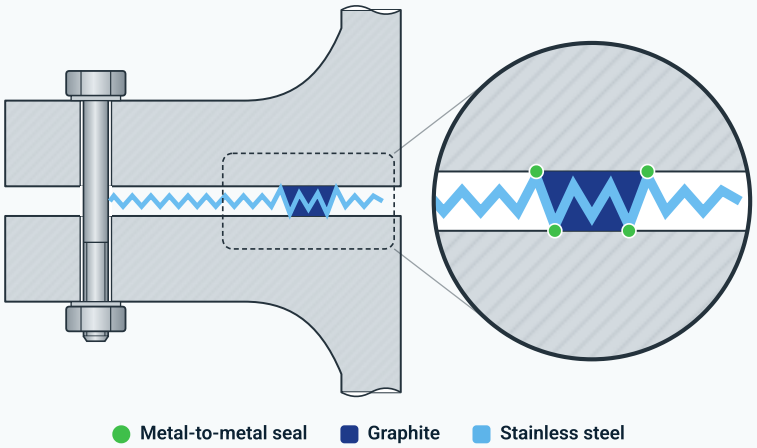
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# Revoseal Revolution Graphite Data Sheet

Embossed flat-profile gasket with spring characteristics – graphite facing.




## PRODUCT DESCRIPTION

The revoseal Revolution is an embossed flat-profile gasket made from a flexible stainless steel carrier with graphite encapsulated on both sides. Its innovative design and the flexibility of the embossed tooth height provide a dual metal-to-metal seal and full encapsulation of the graphite. With its wide range of applications, the Revolution is the alternative to all conventional flat gasket types.

## KEY BENEFITS

- **Dual metal-to-metal seal – graphite fully encapsulated**
- **No bolt retightening thanks to spring-elastic behaviour**
- **80× tighter than L0.01 – even with grade 5.6 bolts**
- **Fewer gasket variants, lower inventory costs and no risk of mix-ups**

## TECHNICAL DATA

| | |
|---|---|
| **Design** | Embossed flat-profile gasket with corrugated profile |
| **Operating temperature** | −270 °C to +500 °C |
| **Operating pressure** | Vacuum to 64 bar (ASME Class 400) |
| **Total thickness** | 1.6 mm (± 0.1 mm) |
| **Sizes** | For DIN/EN and ASME flanges up to DN 400 / NPS 16 |
| **Carrier material** | Flexible stainless steel, e.g. 1.4571 (316Ti) |
| **Facing** | Graphite, encapsulated on both sides |
| **Tightness** | 80× tighter than tightness class L0.01 at 90 % Rp0.2 of an M16 grade 5.6 bolt (40 bar helium) |
| **Gasket characteristics** | Tested to EN 13555 – see pages 2 to 6 |
| **Versions** | Also available with PTFE facing (separate data sheet) |
| **Applications** | Creeping media, e.g. heat transfer fluids · high-temperature service, especially cyclic processes · replacement for conventional flat gaskets |

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# Gasket characteristics to EN 13555

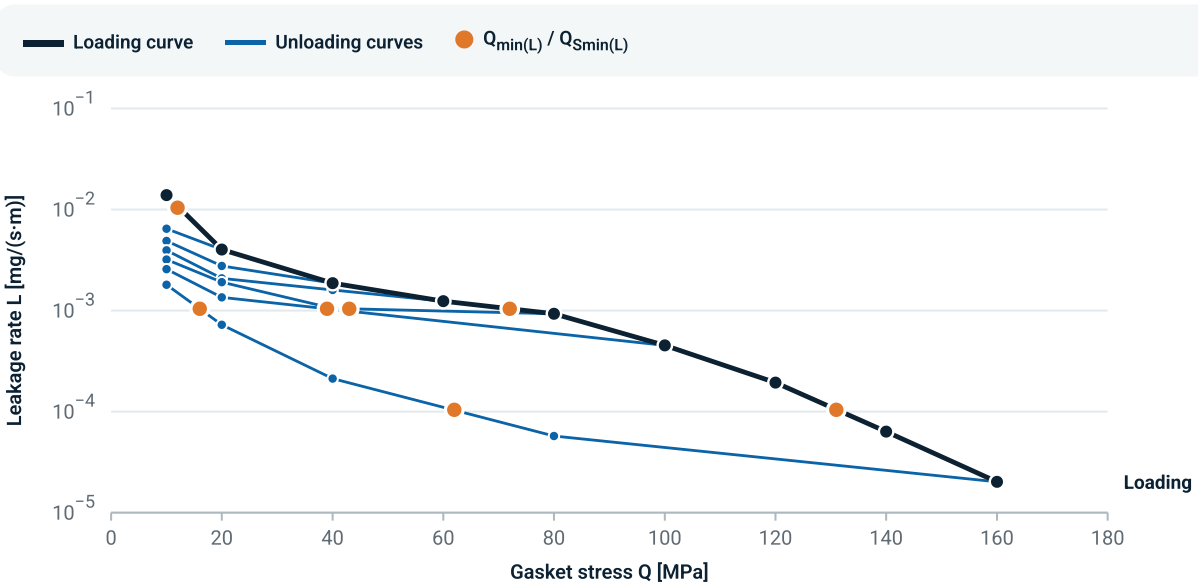
Revolution with graphite, 1.6 mm

| MANUFACTURER | PRODUCT NAME | PRODUCT DIMENSIONS |
|---|---|---|
| revoseal Europe GmbH | Revolution with graphite | 69 × 57 × 1.6 mm (DIN EN 1514-4:1997-08) |
| **TESTED TO** | **REV. NO.** | **DATE OF ISSUE** |
| EN 13555:2014-07 | 1 | 2017-09-06 |

