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Industrie Service

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Technical Report

IS-DDB-MAN-09-50

Fire-Safe-Test according to DIN EN ISO 10497, 11.2004 resp. API 607, fifth edition, 06.2005 at 1 gasket of the type "KLINGERQuantum"

Date: 20th April 2009

Our sign:
IS-DDB-MAN/jo

Document:
PB Fire-Safe_Klinger-Austria_DIN_EN_ISO_10497-Dichtung-Quantum-09 (E).doc

The document consists of:
5 Pages
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The test results obtain just the inspected test objects.

Applicant: Rich. Klinger Dichtungstechnik GmbH & Co.KG
Am Kanal 8-10

A – 2352 Gumpoldskirchen

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1. Order

Company Rich. Klinger Dichtungstechnik GmbH & Co.KG applied at TÜV SÜD Industrie Service GmbH the accomplishment of a Fire-Safe-Test according to DIN EN ISO 10497 resp. API 607, fifth edition at 1 gasket of the type „KLINGERQuantum", which was flanged to a ball valve with a nominal size of DN 50, PN 40.

The test was done on the 17.04.2009 in Graben-Neudorf with presence of an authorised expert of TÜV SÜD Industrie Service GmbH.

2. Accomplishment of the test

The test assembly and the accomplishment was carried out in accordance with DIN EN ISO 10497 (see installation scheme).

3. Test result

The test results mentioned in the attachment show that the requirements according DIN EN ISO 10497 resp. API 607, fifth edition have been achieved by the gasket

KLINGERQuantum, DN 50, nominal pressure PN 40, thickness 1,5 mm, see data sheet in the attachment

in combination with a ball valve INTEC 112-FS.

The gasket was tightened with a torque of 150 Nm which is equal to a surface pressure of 38 N/mm^2.

4. Area of application

According to the testing of a gasket DN 50 simultaneously the requirements for gaskets of the same type are valid for nominal size DN 50 and below, DN 65, DN 80 and DN 100.

According to the testing of the gasket for a nominal pressure PN 40, gaskets of the same type for nominal pressures PN 40, PN 63 and PN 100 are also covered.

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Test protocol

1. **Date of the test** April, 17., 2009

2. **Location of the test** KLINGER SCHÖNEBERG GmbH
Heidelberger Straße 3
76676 Graben-Neudorf

3. **Test specifications** DIN EN ISO 10497, 11.2004 resp. API 607, fifth edition, 6.2005

4. **Gasket manufacturer** Rich. Klinger Dichtungstechnik GmbH & Co. KG
Am Kanal 8-10
A – 2352 Gumpoldskirchen

5. **Tested gasket (in combination with 1 ball valve)**

Gasket KLINGERQuantum; DN50, PN40
Thickness 1,5 mm; Torque 150 Nm;
Surface pressure 38 N/mm^2
Limits of use: see data sheet as attachment

6. **Test ball valve** INTEC 112-FS, DN50, PN40
Material valve body/flange: 1.0619

7. **Test conditions**

Test fluid:	Water
Test fuel:	Liquid gas acc. DIN 51622
Burn period:	30 minutes
Thermocouples:	The temperature of the flames after 2 minutes should be 750 °C; the average temperature at the flame area should be between 750 °C and 1000 °C and should not fall below 700 °C.
Calorimeter cubes:	The average temperature after 15 minutes should be 650 °C. This temperature should be held during the burn period and should not fall below 560 °C.
Test pressure:	
(Low-pressure)	2 bar
(High-pressure)	30 bar

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8. Test procedure

8.1 Preliminary test: Tightness test of the valve with water (1,4 x PN)

Test pressure: 60 bar

Result: Ball valve was tight

8.2 Burn period

Temperatures of the Calorimetercubes

Temperature after 15 min		Average temperature after 15 min till end of the burn period	
		K1	K2
Ball valve	Temperature 682 °C	649 °C	690 °C

Temperatures of the thermocouples

Temperature after 2 min		Average temperature	
		T1	T2
Ball valve	Temperature 805 °C	794 °C	794 °C

8.3 Cooling-down period of the ball valve to 100°C

Ball valve 8 Min

8.4 Through-seat leakage during burn period

max. permissible Leakage during the burn period: 200 ml/min

determined leakage: Ball valve 76 ml

Result: passed

8.5 Closing of the fuel supply and cooling down to 100 °C

Cooling down with air blast cooling and water.

