TYPE APPROVAL CERTIFICATE
No. **MAC320021XG**

This is to certify that the product identified below is in compliance with the regulations herewith specified.

Description	**MECHANICAL JOINTS FOR PIPES**
Type	**STAUFF FORM EVO**
Applicant	**WALTER STAUFFENBERG GMBH & CO. KG** **IM EHRENFELD 4** **58791 Werdohl** **GERMANY**
Manufacturer *Place of manufacture*	**WALTER STAUFFENBERG GMBH & CO. KG** **IM EHRENFELD 4** **58791 Werdohl** **GERMANY**
Reference standards	**Part C, Chapter 1, Section 10 of RINA Rules for the Classification of Ships and RINA Rules for the Type Approval of Mechanical Joints for Pipes**

Issued in **Hamburg** on **November 8, 2021**. *This Certificate is valid until* **November 7, 2026**

RINA Services S.p.A.
Giuseppe Russo

This certificate consists of this page and 1 enclosure

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Reference Documents:

- Catalogue 2 STAUFF Connect Ed. 05-2021 Filed under Drawing HMMC/20415
- Tests Report Filed under Drawing HMMC/20416
- Material Certificates and other Certificates filed under Drawing HMMC/20417
- Technical Drawings approved under Drawing HMMC/20418

Description of the Product:

The STAUFF FORM EVO belongs to the family of the tube coupling system and is based on standard parts made of carbon steel and stainless steel (acc.to 8434-1)and consists of only four key components that are:Fitting Body, Union Nut, STAUFF Form EVO Sealing Ring and Formed Tube end.
The STAUFF Form EVO Sealing Ring is slid onto the tube end, which has previously been mechanically contoured. This creates a positive-locking connection that provides a reliable, permanent and maintenance-free seal when used with a conventional fitting body with 24° conical bore and a union nut.

*Description/Type Designation and use of the Parts covered by this type Type Approval Certificate.**

Description	Type Designation	Material	Light Series	Heavy Series
Stauff Form Evo Ring	FI-FD	FKM (Viton®) 90 Shore	YES	YES
Straight Male Stud Fitting	FI-GE	Steel, zinc/nickel-plated,Ssteel	YES	YES
Male Stud Elbow	FI-WE	Steel, zinc/nickel-plated,Ssteel	YES	YES
Male Stud Branch Tee	FI-TE	Steel, zinc/nickel-plated,Ssteel	YES	YES
Male Stud Barrel Tee	FI-LE	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Union	FI-G	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Reducer	FI-G	Steel, zinc/nickel-plated,Ssteel	YES	YES
Union Nut	FI-M	Steel, zinc/nickel-plated,Ssteel	YES	YES
Equal Elbow	FI-W	Steel, zinc/nickel-plated,Ssteel	YES	YES
Equal Tee	FI-T	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Bulkhead Fitting	FI-GS	Steel, zinc/nickel-plated,Ssteel	YES	YES
Elbow Bulkhead Fitting	FI-WS	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Bulkhead Weld Fitting	FI-ES	Steel, phosphated,Ssteel	YES	YES
Equal Cross	FI-K	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Male Stud Fitting (24°Taper)	FI-EGED	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Reducer for Tube Ends (24°Taper)	FI-REDSD	Steel, zinc/nickel-plated,Ssteel	YES	YES
Adjustable Elbow (90°) (24°Taper)	FI-EWD	Steel, zinc/nickel-plated,Ssteel	YES	YES
Gauge Fitting	FI-MA	Steel, zinc/nickel-plated,Ssteel	YES	YES
Gauge Standpipe Fitting	FI-EMA	Steel, zinc/nickel-plated,Ssteel	YES	YES
Gauge Fitting (24°Taper)	FI-EMAD	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Weld Fitting	FI-AS	Steel, phosphated,Ssteel	YES	YES
Elbow Weld Fitting	FI-WAS	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Female Stud Fitting	FI-GA	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Male Stud Standpipe Fitting	FI-EGE	Steel, zinc/nickel-plated,Ssteel	YES	YES
Straight Standpipe Reducer	FI-REDS	Steel, zinc/nickel-plated,Ssteel	YES	YES
Adjustable Standpipe Branch Tee	FI-ET	Steel, zinc/nickel-plated,Ssteel	YES	YES
Adjustable Standpipe Elbow	FI-EW	Steel, zinc/nickel-plated,Ssteel	YES	YES
Adjustable Standpipe Barrel Tee	FI-EL	Steel, zinc/nickel-plated,Ssteel	YES	YES
Adjustable Branch Tee (24°Taper)	FI-ETD	Steel, zinc/nickel-plated,Ssteel	YES	YES

