04.10-PB 005/2005

TEST CERTIFICATE

Total leak rate/ Diffusion rate of sealing elements (valve)

The certifying body hereby declares, with reference to the Test Report issued by GEMTEC GmbH on 02.02.2005, that

sealing elements (valve)

of types ADE/V, UA/V, RRA/V, A-UD/V, A-OD/V etc.

manufactured by Wolf Kabeltechnik GmbH, 70437 Stuttgart,

have a reduced total leak rate of ≤ 2,7 mbarl/ year, compared with the leak rate of 38 mbarl/ year required by T-Com TS 0307/96.

The reduction of the total leak rate /diffusion rate has a positive effect on the length of service life of the sealing system.

The total leak rate /diffusion rate result refers to the sealing elements tested, which consist of a five-layered aluminium composite foil in combination with a welded-on, plastic-coated tyre valve extension.

Significant changes in materials or design may render the test certificate invalid.

Applicable Test Report: GEMTEC GmbH, 02.02.2005

Date: 02.02.2005

qualitätsüberwacht
quality controlled
fibre optics
CT Consulting & Testing

Kabel-Abdichtsystem
Prüfzertifikat
04.10-PB005/2005

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Prüfbericht GEMTEC GmbH

(Translation from the German original)

GEMTEC Laseroptische Systeme GmbH

GEMTEC GmbH, Otto-Hahn-Str. 3, D - 71364 Winnenden

Fibre Optics CT GmbH
Consulting & Testing
Herrn Roland Wolf
Zazenhäuser Str. 52

D-70437 Stuttgart

Fax: (0711) 871230

Otto-Hahn-Str. 3
D - 71364 Winnenden
Tel.: +49 (0) 7195 / 911 2950
Fax: +49 (0) 7195 / 911 2959
email: info@gemtec-online.com
http://www.gemtec-online.com

Ihr Zeichen	Ihre Nachricht vom	Unser Zeichen	Datum
		SCH/ee	02.02.2005

Test report: Determination of the total leak rate of ADE sealing elements

Examples of the total leak rate were determined on two ADE sealing element specimens (designated No.1 and No.2). Apparatus was set up for this purpose, as shown in the diagram. The test specimen was laid in one of the plastic tubes provided by the client and filled with test gas (100% SDF_6) to a (absolute) pressure of 2.8 bar.

Test method:

The test specimen was laid in the testing chamber, which was evacuated to a pressure of 17 hPa. A measurement was taken at the lowest level and then again after 30 sec to determine the concentration of test gas (SDF_6) that had leaked out. The change in concentration is a clear indication of the total leak rate at the sample. The testing chamber has a volume of 13 litres. An LTS 311 V, S/N: 01105 was used. The test layout was calibrated with a pulse leak PLV 40. Further information on the test method can be found in our "Allgemeinen Informationen zum Einsatz der Dichtheitsprüfsysteme LTS 310(V)/320(V)200", edition of 02/2003, or in the lecture I gave in the 3rd specialist seminar in the DGZfP training centre in Dortmund on the theme of "Leak testing and detection".

The following measurements were carried out:

1. Total leak rate directly after inflation of the test samples. (Interval between inflation and check under 10 min.) No sealing cap on the valve.
2. Total leak rate directly after inflation of the test specimens. (Interval between inflation and check less than 30 min) The valve on the sealing element was closed off beforehand with the sealing cap provided.
3. Total leak rate after 24 hr. During this time, the valve on the sealing element was closed off with the cap that had been provided.
4. Total leak rate after 25 h, after the sealing cap had been removed from the valve.

Results:

Measurement No.	ADE No.1	ADE No.2
1	L = 3.1 x 10_{-6} mbarl/s	L = 2.6 x 10_{-6} mbarl/s
2	L = 7.8 x 10_{-8} mbarl/s	L = 8.4 x 10_{-8}mbarl/s
3	L = 5.5 x 10_{-8} mbarl/s	L = 6.2 x 10_{-8}mbarl/s
4	L = 2.9 x 10_{-6} mbarl/s	L = 3.2 x 10_{-6} mbarl/s

The given leak rates are the average of the 4 measurements taken. The standard deviation determined by these values was always within 12% of the average value.

