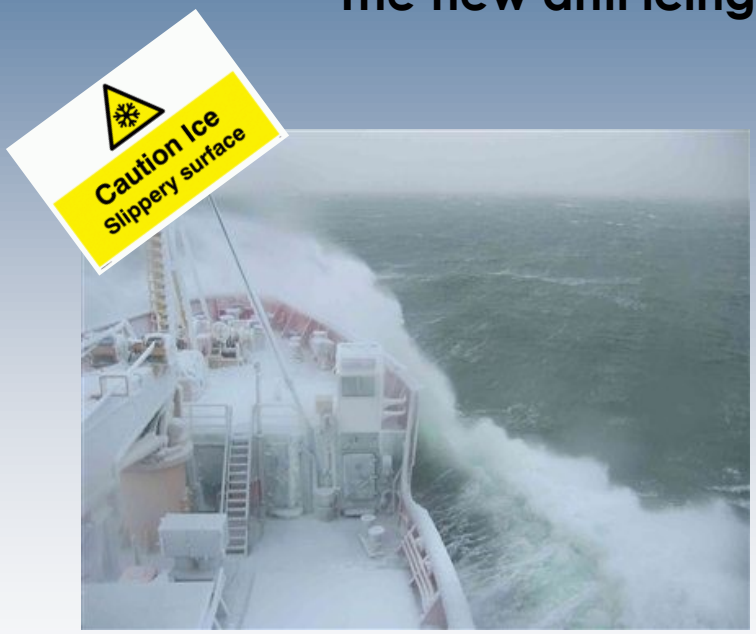
Marine Conductive Heat Tracing

The new anti icing / anti skid technology



Protecting crew and passengers - saving energy with Anti Ice Deck Pads and Marine Enclosed Step Covers.

BPAB's Conficomp™ system is an innovative and well proven Swedish technology based on conductive composites, enhancing safety for marine boot surfaces in need to be kept free from ice, frost and snow - protecting crew and passengers alike.

Improve safety - save energy - apply Conficomp!

Heat what you need to heat - don't waste energy

Marine operations in cold climates require higher safety levels for crew and vessel operations. Traditional de-icing solutions such as heat tracing cables, hot water, manual de-icing, etc. can do the job in one way or the other but they also tend to waste massive amounts of energy. They are also often difficult and costly to install and operate.

Anti Ice Deck Pads and Marine Enclosed Step Covers from BPAB are easy to install on deck surfaces such as muster stations, escape routes, embarkation areas as well as lat ladders where accretion of ice is likely to occur.

The highly efficient and unique composite structure along with temperature sensors makes for very little heat dissipation downwards, achieving energy savings to at least 70% compared to heat tracing cable installations.

In other words, large amounts of fossil fuel can be saved yearly on a winterized vessel – hence payback time on the investment is quick and at the same time environmental concerns have made a mark.

- ⇒ **Produces even heat distribution on surface. No hot-spots - no cold spots**
- ⇒ **Large energy savings compared to heat tracing with cables**
- ⇒ **Very high resistance to corrosion, chemicals, acids, salt, etc.**
- ⇒ **Shock proof - high resistance to mechanical impact (IK10)**
- ⇒ **Enhanced anti skidding surface all year around**
- ⇒ **Completely enclosed electrical parts in pad**
- ⇒ **Light weight (15 kg/sqm)**
- ⇒ **Environmental friendly**
- ⇒ **Sound dampening**

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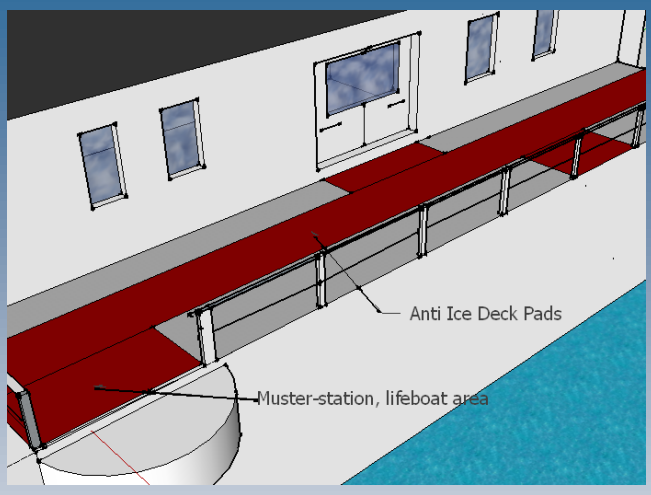
AIDP™ – Anti Ice Deck Pads



A typical installation consist of AIDP's mounted alongside each other in groups of e.g. 2-10 units. Each group is monitored by built-in sensors connected to the control box including advanced thermostats or thyristor units, automatically keeping the boot surface at constant temperature.

Each pad is fed with extra low voltage for safety reasons.

Anti Ice Deck Pads are currently constructed in two standard sizes for easy installation on decks, 0,5x0,5 mtr or 1x1 mtr.

Tests show that only 230W/sqm is sufficient to keep the surface free from ice, frost and snow at -15 ^{0}C with laminar wind speeds of 5m/s.

