MIKO MARINE

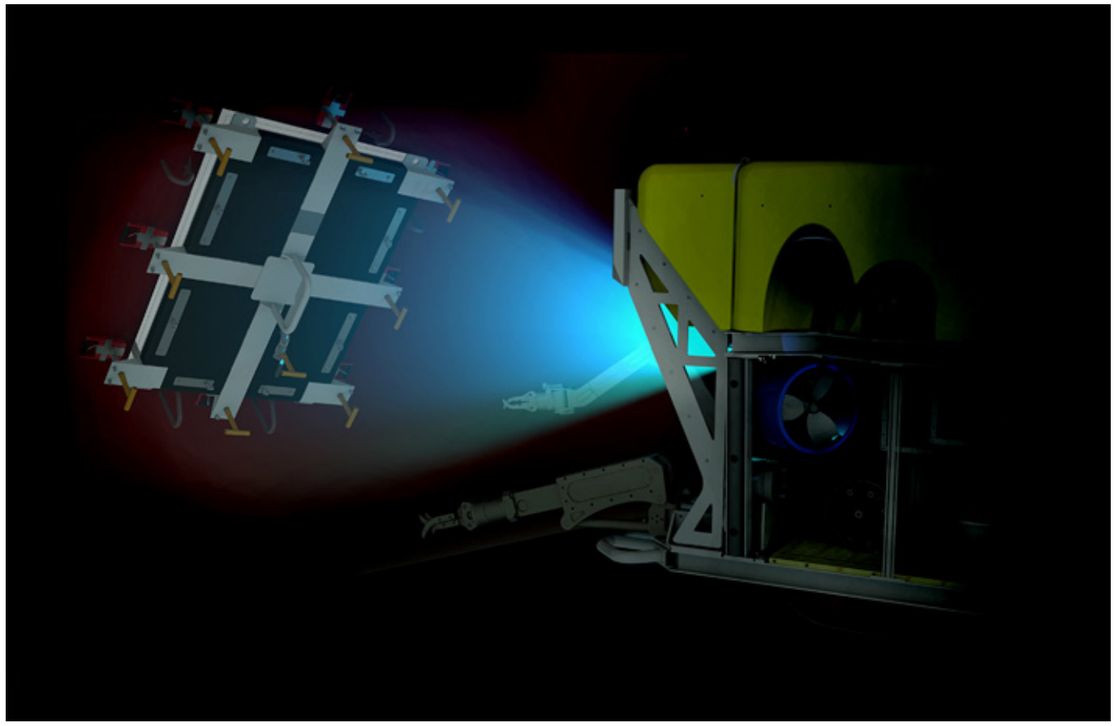
Underwater Blanking

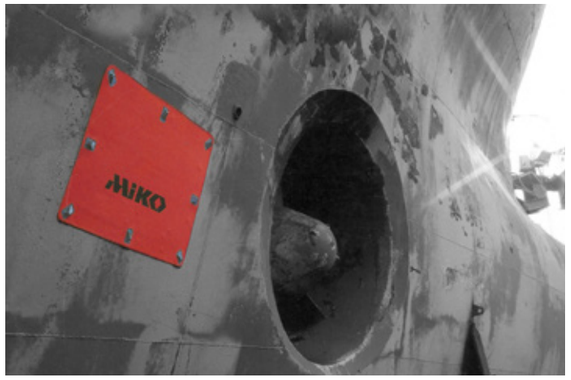
Underwater Blanking Tools

Miko Marine has been in the business of underwater blanking since 1997. Miko offers class-qualified tools for the temporary sealing of openings below the waterline, as required for in-water repair of sea chests and sea-water inlets and outlets. In-water repair is a cost-saving alternative to dry-docking and enables shipowners to extend the dry-docking interval of the ship.

- → Safe and reliable alternative to dry docking
- → In-water survey
- → Solutions for both diver and ROV operations
- → Proven technology used world-wide

Miko offers engineering services and custom-made solutions for specific projects, supervision and on-site support as needed. Our team of engineers has long experience with underwater blanking and will deliver the best solution to your challenge.



