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Technical Report

IS-DDB-MAN/156/08

Detailing Helium Leak Test In Accordance With VDI 2440 for a Ball Valve Manufactured by Parker Hannifin Ltd, England

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Dokumentes und die Verwendung
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Die Prüfergebnisse beziehen
sich ausschließlich auf die
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1. Introduction

Parker Hannifin applied to TÜV SÜD Industrie Service GmbH for TA-Luft-Test in accordance to VDI 2440.

On 18.07.2007 Parker conducted TA-Luft Test according to DIN EN ISO 15848-1:2006 with Lloyd's Register EMEA inspectors to endorse testing. All testing parameters meet the requirements of TA-Luft Test / VDI 2440. The test results and method have been verified and no additional testing has been required in addition to NP465-Valve 0.888 date 18.07.2007 because of this evidence.

2. Test

2.1 Prüfgegenstand Test Valve

Valve:	Ball Valve
Type:	15 mm Hi-Pro / Pro-Bloc
Nominal Orifice:	15 mm
Nominal Pressure:	414 bar
Material Grade:	ASTM A182-F316
Sealing Design:	As per appendix drawing FEBVX001.

2.2. Test Apparatus

Alcatel:	ASM 142
Serial Number:	HLD0742595
Sensitivity:	$1 \cdot 10^{-11} \frac{\text{atm} \cdot \text{cm}^3}{\text{s}}$
Leakage rate (extern):	$1 \cdot 10^{-7} \frac{\text{atm} \cdot \text{cm}^3}{\text{s}}$
Test gas:	Helium 97,0 %



2.3 Test Method

The valve assembly is pressurised to the full test rating. An external chamber is fitted to the valve body which encapsulates the valve and a vacuum is formed within the chamber. The global helium leakage measurements are analysed using this vacuum method.

2.4 Test Report

See attached

2.5 Requirements According To VDI 2440

Maximum leakage rate VDI 2440 = 10^{-4} mbar · l / (s · m) at a sealing system temperature less than 250 °C. Equating to the mid valve sealing circumference of 0.0474 m (di = 13.4 mm; da = 16.77 mm) the maximum allowable leakage rate is $4.7 \cdot 10^{-6}$ mbar · l / s.

2.6 Leakage Measurement At Start (0 Cycles)

Test Temperature	Test Pressure	Leak rate in mbar * l / s Static
Room Temp.	414 bar	$2.3 \cdot 10^{-9}$

2.7 125 cycles at room temperature , 414 bar

2.8 Leak measurement after 125 cycles

Test Temperature	Test Pressure	Leak rate in mbar * l / s Static
Room Temp.	414 bar	$3.0 \cdot 10^{-9}$

2.9 125 cycles at 180°C, 414 bar

2.10 Leak measurement after 125 cycles at 180°C, 414 bar

Test Temperature	Test Pressure	Leak rate in mbar * l / s Static
Room Temp	414 bar	$1.0 \cdot 10^{-7}$

2.11 125 cycles at room temperature, 414 bar



2.12 Leak measurement after 125 cycles at room temperature, 414 bar

Test Temperature	Test Pressure	Leak rate in mbar * l / s Static
Room Temp	414 bar	$3.0 \cdot 10^{-9}$

2.13 125 cycles at 180°C, 414 bar

2.14 Leak measurement after 125 cycles at 180°C, 414 bar

Test Temperature	Test Pressure	Leak rate in mbar * l / s Static
Room Temp	414 bar	$1.0 \cdot 10^{-7}$

3. Test Results


The requirements of VDI 2440, November 2000 referring to leakage rates (as detailed in section 2.5.) have been achieved.

4. Comments

- Ball valves of the same design with the identical body and stem sealing technology can also be qualified when manufactured and constructed with the following material:
316 (1.4401), 316L (1.4404), Monel (2.436), 6Mo (1.4529), 625 (2.4856), 825 (2.4858), C276 (2.4819), Duplex (1.4462).
- This report covers Ball Valves of Hi-Pro series from DN10 to DN25 no matter what end connections
- The tested valves (Needle valves in report IS-DDB-MAN/155/08 and these ball valves) are used together as one in the Pro-Bloc series.

Mannheim, 15. October 2008
IS-DDB-MAN/jo

TÜV SÜD Industrie Service GmbH
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Die Sachverständigen


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Attachment: Drawings

