

# TYPE APPROVAL CERTIFICATE

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the DNV GL Type Approval System.

Certificate No.	<b>61 703 - 14 HH</b>
Company	<b>Schwer Fittings GmbH</b> <b>Hans-Schwer-Platz 1</b> <b>78588 Denkingen, GERMANY</b>
Product Description	<b>Compression couplings</b>
Type	<b>u2 Twin Ferrule Fittings</b> <b>Metric and Fractional Tube Sizes</b>
Environmental Category	<b>None</b>
Technical Data / Range of Application	<b>Technical data</b> <b>The u2 twin ferrule fittings in the standard configuration are made of stainless steel 1.4401/ AISI 316</b> <b>The fitting consist of the fitting body, a back and a front ferrule and coupling nuts with silvered thread</b>  <b>Range of Application</b> <b>Range of application, size , pressure and temperature range according to the following pages</b>  <b>LIMITATION</b> <b>Refer to page 3.</b>
Test Standard	<b>GL VI-7-8 Test Requirements for Components and Systems of Mechanical Engineering and Offshore Technology:2008,</b> <b>DNV TA Programme No. 5-792.20:2010</b>
Documents	<b>Refer to page 3</b> <b>GL Approval Reference No.: 14-052446, 14-060873, 14-081713</b>
Remarks	<b>Refer to following pages</b>

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**Range of Application**

The schwer u2 twin ferrule fitting system is type approved for application in piping systems as specified in the GL Rules I-1-2 Machinery Installation, Section 11- D, Table 11.14

Fitting types with rubber sealing shall not be used in systems/locations where a flame resistance test according to table 11.14 is required

**Fitting types with rubber seals:**

- Male connector MC\_OR, MC\_SAE, MCL\_SAE,
- 45 Degree Male Elbow ME45\_SAE,
- Male-Shaft Adaptor MAX\_U\_OR, MAX\_SAE and further fittings with seal RS/MS.

**Size and pressure range**

**Metric fittings acc. to tube diameter**

OD [mm]	6	8	10	12,14,15	16,18,20	22,25	28
Nominal Pressure PN [bar]	700	520	450	390	360	270	320
Pipe tolerances according to EN10305							

**Fractional fittings acc. to tube diameter**

OD [inch]	1/8"	3/16", 1/4"	5/16"	3/8", 1/2"	5/8"	3/4"	7/8", 1"
Nominal Pressure PN [bar]	750	710	540	440	400	380	270
Pipe tolerances according to ASTM A213/269							

For selection of the fittings and tube dimensions for the specific application the maximum allowable service pressures and tube qualities specified in the u2 assembly instruction brochure are to be observed. (www.schwer.com)

Assembling of the fittings shall be carried out according manufacturer assembly instructions.

**Temperature range with metallic seal**

-55°C up to +300°C

**Temperature range with rubber seal**

Elastomer sealing Buna-N: -30°C up to +100°C  
 Elastomer sealing FKM: -20°C up to +200°C

For service temperatures above 50°C the pressure reduction factors specified by the manufacturer are to be observed.

**Fitting material**

-4 = 1.4401 / AISI316	-C22 = 2.4602 Hastelloy	-DX = 1.4462 Duplex
-4L = 1.4404 / AISI 316L	-C6 = 2.4819 Hastelloy	-SDX = 1.4410 Superduplex
-7 = 1.4571 / AISI 316Ti		
-5 = 1.4435 / AISI 316L		
-39 = 1.4539		

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## Fitting types

This type approval includes the fitting types as specified in the u2 catalogue issue date 08/2013, except needle valves, check valves and ball valves

### TUBE TO TUBE

U Union  
 RU Reducing Union  
 BU Bulkhead Male Connector  
 RBU Reducing Bulkhead MC  
 E Union Elbow  
 T Union Tee  
 RT Reducing Union Tee  
 C Union Cross

### TUBE TO MALE PIPE

MC\_NPT, MC\_R, MC\_G\_ES, MC\_G\_RS, MC\_G\_CS, MC\_OR, MC\_SAE, MCL\_SAE, MCJ\_JIC Male Connector  
 BMC\_NPT, BMCJ\_JIC Bulkhead Male Connector, ME45\_NPT, ME45\_SAE 45 Degree Male Elbow  
 ME\_NPT, ME\_R, ME\_G\_OR, ME\_SAE Male Elbow  
 MRT\_NPT, MRT\_G\_OR, MRT\_SAE Male Run Tee, MBT\_NPT, MBT\_G\_OR, MBT\_SAE Male Branch Tee

### TUBE TO FEMALE PIPE

FC\_NPT, FC\_R, FC\_G Female Connector, GC\_G Gauge Connector  
 BFC\_NPT Bulkhead Female Connector (refer to limitations)  
 FE\_NPT Female Elbow, FRT\_NPT Female Run Tee, FBT\_NPT Female Branch Tee

### TUBE TO WELDED PORTS

WPC Weld Pipe Connector  
 SWC Socket Weld Connector  
 WPE Weld Pipe Elbow  
 SWE Socket Weld Elbow

### TUBE TO SHAFT

RUS Union with Shaft  
 RUSL Union with long Shaft  
 BUS Bulkhead Union with Shaft  
 EUS Union Elbow with Shaft  
 TUBS  
 TURS  
 TU2S Union Tee with Shaft

### ADDITIONAL COMPONENTS

TC Tube Cap Union

### LIMITATIONS

**Screwed socket tube fittings**

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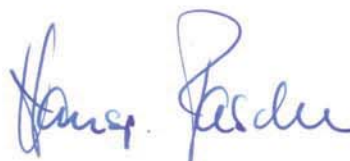
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For application of the following screwed socket tube fittings the limitations as stipulated in the Rules I-1-2 Machinery Installation, Section 11 – D.2.4 are to be observed:

- Male Connector: MC-NPT, MC-R, MCT
- Female Connector FC-NPT, FC-R, FC-G
- Male Elbow ME-NPT, ME-R
- Female Elbow FE
- 45 Degree Male Elbow ME45
- Male Run Tee MRT-NPT
- Male-Shaft Adaptor MAX-R

#### Bulkhead fittings

The fittings of type BU and RBU are not approved through tank walls and watertight deck and bulkheads.

#### Documents

##### Test report IMA Dresden K056/14

Test scope

- Tightness Test, Pressure Test, Burst Test, Vacuum Test
- Combined Pressure Pulsation and Vibration Test
- Pull-out Test
- Repeated Assembly Test

##### Audit report dated 2013-11-12

##### Drawings of test specimens

- According to GL Approval Reference 14-052446, 14-060873 and 14-081713

##### Product catalogue, August 2013

##### Assembly instruction brochure, February 2015

#### Marking of product

For traceability to this Type Approval Certificate each product is to be marked with:

- Manufacturer's name or trade mark.
- Type designation

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