**More detailed information in HMMC-20415,In the Stauff catalogue, the components "carbon steel with surface protection W3" are referenced (W3 = zinc / nickel coating). The components are specified in stainless steel by replacing the product designation from W3 with the code "W5".*

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Description/Type Designation and use of the Parts covered by this type Type Approval Certificate.*

Adjustable barrel Tee (24°Taper)	FI-ELD	Steel, zinc/nickel-plated	YES	YES
Blanking Screw for Ports	FI-VSV	Steel, zinc/nickel-plated	NO	YES
Blanking Screw for Ports	FI-VS	Steel, zinc/nickel-plated	YES	NO
Blanking Plug (24°Taper)	FI-VD	Steel, zinc/nickel-plated	YES	YES
Blanking Plug for Tube Ends	FI-VSK	Steel, zinc/nickel-plated	YES	YES
Straight Fitting Reducer (24°Taper)	FI-SNV	Steel, zinc/nickel-plated	YES	YES
Profile Sealing Ring for Male Studs	WDG	NBR (Buna-N®)/FKM (Viton®)	YES	YES
O Ring for Male Studs	O-Ring	NBR (Buna-N®)/FKM (Viton®)	YES	YES

**More detailed information in HMMC-20415,In the Stauff catalogue, the components "carbon steel with surface protection W3" are referenced (W3 = zinc / nickel coating). The components are specified in stainless steel by replacing the product designation from W3 with the code "W5".*

Tube Size and Pressure Range*
(applicable to fittings made of carbon and stainless steel)

TUBE O.D. [mm]	Nominal Pressure [bar]**	
	Light Service	Heavy Service
6	500	800
8	500	800
10	500	800
12	400	630
15	400	N/A
16	N/A	630
18	400	N/A
20	N/A	420
22	250	N/A
25	N/A	420
28	250	N/A
30	N/A	420
35	250	N/A
38	N/A	420
42	250	N/A

**More detailed information in HMMC-20415*
**Max working pressure of the piping system depends on the selected pipe material and wall thickness.

Range of Temperature/Service Pressure reduction at high temperature:

Material of the Elastomer Seal*	Min Allowable Temperature (°C)	Max Allowable Temperature (°C)
NBR (Perbunan®)	-35	+100
FKM (Viton®)	-25	+200

**The range of temperature is limited by the soft Seal Material used.*

Material of the Fitting*	Min Allowable Temperature (°C)	Max Allowable Temperature (°C)
Un-alloyed Carbon Steel	-40/-20**	+250
Stainless steel	-55	+400

**Refer to RINA RULES Pt.C, Ch.1, Sec.10 Table 4 for the condition of use of metallic materials in piping system.*
***Lowest environmental temperature -40°C and lowest medium temperature -20°C (DIN 3859-1)*

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Service Pressure reduction at high temperature for Un-alloyed Carbon Steel:

Temperature	-20(°C) to+120 (°C)	+150 (°C)	+175(°C)	+200(°C)	+250(°C)
Pressure Reduction	0%	11%	15%	19%	28%

Service Pressure reduction at high temperature for Stainless Steel:

Temperature	-55(°C) to +20 (°C)	+50(°C)	+100(°C)	+200(°C)	+300(°C)	+400(°C)
Pressure Reduction	0%	4.55	11%	20%	29%	33%

Fields of Application:

- Application of the mechanical joints and their acceptable use for each service are indicated in Tab.15 and Tab.16, Pt. C, Ch. 1, Sec. 10 of RINA Rules.
- The Application depending upon the class of piping are shown in the Tab. 17 of Pt. C, Ch. 1, Sec.10 of RINA Rules.

Acceptance Condition:

- The installation of this product is to be in accordance with Walter Stauffenberg's assembly instructions and in accordance with RINA RULES Pt.C, Ch.1, Cap.10.
- The acceptance of the above mentioned products on board ships and other units classed RINA is subject to the satisfactory outcome of testing as per RINA Rules.
- The use of this product outside the range of application requires the special consideration by RINA in each individual case.

Marking of Products:

The mechanical joints for pipes are to be permanently marked by the Manufacturer with the following details as applicable :

- Manufacturer's name or trademark.
- Identification code and dimension.
- Max. working temperature and pressure.

Hamburg November 8, 2021

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