

This certificate replaces certificate number DTM 0613089/1 issued on 06.09.2006 which is hereby cancelled.

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## Inspection Certificate

Project: --

Client: **Klinger Fluid Control GmbH**  
**Gumpoldskirchen / Austria**

Office: **Dortmund**

Clients Order Number: **117491**

Date: **26 September 2006**

Order Status: **complete**

Inspection Dates

First: **02 August 2006**

Final: **02 August 2006**

This certificate is issued to the above client to certify that a surveyor to Lloyd's Register did, at their request, attend the testing laboratory of Dr.-Ing. T. Bäumer – Ingenieurbüro -, Herford / Germany for the purpose of inspecting the product listed below.

<b>Description:</b>	<b>Flame resistant test of -1- Ball Valve</b>	
<b>Type:</b>	<b>KHE-FK</b>	
<b>Nominal bore:</b>	<b>DN 50</b>	
<b>Pressure rating:</b>	<b>PN 16</b>	
<b>Manufacturer's drawing:</b>	<b>WT2595.0-0000</b>	
<b>Materials:</b>	<b>Body/flanged end piece material:</b>	<b>1.0619</b>
	<b>Operating stem material:</b>	<b>1.4104</b>
	<b>Ball material:</b>	<b>1.4401</b>
	<b>Sealing elements:</b>	<b>KFC-25</b>
	<b>Stem seal material:</b>	<b>Graphite/ K-Flon</b>
<b>Test requirements:</b>	<b>DIN EN ISO 10497, 2004</b>	
<b>Qualified pressure rating:</b>	<b>Class 150</b>	

The flame resistance tests have been carried out at the independent laboratories of Dr.-Ing. T. Bäumer.

**Conclusion:** All test results, witnessed by the Lloyd's Register Surveyor, were found to be satisfactory and fulfil the requirements of DIN EN ISO 10497, 2004 in every respect. For details please refer to the attached signed and stamped test reports dated 02.08.2006 (4 pages).

**Remarks:** Ball valve DN 50 pressure rating PN 16 also covers DN 50 and below, DN 65, DN 80 and DN 100.

M. Nowak  
Surveyor to Lloyd's Register EMEA

**E&T/Jbe**

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## TEST Report

Entwicklung · Auslegung  
Messung · Berechnung  
Beratung

### Flame - resistance tests according to DIN EN ISO 10497 Report Hc-383

This report confirms the successful testing of a representative valve in compliance with the DIN EN ISO 10497, 2004.

<b>Manufacturer</b>	Klinger Fluid Control GmbH Am Kanal 8 - 10 A - 2352 Gumpoldskirchen
<b>Test Valve</b>	Ball -Valve, KHE - FK, flange end connections, Lever opened Nominal bore: DN 50 Pressure rating: PN 16 Weight: 11,3 kg Bore: Full bore Body/flanged end piece material: 1.0619 Operating stem material: 1.4104 Ball material: 1.4401 Sealing elements: KFC-25 Stem seal material: Graphite / K - Flon Drawing number: wT2595.0-0000 Operation device: Lever 317 mm length
<b>Date of Testing</b>	02 August 2006
<b>Test Report</b>	4 pages
<b>Qualified sizes</b>	DN 50 and below, DN 65, DN 80, DN 100
<b>Qualified pressure ratings</b>	Class 150 PN 16, PN 25
<b>Testing location</b>	Laboratory of consultant engineer Dr.-Ing. T. Bäumer, Altensenner Weg 75, D - 32052 Herford
<b>Test requirements</b>	The tests were carried out strictly in accordance with DIN EN ISO 10497, 2004 The tests are in conformity with API 607, 5th edition
<b>Participants</b>	Mr. M. Nowak                      Lloyds Register, EMEA Mr. Dr. T. Bäumer              Ingenieurbüro Dr.-Ing. T. Bäumer

## Test examination

The water filled ball valve was subjected to fire for 30 minutes at a temperature between 750 °C and 1000 °C and a pressure of e.g. 2,0 barg. After the burn period the through-seat-leakage was determined and after a cool down period the external leakage was measured. Then the ball valve was opened, and the external leakage was determined.

## Instrumentation

Temperature: 4 Thermocouples, Ni Cr Ni, accuracy 1 K.

Pressure: Pressure transmitter, accuracy 0,5 %.

PC-system: AD converter board, software for measuring, Personal Computer

The measuring devices are controlled by an accredited calibration service.

Body cavity set relief pressure and setting: 24 barg

## Test results

Time of test start (ignition of burners): 10.25 a.m.

