



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **K-5776**

This is to certify that the  
**Plastic Pipes, Thermoplastic**

with type designation(s)  
**Henco Sandwich Tube; PE-Xc/Al/PE-Xc**

Issued to  
**Henco Industries N.V.**  
**HERENTALS ANTWERPEN, Belgium**

is found to comply with  
**Det Norske Veritas' Rules for Classification of Ships**  
**Det Norske Veritas' Type Approval Programme 1-501.2, 2011, Thermoplastic Pipes**

Application

**Non-essential systems for hot and cold fresh and sea water and for heating applications up to 10 bar and 70°C (95°C for shorter periods). The piping system is not tested with respect to Fire Endurance and Flame Spread characteristics**

This Certificate is valid until **2017-12-31**.

Issued at **Høvik** on **2013-12-19**

for **Det Norske Veritas AS**

DNV local station: **Antwerp**

Approval Engineer: **Helene Bjerke**

**Martin Strande**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.

The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

**HENCO SANDWICHTUBE PE-Xc/Al/PE-Xc**; Multi-layered composite pipe:  
Crosslinked Polyethylene inner and outer liner, Continuously Butt-welded Aluminium Core Pipe. The different layers are adhesively bonded to each other.

### Legends:

PE-Xc: Polyethylene - Crosslinked  
Al: Aluminium

### Fittings/Couplings:

Pipes to be joined with HENCO's press and screw joints/fittings made from MS 58 brass (*as per HENCO's pricelist*) or with HENCO's plastic compression joints/fittings made of PVDF (polyvinylidene fluoride).

### Dimensions:

Diameters and wall thicknesses:

Type	OD [mm]	Wall thickness [mm]	Wall thickness of the various layers [mm]		
			Inner	Al	Outer
HENCO SANDWICHTUBE PE-Xc/Al/PE-Xc PN 10 bar	16,0	2,0	1,0	0,4	0,6
	18,0	2,0	1,0	0,4	0,6
	20,0	2,0	1,0	0,4	0,6
	26,0	3,0	1,8	0,5	0,7
	32,0	3,0	1,3	0,7	1,0

**Note:** The maximum long-term working pressure is set to 10 bar for all temperatures up to 70°C (continuous service) and is based on the long-term internal tests carried out. A safety factor >1,8 has been applied w.r.t. the submitted regression curves.

## Application/Limitation

Non-essential sanitary and drainage systems for hot and cold fresh and seawater, and for heating applications up to 10 bar and 70 °C (95 °C for shorter periods).

The piping system is non-conductive, not for installation in gas hazardous area.

The installation and application of the pipes shall be in accordance with the manufacturer's recommendations.

The Fire Endurance and Flame Spread characteristic of the piping system have not been determined.

The pipes and fittings are not to be used in submerged condition.

## Type Approval documentation

1. Previous Type Approval Certificate No. K-4071.
2. Type Approval Assessment Report from DNV Antwerp of 2013-12-17.

## Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

## Marking of product

The piping shall be marked with:

- Trade name,
- Maximum Working Temperature,
- Maximum Working Pressure, and
- Dimensions

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV Type Approval Certificate.

### **Periodical Assessment**

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Assessment to be performed after two (2) years (Certificate Retention) and at renewal after four (4) years (Certificate Renewal).

The main elements of the Periodical Assessment are:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE