DNV·GL

Certificate No:
TAK00001A1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Thermoplastic

with type designation(s)
HENCO STANDARD multilayer pipe PE-Xc/Al/PE-Xc

Issued to
Henco Industries N.V.
HERENTALS, Belgium

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Hamburg** on **2019-01-28**

This Certificate is valid until **2024-01-27**.
DNV GL local station: **Antwerp**

Approval Engineer: **Joachim Rehbein**

for **DNV GL**
Digitally Signed By: Wildhagen, Christian
Location: DNV GL Hamburg, Germany
Signing Date: 2019-01-30, on behalf of

Thorsten Lohmann
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.

Product description

The HENCO STANDARD plastic piping system consist of:
- Polyethylene crosslinked multilayer pipes of type HENCO STANDARD-PE-Xc/Al/PE-Xc
- Press fittings made of Polyvinylidenfluoride (PVDF)
- Press and screw joints/fittings made from brass
- Pressing machines and tools released by HENCO

Overview

Pipe types	HENCO STANDARD PE-Xc/Al/PE-Xc								
Outer diameter (O.D.) mm	16	18	20	26	32	40	50	63	75
Wall thickness (s) mm	2.0	2.0	2.0	3.0	3.0	3.5	4.0	4.5	6.0
Fittings/Couplings									
Materials	Body	PVDF							
	Insert	brass							
Types[1]	Couplings, T-pieces, Bends, Adapters/-bends and connecting fittings (press fitting - screwed connection), Socket plugs, Caps.								
Service temperature range[2]	0°C up to + 70°C (short periods up to 95 °C)								
Maximum internal service pressure[2]	10 bar								
External pressure rating	none								
Joining techniques[1]	Press/screw								

Notes:
[1] Refer to HENCO Technical Manual DO03-0005EN03 - HENCO PRESS – STANDARD
[2] The maximum long-term working pressure is set to 10 bar for all temperatures up to 70ºC (continous 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

The HENCO STANDARD plastic piping system is type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of DNV GL Rules Pt.4, Ch.6, Section 2 as follows:

Item	**Piping system[1]**	
22	Freshwater - Non-essential systems	- Potable and wash water systems (internal) - Hot water heating systems.
29	Miscellaneous	- Service air (non-essential systems)

Notes
[1] Approved installation locations where "0" is specified in "Table 1 - Fire endurance requirements matrix". Appropriate footnotes are to be observed.

The HENCO STANDARD piping system is not approved for installation in gas hazardous area.

The HENCO STANDARD piping system is not suitable for vacuum conditions or liquid acting on the outside.

Extent of Type Tests applicable to piping system dependent on application

Fire endurance Level
The HENCO STANDARD piping system is not tested with respect to Fire Endurance characteristics.

Flame spread
The HENCO STANDARD piping system is not tested with respect to flame spread characteristics.

Smoke and toxicity
The HENCO STANDARD piping system is not tested with respect to smoke and toxicity characteristics.

Electrical conductivity
Not applicable.

Passenger vessels
For application on passenger vessels additional requirements specified in the Rules and Regulations of the appropriate flag state authority may have to be observed.

Installation

For installation of the piping system the instructions and list of released pressing tools specified in the HENCO TECHNICAL MANUAL are to be observed.

In addition the installation requirements specific to the ship as specified by the ship yard as well as DNVGL Rules Pt.4, Ch6, Section 9 .

Bulkhead and Deck Penetration

Pipe penetration through watertight bulkheads or decks as well as through fire divisions shall be type approved unless the pipe is welded into the bulkhead/deck.

When plastic pipes pass through watertight bulkheads or decks which are also a fire division and a fire may cause flooding of watertight compartments, the watertight integrity of the bulkhead or deck is to be maintained by a metallic shut-off valve fitted at the bulkhead or deck. The operation of this valve shall be provided from above the freeboard deck.

Refer to DNV GL Rules Pt.4, Ch.6 Section 3 – 1.4 Fittings on watertight bulkheads.

On passenger vessels, where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed.

Type Approval documentation

- previous certificate K-5776
- Type approval assessment report 90.02a, issued 2018-03-21
- Internal pressure – short term test reports nos. 2018030137/000 and /001
- HENCO Technical Manual DO03-0005EN03
- HENCO TDS DO04-0000EN03
- HENCO Product overview 2017/2, DO02-0017IN01
- SKZ test report 10337/12-III, 2015-10-26
- kiwa test report LC 9094-1, 2014-07-21 (Determination of long-term hydrostatic strength)

Tests carried out

According to Type Approval documentation

Production Testing

Each batch of pipes and fittings shall be subjected to product tests as specified in DNVGL CP - 0072 - Table 1 "Requirements for manufacturers quality control".

Marking of product

	Scope	**Example**
Pipes	- Manufacturer name and or trade mark - Nominal outside diameter - Nominal wall thickness - Material designation - Nominal working pressure / max. temperature - Application class with design pressure - Manufacturer information	- HN - 16 - 2,2 - PE-Xc/Al/PE-Xc - 10bar / 70°C - Klasse 1,2,4,5/10bar - batch no. / production date
Fittings	- Manufacturer name and or trade mark - Nominal outside diameter - Manufacturer information	- HN - 16 - batch no. / production date

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:
- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE