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Installation and operating instructions
Separating plant for light liquids
Part A: Installation
Part B: Operation

Part A: Installation

Part B: Operation

Target group

These instructions for the installation of the separating plant are intended for the specialist company which has appropriate experience in the areas of channel construction and installation of wastewater treatment systems. In addition to providing the necessary technical equipment, the company must also employ qualified and trained personnel (e.g. civil engineering specialists with experience in channel construction work).
If the separating plant falls within the field of application of the Ordinance on Installations for the Handling of Substances Hazardous to Water (Anlagenverordnung zum Umgang mit wassergefährdenden Stoffen, AwSV), qualification as a WHG (Water Resources Act) specialist or expert is also required. The installing company must then be a specialist company according to WHG.

Scope

These installation instructions apply to all Neutra separating plants for light liquids made of reinforced concrete intended for underground installation.
The connection of optional electrical equipment (e.g. NeutraStop warning system) is not covered by these installation instructions. As for other optional product supplements (e.g. the chamber sealing system NeutraProof), separate instructions for use apply to each of these products.

Notes on these installation instructions

Read this manual carefully and completely. It contains important information on how to use the product.
Observe the instructions and in particular, follow the safety and warning instructions.
Failure to observe may result in

- persons can be exposed to danger through mechanical effects,
- the environment can be damaged by the escape of liquids hazardous to water,
- damage to the product,
- the function of the separating plant not being ensured,
- the accessibility for the operation of the plant (own inspection, maintenance, inspection) may not be sufficient,
- invalidation of warranty and claims for damages.

After the installation has been completed, pass on these instructions and the short instructions enclosed with the separating plant to the operator of the separating plant.
These operating instructions must be kept in a safe place and it must be ensured that they are available and accessible at all times for the operator of the product.

Warnings and notes used

These instructions contain warnings that must be observed.
In addition, notes are provided for individual sections which are to be understood as practical assistance in carrying out the activities.

 **WARNING**	This symbol indicates dangers which can lead to death or serious injury.
 **NOTE**	Indicates recommendations that are intended to facilitate work or provide advice.

Installation

Points to be clarified before installation

The following list presents the points that must be clarified before work can begin so that both the installation and the subsequent operation of the system can be carried out correctly.

Aspect	Through	No	Yes
Plant dimensioning	Planner	☐	☐
Overshoot	Planner	☐	☐
Warning system	Planner	☐	☐
Backwater	Planner	☐	☐
Height	Planner	☐	☐
Installation drawings	Planner	☐	☐
Protection against buoyancy	Planner	☐	☐
Frost-proof depth of the pipelines	Planner	☐	☐
Structural stability of the subsoil	Planner	☐	☐
Permission to discharge / Notification / Permission	Planner	☐	☐
Sewage connection / additional wastewater	Planner	☐	☐
Access	Installer	☐	☐
Loads and boom lengths	Installer	☐	☐
Necessary lifting gear	Installer	☐	☐
Suitability of the pipelines	Installer	☐	☐
Sewage connection / additional wastewater	Installer	☐	☐
Permission to discharge / Notification	Installer	☐	☐

Excavation pit

WARNING

Improper excavation work and excavation pit

Lead to the collapse of the excavation walls and serious accidents due to burial.

The excavation pit must be constructed according to the component dimensions and in observance of DIN 4124 (lateral work space: at least 50 cm, slope etc.). The edge of the pit is to be safeguarded in accordance with the regulations.

The support surface of the container is to be levelled and is to comprise approximately 10 to 20 cm of compacted gravel sand (max. grain 16 mm). Point and edge pressure must be precluded.

If the subsoil is not sufficiently load-bearing, it may be necessary to replace the subsoil, or to install a foundation slab. The approximate sealing requirement is: Proctor density Dpr = 1.0!

The base of the excavation pit must be free of groundwater and stratum water! If necessary, a suitable water retention system must be provided until the completion of work.
If groundwater is present, the buoyancy safety of the containers must be checked in the final state.
If necessary, measures must be taken to prevent buoyancy (buoyancy ring at the base).

Delivery

A sealed, unobstructed and safe access route is a prerequisite for delivery to the construction site.

The delivery must be checked for completeness and damage based on the delivery note. Any defects are to be confirmed on the delivery note by the receiver and the supplier and then immediately forwarded.

