

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Gaskets and Sealings**

with type designation(s)

Flat Gasket - KLINGER®top-chem 2000, KLINGER®top-chem 2003, KLINGER®top-chem 2005, KLINGER®top-chem 2006

Issued to

Rich. Klinger Dichtungstechnik GmbH & Co. KG
Gumpoldskirchen, NÖ, Austria

is found to comply with

ASTM F36
DIN 28090**Application :****Refer to section Application in the certificate.****Temperature range:** Refer to certificate.**Max. working press.:** Refer to certificate.**Design:** Plate material.**Sizes:** 1500x1500mm. Thickness 1.0, 1.5, 2.0 and 3.0mmIssued at **Hamburg** on **2019-05-17**This Certificate is valid until **2024-05-16**.for **DNV GL**DNV GL local station: **Augsburg**Approval Engineer: **Hagen Markus**

Olaf Drews
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

Dimensions of plate material:

- Sizes: 1500 x 1500 mm
- Thicknesses: 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm
- Tolerances: Thickness acc. DIN 28091-1
Length $\pm$ 50 mm, width $\pm$ 50 mm

KLINGER®top-chem 2000

Asbestos free and fire safe (API 607) flat gasket material from PTFE, filled with SiC (Silicon Carbide).

Values for 2.0 mm thickness¹:

Technical data	Standard	Conditions	Value	Unit
Density	DIN 28090-2	--	2.5	g/cm ³
Compressibility	ASTM F36M	--	4	%
Recovery	ASTM F36M	--	50	%
Tightness	DIN 28090-2	--	0.08	mg/s*m
Klinger cold compression	Klinger	50 MPa / 23°C	5	%
Klinger hot compression	Klinger	50 MPa / 260°C	11	%

KLINGER®top-chem 2003

Asbestos free flat gasket material from PTFE, filled with hollow glass-microspheres.

Values for 2.0 mm thickness¹:

Technical data	Standard	Conditions	Value	Unit
Density	DIN 28090-2	--	1.7	g/cm ³
Compressibility	ASTM F36M	--	18	%
Recovery	ASTM F36M	--	35	%
Tightness	DIN 28090-2	--	0.01	mg/s*m
Klinger cold compression	Klinger	25 MPa / 23°C	10	%
Klinger hot compression	Klinger	25 MPa / 260°C	39	%

KLINGER®top-chem 2005

Asbestos free gasket material from PTFE, filled with inorganic fillers.

Values for 2.0 mm thickness¹:

Technical data	Standard	Conditions	Value	Unit
Density	DIN 28090-2	--	2.2	g/cm ³
Compressibility	ASTM F36M	--	4	%
Recovery	ASTM F36M	--	40	%
Tightness	DIN 28090-2	--	0.02	mg/s*m
Klinger cold compression	Klinger	50 MPa / 23°C	5	%
Klinger hot compression	Klinger	50 MPa / 260°C	35	%

Job Id: **262.1-029480-1**
Certificate No: **TAP00001MJ**

KLINGER®top-chem 2006

Asbestos free flat gasket material from PTFE, filled with Barium sulphate.

Values for 2.0 mm thickness¹:

Technical data	Standard	Conditions	Value	Unit
Density	DIN 28090-2	--	3.0	g/cm ³
Compressibility	ASTM F36M	--	4	%
Recovery	ASTM F36J	--	40	%
Tightness	DIN 28090-2	--	0.01	mg/s*m
Klinger cold compression	Klinger	50 MPa / 23°C	12	%
Klinger hot compression	Klinger	50 MPa / 260°C	41	%

Note¹ : Reference "Declaration of conformity acc. to DIN EN ISO 17050-1" issued by
KLINGER Dichtungstechnik.

APPLICATION

The above listed gasket material sheet type may be used under consideration of the mechanical and technical characteristics as well as physical and chemical properties for the following applications:

- On board ships and other structures classed by DNV GL as follows:
Ship's piping systems as specified in DNV GL Rules Pt.4, Ch.6 Piping systems, cargo lines on oil and chemical tankers including cargo oil line carrying propylene oxide and mixtures of ethylene / propylene oxide.
- The selection of the gaskets for the corresponding application and appropriate installation has to be in accordance with the instructions of the manufacturer.

TYPE APPROVAL DOCUMENTATION

MARKING OF PRODUCT

For traceability of products, marking shall be legible and indelible.
Products are to be marked at least as follows:

- Manufacturer's name / label
- Product type / name
- Safety Information (MSDS – Material Safety Data Sheet)

Marking sample: **KLINGER®top-chem 2000**
FOR SERVICE DATA SEE MSDS

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PERIODICAL ASSESSMENT

A condition for retention of the type approval certificate in its validity period is that periodical assessments are successfully carried out. The objective of the periodical assessment is to verify that the conditions for the type approval have not been altered. Regulations for the periodical assessment of the type approval certificate are to be found in the DNVGL Class Programme CP-0338.

It is further to be noted that the Society shall be informed of any:

- Modifications to the product which are liable to affect its characteristics and functions, as originally specified and tested;
- Shifting of the production site and additional production site.

If such notifications are not made, the validity of the type approval certificate terminates.

END OF CERTIFICATE