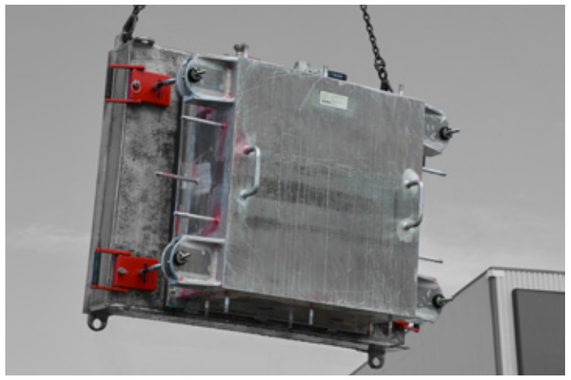


Miko Plaster

- → Heavy duty magnetic tarpaulin
- → Qualified by DNV GL
- → Patented technology
- → Reusable

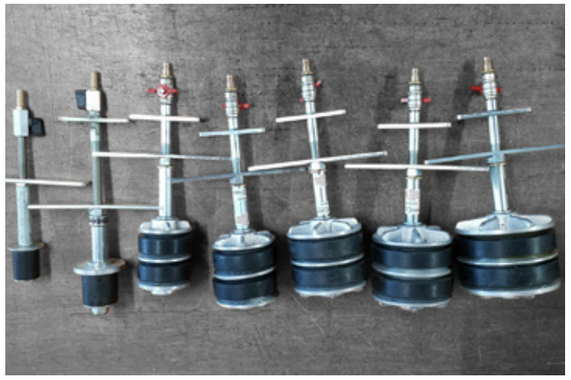
Tanker Kit

- → For sealing sea chests, water inlets and outlets directly in the water.
- → All tools required in one kit
- → No hot work or hydraulics
- → Neutrally buoyant patches



Sea Chest Blanking

- → Diver or ROV operated
- → Single or double curvature
- → Double independent barriers
- → Magnetic and mechanic attachment



Pipe Plugs

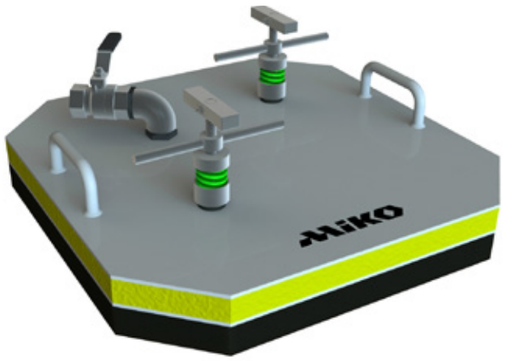
- → Sealing pipe openings
- → Diver or ROV operated
- → Standard and customized sizes
- → Each plug covers several pipe sizes.

Sea Chest Covers

Miko delivers Sea Chest Blanks for any vessel, in any size and at any depth. Hull curvature, sea chest grid arrangement and other data are taken into account for the design.

- → Diver or ROV operated
- → Single or double curvature
- → Neutral buoyancy
- → Double independent barriers
- → Magnetic and mechanic hull attachment

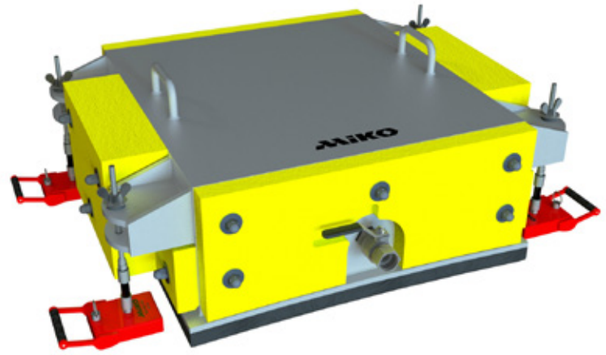
Sea Chest Cover



The threaded rods are used to lock onto the sea chest grid and keep the cover firmly in place. By tightening the wing nuts, the rubber gasket is compressed slightly and an initial watertight seal against the hull is created.

