

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)

**Trale/Triagle hoses with DICSA stainless/carbon steel permanently fitted couplings
(see second page of this certificate for product description)**

Issued to

**DISTRIBUIDORA INTERNACIONAL CARMEN, S.A -DICSA-
Zaragoza Zaragoza, Spain**

is found to comply with

DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems****DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL.****Temperature range: Dependent on the application (see page 2)****Max. working press.: Dependent on the size (see page 2)****Sizes: DN 6/8/10/12/16/19/25/31/38/51 (see page 2)**This Certificate is valid until **2019-06-30**.Issued at **Høvik** on **2016-11-28**for **DNV GL**DNV GL local station: **Barcelona**Approval Engineer: **Zeinab Sharifi**

**Marianne Spæren Marveng
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

Six types of flexible hoses of non-metallic material with permanently fitted couplings.

Hoses (Semperit hoses) Branded TrΔle[®]/Triagle and Semperit:

TrΔle [®] / Triagle SAE 100 R1AT	EN853 1SN	DN 6/8/10/12/16/19/25/31/38/51
TrΔle [®] / Triagle SAE 100 R2AT	EN853 2SN	DN 6/8/10/12/16/19/25/31/38/51
TrΔle [®] / Triagle SAE 100 R9R (4SP)	EN856 4SP	DN 10/12/16/19/25/31/38/51
TrΔle [®] / Triagle	EN856 4SH	DN 19/25/31/38/51
TrΔle [®]	EN857 1SC	DN 6/8/10/12/16/19/25
TrΔle [®]	EN857 2SC	DN 6/8/10/12/16/19/25

DISCA Couplings made of stainless steel (AISI 316L / 1.4404) and carbon steel (EN 10277-3, 1.0737).

Application/Limitation

Hose assemblies are suitable for use with:

- hydraulic fluids in accordance with ISO 6743-4 with the exception of HFD R, HFD S and HFD T at temperatures ranging from -40 °C + 100°C;
- water based fluids at temperatures ranging from -40 °C to +70°C;
- water at temperatures ranging from 0 °C to +70°C.

Maximum working pressure as below:

Size	EN853 1SN (bar)	EN853 2SN (bar)	EN 856 4SP (bar)	EN 856 4SH (bar)	EN857 1SC (bar)	EN857 2SC (bar)
DN6	225	400	-	-	225	400
DN8	215	350	-	-	215	350
DN10	180	330	445	-	180	330
DN12	160	275	415	-	160	275
DN16	130	250	350	-	130	250
DN19	105	215	350	420	105	215
DN25	88	165	280	380	88	165
DN31	63	125	210	325	-	-
DN38	50	90	185	290	-	-
DN51	40	80	165	250	-	-

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

All hose assemblies delivered under this type approval certificate shall be in compliance with an assembly procedure issued by the certificate holder.

All hose assemblies delivered under the DNV GL type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate.

The hoses must only be fitted in places where they are always accessible.

Hoses shall not be subjected to pressures below atmospheric pressure.

Flexible hoses of these types are not to be used on boiler fronts.

It must be possible to shut off from the system all flexible hoses used in systems for lubrication oil, fuel oil and petroleum base hydraulic oil.

Hose assemblies with couplings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalized.

Type Approval documentation

Coupling Drawings :

ZA610101200-V2 / ZA610102400 rev.1 / ZPF1224004 rev.3 / ZPF1224006 rev.3 / ZPF1224008 rev.3 / ZPF1224016 rev.3 / ZPF1224032 rev.3 / ZPF122401200_V1 / ZPF122402400_V1 / ZPF122403200-V1 / ZPF2212004 rev.12 / ZPF2212008 rev.7 / ZPF2212016 rev.5 / ZPF221203200_V5

Burst test reports

Burst test report for SAE 100 R1AT/ EN853 1SN (Stainless steel fitting):

- DN06 IPP20131106/4 dated 2013/11/06
- DN12 IPP20131106/5 dated 2013/11/06
- DN25 IPP20131106/1 dated 2013/11/06
- DN51 IPP20131106/9 dated 2013/11/06

Burst test report for SAE 100 R1AT/ EN853 1SN (Carbon steel fitting):

- DN06 IPP1633/7 dated 2016/03/03
- DN12 IPP1633/8 dated 2016/03/03
- DN25 IPP1633/9 dated 2016/03/03
- DN51 IPP1633/10 dated 2016/03/03

Burst test report SAE 100 R2AT/ EN853 2SN (Stainless steel fitting):

- DN06 IPP20131106/6 dated 2013/11/06
- DN12 IPP20131106/2 dated 2013/11/06
- DN25 IPP20131106/3 dated 2013/11/06
- DN51 IPP20131107/5 dated 2013/11/07

Burst test report for SAE 100 R2AT/ EN853 2SN (Carbon steel fitting):