If the unloading or relocation into the excavation pit is to be done using the vehicle's own crane, the possible extension arm lengths must be clarified in advance with the supplier.

Unloading, offsetting process

Suspended loads

Standing under suspended loads can lead to serious accidents or even death.

WARNING

The following aspects must always be taken into account when transporting the components:

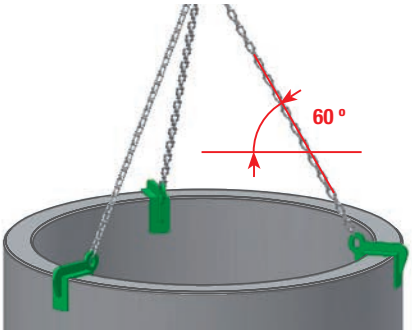

Image 1: Angle to the horizontal


Image 2: Bights and traverse


Image 3: Shaft suspension with claws

- Component weights and loads shall be checked taking into account the extension arm length.
- The maximum permissible loads of the lifting gear must be taken into account.
- Only approved and undamaged lifting gear may be used.
- The angle of the chain to the horizontal must be greater than 60º (Image 1).
  (Rule of thumb: Chain length must be at least the same as the shaft diameter.)
- Avoid diagonal pulling – if necessary use a lifting beam (Image 2) or long chains.
- The required crane hook size and rounding for the respective slung load must be observed.
- Under no circumstances may persons be under suspended loads.

Components with bights

- The internal thread of the sleeves and the external thread of the loops must not be contaminated.
- The condition of the rope eyelets must be checked. If strand breakage, crushing, kinks, corrosion or loose connections are present, the bight must not be used.
- First screw in the bight as far as it will go. After that, a maximum of one thread may protrude over the sleeve.
- After screwing it in, the bight must be unscrewed again by half a turn in order to prevent it from getting stuck under load.

Components with shaft claws

- The claws are to be placed at the equidistant distance along the circumference of the component.
- The claws are to be pushed as far as they will go.
- For all shaft components – except shaft necks – attach the movable bracket of the claw to the inside of the component (Image 3).
- In the case of shaft necks, place the movable clamp of the gripper on the outside of the component. For eccentric shaft necks, horizontal suspension can be achieved by repeatedly lifting and repositioning.
- The concrete components must not be iced, oily or saturated!

Installation of components

WARNING

Crushing hazard

Do not reach between the components.

Positioning of the reinforced concrete tank

The reinforced concrete tanks are in the correct position and height in the excavation pit on the prepared surface.

NOTE

Do not mix up the inlet and outlet sides.

The pipe connections are marked with inlet or outlet.

Transition plate / shaft neck with Neutra socket (ø2000 and ø2500)

- Unscrew the bights on the reinforced concrete tank.
- Insert the supplied round cord sealing ring into the cleaned groove on the upper side of the reinforced concrete tank.
- Insert the supplied three screws and washers from above into the cut-outs provided for this in the transition plate or shaft neck.
- Raise the transition plate/cone with suitable lifting equipment over the reinforced concrete tank at low height and maintain this height.
- Rotate the transition plate/cone until the markings on the plate and tank line up and then temporarily screw in the screws previously fitted to the plate a few turns into the threaded sleeves in the tank.
- Fit the transition plate / shaft neck
- Screw "hand tight", maximum torque of 40 Nm).

Shaft components DIN V 4034-1 with peaked end and socket

- Clean the peaked end of the lower component and the socket of the component to be mounted with a hand brush.
  The area of the joint formation must be free of loose and separating components (Image 4).

In the case of shaft components where the seal is not integrated into the socket at the factory:

- Fit the supplied mechanical seals onto the peaked end.

For shaft components where the seal is integrated into the sleeve at the factory:

- Apply the supplied lubricant evenly and generously to the peaked end and socket. Make sure that there are no imperfections and that a closed lubricating film surface is created (Image 5).
- Place the supplied load balancing ring on the machine. This must not be twisted and must lie flat (Image 6).


Image 4: Cleaning the connecting surface


Image 5: Applying the lubricant


Image 6: Load balancing ring


Image 7: centrical placement

At low temperatures, it is recommended that the mechanical seals, lubricant and load transfer ring be kept warm before assembly.