When the water has been pumped out on the inside and the pressure difference is acting on the sea chest cover, the rubber gasket will be compressed further. The springs under the wing nuts maintain a constant tension in the rods as this happens, by compensating for the movement of the cover. This means that the divers do not need to go back and re-tighten the wing nuts after emptying the sea chest. Miko's Sea Chest Covers will keep the sea chest dry throughout the entire operation.

Sea Chest Cofferdams



With neutral buoyancy - achieved by blocks of rigid PVC foam mounted externally on the walls - the Cofferdams are easily handled under water by divers.

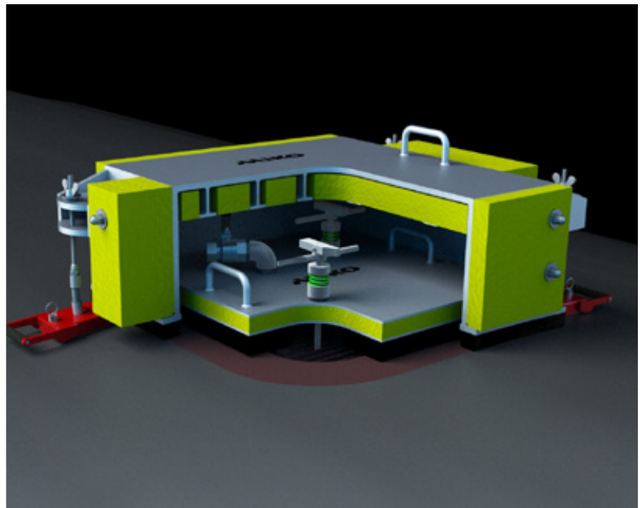
They are kept firmly in place on the hull by utilizing Miko Anchor Magnets model MAM-003, each with an ideal holding force of 450 kg. The magnets are fitted with rubber flex joints, which enables them to be used on curved or uneven steel surfaces. By tightening the wing nuts, the rubber gasket is compressed slightly and an initial watertight seal against the hull is created.

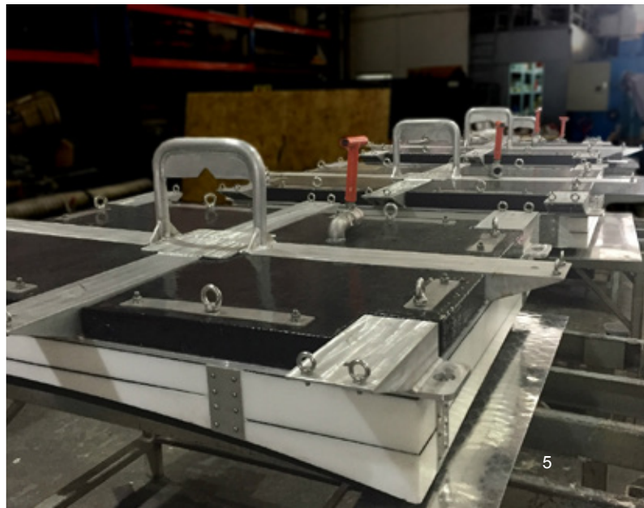
Once the inside has been pumped dry, the pressure difference will compress the rubber gasket further. At this point, the watertight seal is mainly achieved by the water pressure itself.

Engineering

There is a great variety in blanking of sea chests and what requirements are made. Miko Marine offers engineering services and custom-made solutions for specific projects and provides a safe and reliable option.

- → Optimization of the structure through advanced FEM-analysis
- → 3D-scanning of the hull for coinciding curvature
- → Pressure testing on specially manufactured tanks which simulate the hull
- → Verification by DNV and fit-up test
- → Supervision and on-site support





Magnetic Miko Plaster

Miko Plaster® is a registered trademark and covers a large variety of patches for stopping a leak.