- DN06 IPP1633/11 dated 2016/03/03
- DN12 IPP1633/12 dated 2016/03/03
- DN25 IPP1633/13 dated 2016/03/03
- DN51 IPP1633/14 dated 2016/03/03

Burst test report for SAE 100 R9R/ EN853 4SP (Stainless steel fitting):

- DN10 IPP20131106/7 dated 2013/11/06
- DN19 IPP20131107/1 dated 2013/11/07
- DN38 IPP20131107/2 dated 2013/11/07

Burst test report for SAE 100 R9R/ EN853 4SP (Carbon steel fitting):

- DN10 IPP1633/15 dated 2016/03/03
- DN19 IPP1633/16 dated 2016/03/03
- DN38 IPP1633/17 dated 2016/03/03

Burst test report for EN856 4SH (Stainless steel fitting):

- DN19 IPP20131106/8 dated 2013/11/06
- DN38 IPP20131106/9 dated 2013/11/06

Burst test report for EN856 4SH (Carbon steel fitting):

- DN19 IPP1633/18 dated 2016/03/03
- DN38 IPP1633/19 dated 2016/03/03

Burst test report for 1SC (Stainless steel fitting):

- DN06 IPP1632/5 dated 2016/03/02
- DN12 IPP1632/6 dated 2016/03/02
- DN25 IPP1632/7 dated 2016/03/02

Burst test report for 1SC (Carbon steel fitting):

- DN06 IPP1633/1 dated 2016/03/03
- DN12 IPP1633/2 dated 2016/03/03
- DN25 IPP1633/3 dated 2016/03/03

Burst test report for 2SC (Stainless steel fitting):

- DN06 IPP1632/8 dated 2016/03/02
- DN12 IPP1632/9 dated 2016/03/02
- DN25 IPP1632/10 dated 2016/03/02

Burst test report for 2SC (Carbon steel fitting):

- DN06 IPP1633/4 dated 2016/03/02
- DN12 IPP1633/5 dated 2016/03/02

- DN25 IPP1633/6 dated 2016/03/02

Fire Test reports (Done by LAPI) according to ISO 15540, ed. 1999:

Fire test report for SAE 100 R1AT/ EN853 1SN (Stainless steel fitting):

- 307.0IS0110/14 dated 20/03/2014 (DN06)
- 091.0IS0110/14 dated 13/02/2014 (DN19)
- 308.0IS0110/14 dated 20/03/2014 (DN51)

Fire test report for SAE 100 R1AT/ EN853 1SN (Carbon steel fitting):

- 1097.0IS0110/16, dated 24/06/2016 (DN06)
- 1098.0IS0110/16, dated 24/06/2016 (DN19)
- 1099.0IS0110/16, dated 24/06/2016 (DN51)

Fire test report for SAE 100 R2AT/ EN853 2SN (Stainless steel fitting):

- 311.0IS0110/14 dated 20/03/2014 (DN06)
- 093.0IS0110/14 dated 13/02/2014 (DN19)
- 1053.0IS0110/14 dated 08/07/2014 (DN51)

Fire test report for SAE 100 R2AT/ EN853 2SN (Carbon steel fitting):

- 1100.0IS0110/16, dated 24/06/2016 (DN06)
- 1101.0IS0110/16, dated 24/06/2016 (DN19)
- 1102.0IS0110/16, dated 24/06/2016 (DN51)

Fire test report for SAE 100 R9R/EN856 4SP (Stainless steel fitting):

- 1054.0IS0110/14 dated 08/07/2014 (DN10)
- 094.0IS0110/14 dated 13/02/2014 (DN19)
- 1329.0IS0110/14 dated 29/08/2014 (DN51)

Fire test report for SAE 100 R9R/EN856 4SP (Carbon steel fitting):

- 1408.0IS0110/16 dated 25/08/2016 (DN10)
- 1409.0IS0110/16 dated 25/08/2016 (DN19)
- 1410.0IS0110/16 dated 25/08/2016 (DN151)

Fire test report for SAE 100 EN856 4SH (Stainless steel fitting):

- 095.0IS0110/14 dated 13/02/2014 (DN19)
- 315.0IS0110/14 dated 20/03/2014 (DN31)
- 316.0IS0110/14 dated 20/03/2014 (DN51)

Fire test report for SAE 100 EN856 4SH (Carbon steel fitting):

- 1405.0IS0110/16 dated 25/08/2016 (DN19)
- 1406.0IS0110/16 dated 25/08/2016 (DN31)
- 1407.0IS0110/16 dated 25/08/2016 (DN151)

Fire test report for EN857 1SC (Carbon steel fitting):

- 812.0IS0110/16, dated 03/05/2016 (DN06)
- 813.0IS0110/16, dated 17/05/2016 (DN12)
- 814.0IS0110/16, dated 17/05/2016 (DN25)