8.6 External leakage during the burn period and the cooling-down period

max. permissible leakage during the burn period and cooling down period: 50 ml/min

determined leakage: Ball valve 3 ml

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Result: passed

8.7 For valves PN 100 and below the test pressure should be held constant at 2 bar and the leakage through the seat should be measured over a period of 5 minutes.

8.8 Through-seat Leakage after cooling-down

max. permissible leakage:		80 ml/min
determined leakage:	Ball valve:	3 ml
Result:	passed	

8.9 Operability

Increase the test pressure to high pressure, close the shut-off valve (Nr. 15) and open the ball valve against the upcoming pressure.

Holding of the high test pressure and measuring of the outer leakage over a period of 5 minutes.

8.10 External leakage following operational test

max. permissible Leakage:		50 ml/min
determined Leakage:	Ball valve:	4 ml
Result:	passed	

8.11 Optical appearance of the gasket after completion of the Fire-Safe-test

The printing on the gasket was still readable. The gasket was in one piece and sticked on the flange.

Mannheim, 20th April, 2009
IS-DDB-MAN/jo

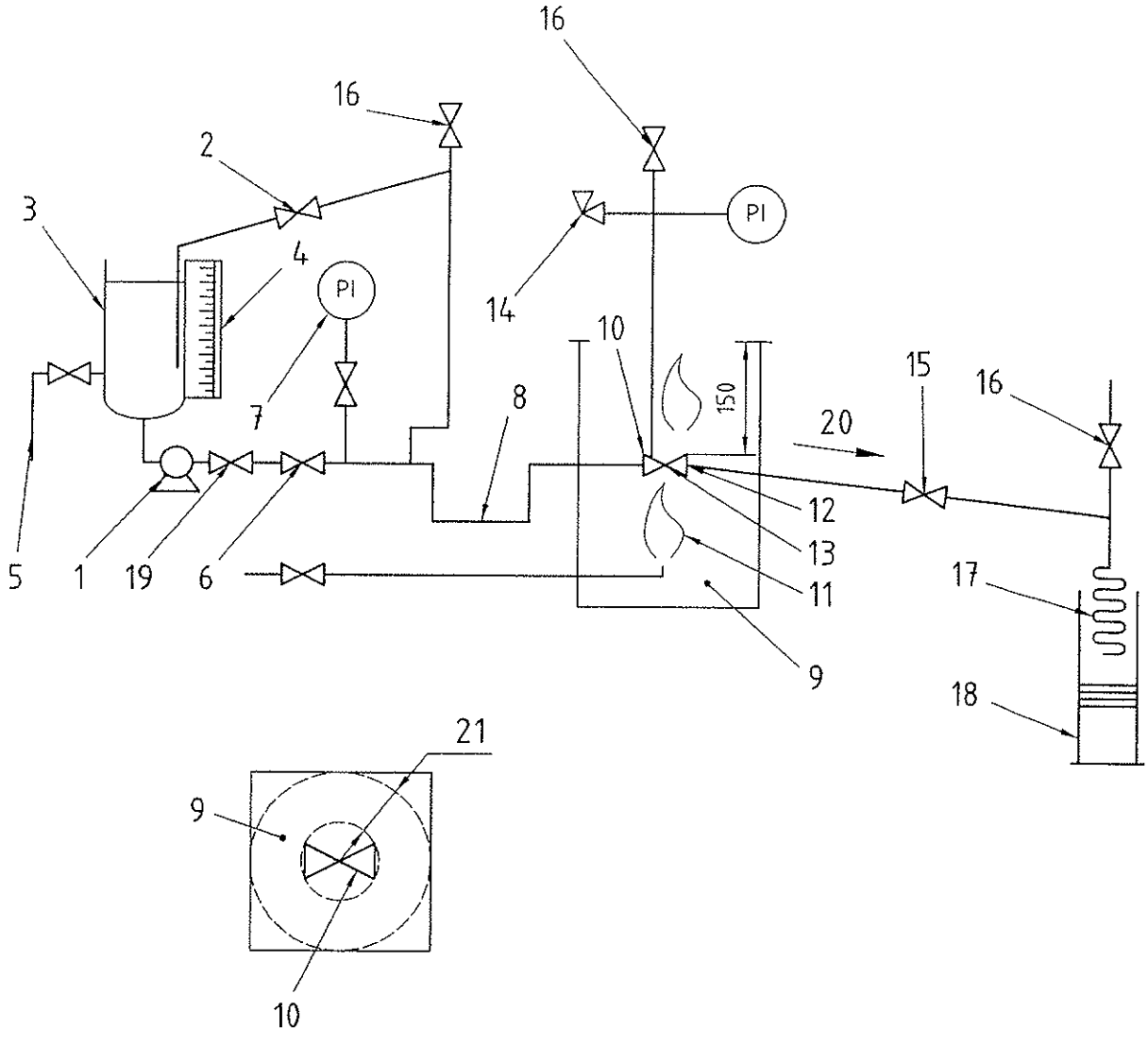
TÜV SÜD Industrie Service GmbH
Abteilung Druckbehälter
Die Sachverständige

TÜV SÜD Industrie Service GmbH 00 36 Benannte Stelle

Dipl.-Ing. John

Attachments: Installation scheme of the test rig
Data sheet

Maße in Millimeter

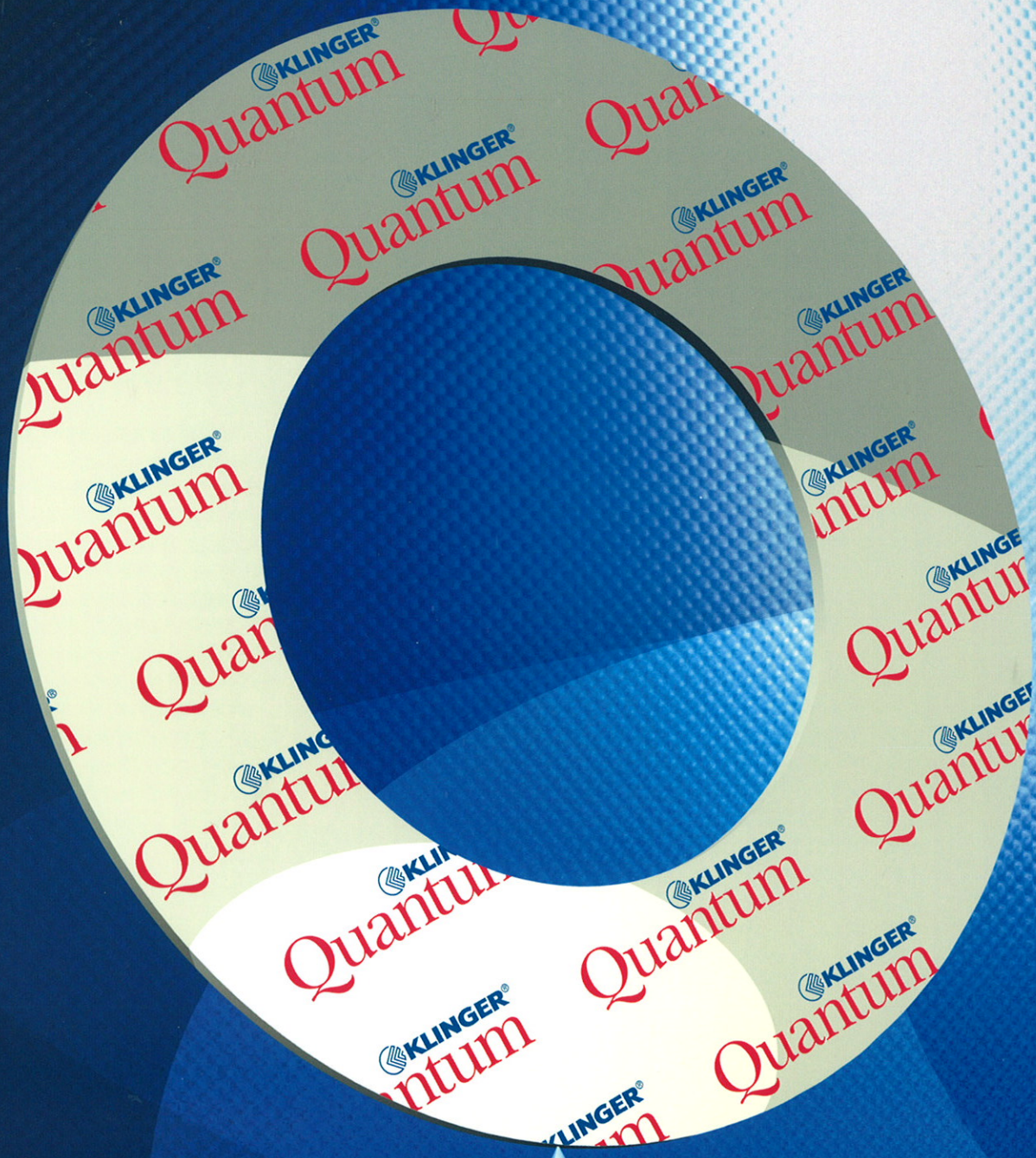


a) Pumpe als Druckerzeuger

Bild 1 — Empfohlenes System

KLINGER®

KLINGER® Quantum



Right on Top

World-wide Innovation

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KLINGER – The global leader in static sealing

KLINGER® Quantum
Technical data

Application

Unique gasket material with the highest flexibility at high temperatures, manufactured from a high-quality fibre and filler compound.

A high temperature-resistant HNBR matrix is used as the binding agent. Suitable for use in oils, water, steam, gases, salt solutions, fuels, alcohols, weak organic and inorganic acids, hydrocarbons, lubricants and refrigerants.

Dimensions of the standard sheets

Sizes:
1,000 x 1,500 mm, 2,000 x 1,500 mm
Thicknesses: 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm
other thicknesses and sizes on request.
Tolerances:
thicknes ± 10%, length ± 50 mm, widt ± 50 mm

Surfaces

The gasket materials are generally furnished with surfaces of low adhesion. On request, graphite facings and other surface finishes on one or both sides are also available.

Function and durability

