stop the supply of flushing liquid shortly before standstill of the rotor.
- The liquid ring in the bowl collapses shortly before standstill of the machine and a „water splash“ discharges at the centrate chutes and perhaps at the cake end.
- After standstill of the centrifuge (which may take more than 30 minutes after stopping the main motor), the main motor should be restarted for 20-30 seconds to clear away solids released during collapse of the water ring.



Warning!

No part must be detached from the centrifuge before complete standstill of the bowl.

The procedure described above for stopping the centrifuge is considered typical. The shutdown procedure to be followed for your particular application incl. all conditions and sequences has been outlined in the function charts.

7.3 Emergency-stop disconnection or power failure

After an emergency-stop disconnection or a power failure the machine is to be started under observation of hand again. At oscillations of the centrifuge through solid matter in the machine, the rinsing water valve is to be activated. The machine is then empty cautiously in the manual operation go. In case of continuous oscillations the centrifuge is to interrupt and to notify a HILLER service engineer.

7.4 Influencing the separation performance

Stable conditions, i.e. constant separation performance, will prevail in the machine, given constant operating conditions. The centrifuge settings may, however, have to be altered if the feed suspension characteristics or performance requirements vary during the long years of machine operation. These interrelations have to be duly accounted for always to ensure optimal centrifuge operation, commissioning the centrifuge and failure eliminations.

By reasonably combined parameter changes, the centrifuge can always be set to its optimum performance.

It is advisable that parameters are changed only one after another and that an adequate period elapses until the operating point has stabilized before analyzing the effect.



Important!

If the centrifuge operating point has been shifted on account of a process change and if the result is no longer satisfactory, we recommend consultation with HILLER centrifuge service expert for optimizing the machine and adjusting it to the new operating conditions.

On account of the multitude of properties of feed suspension to be dewatered, the changes mentioned have been described in general only. Our intention is merely to outline the technological interrelations for solid-liquid separation and to make possible changes in performance understandable.

7.4.1 Process changes

- An increase of the solids concentration in the feed suspension results in an increase of the solids level. Thus the oil centrate can have a higher solids and water concentration.
- A higher cake discharge volume will result in an increased solids level, thereby deteriorating the oil centrate and the separating efficiency. This can be counteracted by reducing the amount of feed suspension and adjusting the differential screw speed.
- Increasing the quantity of feed suspension will result in an increased solids load of the machine, thus raising the solids level. This gives a unclear, with solid burdened centrate. This can be counteracted by an increase in the differential scroll speed.

7.4.2 Mechanical changes



■ Changing the bowl speed/g-force

Warning!

The bowl speed has been adapted to the centrifuge duty. It should only be altered consultation with the after sales service of HILLER.

■ Increasing the differential speed

The solids retention time in the bowl is shortened so that the cake becomes wetter. At the same time the solids level drops resulting in a lower centrate load. The oil centrate becomes clearer and the separation efficiency is improved. In general, the transport torque drops.

■ Changing the pool depth

When increasing the weir diameter at the liquid end, the pool depth in the bowl is lowered. The clarification volume in the bowl decreases and the beach becomes longer which causes an increase in solids content of the cake.

The product level goes up at the same time which may induce poorer oil centrate quality. The separating efficiency will decline and the torque for solids transport increase.

If the weir diameter is reduced, the pond depth and the volume to be clarified become larger and the beach shorter. The centrate solids contents theoretically reduced and the separating efficiency raised. Due to the shorter beach the cake may become wetter.

■ Changing the layer thickness of the liquid phases

The layer thickness of the two liquid phases in the bowl is determined by the difference of the overflow diameters for the light phase and the heavy phase. If the difference of the diameter is increased, the layer thickness of the light phase becomes larger. Large difference of the diameters: high purity of the light phase; danger of loss parts of the light phase in the direction of the heavy phase. Small difference of the diameters: small purity of the light phase; high output of the light phase

7.4.3 Adjusting of the outflow diameter of the water phase



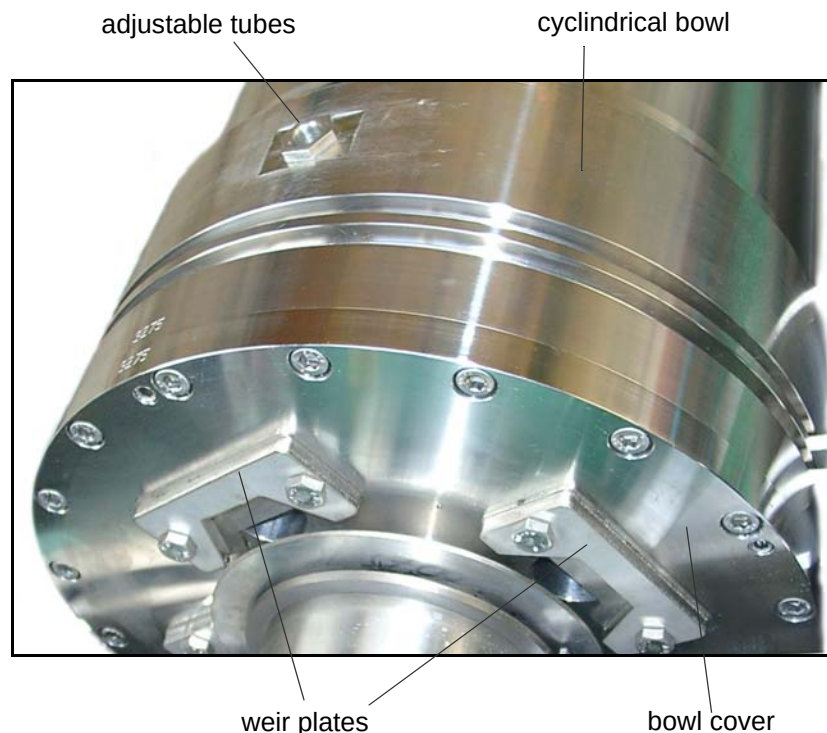
Warning!

Opening the housing and/or access hand hole cover should not be done in an explosive atmosphere. If this cannot be ensured, the operator has to fulfill his obligations respecting Directive 1999/92/EC or operational safety regulation and to take appropriate protection measures.



After opening the housing and/or the access hole cover, replace all relevant seals or re-seal the relevant components.

- Stop the centrifuge as we had instructed in chapter 7.2.
- Dismantle handhole cover at the inlet side of the housing.
- Unscrew the hexagonal head screws of the weir plates, adjust the rear weir plate in accordance with the table „Solid and liquid side“ (see machine documentation - „Drawings and tables“). Tighten the hexagonal head screws.
- You have the right weir diameter, when the mark of the required weir diameter aligns with the edge of the front weir plate.
- All four weir plates must be set to the same diameter.
- Mounting handhole cover again onto the housing front.
- Machine can be started again.



7.4.4 Adjusting of the outflow diameter of the oil phase

- Stopping the centrifuge as we had instructed at chapter 7.2.

- Dismantling handhole cover at the inlet side on the top of the housing.
- Adjust the adjustable tubes in the cylindrical bowl in accordance with the table „Weir setting table for the light centrate phase“ (see machine documentation - „Drawings and tables“).
- Mounting handhole cover again onto the housing top.
- Machine can be started again.

7.4.5 Conversion from 3-phase to 2-phase operation

- Stop the centrifuge as instructed at chapter 7.2.
- Dismantling handhole cover at the inlet side on the top of the housing.
- Turn out the adjustable tubes in the bowl and put them into the enclosure.
- Close the threaded holes with screw plugs (enclosure).
- Mount handhole cover at the inlet side onto the housing top again.
- Dismantling handhole cover at the inlet side of the housing.
- Unscrew the hexagonal head screws of the weir plates and take off the weir plates.
- Turn out the then visible screw plugs using the socket wrench (enclosure) and put them into the enclosure.
- Adjust the rear weir plate to the desired diameter in accordance with the table „weir adjustment table for the heavy centrate phase“ (see machine documentation - „Drawings and tables“). Tighten the hexagonal head screws.
- You have the right weir diameter, when the mark of the required weir diameter aligns with the edge of the front weir plate.
- All four weir plates must be set to the same diameter.
- Mount handhole cover again onto the housing front. Machine can be started again.



Important!

During a 2-phase operation the light liquid phase (oil) is discharged via the overflow edges at the water centrate chute.

8. Errors

In the case of errors, or if questions arise, please contact:

HILLER GmbH. Schwalbenholzstrasse 2, 84137 Vilsbiburg, Germany
Tel.: +49(0)8741/48-175
Fax: +49(0)8741/48-740
Email: aftersales@hillerzentri.de

The following visible-audible phenomena are indicative of failures:

- abnormal running noises and unusually loud centrifuge operation.
- high centrifuge vibrations (7.1 Vibrations as well as the following tables).
- irregular cake discharge

■ Error

Cause	Elimination
-------	-------------

■ Acceptable oil and water centrate, high remaining oil content in the cake

Oil content in the feed suspension comparatively high	Add feed water and/or increase the feed water amount.
Excessive amount of feed suspension.	Reduce feed suspension quantity.
Temperature of the feed suspension too low.	Reduce the differential speed.
Outflow diameter of the oil centrate too small.	Enlarge the outflow diameter of the oil centrate.
Outflow diameter of the water centrate too large.	Reduce the outflow diameter of the water centrate.

■ Acceptable oil and water centrate, cake concentration too thin

Concentration of the suspension supply too small.	Enlarge the outflow diameter.
	Reduce differential speed.
Quantity of the suspension supply too small.	Enlarge suspension supply.
	Check pump, check wearing parts condition and replace if necessary..
	Check pump stuffing box (if available), retightening and replace respectively .

■ **Poor water centrate quality, acceptable oil centrate**

Differential speed too low.	Increase the differential speed
Excessive concentration of the feed suspension.	Increase the differential speed and/or reduce the feed suspension amount.
	And/or reduce the outflow diameter of the water centrate.
Excessive amount of feed suspension.	Reduce feed suspension quantity.
Difference between the weir diameter of the oil centrate and the weir diameter of the water centrate too large.	Reduce the difference between the outflow diameters (reduce the outflow diameter of the water centrate).
Quality of the feed suspension changed.	Reducing feed suspension amount or optimizing centrifuge again (to coordinate rotation speed, differential speed and outflow diameter again).
Quality of the solid matter in the feed suspension changed	Generally new optimization of the machine settings.
	Reduce feed suspension quantity.
	Increase the differential speed.
	Reduce weir diameter, if a better oil centrate is necessary.
Scroll flights too much worn down. The condition of the scroll flights can be checked through the solid outlets in the bowl.	Dismantle and check wear of flights. If necessary. If required, eliminate wear and install replacement scroll.
Adjustable tubes block.	After standstill the centrifuge remove the handhole cover at the housing and clean the two opposite adjustable tubes in the cylindrical bowl. After cleaning mount the handhole cover again.

■ **Poor oil centrate quality, acceptable water centrate**

Differential speed too low.	Increase the differential speed
Excessive concentration of the feed suspension.	Increase the differential speed and/or reduce the feed suspension amount and/or reduce the outflow diameter of the oil centrate.
Excessive amount of feed suspension.	Reduce feed suspension quantity.
Difference between the outflow diameter of the oil centrate and the outflow diameter of the water centrate too small.	Increase the difference between the outflow diameters (increase the outflow diameter of the water centrate).
Quality of the feed suspension changed.	Reducing feed suspension amount or optimizing centrifuge again (to coordinate rotation speed, differential speed and outflow diameter again).

Quality of the solid matter in the feed suspension changed	Generally new optimization of the machine settings.
	Reduce feed suspension quantity.
	Increase the differential speed.
	Reduce outflow diameter, if a better oil centrate is necessary.
Scroll flights too much worn down. The condition of the scroll flights can be checked through the solid outlets in the bowl.	Dismantle and check wear of flights. if necessary. If required, eliminate wear and install replacement scroll.
Adjustable tubes block.	After standstill the centrifuge remove the handhole cover at the housing and clean the two opposite adjustable tubes in the cylindrical bowl. After cleaning mount the handhole cover again.

■ No centrate discharge

Ring of rotating solids builds up between the flights. Solids no longer transported and discharged with centrate.	Switch off suspension supply and main drive in operation and rinse the system. If solid emerges before the bowl has come to a stillstand, the centrifuge can be re-started.
	If there is no cake discharge before standstill safeguard centrifuge against inadvertent starting.
	After standstill open handhole covers an centrate and cake end, if necessary remove housing top section.
	Thorough flushing of the discharge and outlet openings in the bowl by inserting a stiff hose (preferably Atumat with nozzle).
	If possible flush also with hot water.
	Re-start machine after thorough flushing (do not forget to re-fit weir plates) and have it run at operating speed with much flushing water.
	If none of the flushing operations is successful, dismantel scrow conveyor and ask for assistance of a service specialist, if necessary.

■ Unstable machine operation, high vibrations

Unbalance due to uneven mechanical wear, worn parts, deformed flights.	Dismantle scroll. Repair it or install a new one.
Scroll bearing defective: due to inadequate lubrication or penetration of product due to wear of seal or due to normal wear.	Dismantle scroll and replace scroll bearing and seals.
Bowl bearing defective.	Dismantle rotor, replace bowl bearing.
Unbalance due to deposits in bowl and/or scroll.	Rinsing centrifuge: „11.2 Procedure of a water rinsing (Example)“.

■ Machine shutdown due to excessive power consumption during starting

Solids in shaft.	Thoroughly clean solids discharge shaft.
------------------	--

■ Excess temperature of main bearing (max. temperature 115°C)

Too little grease.	Regrease bearing.
Too much grease	Remove excess grease from bearing (e.g. with compressed air through the lubrication hole).
Incorrect grease quality.	Change the type of grease as recommended on the „List of lubrication points“ (Machine documentation „Drawings and tables“).
Damage to bearing	Replace bearing.

9. Disassembly/assembly

We recommend requesting the services of our customer service department when replacing and repairing the drum and scroll. However, if replacing the equipment in-house, all the laws, regulations and guidelines given in chapter "2. Safety" must be observed.



Warning!

Never remove a component or safety cover (belt guard, housing, etc.) on the centrifuge until the centrifuge rotor is at a complete standstill.

This can be checked at the inspection slit in the cover between the feed-side top pillow block housing section and housing.



Warning!

Opening the housing and/or access hand hole cover should not be done in an explosive atmosphere. If this cannot be ensured, the operator has to fulfill his obligations respecting Directive 1999/92/EC or operational safety regulation and to take appropriate protection measures.



After opening the housing and/or the access hole cover, replace all relevant seals or re-seal the relevant components.



Note!

All item numbers in brackets relate to the assembly diagram (see technical machine documentation "Diagrams and tables").



Caution!

The following points must be observed during assembly:

- It is essential that the assembly diagram is followed during assembly work.
- Check all parts before assembly.
- Pay attention to cleanliness!
- All centering points and contact surfaces must be completely clean and must not be damaged in any way.
- During assembly, observe the marks on the flanges on the drum sections and the front walls! (Zeroing)
- All sealing rings must be installed undamaged.
- All bearings and sealing rings must be filled with grease or wetted.
- The screws must be secured during assembly using liquid Loctite 243 screw lock.
- When using new replacement parts, genuine parts must always be used. HILLER cannot accept any liability for personal injury or material damage due to the use of replacement parts from other sources. All warranty provisions from HILLER become null and void.
- If any screws become unusable following disassembly, replacement screws of the same quality (strength, material) and design must be used. Check the counter-thread for damage. See the replacement parts list for more information.



Warning!

For "rotor screws subject to significant loading", the torques, sizes, materials and quality grades are specified in the assembly diagram. Not observing these specifications may result in personal injury as well as considerable damage to the centrifuge, and HILLER cannot accept any liability for either event.



The following points must be observed during assembly:

9.1 Disassembly/assembly of the housing

- Lift off the housing at the eyelets in a horizontal position!
- During assembly, ensure that there is a gap of 0.5 mm between the halves of the seal and rotor (use a feeler gauge!)



9.2 Changing the belt

- Only loosen the nuts at the motor bracket!

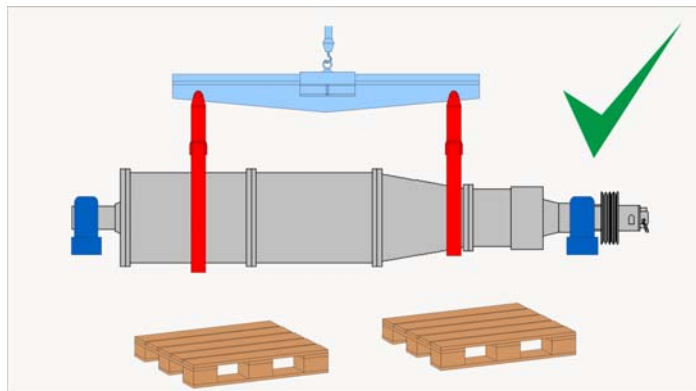
9.3 Removing/fitting the rotor



Important!

Remove hydraulic hoses and sensor cables. Seal connections on the hoses, hydromotor and sensors with sealing caps to prevent dirt penetration and hydraulic oil leaks.

- Remove the product lines, drain pipe and the lines for grease lubrication and any monitoring equipment fitted!
- Loosen the taper pins at the pillow block housings by fastening nuts.
- Never lift the rotor at the pillow-block frames! Place hoisting slings around the bowl. Use a traverse to raise the rotor out the foundation.



Important

Fix the pillow block housings using the taper pins again!

- Connect lines for grease lubrication, any monitoring equipment, the product and drain lines.
- Turn rotor by hand to check clearance!

- Use the grease pump to supply grease until it escapes from the grease outlet openings on the pillow block housing!
- Connect the cables of the speed sensors!

9.4 Removing/fitting the dowel pin

- Do not damage wear protection!

9.5 Remove and install the scroll



Warning!

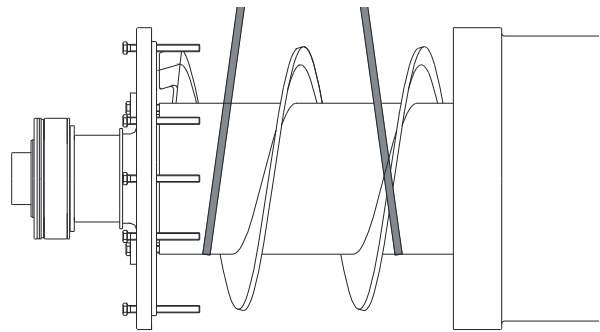
Before pulling the scroll out of the bowl remove the adjustable tubes!



Caution!

Do not damage any seatings or depressions. Place wooden blocks underneath.

- Use forcing bolts to remove the scroll.
- To install the scroll use threaded rods with counter nuts and washers!



Caution!

In stiffness step 9.8 is preferable!

9.6 Remove and install the pillow block housings and the inlet pipe



- Important
- Ensure the highest cleanliness!

9.7 Replace the main bearing on the inlet side

- Renew all O-rings and gaskets!



Caution!

Carefully remove the bowl cover from the loose scroll bearing. Do not damage the scroll bearing, the running surfaces or sealing rings.

9.8 Remove and install the scroll drive

- Use forcing bolts to remove the scroll drive!
- To install the scroll drive use threaded rods with counter nuts and washers!

9.9 Replace the main bearing on the removal side



- Important

After removing the seal plate it is essential that the bearings will be covered to prevent ingress of dirt!

- Renew all O-rings and gaskets!

9.10 Repairs

If repair work is required on the rotor parts or if bearings or seals need to be replaced, we recommend engaging the services of our service technicians to either carry out or oversee the works.

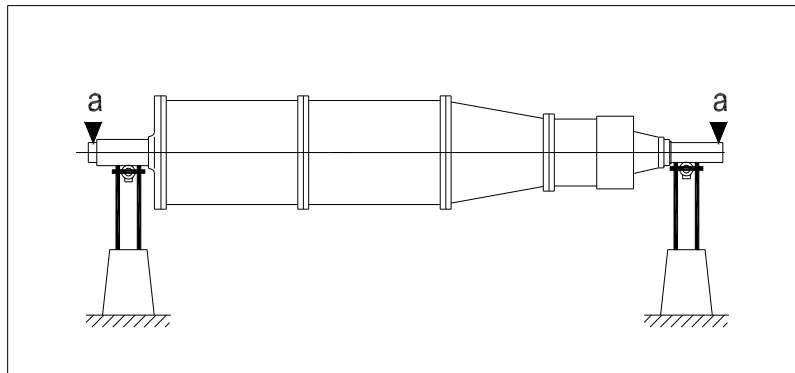
HILLER is unable to offer any mechanical warranty if the works are undertaken by the operator in-house without the help of our service technicians.

The safest way to prepare the equipment is to have the work carried out at the HILLER site, followed by a mechanical test run and with a warranty being provided.

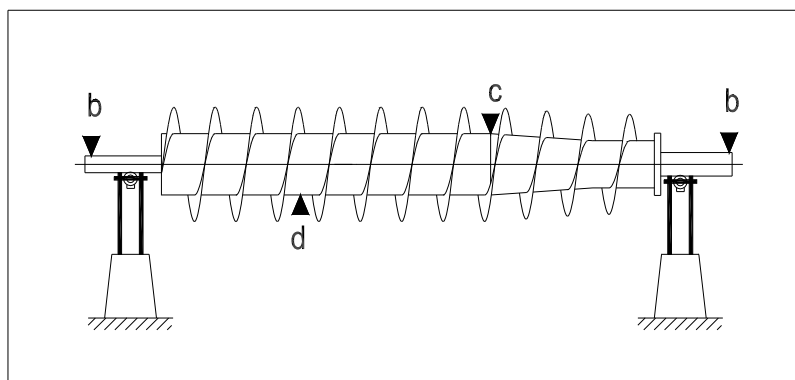
9.11 Concentricity check

After repairing the rotor parts, the drum and scroll must be checked for concentricity. In this process, the following concentricity deviations are permissible (drum and scroll positioned on a roller mount):

- Max. eccentricity of the front wall, measurement point "a" = 0.02 mm



- Max. eccentricity of the feed-side scroll pin, measurement point "b" = 0.05 mm, of the discharge-side balancing pin, measurement point "b" = 0.05 mm, on the scroll body, measurement point "c", "d" = 0.5 mm



Note!