NOTE

- Attach the following manhole component to the manhole ring hanger, push the gripper as far as it will go, and ensure that the component hangs securely and horizontally.
  In the case of shaft necks, in contrast to shaft rings, the movable bracket is placed on the outside, otherwise the cone will be destroyed.
- Place the component on the peaked end. Make sure that the drain is centered and not inclined (Image 7). The component must rest flush on the load balancing ring.

In the case of reinforced concrete slabs with eccentric openings, placing the next component over the opening can ensure that the settling forces are evenly distributed over the circumference.

NOTE

Folded connection per DIN V 4034-1 for bearing rings and cover frame

- The connection between the components must be made flush over the entire surface.
- The minimum requirement is MG III (cement mortar).
- Point and edge pressure must be excluded.
- After the repositioning, the seam areas inside and outside must be thoroughly trowelled flush, sealed, and excess material removed.
- The complete shaft superstructure (including support rings and cover frame) of separator systems must be permanently leak-tight.

NOTE

The use of 2-component adhesive based on epoxy resin is recommended.
A complete set for this can be ordered from Mall GmbH.

NOTE

The shaft sealing system NeutraProof is available from Mall GmbH especially for the problematic area of folded connections.

Pipe connections

Suitable seals are pre-assembled at the tanks in the factory for connecting the inlet and outlet lines (Image 8). This ensures a tight and articulated connection.
The pipe diameters suitable for the pipe connection prepared at the factory are listed in Table 1. Transitions to other pipe types and diameters can be made with commercially available transition pieces.

Dimensions of the suitable external pipe diameters

Nominal size	External diameter of the pipe
DN 150	160 mm
DN 200	200 mm
DN 250	250 mm
DN 300	315 mm
DN 400	400 mm

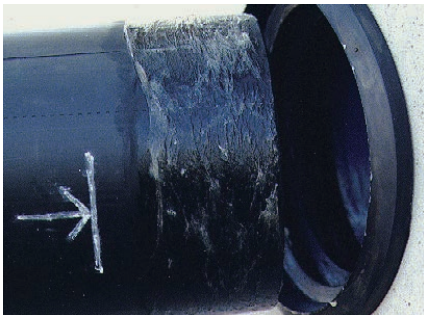

Image 8: Establishing the pipe connections

- Chamfer and deburr the pipe to be connected.
- Mark the insertion depth on each respective pipe be inserted.
- Apply commercially available lubricant to the outside of the pipe and the sealing element.
- Position the pipe and push it into the elastomer seal with even pressure.
- When using mechanical tools, do not apply too much force, as there is a danger of destroying components.

NOTE

For containers in which a component is mounted on the inside, this determines the insertion depth.
For sludge traps and other tanks, the insertion depth is to be determined that the pipes are inserted flush with the inner side of the tank wall.
For sampling shafts, the supply pipe must protrude approx. 10 cm into the lower section of the shaft so that correct sampling is possible.

Type plate

After completion of the shaft structure, the type plates provided with the tanks must be relocated in the upper region of the shaft so that they can be read in the operational state by removing the fastening chain after removing the shaft cover.

Backfilling the construction pit

Due to the high stability of the concrete, the previously excavated material can generally be used as backfill. However, the settlement tendency (or traffic load) of the areas above it must be taken into account. The loads applied to the tanks by (heavy) compactors must not exceed the guaranteed load profile. With plate vibrators and light compactors of up to 2.5 t the prefabricated
elements can be driven over without restrictions.
In the area of the connected lines, care must be taken that they are not damaged by the compression (proper embedding).

NOTE

We recommend that the General Inspectorate's leak testing be carried out before filling the excavation pit, so that any leaks that may occur during installation can be better located and repaired.

Commissioning

No waste water may be fed into the separating plant during the construction period.
The plant must be cleaned after completion of the installation process.
A general inspection must be carried out by an expert recognised in the field of separation technology before commissioning of the plant.
For commissioning, the separating plant is to be filled with suitable supply water until overflow in the channel. The float of the self-closing mechanism must be brought into the floating position.

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Installation and operating instructions
Separating plant for light liquids
Part B: Operation

Target group

These instructions for operating the separating plant are intended for persons who are experts in the operation and maintenance of separating plants.
Specialists are persons who, based on their training, their knowledge and their experience gained through practical work, ensure that they properly carry out assessments or inspections in this field.
The expertise for the operation and maintenance of separating plants can be acquired through training followed by on-site instruction, for example, by the relevant manufacturers, professional associations, chambers of crafts and expert organisations active in the area of separation technology.

Notes on these operating instructions

Read this manual carefully and completely. It contains important information on how to use the product.
Observe the instructions and in particular, follow the safety and warning instructions.
Failure to observe may result in

- persons being exposed to danger of falling, mechanical and chemical effects, or explosions,
- the environment being damaged by the escape of liquids hazardous to water,
- damage to the product,
- the function of the separating plant not being ensured,
- invalidation of warranty and claims for damages.

These instructions must be provided to the operator of the separating plant. It must also be passed on in the event of a change in the persons responsible.
The operating instructions must be kept in a safe place and it must be ensured that they are available and accessible at all times.

Warnings and notes used

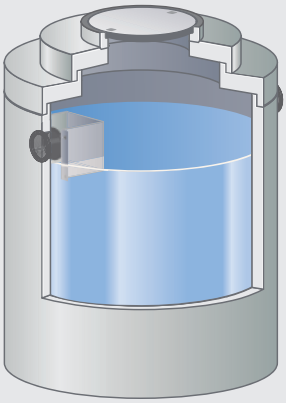
These instructions contain warnings that must be observed.
In addition, notes are provided for individual sections which are to be treated as practical advice for carrying out the activities.

 **WARNING**	This symbol indicates dangers which can lead to death or serious injury.
 **NOTE**	Indicates recommendations that are intended to facilitate work or provide advice.

Scope, identification of the product

This installation guide applies to all Neutra separator plants for light liquids of reinforced concrete intended for underground installation.
Optional electrical equipment (e.g. NeutraStop warning system) and other optional product supplements (e.g. NeutraProof shaft sealing system) are not covered by these operating instructions. Each product has its own instructions for use.

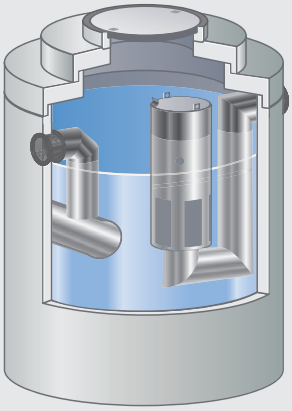
The products are listed below for identification purposes.



S

NeutraSed sludge trap

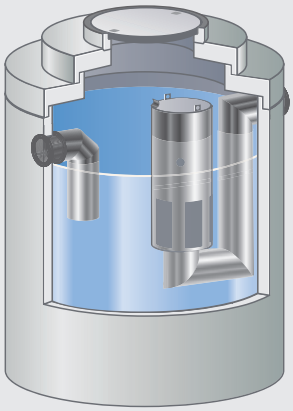
Contents 200 l to 17,700 l



II

Class II separator NeutraPlus

NS 3 – 40



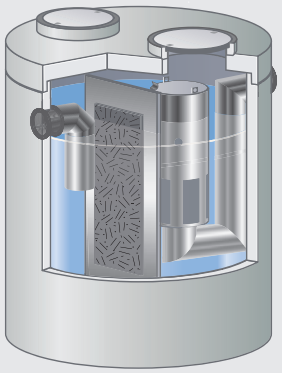
S II
S II P

Class I separator with NeutraSub sludge trap

NS 3 – 30

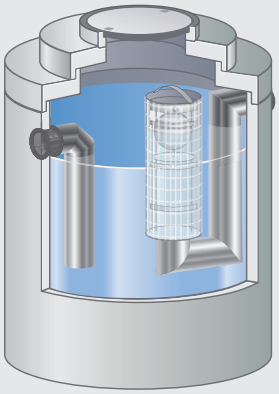
I

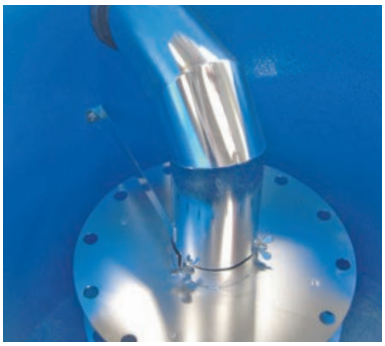
Class I separator
NeutraStar
NS 3 – 100



S I
S I P

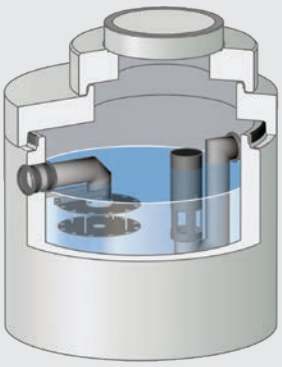
Class I separator with
NeutraCom
sludge trap
NS 3 – 20

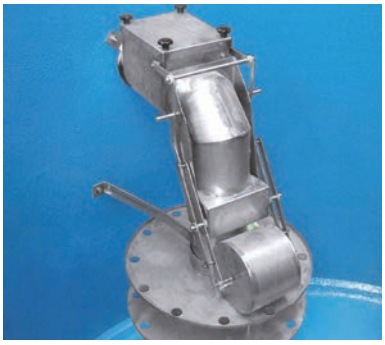




S I

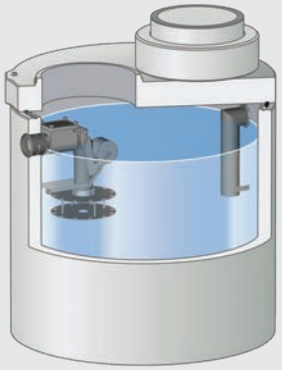
Class I separator with
NeutraSpin
sludge trap
NS 3 – 30

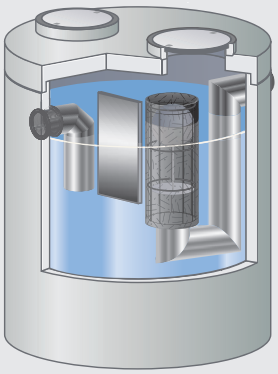




S I
S I O

Class I separator with
NeutraPrim
sludge trap
NS 3 – 30

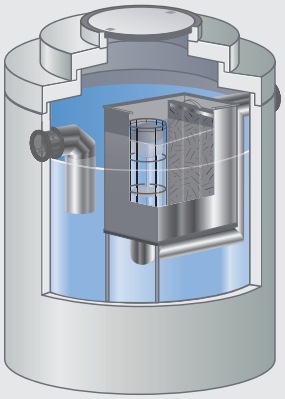




S II I
S II I P

Class II and class I separator with a NeutraPro sludge trap

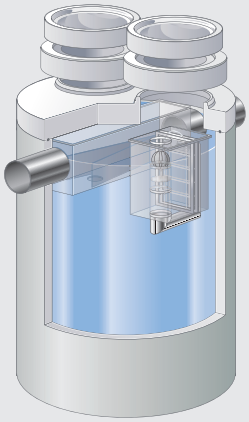
NS 3 – 30



S II I
S II I P

Class II and class I separator with a NeutraMax sludge trap

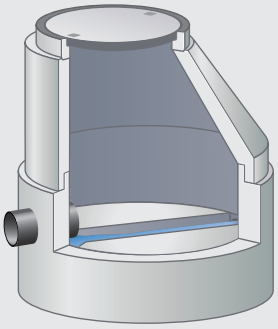
NS 3 – 40



Ü S V I

Class I separator with a sludge trap and NeutraPass bypass device

NS 6/18 – NS 20/180



P

NeutraCheck sample-removal manhole

DN 150 – 400

General safety instructions

Normal operation does not require persons to enter the separating plant. Access to the separating plant as part of the general inspection or for maintenance measures is reserved exclusively for specialists for separation technology.

If the shaft coverings are open, there is a risk of falling.
While work is being carried out on the plant, the area must be closed off and secured.

WARNING

Due to the separated substances, a potentially explosive atmosphere may form in the separator.
Smoking, open flame, and activities that can produce sparks are not permitted in the area of the plant.

WARNING

All work on the separating plant must comply with the relevant occupational health and safety regulations. Before starting work in the structures, hazards, e.g. from hazardous substances, electrical systems, explosive atmospheres, must be determined and the necessary measures for occupational safety and health protection must be taken.

Operated by

General

DIN EN 858-2, DIN 1999-100, DIN 1999-101 and any applicable decisions by public authorities shall be applied to operation, own inspections, maintenance, draining, and general inspection of the separating plant.

In addition, existing statutory and water legislation provisions on own inspection, maintenance and general inspection (type and scope of activities, qualifications required for carrying out the activities) shall be observed. In particular for separating plants used as retention facilities in the drainage system for materials hazardous to water, the relevant regulations (e.g. TRwS) shall be observed for separator systems.

Trainings for the acquisition of the qualification as a specialist are offered by the Mall GmbH.
Further information at www.mall.info

NOTE

Intended use

Substances passing into the separating plant must not impair the functionality of the system, the stability of the materials used, or compliance with the discharge requirements into the downstream wastewater systems or into a body of water.
Stable emulsions shall not be discharged into separator plants. When cleaning oil-contaminated surfaces, the formation of stable emulsions is generally not to be expected if, during the cleaning processes at the waste water accumulation points

- the washing water pressure is not over 6 MPa (60 bar) (device setting),
- the washing water temperature is not over 60 °C (device setting),
- the cleaning agent used does not form stable emulsions (i.e. is separation-compatible),
- only matched cleaning agents are used.

Deviations in washing water pressure and washing water temperature are possible if this is permissible according to the product descriptions of the cleaning agent manufacturers for the agents used.

Commissioning

If the system is not ready for operation (e.g. during construction or refurbishment), no waste water may be fed into the separator system.

A general inspection must be carried out by an expert recognised in the field of separation technology before commissioning of the plant.

For commissioning, the separating plant is to be filled with suitable supply water until overflow in the channel. The float from the previously removed self-closing mechanism must then be brought into the floating position.

Operational log book

An operational log book is to be maintained for this plant, in which all checks and incidents in connection with the plant shall be recorded in writing.

NOTE

A prepared operational log book, in which all data related to the plant is recorded,
is available from Mall GmbH. Further information at www.mall.info

Own inspections

The functionality and condition of the separating plant must be checked at least once a month by the specialist through the following measures:

- inspection of the inlet and outlet areas of the sludge trap and separator, as well as of the technical equipment for irregularities, e.g. back water events
- measurement of the layer thickness or determination of the volume of the separated light liquid in the separator
- measurement of the state of the sludge level in the sludge trap
- inspection of the self-closing mechanism in the separating plant and any warning devices present for functionality and contamination (Image 1a – 1b)
- inspection of the coalescence device (when present) for functionality and contamination (Images 2a – 2b)

Any defects found must be corrected immediately, the coalescing device cleaned if necessary, and large floating solids removed.

NOTE

All devices and aids required for own inspection and maintenance are included in the practical NeutraTool maintenance set.
Further information at www.mall.info

Checks must be documented in the operational log book.


Image 1a: Float in a cage


Image 1b: NeutraCom float

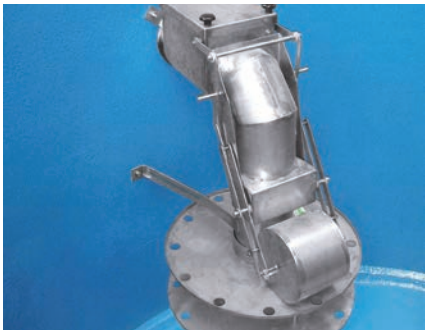


Image 1c: self-closing mechanism NeutraPrim

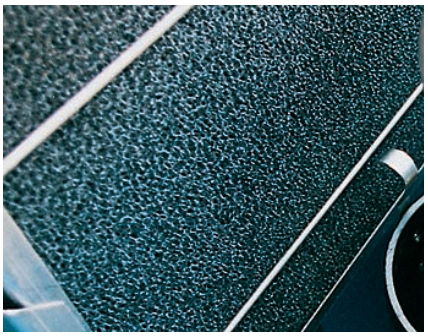


Image 2a: Coalescence insert made of PU

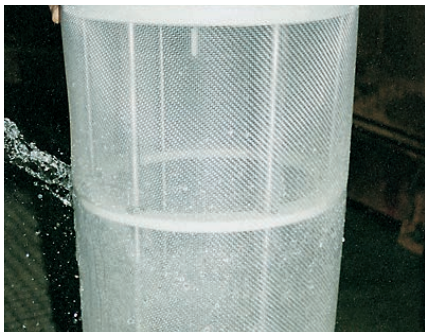


Image 2b: Coalescence insert NeutraCom

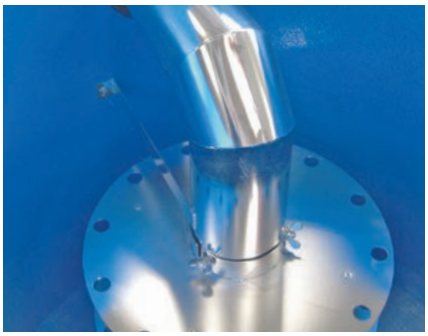


Image 2c: NeutraSpin and NeutraPrim

Maintenance

The separating plant must be checked half-yearly by the specialist.
In addition to the own inspection measures, the following work must also be carried out:

- inspection of the coalescing device for damage as specified by the manufacturer and replacement, if necessary
- inspection of the visible interior of the plant, fitted components and coatings by visual inspection for visible damage and irregularities, e.g. back water events, discoloration, blistering, detachment, corrosion, etc.
- cleaning of the self-closing mechanism
- cleaning of the probes, warning devices present, and testing by triggering according to the operating and maintenance instructions of the manufacturer
- draining and cleaning the separating plant in case of exceptional contamination
- cleaning of the sampling system / sampling shaft, if necessary

Any defects found must be corrected immediately.
The work and findings carried out must be documented in the operational log book.

NOTE

No wastewater may be fed into the system during own inspection and maintenance and maintenance.

NOTE

If you conclude a maintenance contract with Mall GmbH for your separating plant, you are on the "safe side". Further information at www.mall.info

General inspection

Before commissioning and thereafter at regular intervals of no more than five years, the separating plant must be completely drained and cleaned and then checked by a specialist to ensure its proper condition and proper operation (general inspection).

The customer must provide proof of the required qualification of the specialist for carrying out the general inspection.

The following measures shall be carried out before the inspection of the structural condition and the leak test are carried out:

- Complete draining and thorough cleaning of the plant (components)
- Exclusion of incoming water
- Keep all documents relating to the plant at the ready

NOTE

Commission the service of the Mall GmbH with the execution of the general inspection. These specialists know the system best. Further information at www.mall.info

Draining

The light liquid retained in the separator must be removed at the latest when the separated light liquid has reached 80% of the maximum storage capacity. The maximum storage capacity is indicated on the separator type plate.

In the case of separating plants which serve to secure systems or areas in or on which light liquids are handled (e.g. refuelling areas), the retention volume required in accordance with the provisions of water legislation must also be maintained at all times. Therefore, the separated light liquid must also be removed if the retention volume is below this level, even if the separated light liquid has not yet reached 80% of the maximum storage volume. To determine the quantity of light liquid, the maximum storage volume can be linearly interpolated using the measured layer thickness and maximum layer thickness.

If the separated light liquids contain a proportion of biodiesel, this must be removed from the water surface after not longer than one year.

After accidents involving ethanol-containing fuel or biodiesel, the separator system must be emptied and cleaned in the near term.

The sludge contained in the sludge trap must be removed no later than when the separated sludge volume has reached half of the sludge trap volume.

The plant must be cleaned as part of the disposal process. It must be ensured that the plant (in particular fitted components and internal coating) is not damaged by the suction nozzle and the HP spray jet.

The waste disposal regulations must be observed when disposing of the substances removed from the plant. The accompanying documents must be kept in the operational log book.

The separating plant must be refilled with water (e.g. drinking water, service water, treated wastewater from the separating plant) that complies with the local discharge regulations. The float of the self-closing mechanism must then be brought into the floating position.

mall
environmental
systems

Mall GmbH
Hüfinger Strasse 39-45
78166 Donaueschingen,
Germany
Phone +49 771 8005-0
Fax +49 771 8005-100
info@mall.info
www.mall.info

Mall GmbH
Grünweg 3
77716 Haslach i. K.,
Germany
Phone +49 7832 9757-0
Fax +49 7832 9757-290

Mall GmbH
Industriestrasse 2
76275 Ettlingen,
Germany
Phone +49 7243 5923-0
Fax +49 7243 5923-500

Mall GmbH
Rosslauer Strasse 70
06869 Coswig (Anhalt),
Germany
Phone +49 34903 500-0
Fax +49 34903 500-600

Mall GmbH
Oststrasse 7
48301 Nottuln, Germany
Phone +49 2502 22890-0
Fax +49 2502 22890-800