### Temperatures and pressure during burn period

Time [s]	p [barg]	T <sub>Fire1</sub> [°C]	T <sub>Fire2</sub> [°C]	T <sub>Cal1</sub> [°C]	T <sub>Cal2</sub> [°C]
0.00	2.00	205.45	209.95	31.45	96.31
30.00	2.00	728.94	746.94	85.45	349.25
60.00	2.00	832.44	901.43	119.95	426.04
90.00	2.00	934.43	899.43	172.45	541.97
120.00	2.00	880.44	824.93	209.95	496.80
150.00	2.00	935.93	886.93	208.45	544.98
180.00	2.00	919.43	805.93	212.95	561.55
210.00	2.00	826.44	819.93	214.45	492.29
240.00	2.00	865.44	845.43	221.95	543.48
270.00	2.00	851.94	933.43	229.45	538.96
300.00	2.00	823.44	942.43	232.45	490.78
330.00	2.00	910.43	891.43	241.44	528.42
360.00	2.00	890.93	837.93	248.94	557.03
390.00	2.00	853.44	831.93	259.44	543.48
420.00	2.15	839.94	861.93	268.44	554.02
450.00	2.15	901.43	876.93	275.94	548.00
480.00	2.00	841.44	831.93	275.94	549.50
510.00	2.00	793.44	819.93	281.94	546.49
540.00	2.00	815.94	875.43	283.44	538.96
570.00	2.10	944.93	913.43	299.94	603.70
600.00	2.05	844.44	946.43	310.44	573.59
630.00	2.10	854.94	862.43	316.44	558.53
660.00	2.05	955.93	867.93	349.44	657.91

690.00	2.05	905.93	859.93	349.44	587.14
720.00	2.10	912.43	898.93	350.94	645.86
750.00	2.10	954.43	834.43	350.94	654.89
780.00	2.10	912.43	829.93	353.94	665.43
810.00	2.10	973.43	937.43	364.44	632.31
840.00	2.10	965.93	884.93	391.44	737.70
870.00	2.15	938.43	849.43	389.94	683.50
900.00	2.15	965.43	884.93	401.94	707.59
930.00	2.10	920.43	865.43	415.44	704.58
960.00	2.15	951.93	893.93	419.94	722.65
990.00	2.10	975.93	943.43	436.44	725.66
1020.00	2.10	975.93	887.93	442.44	715.12
1050.00	2.15	963.43	896.93	449.94	730.18
1080.00	2.10	977.93	876.93	452.94	660.92
1110.00	2.15	944.43	848.93	473.94	713.61
1140.00	2.15	977.43	893.43	466.44	704.58
1170.00	2.15	896.43	922.93	478.44	704.58
1200.00	2.10	936.93	872.43	505.44	728.67
1230.00	2.15	921.43	833.94	478.44	665.43
1260.00	2.10	884.94	867.94	467.94	627.79
1290.00	2.10	943.43	813.94	473.94	620.27
1320.00	2.10	903.43	918.43	542.94	748.24
1350.00	2.10	999.43	869.93	529.44	710.60
1380.00	2.10	936.43	889.93	521.94	734.69
1410.00	2.10	911.43	870.93	557.94	763.30
1440.00	2.10	971.43	885.93	589.44	781.37
1470.00	2.10	962.43	890.43	583.44	764.80
1500.00	2.10	941.43	894.93	604.44	799.43
1530.00	2.10	975.93	881.93	613.44	811.48
1560.00	2.10	926.93	905.43	628.44	797.93
1590.00	2.10	916.43	921.93	628.44	796.42
1620.00	2.10	973.93	857.43	614.94	793.41
1650.00	2.10	937.43	854.93	640.44	817.50
1680.00	2.10	966.93	911.43	649.44	816.00
1710.00	2.10	965.93	885.43	628.44	772.33
1740.00	2.10	963.43	849.43	604.44	758.78
1770.00	2.10	950.93	802.93	598.44	743.73
1800.00	2.10	894.93	776.93	616.44	767.82

**Time required for valve to cool down to 100 °C: 8 min**

**Test valve unseated: Yes**

**Test valve moved to the fully open position: Yes**

	Leakage [ml/DN/min]	Allowable leakage [ml/DN/min]
<b>Through-seat-leakage in burning phase:</b>	0,2	4,0
<b>External leakage in burning and cooling phase:</b>	0,0	1,0
<b>Through-seat-leakage at low pressure:</b>	0,0	1,6
<b>External leakage in the open position:</b>	0,1	1,0

### Comments on the results

The test valve is an asymmetric ball valve. Because it is intended for one-directional installation, the tests were carried out only for one flow direction.

### Conclusion

The test valve fulfilled the test requirements according to DIN EN ISO 10497, 2004. Only allowable through-seat-leakages and external leakages were observed during the test.

Herford, 02 August 2006

Lloyd's Register  
EMEA



Mr. M. Nowak  
Surveyor

ATTACHMENT TO LLOYD'S  
REGISTER CERT. NO. DTM

0613089/1 -

Dr.-Ing. T. Bäumer  
Ingenieurbüro

Mr. Dr. T. Bäumer  
Consultant engineer