Fire test report for EN857 1SC (Stainless steel fitting):

- 704.0IS0110/16, dated 28/04/2016 (DN06)
- 705.0IS0110/16, dated 28/04/2016 (DN12)
- 706.0IS0110/16, dated 28/04/2016 (DN25)

Fire test report for EN857 2SC (Stainless steel fitting):

- 707.0IS0110/16, dated 28/04/2016 (DN06)
- 708.0IS0110/16, dated 28/04/2016 (DN12)
- 709.0IS0110/16, dated 28/04/2016 (DN25)

Fire test report for EN857 2SC (Carbon steel fitting):

- 815.0IS0110/16, dated 17/05/2016 (DN06)
- 816.0IS0110/16, dated 17/05/2016 (DN12)
- 1103.0IS0110/16, dated 24/06/2016 (DN25)

Impulse test report:

Impulse test report for SAE 100 R1AT/ EN853 1SN (Stainless steel fitting):

- IED20131025/1 dated 25/10-2013 for ¼"

- IED20131028/1 dated 28/10-2013 for ½"
 - IED2014114/1 dated 14/11-2014 for 1"
 - IED20140520/1 dated 17/06-2014 for 2"
- Impulse test report for SAE 100 R1AT/ EN853 1SN (Carbon steel fitting):
- EI20151120/1 dated 20/11/2015 for ¼"
 - EI2015113/1 dated 03/11/2015 for ½"
 - EI2015119/1 dated 09/11/2015 for 1"
 - EI201621/1 dated 01/02/2016 for 2"
- Impulse test report for SAE 100 R2AT/ EN853 2SN (Stainless steel fitting):
- IED20111115/1 dated 15/11-2011 for ¼"
 - IED2013413/1 dated 13/04-2013 for ½"
 - IED20131016/1 dated 16/10-2013 for 1"
 - IED20140520/1 dated 13/06-2014 for 2"
- Impulse test report for SAE 100 R2AT/ EN853 2SN (Carbon steel fitting):
- EI20151130/3 dated 30/11/2015 for ¼"
 - EI2015727/2 dated 27/07/2015 for ½"
 - EI201645/1 dated 05/04/2016 for 1"
 - EI201647/1 dated 07/04/2016 for 2"
- Impulse test report for SAE 100 R9R/ EN856 4SP (Stainless steel fitting):
- IED2013118/1 dated 8/11-2013 for 3/8"
 - IED20131216/1 dated 16/12-2013 for 3/4"
 - IED2014421/1 dated 21/04-2014 for 1 ½"
- Impulse test report for SAE 100 R9R/ EN856 4SP (Carbon steel fitting):
- EI16316/16 dated 16/03/2016 for 3/8"
 - EI201654/1 dated 04/05/2016 for 3/4"
 - EI16512/1 dated 12/05/2016 for 1 ½"
- Impulse test report for SAE 100 EN856 4SH (Stainless steel fitting):
- IED20131115/1 dated 15/11-2013 for ¾"
 - IED2014331/1 dated 31/3-2014 for 1 ½"
- Impulse test report for SAE 100 EN856 4SH (Carbon steel fitting):
- EI2016310/1 dated 10/03/2016 for ¾"
 - EI2016524/1 dated 24/10/2016 for 1 ½"
- Impulse test report for EN857 1SC (Stainless steel fitting):
- EI2015914/1 dated 14/09/2015 for ¼"
 - EI2015722/3 dated 22/07/2015 for ½"
 - EI2015105/1 dated 05/10/2015 for 1"
- Impulse test report for EN857 1SC (Carbon steel fitting):
- EI2015914/2 dated 14/09/2015 for ¼"
 - EI2016321/2 dated 21/03/2016 for ½"
 - EI2016125/1 dated 25/01/2016 for 1"
- Impulse test report for EN857 2SC (Stainless steel fitting):
- EI20151125/1 dated 25/11/2015 for ¼"
 - EI2015518/2 dated 18/05/2015 for ½"
 - EI2016122/1 dated 22/01/2016 for 1"
- Impulse test report for EN857 2SC (Carbon steel fitting):
- EI20151125/2 dated 25/11/2015 for ¼"
 - EI201615/2 dated 05/01/2016 for ½"
 - EI2016119/1 dated 19/01/2016 for 1"

Semperit letters dated 17/09/2013 and 07/01/2013 with reference: Declaration of consent enclosed with Semperit test reports for 1SN, 2SN, 1SC, 2SC, 4SP and 4SH.

Job Id: **262.1-016224-2**
Certificate No: **TAP00000MD**

Tests carried out

On the hoses: Dimensional check test, Change in length test, Cold flexibility test, Oil Resistance test, Cover adhesion test, Ozone resistance test

On the hose assembly: Burst test, Fire test, Impulse test

Marking of product

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

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Dimensional check.
- Change in length
- Leakage test
- Burst test

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.