For ships with composite decks the pads can be neatly integrated into deck laminate adding to the fiber strength of deck.

Table chart for AIDP's depending on winterized vessel design temperature (example)

AIDP	Basic (t_w,t_a) -15 °C	Cold (t_w,t_a) -30 °C	Polar (t_w,t_a) -45 °C
Power load/sqm (230V)	Appr 220W m² (6 x 1m²)	330W/ m² (5 x 1m²)	Appr. 490W (4 x 1m²)
Heat dissipation	Appr. 15%	Appr. 20%	Appr. 25%
Weight/sqm	15 kg	15 kg	15 kg
Thickness	22 mm	22 mm	22 mm

Deck fastening detail (Hilti X-BT)

Sloped deck fastening rim

Access ramp with integrated heating function on a small passenger ferry in the Baltic sea.

AIDP's integrated in the composite deck onboard passenger ferry.

An elevated (heated) access ramp with the Conficomp technology, onboard Stena Danica.

MESC™ - Marine Enclosed Step Covers

Anti Ice Deck Pads can be combined with equally heated access ramps and ladders, allowing for safe passages wherever needed onboard.

Slippery ladders can be hazardous. Marine Enclosed Step Covers (MESC) with efficient and easy anti icing will take care of the problem with slippery ascends/descends. Conficomp is a heavy duty and energy efficient solution keeping laddersa and other boot surfaces skid free at all times.

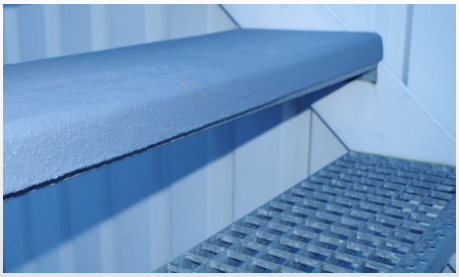
A-ISS™ access stairway for airport in cold climate. Approximately 1.000.000 passengers have used this stairway over ten years of time, still in mint condition.

Boarding stairway with smooth anti-skid surface and integrated heating function.

Marine Enclosed Step Covers are manufactured with the same Conficomp technology as the Anti Ice Deck Pads, with integrated heat.

A natural choice for OHS conscious operators and green class vessels.

Dynagrip aggregates makes it virtually impossible to slip and fall due to prevailing bad conditions.



An enclosed step cover (sand coated) versus a grated step.

Add extra safety for e.g. escape routes etc. with alert colors or imprints of your choice (optional).

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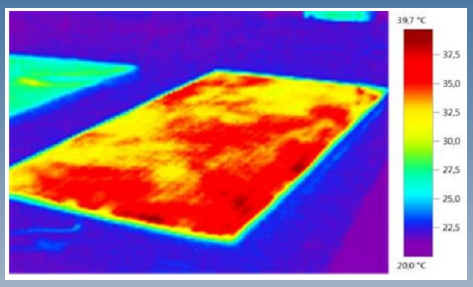
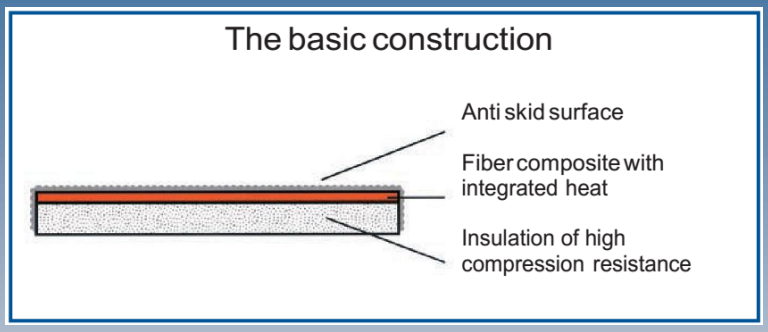


The Conficomp system gives an even temperature distribution on the surface, without cold and hot spots.



AIDP's and MESC's are made of a non-ferrous, non-magnetic, non-toxic composite material with a built-in conductive fibre technology, re-inforced by an isoftal fire resistant polymer, three times more resistant to compression, wear and tear compared to e.g. B30 concrete. Core insulation by Divinycell® and anti-skid protection is best ensured with Dynagrip® aggregates, coated with Unica Coatings MC Finish.

Accidents and injuries due to slips and falls caused by slippery surfaces, ice and snow are costing our society and healthcare systems enormous amounts of money and personal suffering every year. Our mission is to minimize these accidents.

Our anti-ice applications can also be used in a multitude of different settings and segments such as pipes, handrails, hatches, textiles, on– and offshore etc. R&D is being carried out also for wind power plants (turbines and blades) and more.

Safe operation – save energy – save weight - the BPAB way.

BPAB

BPAB (HQ)

Klippan 3
414 51 Göteborg
Sweden

Phone: +46 768 688086
E-mail: kristian@bpabco.com

BPAB (R&D)

Tegelbruksvägen 1,
Forssa Företagscenter
517 91 Bollebygd
Sweden
Phone: +46 33 284780
E-mail: bo@bpabco.com