



## European Union Recognised Organisation (EU RO) Mutual Recognition Type Approval Certificate in accordance with Article 10.1 of EU Regulation 391/2009.

This is to certify to the Manufacturer named below, that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognised Organisation Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements. The most demanding and rigorous standard from all EU ROs has been taken as a reference for the development of the Technical Requirement on which present certificate is based.

This certificate is issued to:

<b>Manufacturer</b>	<b>Thermaflex Izolacji Sp. z o.o.</b>
<b>Address</b>	Przemysłowa 6, Żarów, 58-130, Poland
<b>Product Type</b>	Thermal Insulation of Organic Foams for Piping
<b>Description</b>	Thermal halogen free insulation product made of direct extruded, closed-cell high quality Polyolefin Elastomer foam with aluminium black foil
<b>Trade Name</b>	ThermaSmart Marine 4.0
<b>Application</b>	<p>Thermal insulation of organic foams used for piping and ventilation ducts penetrating the cargo spaces, mail rooms, baggage rooms and refrigerated compartments of service spaces, as well as for pipe fittings for cold service systems.</p> <p>Insulation of piping and ventilation ducts penetrating other areas such as accommodation, service spaces and machinery spaces and insulation of piping for hot and cold sanitary water is outside the scope of the Technical Requirement.</p> <p>Installation in spaces or areas is to be according to the required environmental</p>

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categories of the RO classing the ship.

<b>Specified Standard</b>	EU RO Mutual Recognition Technical Requirements - Thermal Insulation of organic foams for piping, Tier 4, Version 0.3, 01 July 2025	
<b>Ratings</b>	Service temperature:	-80 °C to +95 °C
	Thermal Conductivity:	0.0353 ± 1% W/mK at 10 °C 0.0406 ± 1% W/mK at 50 °C
	Flame Spread:	acc. FTP Code, Annex 1, Part 5
	Smoke and Toxicity:	may be installed without testing acc. FTP Code, Annex 2, 2
	Maximum calorific value:	40.76 MJ/kg
	Density:	≤40 kg/m <sup>3</sup>
	Water Vapour Penetration:	5.0 mg/(m <sup>2</sup> h)
<b>Additional Tests</b>	Thermal Resistance acc. to ISO 8301 Closed Cell Content acc. to ISO 4590 Flame Spread characteristics acc. to FTP Code 2010, Annex 1, Part 5 Smoke and Toxicity not required acc. to FTP Code 2010, Annex 2, Part 2 Maximum calorific value acc. to ISO 1716 Density acc. to ISO 845 Water vapour penetration acc. to EN 12086	
<b>Special Conditions</b>	Product to be marked acc. to EU RO Mutual Recognition Technical Requirements with: - Manufacturer's name or trade mark - Type designation under which the product is type approved.	

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This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document No. TSO/25-042687-P-1 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- *American Bureau of Shipping (ABS);*
- *Bureau Veritas (BV);*
- *China Classification Society (CCS);*
- *Croatian Register of Shipping (CRS);*
- *DNV GL;*
- *Indian Register of Shipping (IRS);*
- *Korean Register (KR);*
- *Lloyd's Register Group Ltd. (LR);*
- *Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);*
- *Polish Register of Shipping (PRS);*
- *RINA Services S.p.A. (RINA).*

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).