

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000D9
Revision No:
4

This is to certify:

That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings

with type designation(s)

HIPAC 2SC /LONGLIFE 2SC- product code THE002K/THE202K, KAIZEN 2SN -product code THD0021

Issued to

I.M.M. Hydraulics S.p.A.
Atessa, CH, Italy

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

DNV class programme DNV-CP-0183 – Type approval – Flexible non-metallic hoses

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
HIPAC 2SC /LONGLIFE 2SC- product code THE002K/THE202K	-40°C to +100°C	65-430 bar	DN6 to DN76
KAIZEN 2SN -product code THD0021	-40°C to +100°C	90-420 bar	DN5 to DN51

Issued at **Høvik** on **2022-09-05**

for **DNV**

This Certificate is valid until **2027-06-30**.

DNV local station: **Italy/Malta CMC**

Approval Engineer: **Renata Rossi**

Sinisa Sedlan
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Two types of flexible hose assemblies:

Inner tube : NBR tube, oil resistant synthetic rubber
 External cover : SBR/NBR/PVC, Anti abrasive synthetic rubber, oil and ozone resistant.
 Reinforcement : 2 high tensile steel wire braids.

Couplings : Carbon steel (Ferrule Code 2SC:001C & 2SN:0022 and related carbon steel inserts as per IMM Catalogue) or inox fittings of stainless steel (Ferrule Code 2SC:X001C & 2SN:X0022 and related stainless steel inserts as per IMM Catalogue)

Materials : EN 10277-3 1.0737 (11SMnPb37)
 EN 10263-2 1.0214 (C10C)
 EN 10210-1/2 S355J2H
 EN 10088-3 1.4404 (AISI 316L)

Hoses & Couplings are manufactured by:

I.M.M. Hydraulics S.p.A

Assembling locations: I.M.M. Hydraulics S.p.A., Atessa CH, Italy
 I.M.M. Hydraulics S.p.A. Genova Bolzaneto GE – Italy

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled in the above mentioned assembling locations and delivered by the holder (named as manufacturer) of this certificate.

Size		HIPAC 2SC product code THE002K/ LONGLIFE 2SC product code THE202K	KAIZEN 2SN - product code THD0021				
ID		Part Number	Pressure		Part number	Pressure	
Inch	DN		psi	bar		psi	bar
3/16"	5	-	-	-	THD0021-03	6090	420
1/4"	6	THE002K-04 / THE202K-04	6235	430	THD0021-04	6090	420
5/16"	8	THE002K-05/ THE202K-05	5800	400	THD0021-05	5220	360
3/8"	10	THE002K-06/ THE202K-06	5075	350	THD0021-06	5075	350
1/2"	12	THE002K-08/ THE202K-08	4495	310	THD0021-08	5075	290
5/8"	16	THE002K-10/ THE202K-10	4060	280	THD0021-10	3625	250
3/4"	19	THE002K-12/ THE202K-12	3480	240	THD0021-12	3118	215
1"	25	THE002K-16/ THE202K-16	3045	210	THD0021-16	2538	175
1 1/4"	31	THE002K-20/ THE202K-20	2320	160	THD0021-20	2030	140
1 1/2"	38	THE002K-24/ THE202K-24	2175	150	THD0021-24	1813	125
2"	51	THE002K-32/ THE202K-32	1450	100	THD0021-32	1305	90
2 1/2"	63	THE002K-40/ THE202K-40	1160	80	-	-	-
3"	76	THE002K-48/ THE202K-48	943	65	-	-	-

Hose assemblies covered by this certificate are approved to be used for systems conveying petroleum based hydraulic fluids and lubricating oil where no pressure impulse and/or high level of vibrations are expected.

Hose assemblies covered by this certificate are suitable for:

- petroleum base hydraulic fluids within a temperature range of -40°C to +100°C

- water base hydraulic fluids and compressed air within a temperature range of -40°C to +70°C.
- fresh water within a temperature range of 0°C to +70°C.

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/ required.

The hose assemblies must only be fitted in places where they are always accessible and shall not be used on boiler fronts.

The cover of hoses for gaseous applications shall be pin-pricked.

The outer end of the pipe coupling (performing the connection to the fixed piping) is not covered by this certificate and shall follow the below requirements:

- Flanged ends shall be according to a recognized standard
- Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized standard. Limitations stated in DNV-RU-SHIP Pt.4 Ch.6 Sec.9 [5.2.6] to be followed.
- If these outer ends are going to be part of a mechanical joint as covered by Table 8 DNV-RU- SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

Production testing

Each hose assembly shall be hydrostatically tested at a pressure of 1.5 times the maximum working pressure and be delivered with the pressure test report with reference to this type approval certificate.

Type Approval documentation

Manufacturer datasheets for couplings and hoses.

Manufacturer hose assembly test reports.

Impulse and burst test reports MIL-08-0331-1.

Manufacturer test reports dated 2006-01-13 and 2006-01-12 (tests on rubber hose)

Manufacturer test report (tests on rubber) 22CQ pages 1,2,3,4 dated 2012-08-27

LAPI test n° 1109-1110-1111. OIS0110/12 and 889-890-891-892-893-894 OIS0110/13

Test report numbers 001,002,003,004,005,006,007,008DNV-17 dated 2017-06-28 containing burst pressure, leakage, change in length and dimensional check test reports.

Renewal burst pressure test report (work order no. 17/0153) witnessed by DNV GL surveyor dated 2017-06-29

Vacuum test report Mod. 30 CQ Rev.R0 dated 2018-10-31.

Cold Flexibility, Adhesion & Fluid Resistance Test report. Dated 31.03.2021

Tests carried out

Fire, Burst, Impulse, Change in length, Abrasion, Adhesion, Oil resistance, Cold flexibility, Ozone resistance, Dimensional check, vacuum test.

Marking of product

For traceability to this Type Approval, the products are at least to be marked with:

- Hose manufacturer's name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- Nominal diameter;
- Pressure rating;
- Temperature rating.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.