The balancing pin is not supplied as standard. The pin can be ordered from HILLER or hired via the customer service department.

9.12 Balancing

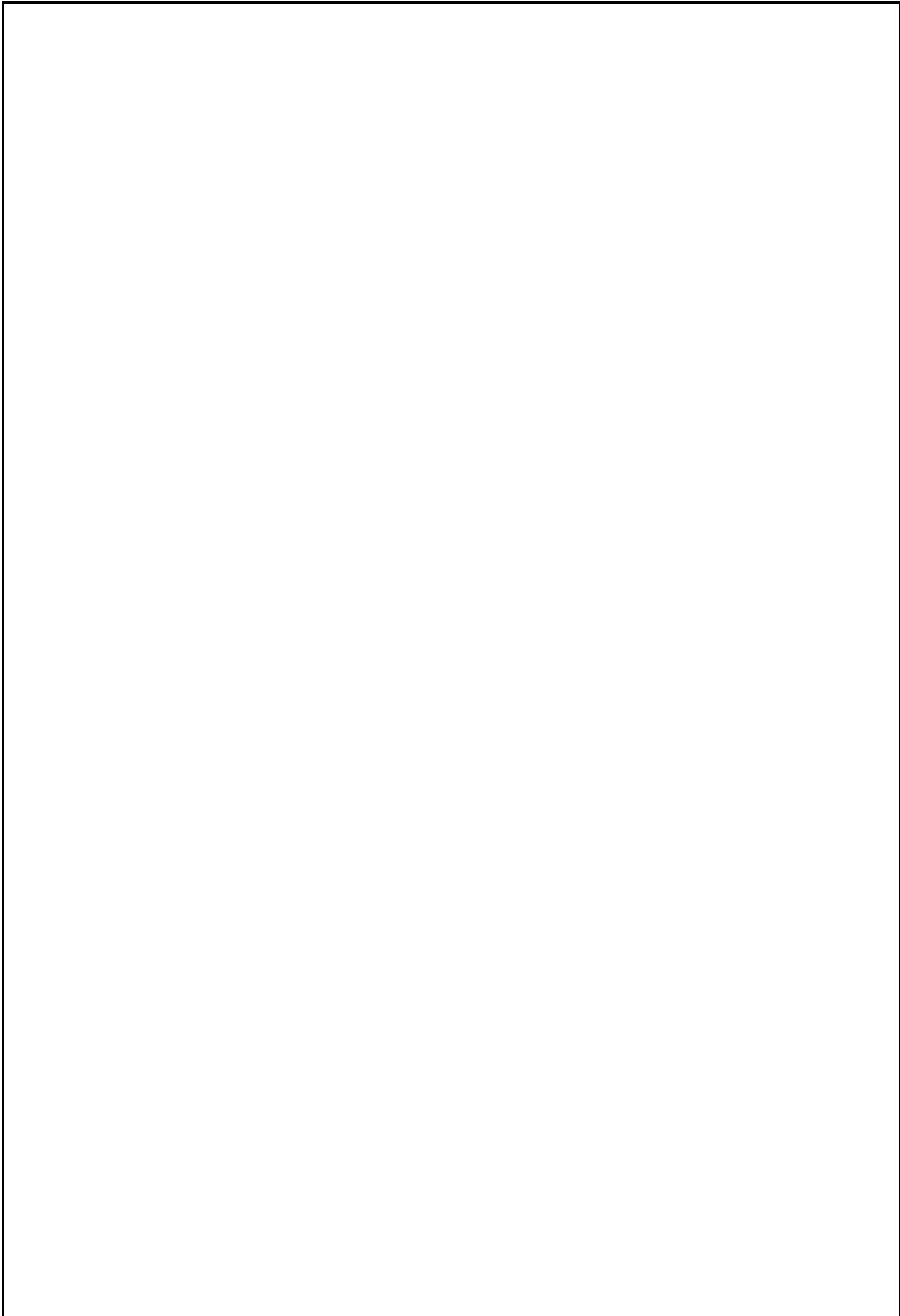
After the concentricity check, we recommend balancing the drum and the scroll dynamically. In this process, separate balancing operations are carried out for the scroll with the scroll pin fitted and the drum with the front walls fitted.



Note!

The balancing speed should be close to operating speed. The necessary balancing quality according to VDI 2060 (ISO 1940/1, quality level G 2.5) should conform to Q 2.5.

The "Concentricity check" and "Balancing" activities ensure that quiet running of the centrifuge when re-started.



10. Servicing/maintenance

10.1 Maintenance table



Warning!

Service- and maintenance works should not be done in an explosive atmosphere. If this cannot be ensured, the operator has to fulfill his obligations respecting Directive 1999/92/EC or operational safety regulation and to take appropriate protection measures.

The earthing cables must not display any signs of damage and must ensure a reliable contact between the components. Otherwise, non-permissible sources of ignition may occur, which increase the explosion hazard.



Warning!

Risk of bearing damage. The lubrication intervals and quantities required for the drum and screw bearings are dependent on the application process. Especially increased start-up/stop processes and/or flushing processes at low speeds require adaptation of the lubricant quantities.

The time specifications detailed in the following table are based on continuous uninterrupted operation and are to be considered as a recommendation. Depending on your usage of the centrifuge, select the relevant specification based on the period or the hours. A complete overhaul must be carried out at least once every three years, however.



Caution!

For all lubrication tasks, observe the "10.4 Lubrication service" chapter and list of lubrication points in "Diagrams and tables" in the machine documentation!

■ **daily / every 24 hours / when machine is running**

Running of the centrifuge (vibration).
Unusual noises.
Temperature of the main bearing, max. limit temperature max. 115 °C.
Power requirement / Power consumption of the drive motor.
Hydraulic pressure of the hydraulic unit

■ **daily / every 40 hours / when machine is running**

Lubricate the main bearing using a hand lever press.
--

■ **weekly / every 150 hours / when machine is stopped**

Clean the fan guards on the electric motors if necessary.
Check compensators and flexible connections for damage and replace if necessary.

■ **monthly / every 500 hours / when machine is stopped**

Lubricate the loose scroll bearing using a manual grease pump.
Check the V-belt tension. See "10.7 V-belt tension".
Empty the grease container underneath the main bearing on the discharge side.
Empty the grease collecting tub underneath the main bearing on the feed side.

■ **after the first 1000 hours / when machine is stopped**

replace the pressure filter element of the hydraulic unit for the first time
carry out the first oil change on the scroll drive hydraulic unit

■ **every 3000 hours or annually / when machine is stopped**

carry out an oil change on the scroll drive hydraulic unit
replace the pressure filter element of the hydraulic unit

■ **yearly / every 8000 hours (min. every 3 years) / when the machine is stopped**

Complete overhaul, clean bowl, scroll and housing completely and remove deposits.
Check for wear on following parts in disassembled state: Bowl (solids discharge openings, slip ring, dam plates, wear-resistant supports), scroll (feed chamber helixes, slip ring, orifices) (see "11.3 Checking for wear")
Repair or replace faulty parts.
Check bowl bearing, scroll, housing, drive unit, replace if necessary.
All sealing components removed must be replaced.
Check hollow rubber springs and expansion joints for external signs of damage and deformation.
Conduct a functional test of all safety devices (e.g. PTX, speed-, vibration sensor).
Check for wear and replace the V-belts if necessary. Replace after 3 years at the latest.
Replace hydraulic hoses after 2 and respectively 6 years according to BGR 237.
Check grounding and equipotential bonding

10.2 Checking for wear

Where abrasive media are being used, the scroll helixes are subjected to considerable wear and tear on their outer contours and on the transport side. For a routine check, it is sufficient to check the wear on the helixes through the discharge openings in the bowl by removing the top housing section.

If the solids discharge becomes poorer despite conditions remaining constant, the wear may have reached a point where it is necessary to disassemble the components for checking and repair where appropriate. In this case, we recommend contacting our customer service department for assistance for a fast and efficient overhaul.

Parts	Check for wear
Scroll	External diameter of the helixes
	Back-grinding on the helixes
	Helixes on the rear transport side in the feed area
	Feed chamber in general
	Scroll inlet openings
Loose scroll bearing	Check the bearing ring for secure positioning, check running surfaces on the rollers for wear.
	Check the running gasket rings for traces being caused by sealing rings.
	Replace sealing rings when disassembling.
Bowl	Interior of bowl, general
	External bowl, especially in the area of the dividing walls and the solids discharge shaft.
	Solids discharge openings at armoured material thickness

Parts	Check for wear
Main bearing	Check the bearing for secure positioning, check running surfaces on the rollers for wear.
Seals and O-rings	No check is required under normal circumstances. Following extended operation, the seals and O-rings have often become extremely misshapen and no longer fulfil the requirements. To avoid leaks and hazards, all disassembled seals should always be replaced.

10.3 Centrifuge testing

To meet the requirements of accident prevention regulations, the centrifuge should be tested at least once per year, and in addition, tested in disassembled state at least every 3 years.

This must be carried out by a qualified expert. We recommend contracting our service department to carry out this testing work, who will also be able to rectify any faults detected.

10.4 Lubrication service

- Carefully conducted lubrication servicing is the requirement for fault-free operation without costly repairs. This applies in particular to the correct lubrication of the main bearing and the loose scroll bearing.
- In the event of insufficient lubrication, the service life of the bearings is reduced (uneven running) and they will need to be replaced prematurely which is expensive and takes a considerable amount of time.
- After every disassembly (e.g. repairs), as well as extended standstill period, the scroll bearing should be lubricated thoroughly as described.
- Only the oils and greases specifically approved for usage may be used. The use of inappropriate lubricants can result in destruction or premature wear, as well as the invalidation of the warranty. If none of the recommended lubricants given in the list of lubricants is available, please contact us.
- The relevant lubrication points with the corresponding lubricants, lubrication periods and quantities can be found in the list of lubricants in the "Diagrams and tables" section of the technical machine documentation and the relevant operating instructions for the equipment/machines.



Warning!

The lubrication work, and all works required for the lubrication process, must be carried out when the centrifuge is stopped, unless specifically stated otherwise in the instructions.

10.4.1 Loose scroll bearing

- Remove the safety cover labelled with the "bearing lubrication" sticker on the housing at the inlet side.
- Remove the screw plug which will now be visible.
- Clean the opposite lubrication nipple carefully and lubricate the scroll bearing using the manual grease pump until fresh grease escapes from the opposite drain hole (see list of lubricants for quantity and grade of grease).

- Screw the screw plug back in.
- Re-fit the safety cover.

10.4.2 Main bearing

Carefully clean the lubrication nipples on the pillow block housings. Use the manual grease pump to lubricate the main bearings. (See list of lubricants for quantity and grade of grease).

10.4.3 Motor bearing

See manufacturer's specifications in the operating instructions for the electric motor.

10.4.4 Hydromotor, hydraulic unit

See manufacturer's specifications in the relevant operating instructions in the technical machine documentation. Details on the hydraulic unit electric motor can be found in the hydraulic unit operating instructions.

10.5 V-belt drive, general



Warning!

The drive belts are electrically conductive and certified to ISO 1813.

Non-certified belts are a potential source of ignition!

When changing the drive belts, always use original spare parts!

- The V-belts are designed for the drive output specified. Forcing a higher output by using a non-permissibly high V-belt tension results in belt breaks, bearing damage and poor efficiency.
- Belt tension that is too low results in slippage and thus in an increased belt temperature and premature destruction of the V-belt.
- Extended periods of temperatures over 50°C (e.g. when using a soundproofing hood) means that the V-belts deteriorate, in turn reducing the service life and performance.
- The grooves on the V-belt pulleys must be free of rust and dirt and should not be damaged in any way. The use of belt wax or similar materials to increase the friction coefficient is unnecessary and will only damage the V-belt.
- Contamination due to oils, greases or chemicals must be avoided.
- To ensure optimum power transmission, the V-belt drive must be monitored and serviced.

The following notes must be observed:

- In the case of belt pulleys with multiple grooves, only belt sets of the same length should be used when replacing the V-belt. Individual faulty belts should only be replaced with completely new V-belt sets as old and new belts will not run in combination sufficiently well.
- Each V-belt is identified with a number from the manufacturer. Do not use V-belts with different numbers. When starting up the centrifuge with a new belt set, check the belt tension after a short running-in period and re-tighten the belts if necessary.
- The belt tension should be checked at regular intervals and re-tightened if necessary.

10.6 Changing the V-belt



Warning!

Only disassemble once with the rotor has come to a standstill and the machine has been secured. For additional information, see chapter "9. Disassembly/assembly".

- Remove the belt guard and locking device.
- Unfasten fastening nuts on the drive displacement, unfasten the counternuts on the tension screw and release all tension on the V-belt drive by turning the tension screws.
- Remove hydraulic hoses from the screw connections on the rotary connector and close the openings using safety caps to prevent any dirt entering.
- Remove the cables from the from speed sensors and fit safety caps.
- Remove the old V-belts. Fit the new V-belts by hand and without force. Using force can result in damage to the belts.
- Tighten the V-belt drive by turning the tension screw on the drive displacement and secure with a counternut (see 10.7).
- Fasten the fastening nuts on the drive displacement.
- Re-connect the hydraulic hoses to the rotary connector.
- Connect the cable to the speed sensors.
- Ensure that the hydraulic circuit is correctly sealed!
- Fit the locking device.
- Re-fit the belt guard temporarily.
- Run in the V-belt drive for approx. 15 minutes. The V-belts will stretch during this process and will adjust themselves to the disk grooves.
- Re-tighten the V-belt drive to the required belt tension after the rotor has come to a standstill.
- Tighten the lock nuts on the tension screw and the fastening bolts on the drive displacement.
- Re-fit the belt guard completely, and fasten into place.



Warning!

For safety reasons, the centrifuge must not be operated unless the belt guard are fully fitted!

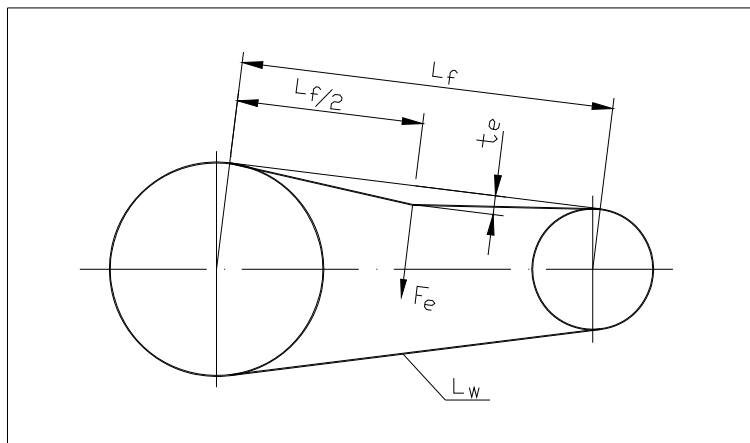
10.7 V-belt tension

The V-belt tension must be sufficient for the V-belts do not slip through during start-up, shock loads and continuous loading. Guideline value for the V-belt tension: After the run-in time, enlarge the axial distance around 0.5 - 1% of the effective length L_w of the V-belt. See DIN 7753 part 2 for more information.

The belt drive should be checked for correct functioning at extended intervals.

The belt tension should be checked every 500 hours. To do this, a ruler is positioned across the washers. See diagram below. Using a spring balance, draw a V-belt through by the measurement " t_e ", with multi-grooved drive on the centre, at a right-angle to the centre of the belt. The deflection " t_e " is checked.

If the force measured during this process is less than the test load " F_e ", the belt drive must be re-tightened. With new V-belts, the test load should be increased by around 50%.



t_e =	Impression depth of the individual belts	23 mm
F_e =	Test force	75 N
f =	Intrinsic frequency	36 Hz
L_w =	Effective length of the V-belt	2240 mm
	Drive output	45 kW
	V-belt profile	SPB
Manufacturer	Continental/Optibelt	

11. Cleaning

11.1 General

- Complete and thorough chemical cleaning depends on the separation task and can consist of rinsing with soapy water, rinsing with acid for neutralisation as well as water rinsing, for example.
- It is necessary to ensure that the cleaning has been carried out effectively when the machine is put into operation for the first time and when the separation task is changed.
- When using alkaline and acid cleaning agents, all parts coming into contact with these products must be made from stainless steel as heavy metals (red bronze, brass, etc.), cast iron and steel may become damaged.
- The external parts of the machine have a permanent and permitted coating applied, but this can only offer limited protection against caustic chemicals.
- To clean the rotor and housing, a circulating pump, heat exchanger for heating the acid / base is required as well as suitable containers to hold the cleaning fluid.
- A strong rinsing action is a prerequisite for good internal cleaning. For this reason, the following pump sizes are recommended (pipelines should have the relevant dimensions):

Machine Size	26/ 31	37/ 45	51/ 54	58/ 66	76/ 84
Rinsing water quantity in [l/s] per rinsing point	0,6 ... 0,8	1,4 ... 2,4	3,4 ... 4,2	5,2 ... 7,6	10,8 ... 14,2

11.2 Completing a cleaning operation with water rinsing (Example)

The times given below may vary depending on the process and should be reduced or extended in accordance with the specific requirements.

- Switch off the feed pump. After approx. 5-15 minutes, the machine will not be discharging any more solids.
- Divert the solids and fluids outlets using 3-way valves.
- Top up water via the feed line.

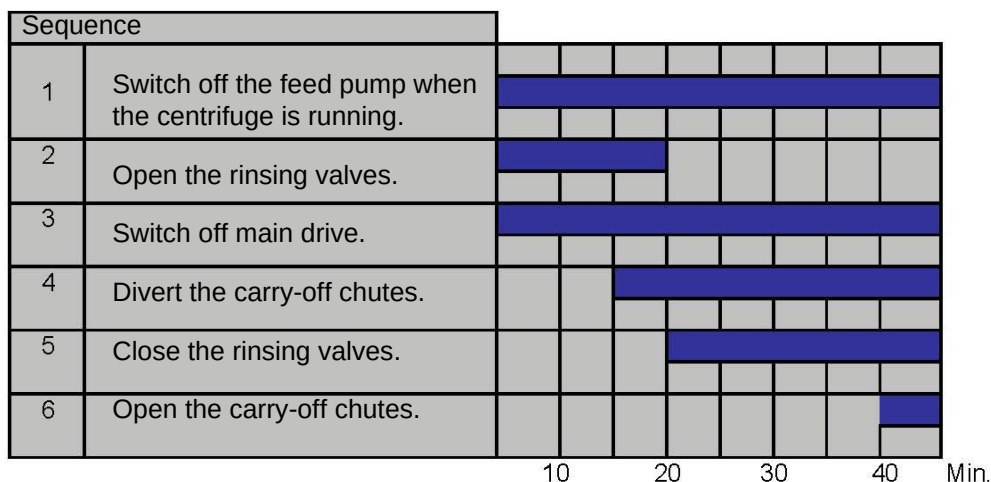
- After approx. 15 minutes, switch off the machine so that the water ring collapses and the remaining solids are carried away. The water rinsing continues to run shortly before the water ring collapses, i.e. up to the time at which the centrifugal force no longer compensates for gravity (duration: approx. 20 minutes).



Caution!

The water feed should be switched off before the machine overflows (e.g. visible on the inlet pipe).

- After the entire cleaning process has been completed, clear the outlets for solids and fluids by opening the 3-way valves.



The procedure given should be modified according to the requirements of the production workflow and optimised using product-specific cleaning and disinfection agents. The choice of suitable cleaning and disinfectant agents should be made in consultation with a cleaning agent manufacturer and the washing process should be repeated multiple times in sequence.



Caution!

Before using caustic cleaning and disinfection agents, the compatibility with the machine materials used must be checked by our service department.



Warning!

Many cleaning and disinfection agents are hazardous substances from a legal point of view, and must not be allowed to enter the environment. When handling, transporting, storing and in particular when disposing of these substances, it is essential that the relevant laws and regulations (e.g. working material regulations, accident prevention regulations, hazardous substance ordinance, chemicals act, manufacturer instructions, country-specific regulations, etc.) are observed. Used and contaminated cleaning and disinfection agents must be taken to authorised collecting points.

12. Storage



Important!

- Do not store the centrifuge outdoors.
- Protect the centrifuge from the weather and in particular, air humidity, temperature fluctuations and dust.
- Storage temperature: +10 to +30 °C
- Optimum air humidity: 20 to 50%

12.1 Long-term preservation

■ Period < 4 weeks

No measures required

■ Period < 3 months (before commissioning)

The rotor must be turned by hand at least 20 revolutions to change the pressure points on the rollers.

■ Period < 3 months (after commissioning)

Switch on the drive motor and allow the rotor to turn for 1-2 hours. If no power is available, the rotor must be turned by hand at least 20 revolutions to change the pressure points on the rollers.

Lubricate the machine at all points.

■ Period > 3 months

Remove the entire rotor and seal in a tear-proof plastic film after adding drying agent DIN 55473, rated in accordance with DIN 55474. Pack in a box packed out with aluminium foil.

Seal the complete drive unit, including V-belt in a tear-proof plastic film after adding drying agent DIN 55473, rated in accordance with DIN 55474, and pack in a box.

Seal the hydromotor and hydraulic unit in a tear-proof plastic film after adding drying agent DIN 44573, rated in accordance with DIN 55474.

Seal the foundation and housing with all remaining parts in a tear-proof plastic film and pack in a box.

■ Period > 12 months

Carry out measures in a period of > 3 months.
First fill the hydromotor and hydraulic unit completely with hydraulic oil.
Remove and check the rotor before installing in the machine.
Check the main bearing. Replace the bearing if there are visible changes in the running action.
Before commissioning, have HILLER service personnel carry out a test run.

12.2 Construction works and the effects of dust

If construction works are carried out in the immediate vicinity of the centrifuge during a standstill phase, the pillow block housing should be covered with film and the labyrinth filled with grease. This prevents any foreign materials entering the machine.

To avoid any damage to the machine bearing due to vibration, there must be no load on the rotor bearing. This is achieved by fitting the transport safety retainer (see chapter "4. Transport") or by removing the entire rotor and storing it separately.

The safest way to prepare the equipment is to have the work carried out at the HILLER site, followed by a mechanical test run and with a warranty being provided.

13. Repairs/spare parts inventory



Warning!

Repair works must not be done in an explosive atmosphere. If this cannot be ensured, the operator has to fulfill his obligations respecting Directive 1999/92/EC or operational safety regulation and to take appropriate protection measures.



Warning!

All repair work that may arise may only be carried out by us or an authorised representative.

The warranty can only be provided on original HILLER spare parts.

Repairs and any assembly/disassembly work carried out yourself or by unauthorized persons and/or the use of spare parts not supplied by HILLER and add-on equipment void any warranty.

Personal injury or material damage through non-observance lie outside the responsibility of HILLER.



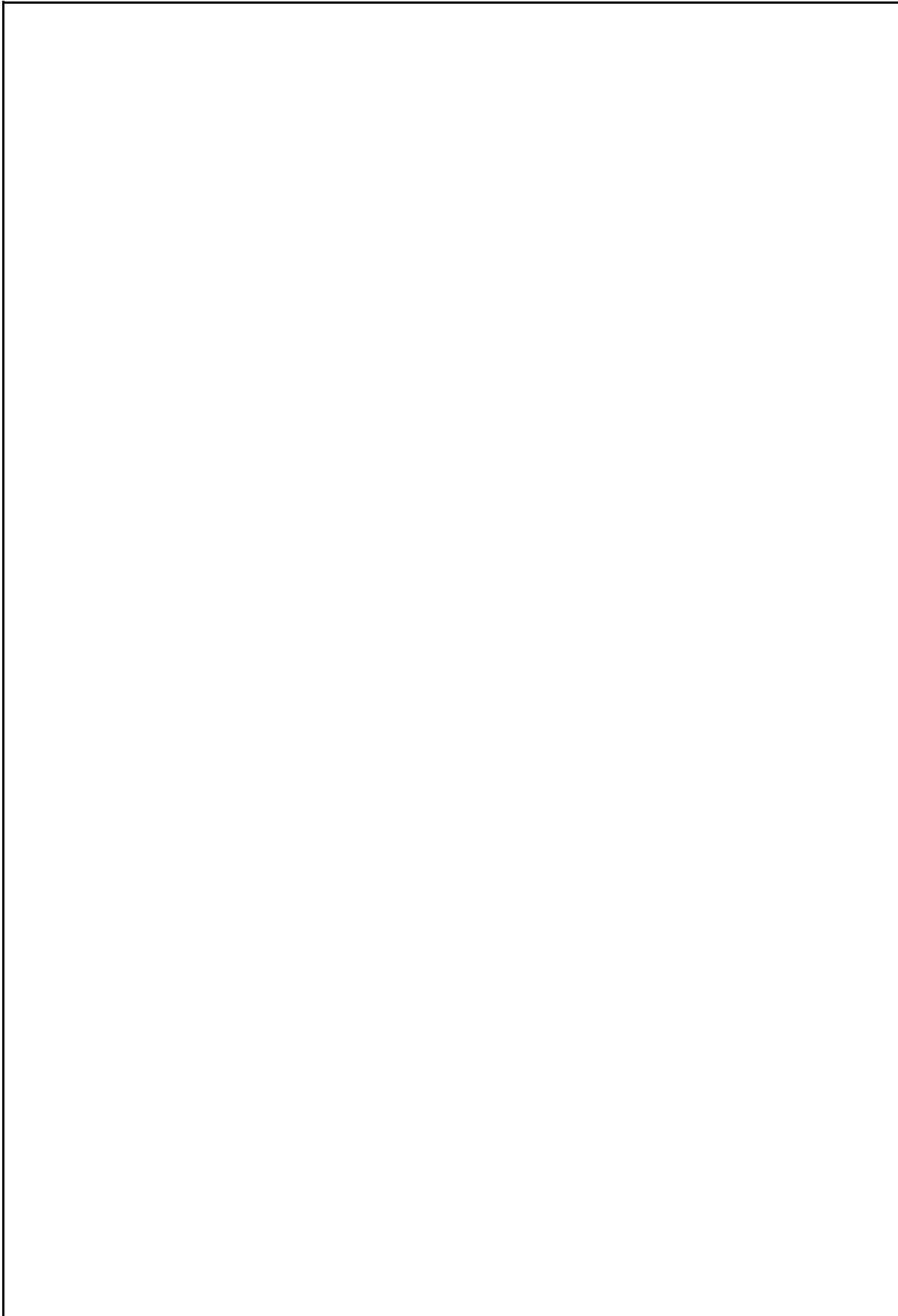
Important!

Stocks of the most important spare parts and parts subject to wear must be held at the installation site to ensure the continuous function and operational readiness of the centrifuge.

To order spare parts, please help yourself to the separate spare parts list. The most important wearing parts and replacement parts are designated with "V" in the list (last column in the tables). We strongly recommend you keep sufficient stocks of these parts as a minimum.

When ordering spare parts, please provide the following information (example):

Machine number	H5239
Spare part list number	ELDP540177-00-01 D/E
Assembly	Bowl
Item number	24
Spare part name	set screw
Order number	N913-0001



Appendix F

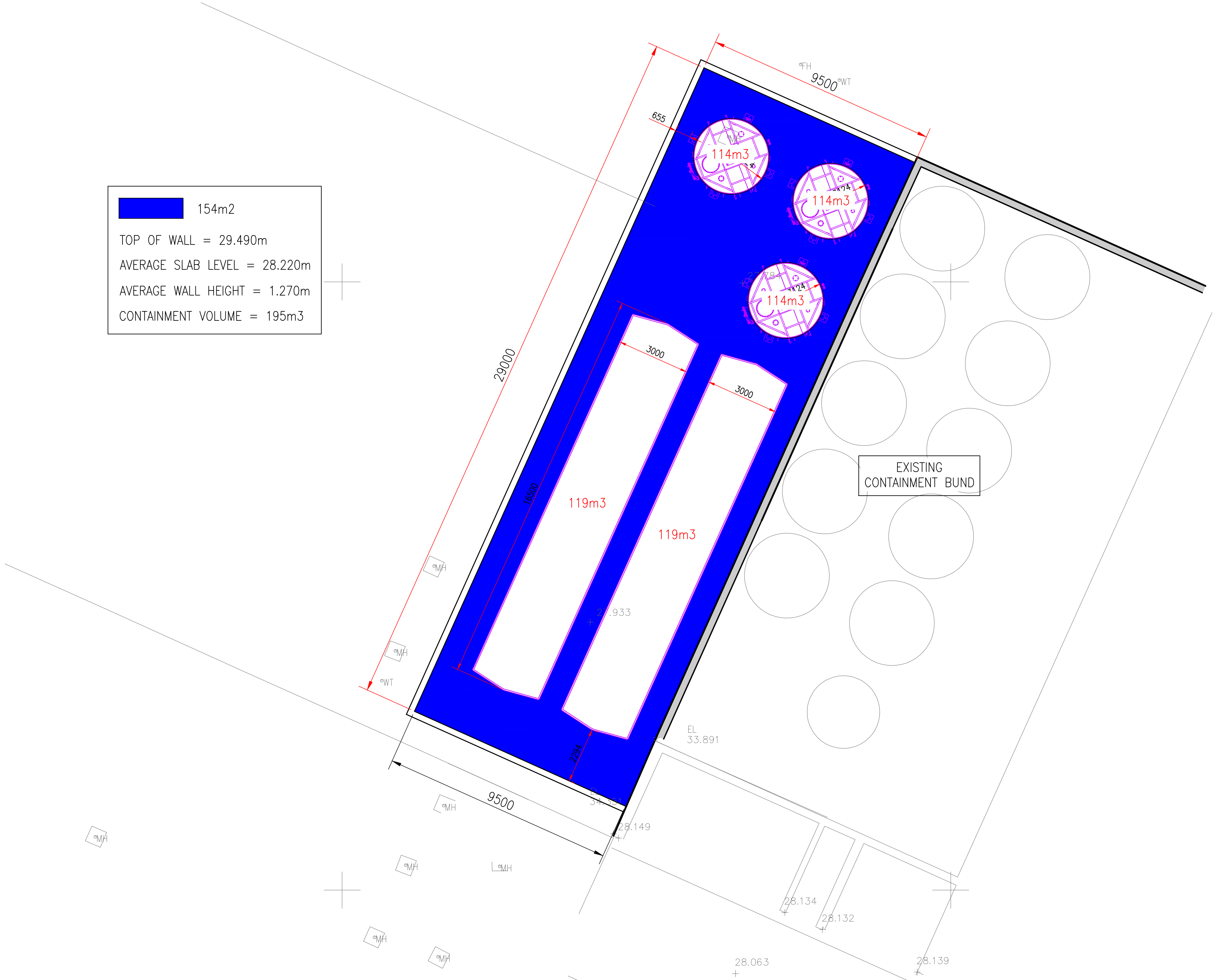
154m2

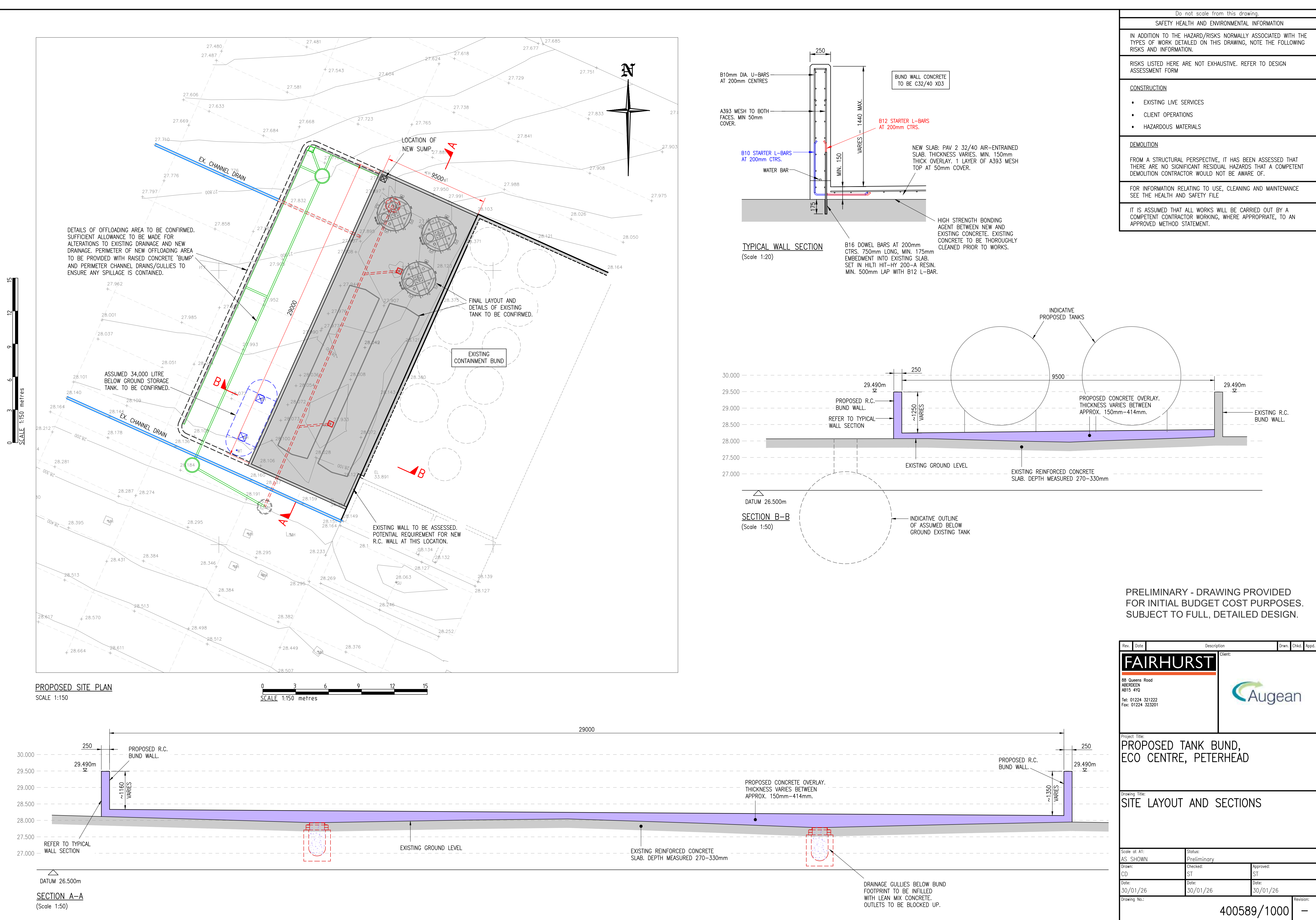
TOP OF WALL = 29.490m

AVERAGE SLAB LEVEL = 28.220m

AVERAGE WALL HEIGHT = 1.270m

CONTAINMENT VOLUME = 195m3





PROPOSED SITE PLAN
SCALE 1:150

SCALE 1:150 metres

SECTION A-A
(Scale 1:50)

SECTION B-B
(Scale 1:50)

PRELIMINARY - DRAWING PROVIDED
FOR INITIAL BUDGET COST PURPOSES.
SUBJECT TO FULL, DETAILED DESIGN.

Rev.	Date	Description	Drawn	Chkd.	Appd.
FAIRHURST			Client:		
08 Queens Road ABERDEEN AB15 4YQ Tel: 01224 321222 Fax: 01224 323201					
Project Title:					
PROPOSED TANK BUND, ECO CENTRE, PETERHEAD					
Drawing Title:					
SITE LAYOUT AND SECTIONS					
Scale at A1: AS SHOWN			Status: Preliminary		
Drawn: CD		Checked: ST	Approved: ST		
Date: 30/01/26		Date: 30/01/26	Date: 30/01/26		
Drawing No.:			Revision:		
400589/1000			—		

Appendix G

MANUFACTURED BY
BYWORTH BOILERS

DENNIS BALDWIN & SONS LTD. PARKWOOD BOILER WORKS,
PARKWOOD STREET, KEIGHLEY, WEST YORKSHIRE, ENGLAND. BD21 4NW
TELEPHONE 01535 665225 / FAX 01535 680997. E-MAIL sales@byworth.co.uk

SERIES, TYPE &
SERIAL NUMBER

MX2000-83

WORKING
PRESSURE

150 PSIG

DESIGN PRESSURE(P.S)
& TEMPERATURE

165 PSIG/250°C

SAFETY VALVE
SET PRESSURE

165 PSIG

DATE OF
MANUFACTURE

APR 2010

INSPECTING
AUTHORITIES
STAMPS

Rs

ED

HYDRAULIC TEST
PRESSURE

248 PSIG

HYDRAULIC TEST
DATE

21/04/10

NOTIFIED BODY
I.D. NUMBER

CE 0038 LR

RATED OUTPUT
(MAX. CONTINUOUS RATING)

2000KG/HR F & A 100°C

No. OF BRITISH STANDARD
& CLASS OF CONSTRUCTION

BS2790 1992 CLASS I

Appendix H

Printing date: 10/9/2022

**SECTION 1: Identification of the substance/mixture
and of the company/undertaking**

1.1. Product identifier

Trade name: D 85L
MSDS code: YY2330
Chemical description: Surfactants

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use:

Industrial uses.

1.3. Details of the supplier of the safety data sheet

Supplier:
Prochem International BV, Mandelaplein 1, 1314CG Almere,
The Netherlands, Tel +31 36 7997589

1.4. Emergency telephone number

+31 36 799 7589

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP)

-  Warning, Skin Irrit. 2, Causes skin irritation.
-  Danger, Eye Dam. 1, Causes serious eye damage.
-  Warning, Carc. 2, Suspected of causing cancer.
-  Warning, STOT SE 3, May cause drowsiness or dizziness.
-  Danger, Asp. Tox. 1, May be fatal if swallowed and enters airways.
-  Aquatic Chronic 2, Toxic to aquatic life with long lasting effects.

Adverse physicochemical, human health and environmental effects:

No other hazards

2.2. Label elements

Hazard pictograms:



Danger

Hazard statements:

H315 Causes skin irritation.
H318 Causes serious eye damage.
H351 Suspected of causing cancer.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.

Safety data sheet

D 85L

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P273 Avoid release to the environment.

P280 Wear protective gloves/clothing and eye/face protection.

P301+P310 IF SWALLOWED: Immediately call a doctor.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a doctor.

P331 Do NOT induce vomiting.

Special Provisions:

None

Contents

Hydrocarbons C10 aromatics > 1% naphthalene.

Benzenesulfonic acid, C10-16-alkyl derivs., compds. with triethanolamine

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

Special provisions according to Annex XVII of REACH and subsequent amendments:

None

2.3. Other hazards

vPvB Substances: None - PBT Substances: None

Other Hazards:

No other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

N.A.

3.2. Mixtures

Hazardous components within the meaning of the CLP regulation and related classification:
>= 40% - < 60% Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics > 1% naphthalene.)

REACH No.: 01-2119463588-24-XXXX, Index number: Not available, CAS: 1189173-42-9, EC: 919-284-0

 3.10/1 Asp. Tox. 1 H304

 3.8/3 STOT SE 3 H336

 3.6/2 Carc. 2 H351

 4.1/C2 Aquatic Chronic 2 H411

EUH066

>= 25% - < 40% Benzenesulfonic acid, C10-16-alkyl derivs., compds. with triethanolamine

REACH No.: Not available, Index Number: Not Available, CAS: 68584-25-8, EC: 271-532-0

 3.2/2 Skin Irrit. 2 H315

 3.3/1 Eye Dam. 1 H318

>= 3% - < 10% Sulfonic acids, petroleum, sodium salts

REACH No.: 01-2119527859-22-XXXX, Index Number: Not Available, CAS: 68608-26-4, EC: 271-781-5

 3.3/2 Eye Irrit. 2 H319

Safety data sheet

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>= 3% - < 10% 2-(2-(2-butoxyethoxy)ethoxy)ethanol.

REACH No.: 01-2119475107-38-XXXX, Index number: 603-183-00-0, CAS: 143-22-6, EC: 205-592-6



3.3/1 Eye Dam. 1 H318

SECTION 4: First aid measures

4.1. Description of first aid measures

In case of skin contact:

Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap.

Seek immediately medical advice.

Remove contaminated clothing immediately and dispose of safely.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

Protect uninjured eye.

In case of Ingestion:

Do not under any circumstances induce vomiting. Seek immediately medical advice.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

4.2. Most important symptoms and effects, both acute and delayed

Not known.

4.3. Indication of any immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

Not known.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water.

Carbon dioxide (CO₂).

Extinguishing media which must not be used for safety reasons:

Not known.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

5.3. Advice for firefighters

Use suitable breathing apparatus .

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency

procedures Wear personal protection equipment.

Remove persons to safety.

See protective measures under point 7 and 8.

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

6.3. Methods and material for containment and cleaning up

Safety data sheet

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Suitable material for taking up: absorbing material, organic, sand
Wash with plenty of water.

- 6.4. Reference to other sections
See also section 8 and 13

SECTION 7: Handling and storage

- 7.1. Precautions for safe handling
Avoid contact with skin and eyes, inhalation of vapours and mists.
Exercise the greatest care when handling or opening the container.
Do not use empty container before they have been cleaned.
Before making transfer operations, assure that there are not any incompatible material residuals in the containers.
Contaminated clothing should be changed before entering eating areas.
Do not eat or drink while working.
See also section 8 for recommended protective equipment.
- 7.2. Conditions for safe storage, including any incompatibilities
Keep away from food, drink and feed.
Incompatible materials:
None.
Instructions as regards storage premises:
Adequate ventilation in working area.
Packaging suggested:
Iron drums.
- 7.3. Specific end use(s)
None in particular

SECTION 8: Exposure controls/personal protection

- 8.1. Control parameters
2-(2-(2-butoxyethoxy)ethoxy)ethanol.
ACGIH - LTE: 10 ppm
EU - Dir. 2006/15/EC (ILV) - LTE: 67.5 mg/m³, 10 ppm
- DNEL
Hydrocarbons C10 aromatics > 1% naphthalene.
Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics > 1% naphthalene.)
Worker Industry: 12.5 mg/kg - Frequency: Long Term, systemic effects Human Dermal Worker
Industry: 150 mg/m³ - Frequency: Long Term, systemic effects Human Inhalation General
population: 7.5 mg/kg - Frequency: Long Term, systemic effects Human Dermal General
population: 32 mg/m³ - Frequency: Long Term, systemic effects Human Inhalation General
population: 7.5 mg/kg - Frequency: Long Term, systemic effects Human Oral
- 2-(2-(2-butoxyethoxy)ethoxy)ethanol.
Worker Industry: 195 mg/m³ - Worker Professional: 195 mg/m³ - General population: 117
mg/m³ - Frequency: Long Term, systemic effects Human Inhalation
Worker Industry: 208 mg/kg bw/day - Worker Professional: 208 mg/kg bw/day - General
population: 125 mg/kg bw/day - Frequency: Long Term, systemic effects Human Dermal
General population: 12.5 mg/kg bw/day - Frequency: Long Term, systemic effects Human Oral
- PNEC
2-(2-(2-butoxyethoxy)ethoxy)ethanol.
Fresh Water 2 mg/l
Marine water 0.2 mg/l
Intermittent release 8.4 mg/l
STP 200 mg/l
Freshwater sediments 7.7 mg/kg
Marine water sediments 0.77 mg/kg
Soil (agricultural) 0.47 mg/kg
Secondary poisoning 111 mg/kg

Safety data sheet

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8.2. Exposure controls

Eye protection:

Use close fitting safety goggles. (ref. EN 166, EN 140, EN175).

Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton. (ref. EN 340).

Protection for hands:

Chemical-resistant protective gloves (EN 374). When prolonged or frequently repeated contact may occur, a glove is recommended to prevent contact. Examples of preferred glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). As general indication we suggest as suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374): nitrile rubber (NBR; ≥ 0.4 mm thickness) and suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): nitrile rubber (NBR; ≥ 0.4 mm thickness). This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances-mixtures.

Respiratory protection:

Use adequate protective respiratory equipment. (ref. EN 136, EN 140, EN 141, EN 143, EN 149, EN 405).

Thermal Hazards:

None

Environmental exposure controls:

None

Appropriate engineering controls:

None

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical

properties Appearance and colour: Yellow liquid

Odour: Slight

Odour threshold: N.D.

pH: 3 - 5 (IPA/wate/product 75:20:5)

Melting point / freezing point: N.D.

Initial boiling point and boiling range: N.D.

Solid/gas flammability: N.D.

Upper/lower flammability or explosive limits: N.D.

Vapour density: N.D.

Flash point: > 60 °C

Evaporation rate: N.D.

Vapour pressure: N.D.

Relative density: Approx. 0.95 - 1.00

Solubility in water: Insoluble

Solubility in oil: N.D.

Partition coefficient (n-octanol/water): N.D.

Auto-ignition temperature: N.D.

Decomposition temperature: N.D.

Viscosity: Kinematic: < 20.5 cSt @ 40 °C

Explosive properties: N.D.

Oxidizing properties: N.D.

9.2. Other information

Miscibility: N.D.

Fat Solubility: N.D.

Conductivity: N.D.

Substance Groups relevant properties N.D.

Safety data sheet

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SECTION 10: Stability and reactivity

- 10.1. Reactivity
Stable under normal conditions
- 10.2. Chemical stability
Stable under normal conditions
- 10.3. Possibility of hazardous reactions
Stable under normal conditions
- 10.4. Conditions to avoid
Stable under normal conditions.
- 10.5. Incompatible materials
Strong oxidizers
- 10.6. Hazardous decomposition products
Not known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological information of the mixture:

- a) acute toxicity:
LD50 Oral Rat > 2000 mg/kg - source: Based on components.
- b) skin corrosion/irritation:
Irritation Skin : Causes skin irritation.
- c) serious eye damage/irritation:
Irritation Eye : Causes serious eye damage.
- f) carcinogenicity:
Carcinogenecity : Suspected of causing cancer.
- h) STOT-single exposure:
Toxicity : May cause drowsiness or dizziness.
- j) aspiration hazard:
Toxicity : May be fatal if swallowed and enters airways.

Toxicological information of the main substances found in the mixture:

Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics> 1% naphthalene.)

- a) acute toxicity:
Toxicity Oral Rat LD50> 5000 mg/kg
Toxicity Skin Rabbit LD50> 2000 mg/kg
Toxicity Inhalation Rat LC50 > 4688 mg/m3

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

- a) acute toxicity:
LD50 Oral Rat = 5170 mg/kg - source: Literature data.
LD50 Skin Rabbit = 3540 mg/kg - source: Literature data.
- b) skin corrosion/irritation:
Irritation Rabbit : Not irritant. - source: Literature data.
- c) serious eye damage/irritation:
Irritation Rabbit : Causes serious eye damage. - source: Literature data.
- d) respiratory or skin sensitisation:
Guinea pig maximization test Skin Guinea pig : Not sensitizing. - source: By analogy to product with similar composition.
- e) germ cell mutagenicity:
OECD 471 Salmonella typhimurium : Not mutagenic. - Duration: 48h - source: Literature data.
- g) reproductive toxicity:
NOAEL Oral Mouse = 720 mg/kg - source: By analogy to product with similar composition.

Other : N.D.

If not differently specified, the information required in Regulation (EU)2015/830 listed below must be considered as N.D.:

Safety data sheet

D 85L

- a) acute toxicity;
- b) skin corrosion/irritation;
- c) serious eye damage/irritation;
- d) respiratory or skin sensitisation;
- e) germ cell mutagenicity;
- f) carcinogenicity;
- g) reproductive toxicity;
- h) STOT-single exposure;
- i) STOT-repeated exposure;
- j) aspiration hazard.

SECTION 12: Ecological information

12.1. Toxicity

Ecological information of the mixture:

a) Aquatic acute toxicity:

LC50> 1-10 mg/l - aquatic species (according to the criteria of the CLP Regulation).

Ecological information of the main substances found in the mixture:

Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics> 1% naphthalene.)

a) Aquatic acute toxicity:

Fish LC50 2-5 mg/l - Duration h: 96

Daphnia magna EC50 3-10 mg/l - Duration h: 48

Algae EC50 = 11 mg/l - Duration h: 72

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

a) Aquatic acute toxicity:

Fish NOEC = 1000 mg/l - Duration h: 96 - Notes: Literature data.

OECD 202 Daphnia magna EC50 > 500 mg/l - Duration h: 48 - Notes: Literature

data. 12.2. Persistence and degradability

Ecological information of the mixture:

Biodegradability: Data not available.

Ecological information of the main substances found in the mixture:

Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics> 1% naphthalene.) Biodegradability: Readily biodegradable - Duration: 28 days. - %: 58

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

Biodegradability: Readily biodegradable - Test: OECD 301 D - Duration: 28 days. - %: 85

- Notes: Literature data.

12.3. Bioaccumulative potential Ecological information of the mixture:

Bioaccumulation: Data not available

Ecological information of the main substances found in the mixture:

Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics> 1% naphthalene.) Bioaccumulation: Data not available

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

Bioaccumulation: Not bioaccumulative - Test: BCF - Bioconcentration factor 3 -

Notes: Calculated data.

12.4. Mobility in soil

Ecological information of the mixture:

Mobility in soil: Data not available

Ecological information of the main substances found in the mixture:

Solvent naphtha (petroleum), heavy aromatic. (Hydrocarbons C10 aromatics> 1% naphthalene.) Mobility in soil: Data not available

2-(2-(2-butoxyethoxy)ethoxy)ethanol.

Mobility in soil: Very high - Test: Koc: 10 - Notes: Calculated

data. 12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: None

12.6. Other adverse effects

None

Safety data sheet

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Use according to criteria of good industrial practice, avoiding product dispersion in the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

If possible recover the product, otherwise dispose of in authorized landfill or incineration in accordance with local regulation.

SECTION 14: Transport information

14.1. UN number

3082

14.2. UN proper shipping name

Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
(Hydrocarbons C10 aromatics >1% naphtalene)

14.3. Transport hazard class(es)

Road (ADR): Class 9

Air (ICAO/IATA): Class 9

Sea (IMO/IMDG): Class 9

Marine pollutant: Yes

14.4. Packing group

III

14.5. Environmental hazards

Environmental Pollutant: Yes

14.6. Special precautions for user

N.A.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

N.D.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Dir. 2000/39/EC (Occupational exposure limit values); Dir. 2006/8/CE. Regulation (CE) n. 1907/2006 (REACH).

For non-EU Countries, the Material Safety Data Sheet it is prepared following the main principles of Globally Harmonized System of Classification and Labelling of Chemicals (GHS) which are adopted worldwide.

15.2. Chemical safety assessment

No

SECTION 16: Other information

N.A. = Not Applicable

N.D. = No Data available

Full text of phrases referred to in Section 3:

H304 May be fatal if swallowed and enters airways.

H336 May cause drowsiness or dizziness.

H351 Suspected of causing cancer.

H411 Toxic to aquatic life with long lasting effects.

EUH066 Repeated exposure may cause skin dryness or cracking.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

This safety data sheet has been completely updated in compliance to Regulation 2015/830.

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

Safety data sheet

D 85L

TOXNET - Databases on toxicology, hazardous chemicals, environmental health, and toxic releases;

NIOSH - Registry of toxic effects of chemical substances (1983) - Occupational Health Guidelines for Chemical Hazards (1995) - Pocket Guide to Chemical Hazards (on line)

OECD - eChemPortal: The Global Portal to Information on Chemical Substances;

CESIO - Human Health and Environmental classification of AE, AES, AS and various surfactant families.

M.Sittig-Handbook of toxic and Hazardous Chemicals and Carcinogens- III Ed.

E.R. Plunkett - Handbook of Industrial Toxicology - III Ed. 1991.

Samson Chem. Pub.-Chemical Safety Sheet working safely with hazardous chemical.

SAX'S Dangerous Properties of Industrial Materials. VIII (1993) ACGIH - "TLVs and BEIs" - latest edition

The product must be stored, handled and used according to criteria of good industrial practice and to regulations in force.

This leaflet complements the Technical Data Sheet but does not replace it. The information herein contained is given to the best of our knowledge at the time of issue.

Due to the several ways in which the product may be used and the possible interaction with variables not depending on or unknown to the supplier, we also cannot accept any liability whatsoever for any loss or damage however arising from the handling and use of our products.

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

CAS: Chemical Abstracts Service (division of the American Chemical Society).

CLP: Classification, Labeling, Packaging.

DNEL: Derived No Effect Level.

EINECS: European Inventory of Existing Commercial Chemical Substances.

GefStoffVO: Ordinance on Hazardous Substances, Germany.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

ICAO: International Civil Aviation Organization.

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).

IMDG: International Maritime Code for Dangerous Goods.

INCI: International Nomenclature of Cosmetic Ingredients.

KSt: Explosion coefficient.

LC50: Lethal concentration, for 50 percent of test population.

LD50: Lethal dose, for 50 percent of test population.

LTE: Long-term exposure.

PNEC: Predicted No Effect Concentration.

REACH: Registration Evaluation and Authorization of Chemicals.

RID: Regulation Concerning the International Transport of Dangerous Goods by Rail.

STE: Short-term exposure.

STEL: Short Term Exposure limit.

STOT: Specific Target Organ Toxicity.

SVHC: Candidate List of Substances of Very High Concerns.

TLV: Threshold Limiting Value.

TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).

WGK: German Water Hazard Class.



SAFETY DATA SHEET
RO SC D4227

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name RO SC D4227

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Demulsifier.

1.3. Details of the supplier of the safety data sheet

Supplier REDA Energy
Concorde House,
Endeavour Drive,
Arnhall Business Park,
Westhill,
Aberdeenshire,
AB32 6UF
Tel: +44(0)1224 937888
Fax: +44(0)1224 937819

Contact person QHSE@redaenergy.com

1.4. Emergency telephone number

Emergency telephone 24 Hr Switchboard: +44(0)1224 937888

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (SI 2019 No. 720)

Physical hazards Not Classified

Health hazards Eye Irrit. 2 - H319

Environmental hazards Not Classified

2.2. Label elements

Hazard pictograms



Signal word Warning

Hazard statements H319 Causes serious eye irritation.

Precautionary statements P264 Wash contaminated skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/ attention.

RO SC D4227

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Alcohols, C8-10 (even numbered), ethoxylated	60 - 100%
CAS number: 71060-57-6	EC number: 941-586-6
Classification Eye Irrit. 2 - H319	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information	Get medical attention immediately.
Inhalation	Remove person to fresh air and keep comfortable for breathing. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if symptoms are severe or persist.
Ingestion	Rinse mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if symptoms are severe or persist after washing.
Eye contact	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention.
Protection of first aiders	First aid personnel should wear appropriate protective equipment during any rescue.