We would be pleased to answer any queries you may have,

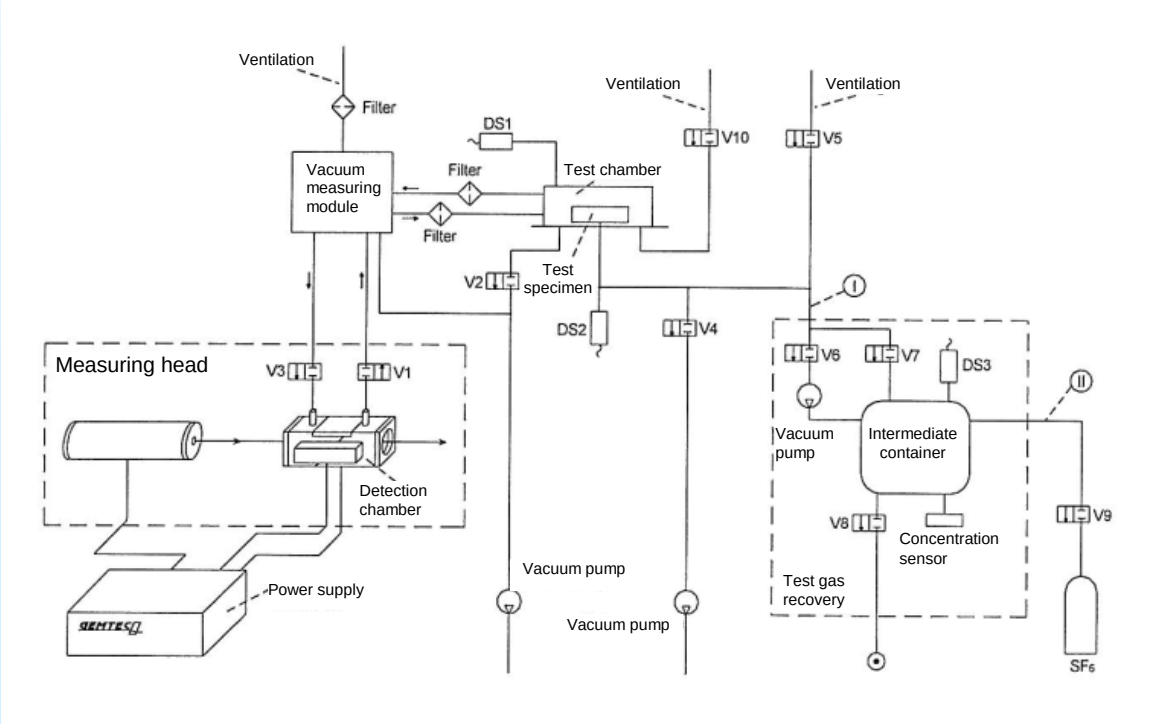
GEMTEC GmbH

Gerhart Schroff

Anlage (5 Seiten)
"Allgemeinen Informationen zum Einsatz der Dichtheitsprüfsysteme LTS 310(V)/320(V)/200", Stand 02/2003

Test setup of GEMTEC GmbH

Setup for tightness testing - Laser Leak Test System LTS 310 V in a vacuum



The following description of procedure for a typical tightness test under vacuum conditions with upstream background measurements will serve to illustrate the use of the apparatus shown in the above diagram:

- Lay the test specimen in the test chamber and adapt it, then close the chamber.

$T_1 = 0$

- Rinse out the test chamber (with ventilation and vacuum valves open).

$T_2 = 2s$

- Evacuate the test chamber 10 mbar absolute pressure.

$T_3 = 6s$

- Wait until the LTS 310 V is ready to start measuring.

$T_4 = 8$ s

- Request the measured value for background from the LTS 310 V system.

$T_5 = 10$ s

- The signal "test chamber free" appears, indicating that the sampling process is completed
- Fill the test specimen with the test gas mixture, thus starting the diffusion period (inflation time = 1 s, diffusion time = 4 s).

$T_6 = 14$ s

- The background measurement is available. If the background is NIO (not in order), deflate the test specimen and repeat from the beginning (T = T1).

$T_7 = 15s$

- End of the diffusion period.
- Wait until the LTS 310 V is ready to start measuring.

$T_8 = 17$ s

- Request the measured value from the LTS 310V. Wait until the signal "Test chamber free" appears.

$T_9 = 19s$

- Ventilate the test chamber, de-adapt the test specimen and open the test chamber. Then wait until the LTS 310 V produces the measurement.

$T_{10} = 23$ s

- Remove the test specimen and carry out an IO/ NIO check.