



**Gasket testing
according to
DIN 3535, DIN 52913,
EN 13555, VDI 2440, ASTM, Shell, API 6FB**

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Issue: January 2020

German Standards DIN and VDI

DIN 28090-1 (withdrawn – replaced by DIN EN 13555)

- compression tests, creep compression tests, creep-/relaxation tests and leakage tests on request

DIN 28090-2 (dated November 2014)

- compressive creep test

- compression modulus at ambient temperature (ϵ_{KSW})
- percentage creep relaxation at ambient temperature (ϵ_{KRW})
- compression modulus at elevated temperature ($\epsilon_{WSW,T}$)
- percentage creep relaxation at elevated temperature ($\epsilon_{WRW,T}$)
- short test
- long term test

DIN 3535-6 (dated April 2019)

- leakage test
single test
triple test

DIN 52913 (dated April 2002)

- compression creep test
compression creep strength ($\sigma_{dE/16}$)
single test
triple test

VDI 2440 (dated November 2000)

- leakage test – TA-Luft

VDI 2200 (dated June 2007)

- leakage test – safety against blow-out



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European Standards EN

DIN EN 13555 (dated July 2014)

- compression test at ambient temperature
 - determination of the characteristics Q_{SMAX} and E_G at ambient temperature
- compression test at elevated temperature $T (\leq 400 \text{ }^\circ\text{C})$
 - determination of the characteristics Q_{SMAX} and E_G at elevated temperature
- creep-/relaxation test at ambient temperature
 - determination of the characteristic P_{QR} and Δe_{Gc}
- creep-/relaxation test at elevated temperature – $T (\leq 400 \text{ }^\circ\text{C})$
 - determination of the characteristic P_{QR} and Δe_{Gc}
- leakage test
 - 1 internal pressure level
 - diagram for increasing gasket stress ($Q_{MIN/L}$)
 - diagram for decreasing gasket stress ($Q_{SMIN/L}$)
- Friction test (RT)
 - determination of friction coefficient μ

- gasket characteristics for one gasket material:
 - Leakage test at 1 pressure level,
 - Compression tests at ambient and 2 elevated temperatures,
 - creep relaxations tests at 3 different stress levels and 3 temperatures, test report
 - single test (13 tests)
 - double test (26 tests)

BS 7531 (dated 2006)

- compressibility test
 - Triple test
- residual stress test
 - Double test
- gas permeability test
 - Triple test



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American Standards ASTM

Room Temperature Tightness Test (ROTT) – ASTM F2836 (dated 2018)

- leakage test
 - single test (High Pressure)
 - single test (Low Pressure)
 - double test (High Pressure)
 - double test (Low Pressure)

Hot BlowOut Test (HOBT) – ASTM WK61856 (dated December 2019)

- leakage test
 - single test
 - double test
 - single test (with thermal cycles – HOBT2C)
 - double test (with thermal cycles – HOBT2C)

ASTM F36-15 (dated 2015)

- compressibility and recovery test
 - single test
 - triple test

ASTM F37-06 (dated 2019)

- sealability test – test method B
 - single test
 - triple test

ASTM F38-18 (dated 2018)

- creep relaxation test – test method B
 - single test
 - triple test

ASTM F2837-11 (dated 2018)

- hot compression test
 - single test
 - triple test



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ASTM F1574-03a (dated 2017)

- compressive strength test
 - single test (one gasket stress level)
 - triple test (one gasket stress level)
 - single test (6 gasket stress levels)
 - Triple test (6 gasket stress levels)

Hot Mechanical Test (HOMT)

- creep test (thermal cycles)
 - single test
 - double test

API 6FB (dated 2008)

- fire test – leakage test

- new flanges or special bolts on request

FSA-G-605-11 (dated 2011) // ASTM F3149-15

- two leakage tests
 - determination y-Factor
 - determination m-Factor

ASTM F3270 (dated 2017)

- compression test
 - single test
 - triple test

ASME B16.20 (dated 2017)

- compression test
 - single test
 - triple test
- leakage test (Methane)
 - single test
 - triple test



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Shell-Type Acceptance Testing

MESC SPE 85/300 (dated February 2019)

- 3.3.1 Visual Examination
- 3.3.2 Fugitive Emissions
 - leakage test – RT
 - leakage test - T (≤ 400 °C)
- 3.3.3 Fire Test
 - API 6FB
- 3.3.4 EN 13555 Testing
 - compression test - RT
 - compression test – T (≤ 400 °C)
 - creep-/ relaxation test – RT
 - creep-/ relaxation test – T (≤ 400 °C)
 - leakage test
- 3.3.5 High Temperature Operational Tightness Test (HOTT)
 - leakage test with thermal cycles ($T \leq 400$ °C)
- 3.3.6 Hot Blowout Test
 - leakage test ($T \leq 400$ °C)
- 3.3.8 Gasket Adhesion
- 3.3.9 BAM (external laboratory)
 - reactivity of gaskets with gaseous oxygen
- 3.3.10 Electrical Isolation Test



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Certificate/ confirmation
englisch

Test report
single report
multiple report
special report





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Special Tests

Cryogenic Tests

- compression test – T (-50 °C)
determination of the characteristics Q_{SMAX} and E_G
- compression test – T (-150 °C)
determination of the characteristics Q_{SMAX} and E_G
- creep-/relaxation test – T (-50 °C)
determination of the characteristic P_{QR} and Δe_{Gc}
- creep-/relaxation test – T (-150 °C)
determination of the characteristic P_{QR} and Δe_{Gc}
- leakage test – T (-50 °C)
1 pressure level
loading and unloading curve
- leakage test – T (-150 °C)
1 pressure level
loading and unloading curve

High Pressure Tests

- leakage test – RT
1 pressure level (> 200 bar)
Loading and unloading curve

Permeability Tests

- leakage Test – RT
1 pressure level (Helium)
- leakage test – RT
1 pressure level (Methane CH₄)



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Gasket Segment Tests

- compression test – RT
compression curve of segments of gaskets with nominal size
> DN150
- compression test – RT
determination of gasket stress at metal to metal contact of spiral
wound gaskets
Nominal size > DN150

High temperature Tests

- compression test – ($T > 600\text{ °C}$)
determination of the characteristics Q_{SMAX} and E_G
- creep-/relaxation test – ($T > 600\text{ °C}$)
determination of the characteristic P_{QR} and Δe_{GC}
- leakage test – ($T > 600\text{ °C}$)
1 pressure level
loading and unloading curve

Leakage tests at elevated temperature

- leakage test – $T (< 400\text{ °C})$
1 pressure level
loading and unloading curve

Special tests, leakage tests and long term tests on request.