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<b>TEST REPORT</b>	<b>F.M.I. S.P.A.</b>
Number: SPS/0078/07e    Date 06/03/2007	VIA TARANTO, 10/12 FRAZIONE SAN PANCRAZIO
OMECO Ref.: 0394    Page 1 of 3	25036 PALAZZOLO SULL'OGLIO BS
CUSTOMER Ref.: Ord. 700314 dated 05/02/07	

Sample: no. 3 gaskets declared Sichem S11

Identification 0394/A

Date of receipt: 05/02/2007

**PNEUMATIC SEAL TEST****Test procedure and standard:**

In accordance with what was established with Dr. Rossi and Mr. Fumagalli from the Requesting Party a cryogenic seal test was performed on a gasket. The gasket was placed between two flanges, in DN 40 PN 10 TYPE "to weld" AISI 304 with cone at the tips. The metal surfaces in contact with the gasket were machined in order to obtain a roughness Ra close to that required by ISO 2632/2:1992 for flange sealing surfaces with common gaskets (6.7µm as opposed to 6.3µm indicated by the standard). The flanges, were connected with M 20 bolts, also in AISI 304, and tightened to a torque of 152 Nm. Type 4.6 ambient temperature helium was introduced into the volume set off by the cones at a pressure of around 6 bar. The gas temperature and pressure were monitored during the test with a heating element (Pt 100) and pressure transducer with 1x10<sup>-3</sup> bar resolution. In terms of the test ambient the flanges were immersed in liquid nitrogen then at a temperature of -196°C (figures 1 and 2).

**Test equipment and instruments:**

- Profilometer identified as STA-0002
- Yokoama N V 200 recorder identified as SPS-0348
- Heating element Pt 100 identified as SPS-0353
- Pressure transducer DRUCK res. 1x10<sup>-3</sup> bar identified as SPS-0103
- Thermometer for ambient temperature identified as SPS-0364
- Torque wrench full scale 350 Nm identified as SPS-0389
- Mass spectrometer identified as SPS-0374

*This test report is the complete translation into English of SPS/0078/07 dated 28/02/2007.*

*This test report concerns only the sample submitted to the test. If not otherwise indicated, the sampling operation were performed by the Customer.*

Date/s of execution: 23/02/2007

At: OMECO Lab. - MONZA

Operator/s	Technical Manager
	ING. M. CASARIL

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<b>TEST REPORT</b>		<b>OMEKO Ref.: 0394</b>	Page 2 of 3
<b>Number:</b> SPS/0078/07e	<b>date:</b> 06/03/2007	<b>CUSTOMER Ref.:</b> Ord. 700314 dated 05/02/07	

**Test results:**

Even after two hours in liquid nitrogen, with the gasket placed as a seal between two flanges, no significant variations in pressure were found, thus no variations greater than  $1 \times 10^{-3}$  bar. From the calculation and the performed test, including with mass spectrometer, losses under  $1 \times 10^{-4}$  mbar l/s are expected.

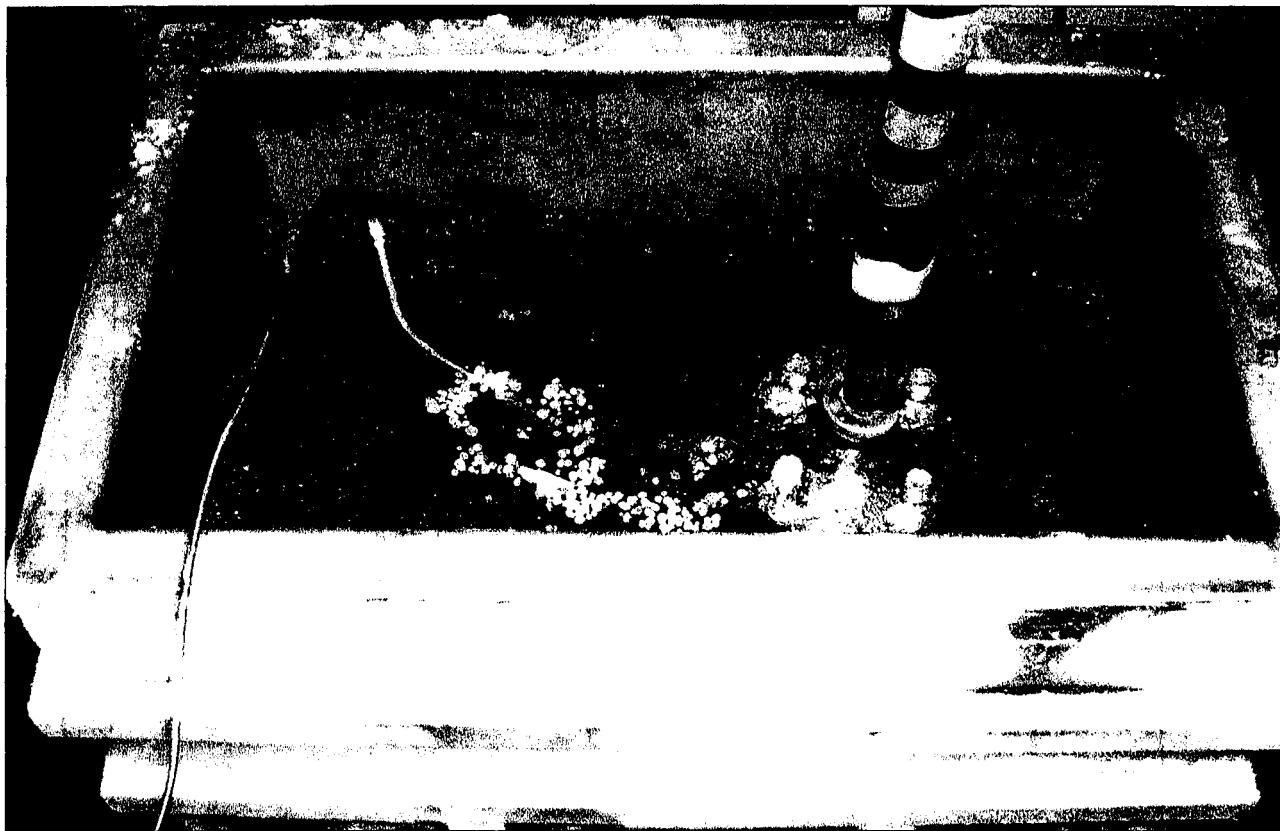


Fig. 1 Appearance of the sample during the test.



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<b>TEST REPORT</b>		<b>OMECO Ref.:</b> 0394	Page 3 of 3
<b>Number:</b> SPS/0078/07e	<b>date:</b> 06/03/2007	<b>CUSTOMER Ref.:</b> Ord. 700314 dated 05/02/07	

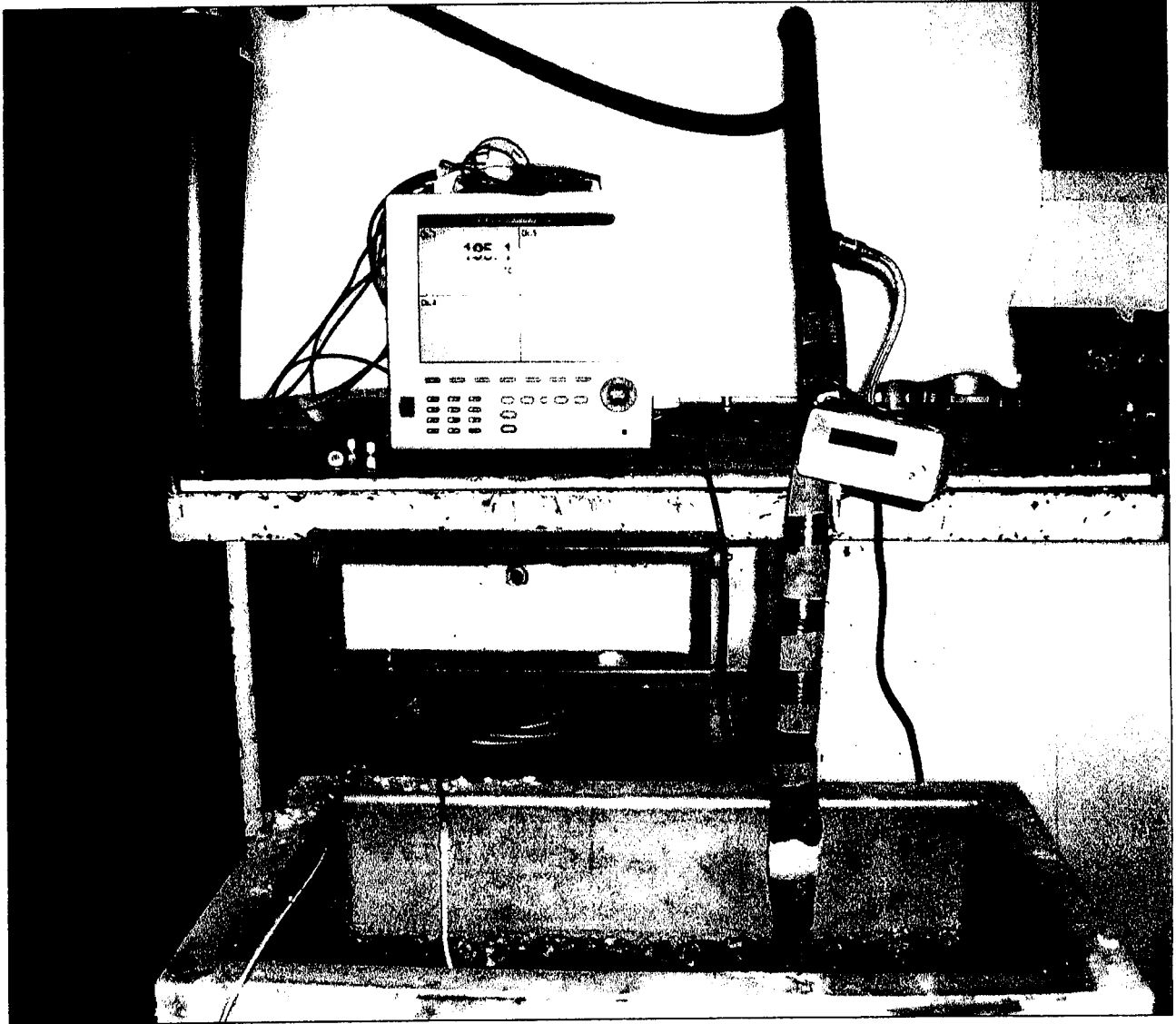


Fig. 2 The recorder indicates the heating element temperature during the test.  
(Class 1 heating element with measurement uncertainty of  $\pm 1^\circ\text{C}$ )

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