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**Advantages of Thermal Insulation Coatings**

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Reference: **Thermal Insulation Coatings**

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**Advantages of Thermal Insulation Coatings**

Thermal insulation coatings keep heat in, cold out and corrosion away in all circumstances, and maintain safe touch levels on top of that and meet the insulation requirements onboard.

**Options in insulation on board** do not provide an abundance in choices. Glass wool insulates both temperature and dampens noise, but lacks anti-corrosion properties, and takes up precious room. In some cases, it even functions as a sponge for water, mold and insects. Polystyrene is very light and easy to apply. It's insulating properties are fair, but again it has no anti-corrosion properties, and just like glass wool insulation, it needs to be held in place by cladding or board. There are special soundproof and thermal insulating foams available, although expensive and still not anti-corrosive, nor do they combat the challenges of cold and heat in one solution.

**The developments in micro- and nanotechnology** during the nineties and the zero years however, didn't bypass the insulation market without notice. Today, high performance insulating coatings use micro-sized material with nano-sized internal architecture that inhibits the transfer of heat, causing the material to act as an effective thin insulator. Because of their ability to enter the very intermolecular structure of materials like steel and synthetics, these coatings actually bond with the surface and bring extremely strong anti-corrosive characteristics, combined with unmatched tear-off rates, so they are very useful in maritime and industrial environments. The thermal insulation coatings are typically applied like a paint.

**1. It insulates. The whole area.**

So, as we talk about thermal insulating coatings, this means we can further reduce the heat loss on fuel lines, as we can now cover the full 100%. This includes the tight bends in small corners, the hard-to-reach tubes between the machinery and the lines running under the floors without cladding due to the lack of space. Typically, thermal insulating nanotech coatings are reported to

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show a performance of 10% to 25% reduction in energy costs and significantly reduced heat transfer.

**2. It improves Safe Touch areas. No burns.**

About 10 coats can reduce line temperatures from 150C/302F to 66C/152F and steam pipe and water-cooling pipes to far under the 47C/118F level where skin burns start to develop, thermal insulating coatings can really enhance safety in the engine room. Safe touch and having enough room are key for safety on board.

**3.It saves space.**

Walking around in engine rooms means climbing and descending small steps and ladders. Bumping ones chest and back against the wider-than-expected cladding of all kinds of lines and tubes, causes an unnecessary bending or denting of cladding and possibly tubes, disturbing ones balance.

**4.It makes metals strongly anti-corrosive.**

As micro- and nanoparticles, like Hydro-NM-Oxide, build a matrix into the metal surfaces, all intermolecular space is taken. Water, oxygen, enzymes, acids and other usual suspects for corrosion can no longer enter the material. Several corrosion tests show that thermal insulating coatings really withstand severe environments that are notorious for causing corrosion. In addition, the chemical resistance of some of the thermal insulating coatings adds to the anti-corrosive properties. The material strength and structural integrity of the host metal remains unaffected.

**5.It keeps tubular systems visible.**

Those who ever have stripped down cladding or glass wool insulation from a tubular system, looking for a leak, know what a mess that can make, and how much money and time it costs before everything is ship shape again. Thermal insulating coatings, especially the translucent ones, enable us to keep a good eye on what is going on with our systems. No surprise rust (from the inside out), no surprise cracks, and the opportunity to immediately check the metals whenever required.

The ability to cover all areas when thermal insulating is there, including extra's like strong anti-corrosion, direct vision on your tubular systems and easy-to-adapt opportunities.

Painting is relatively easy, and it sure beats the work and time that comes with cladding and insulating with old fibrous materials. At least the crew can do the job, making it even more cost-effective than it was.

**Note:** Sound reduction is not included when using thermal insulating coatings and temperatures over 204C/400F are beyond the scope of these coatings. Still, when you are thinking of improving on safety and functionality in your engine room, nanotechnology might be part of your solution.

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REFERENCES:

- Thermal Insulation Coatings

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