The performance and service life of KLINGER gaskets depend in large measure on proper storage and fitting, factors beyond the manufactor's control. We can, however, vouch for the excellent quality of our products.

With this in mind, please also observe our installation instructions.

Tests and approvals

BAM, DIN-DVGW, TA-Luft, DVGW VP401, FireSafe.
Other approvals in preparation.

Patent pending.

Typical values for a thickness of 2.0 mm			
Compressibility ASTM F 36 J		%	10
Recovery ASTM F 36 J		%	60
Stress relaxation DIN 52913	50 MPa, 16h/ 300°C	MPa	28
	50 MPa, 16h/ 175°C	MPa	32
Stress relaxation BS 7531 1,5 mm	40 MPa, 16h/ 300°C	MPa	27
KLINGER cold/hot compression	Thickness decrease at 23°C	%	10
50 MPa	Thickness decrease at 300°C	%	14
	Thickness decrease at 400°C	%	20
Tightness	DIN 28090-2	mg/s x m	< 0.02
Specific leakrate VDI 2440	300°C/30 MPa	mbar x l/s x m	4.4 10E-8
Cold compression	DIN 28090-2	%	6 - 9
Cold recovery	DIN 28090-2	%	3 - 5
Hot compression	DIN 28090-2	%	< 18
Hot recovery	DIN 28090-2	%	2
Thickness increase after fluid	Oil IRM 903: 5 h/150 °C	%	3
immersion ASTM F 146	Fuel B: 5 h/23 °C	%	5
Density	DIN 28090-2	g/cm³	1.7
Designation DIN 28091-2	FA-GAZ		
ASTM F104 line call-out	F712122B3E22M5		
Classification acc BS 7531	Grade AX		

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