The patented Magnetic Miko Plaster® is qualified by DNV GL for sealing off sea chests, water inlets and outlets directly in the water. The seal is achieved by the water pressure coupled with the magnetic adhesion between the patch and the steel surface. The patches are designed for long term storage and are not demagnetized after use.

The patches are produced in Norway and standard sizes can delivered quickly to site in in urgent situations. Standard sizes are available in the **Emergency Response Bag** and the **Tanker Kit** together with supplementary tools for installation. Customized patches are supplied in any shape and size.

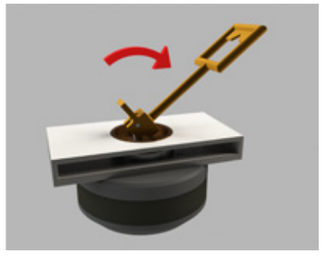
Magnetic holding force	100 g / cm^2
Weight in air	9,0 kg / m^2
Weight in water	5,5 kg / m^2 (or slightly positive with buoyancy sheet)
Lifting lug holding capacity	350 kg each
Max. temperature	120 °C
Thickness	3,5 mm
Stretch strength	8 500 N / 5 cm
Shear strength	1 500 N (DIN 53356)
Welding strength	1 500 N (DIN 53363)

Pipe Plugs

The WRV-8000 is an expansion plug intended for sealing pipe openings below the water surface. It is used for planned operations during maintenance, in-water survey or repair, as well as for emergencies and salvage operations.

Miko **ROV plug** is an plug customized for ROV with two levels of expansion. The crossbeam prevents the plug from being sucked in to the pipe.

Customized sizes and plugs can be supplied if needed.



Tanker Kit

The Tanker Kit is well proven as a cost-saving alternative to dry-docking. It is used world-wide for in-water repair or survey of floating structures.

No hot work or hydraulic tools are required for the installation. The neutrally buoyant Miko Plaster makes the installation easy for the diver. Supplementary tools required for installation are included in the kit.

2 pcs	900 x 1 250 mm Magnetic Miko Plaster®
2 pcs	2 250 x 2 500 mm Magnetic Miko Plaster®
4 pcs	MAM-001 Miko Anchor Magnets
10 pcs	MPM-002 Miko Permanent Magnets
2 pcs	MHT-001 Handling Tool for MPM-002
4 pcs	MHT-002 Handling Ropes
1 pcs	Installation/Storage Drum
1 pcs	User Manual
1 pcs	DNV Technical Report


TECHNICAL REPORT

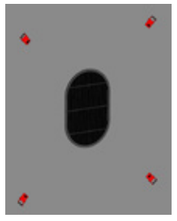
MIKO MARINE A.S

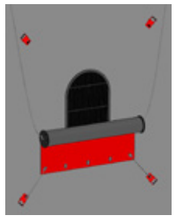
QUALIFICATION OF MIKOPLASTER

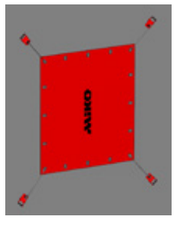
REPORT NO. 530 1022/98

DET NORSKE VERITAS

Installation principle







The drum is used for the storage and transportation of the Miko Plaster®, as well as for its installation. Both the drum and the larger patches are close to neutral buoyancy in water.

One **MAM-001 Miko Anchor Magnet** is placed outside each corner of the sea chest or opening to be patched.

The drum is lowered into the water from the deck by using the handling ropes, while the diver positions it correctly. With the two first corners secured to a MAM-001, the Miko Plaster® is rolled out from the drum. The diver can easily re-position the patch if necessary.

The last two corners are secured to the other MAM-001 once the patch is completely rolled out in the correct position.

The **MPM-002 Miko Permanent Magnets** are placed on top of the patch to further increase the seal and to prevent it from being peeled off by any current.

CONTACT US WITH YOUR CHALLENGES

Miko Marine AS
Vollsveien 4
N-1336 Lysaker
Norway

Website: www.mikomarine.com
E-mail: info@mikomarine.com
Telephone: +47 46 90 50 00