Burgmann Packings

FUGITIVE EMISSION STANDARDS

ISO 15848
ISO 15848 regulation describes measurement, test and qualification procedures for fugitive emissions at industrial valves. The regulation is separated into 2 parts:
- ISO 15848-1: Classification system and qualification procedures for type testing of valves
- ISO 15848-2: Specifies production acceptance test of valves for valve manufacturer

TA LUFT
The German Fugitive Emission Control Legislation refers in TA LUFT regulation to DIN EN ISO 15848-1 for defining leakage rates, test and measuring methods.

FLANGE CONNECTIONS ACCORDING TO VDI 2200, VDI 2440 AND TA LUFT
According to TA LUFT and VDI 2440 flange connections must comply with maximum leakage rate of 10^{-4} mbar × l (s × m) at test pressure of 1 bar. VDI 2200 defines the selection, calculation, design and assembly of bolted flange connections as well as test procedures and refers to VDI 2440 regarding permissible leak rates. VDI 2200 also defines criteria for "Blow-out" safety test for gaskets. Aim of this Blow-out test is to avoid a sudden leakage through seal burst.

CLEAN AIR ACT
The Clean Air Act defines maximum leakage levels for flange connections, valves, pumps and agitators in the USA. Leakage test has to be done according to EPA Method 21 (sniffing method) with methane.

API 622
API 622, 3rd Edition is an international performance test for packing materials considering several factors such as temperature, pressure, thermal and mechanical cycling. 3rd Edition of API 622 defines 1510 mechanical cycles and 5 thermal cycles. High temperature test shall be performed from ambient temperature to 260°C (500 °F) and pressures from 0 to 600 psig (0 – 41 barg). Permissible leakage level is 100 ppm with test medium methane.

API 624
The second edition of API 624 provides type testing of rising stem valves equipped with graphite packing for fugitive emissions. The standard covers rising and rising-rotating stem valves up to 42" in diameter and must be performed on original valves. The test procedure requires 310 mechanical cycles and three thermal cycles to 260°C (500°F). The allowable leakage is a maximum of 100 ppm. It requires that the valve packing be previously tested according to API 622 and be suitable for use at service temperatures ranging from -29°C to +538°C (-20°F to 1000°F). Cryogenic testing is optional only.

ISO 15848 CATEGORISES THREE TIGHTNESS CLASSES:

Class	Measured leakage rate	Remarks
A	≤ 10^{-5} mg / (s × m)	Typically achieved with bellow seals or equivalent spindle / shaft gasket system for swivel valves
B	≤ 10^{-4} mg / (s × m)	Typically achieved with packing system based on PTFE or elastomer materials
C	≤ 10^{-2} mg / (s × m)	Typically achieved with packing on flexible graphite basis

TA LUFT DEFINES FOLLOWING MAXIMUM LEAK RATES FOR HARMFUL VOC'S FOR VALVES:

Temperature Class	Temperature rate	Pressure	Measured leakage rate
LB	≤ 200°C	≤ 40 bar	≤ 10^{-4} mbar × l / (s × m)
LC	> 200°C	≤ 40 bar	≤ 10^{-2} mbar × l / (s × m)
LC	≤ 200°C	> 40 bar	≤ 10^{-2} mbar× l / (s × m)
LC	> 200°C	> 40 bar	≤ 10^{-2} mbar× l / (s × m)

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