4.2. Most important symptoms and effects, both acute and delayed

General information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	May be harmful if inhaled. May cause discomfort. May cause coughing and difficulties in breathing. Vapours may irritate throat/respiratory system.
Ingestion	May be harmful if swallowed. Stomach pain. Nausea, vomiting.
Skin contact	Prolonged contact may cause redness, irritation and dry skin.
Eye contact	Causes serious eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	The product is not flammable. Use alcohol-resistant foam, carbon dioxide or dry powder to extinguish.
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5.2. Special hazards arising from the substance or mixture

Specific hazards	None known.
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Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Oxides of carbon.

5.3. Advice for firefighters

Protective actions during firefighting Avoid breathing fire gases or vapours.

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Do not discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Absorb in vermiculite, dry sand or earth and place into containers. Provide adequate ventilation. Dispose of waste via a licensed waste disposal contractor.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid spilling. Avoid inhalation of vapours and contact with skin and eyes. Do not eat, drink or smoke when using this product.

Advice on general occupational hygiene No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Wash promptly with soap and water if skin becomes contaminated.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Keep only in the original container in a cool, well-ventilated place. Container must be kept tightly closed when not in use.

Storage class Chemical storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Ingredient comments No exposure limits known for ingredient(s).

8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate ventilation.

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Eye/face protection	Tight-fitting safety glasses.
Hand protection	It is recommended that chemical-resistant, impervious gloves are worn. It is recommended that gloves are made of the following material: Nitrile rubber. Frequent changes are recommended.
Other skin and body protection	Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact.
Hygiene measures	Wash hands thoroughly after handling.
Respiratory protection	No specific requirements are anticipated under normal conditions of use. If ventilation is inadequate, suitable respiratory protection must be worn. Combination filter, type A2/P2.
Environmental exposure controls	Keep container tightly sealed when not in use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless to pale yellow.
Odour	Characteristic.
pH	pH (concentrated solution): 6.0 - 8.0
Flash point	> 62°C Closed cup.
Vapour pressure	No data available.
Specific gravity	0.96 - 1.02
Solubility(ies)	Miscible with water.
Viscosity	No data available.

9.2. Other information

Other information	No further information is available.
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SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	There are no known reactivity hazards associated with this product.
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10.2. Chemical stability

Stability	Stable at normal ambient temperatures.
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Under normal conditions of storage and use, no hazardous reactions will occur.
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10.4. Conditions to avoid

Conditions to avoid	Avoid heat, flames and other sources of ignition. Avoid exposure to high temperatures or direct sunlight.
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10.5. Incompatible materials

Materials to avoid	Strong acids. Avoid contact with strong oxidising agents.
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10.6. Hazardous decomposition products

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Hazardous decomposition products Heating may generate the following products: Oxides of carbon.

SECTION 11: Toxicological information**11.1. Information on toxicological effects**

Toxicological effects No information available.

Skin corrosion/irritation

Skin corrosion/irritation Based on available data the classification criteria are not met.

Serious eye damage/irritation

Serious eye damage/irritation Causes serious eye irritation.

Respiratory sensitisation

Respiratory sensitisation Based on available data the classification criteria are not met.

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met.

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met.

Reproductive toxicity

Reproductive toxicity - fertility Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure

STOT - single exposure Based on available data the classification criteria are not met.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Based on available data the classification criteria are not met.

Aspiration hazard

Aspiration hazard Based on available data, the classification criteria are not met.

Inhalation May be harmful if inhaled. May cause discomfort. May cause coughing and difficulties in breathing. Vapours may irritate throat/respiratory system.

Ingestion May be harmful if swallowed. Stomach pain. Nausea, vomiting.

Skin contact Prolonged contact may cause redness, irritation and dry skin.

Eye contact Causes serious eye irritation.

SECTION 12: Ecological information**12.1. Toxicity**

Toxicity No data available.

12.2. Persistence and degradability

Biodegradation The substance is readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential No information available.

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12.4. Mobility in soil

Mobility The product is miscible with water and may spread in water systems.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste is classified as hazardous waste. Dispose of waste via a licensed waste disposal contractor.

Disposal methods Waste material and any included combustible absorbent and containers should be suitable for incineration at an approved facility. Empty containers or liners may retain some product residues and hence be potentially hazardous.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations Health and Safety at Work etc. Act 1974 (as amended).
Control of Substances Hazardous to Health Regulations 2002 (as amended).

15.2. Chemical safety assessment

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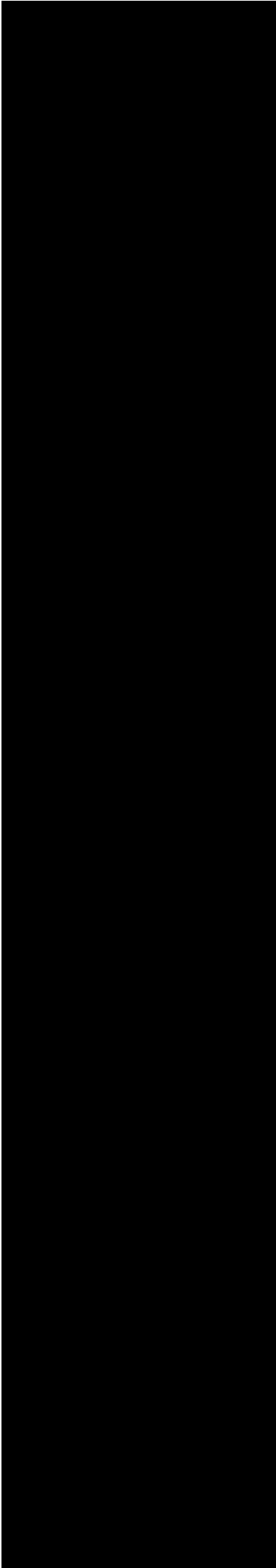
No chemical safety assessment has been carried out.

SECTION 16: Other information

Issued by	Technical Dept.
Revision date	18/11/2022
Revision	1 UK
SDS number	7381
Risk phrases in full	R36 Irritating to eyes.
Hazard statements in full	H319 Causes serious eye irritation.

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

Appendix I





Appendix J

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Augean North Sea Services Ltd
Yard B, Blackdog
Aberdeen
AB23 8BT
United Kingdom

Holds Certificate Number:

FS 745880

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The provision of a waste service to customers including the oil and gas industry, providing specialised industrial cleaning and decontamination. Provision of manpower services for onshore and offshore waste management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and nonhazardous wastes, as well as NORM wastes.

For and on behalf of BSI:


Managing Director Assurance - UK & Ireland

Original Registration Date: 2009-10-07

Latest Revision Date: 2024-09-20

Effective Date: 2024-10-08

Expiry Date: 2027-10-07



Page: 1 of 2

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Certificate No: FS 745880

Location	Registered Activities
Augean North Sea Services Ltd Yard B, Blackdog Aberdeen AB23 8BT United Kingdom	The provision of a waste service to customers in the oil, gas and other industries, providing specialised industrial cleaning and decontamination activities. Provision of manpower for onshore and offshore wastes management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and nonhazardous wastes.
Augean North Sea Services Ltd Unit 2 Bessemer Way Great Yarmouth NR31 0LX United Kingdom	The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes. Industrial and marine vessel tank cleaning and decontamination.
Augean North Sea Services Ltd Greenbank East Tullos Industrial Estate Aberdeen AB12 3BG United Kingdom	The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes, as well as NORM wastes. Industrial tank cleaning and decontamination.
Augean North Sea Services Ltd Damhead Way Peterhead AB42 3GY United Kingdom	The treatment, recycling and disposal of hazardous drilling wastes.
Augean North Sea Services Ltd Pocra Quay Aberdeen AB11 5DQ United Kingdom	The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes, as well as NORM wastes. Industrial and marine vessel tank cleaning and decontamination.

Original Registration Date: 2009-10-07

Latest Revision Date: 2024-09-20

Effective Date: 2024-10-08

Expiry Date: 2027-10-07

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Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that:

Augean North Sea Services Ltd
Yard B, Blackdog
Aberdeen
AB23 8BT
United Kingdom

Holds Certificate Number:

EMS 745843

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The provision of a waste service to customers including the oil and gas industry, providing specialised industrial cleaning and decontamination. Provision of manpower services for onshore and offshore waste management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes, as well as NORM wastes.

For and on behalf of BSI:


Managing Director Assurance - UK & Ireland

Original Registration Date: 2009-10-07

Effective Date: 2024-10-08

Latest Revision Date: 2024-09-20

Expiry Date: 2027-10-07



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Certificate No: EMS 745843

Location	Registered Activities
Augean North Sea Services Ltd Yard B, Blackdog Aberdeen AB23 8BT United Kingdom	The provision of a waste service to customers in the oil, gas and other industries, providing specialised industrial cleaning and decontamination activities. Provision of manpower for onshore and offshore wastes management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes.
Augean North Sea Services Ltd Unit 2 Bessemer Way Great Yarmouth NR31 0LX United Kingdom	The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes. Industrial and marine vessel tank cleaning and decontamination.
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Augean North Sea Services Ltd Damhead Way Peterhead AB42 3GY United Kingdom	The treatment, recycling and disposal of hazardous drilling wastes.
Augean North Sea Services Ltd Pocra Quay Aberdeen AB11 5DQ United Kingdom	The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes, as well as NORM wastes. Industrial and marine vessel tank cleaning and decontamination.

Original Registration Date: 2009-10-07

Latest Revision Date: 2024-09-20

Effective Date: 2024-10-08

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BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

Certificate of Registration

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM - ISO 45001:2018

This is to certify that:

Augean North Sea Services Ltd
Yard B, Blackdog
Aberdeen
AB23 8BT
United Kingdom

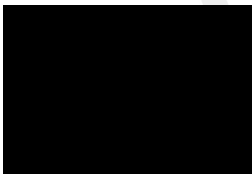
Holds Certificate Number:

OHS 745873

and operates an Occupational Health and Safety Management System which complies with the requirements of ISO 45001:2018 for the following scope:

**The provision of a waste service to customers including the oil and gas industry, providing specialised industrial cleaning and decontamination. Provision of manpower services for onshore and offshore waste management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes, as well as NORM wastes.
[Previously certified to BS OHSAS 18001:2007 since 2013-01-14]**

For and on behalf of BSI:


Managing Director Assurance - UK & Ireland

Original Registration Date: 2020-10-19

Effective Date: 2024-10-08

Latest Revision Date: 2024-09-20

Expiry Date: 2027-10-07



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Certificate No: OHS 745873

Location	Registered Activities
Augean North Sea Services Ltd Yard B, Blackdog Aberdeen AB23 8BT United Kingdom	The provision of a waste service to customers in the oil, gas and other industries, providing specialised industrial cleaning and decontamination activities. Provision of manpower for onshore and offshore wastes management support, including industrial and marine vessel tank cleaning and decontamination and emergency spill response. The transfer, treatment, recycling and disposal of hazardous and non-hazardous wastes.
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