## 1 Minimum gasket stress $Q_{min(L)}$ (at assembly) and $Q_{Smin(L)}$ (after unloading) for p = 10 bar (T = 23 ± 2 °C)

| L [mg/(s·m)] | $Q_{min(L)}$ [MPa] | $Q_{Smin(L)}$ [MPa] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $Q_A$ = 10 [MPa] | $Q_A$ = 20 [MPa] | $Q_A$ = 40 [MPa] | $Q_A$ = 60 [MPa] | $Q_A$ = 80 [MPa] | $Q_A$ = 100 [MPa] | $Q_A$ = 120 [MPa] | $Q_A$ = 140 [MPa] | $Q_A$ = 160 [MPa] |
| $10^0$ | **10** | | 11 | 11 | 11 | 11 | 11 | | | 11 |
| $10^{-1}$ | **10** | | 11 | 11 | 11 | 11 | 11 | | | 11 |
| $10^{-2}$ | **13** | | 11 | 11 | 11 | 11 | 11 | | | 11 |
| $10^{-3}$ | **73** | | | | | 43 | 40 | | | 17 |
| $10^{-4}$ | **132** | | | | | | | | | 62 |
| $10^{-5}$ | | | | | | | | | | |
| $10^{-6}$ | | | | | | | | | | |
| $10^{-7}$ | | | | | | | | | | |
| $10^{-8}$ | | | | | | | | | | |

**Leakage – 23 ± 2 °C / 10 bar**



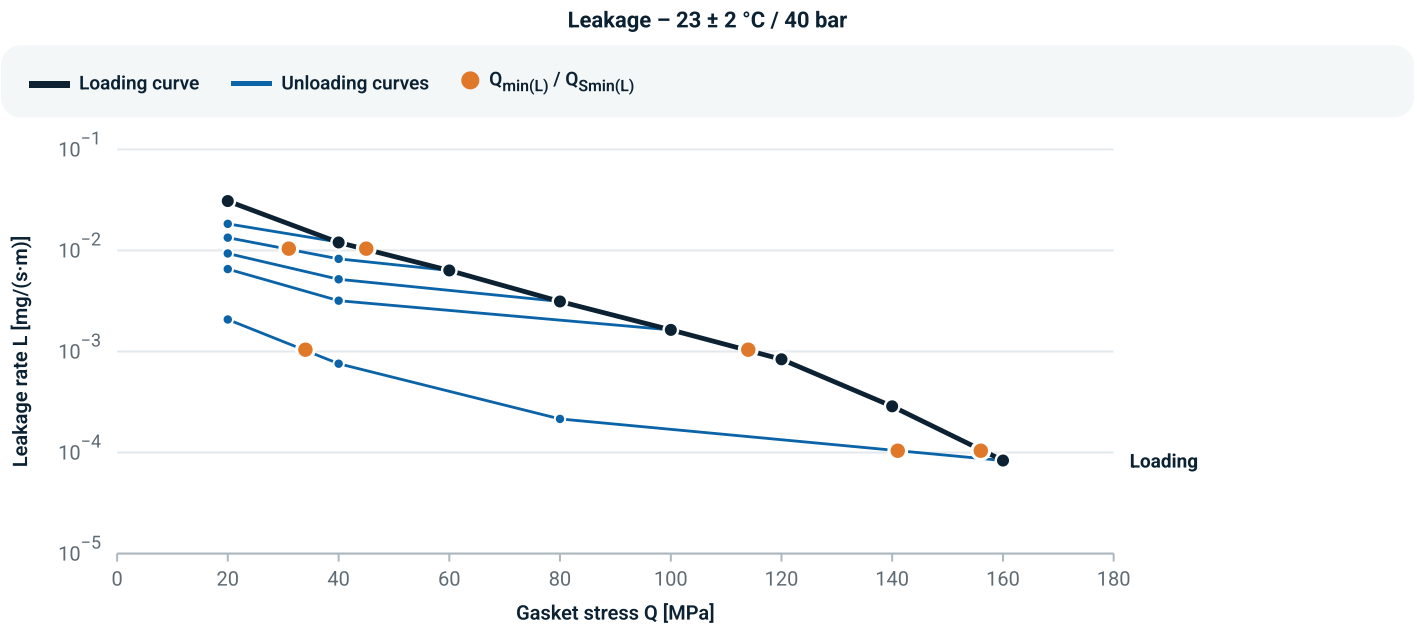

Shaded cells: not determined or not required. Rev. no.: 1 · Test report issued: 2017-09-06 · Center of Sealing Technologies, Bürgerkamp 3, 48565 Steinfurt, Germany

# Gasket characteristics to EN 13555

Leakage at 40 bar internal pressure

## 2 Minimum gasket stress $Q_{min(L)}$ (at assembly) and $Q_{Smin(L)}$ (after unloading) for p = 40 bar (T = 23 ± 2 °C)

| L [mg/(s·m)] | $Q_{min(L)}$ [MPa] | $Q_{Smin(L)}$ [MPa] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | $Q_A$ = 20 [MPa] | $Q_A$ = 40 [MPa] | $Q_A$ = 61 [MPa] | $Q_A$ = 80 [MPa] | $Q_A$ = 100 [MPa] | $Q_A$ = 120 [MPa] | $Q_A$ = 140 [MPa] | $Q_A$ = 160 [MPa] |
| $10^0$ | **20** | | 21 | 21 | 21 | 21 | | | 21 |
| $10^{-1}$ | **20** | | 21 | 21 | 21 | 21 | | | 21 |
| $10^{-2}$ | **45** | | | 31 | 21 | 21 | | | 21 |
| $10^{-3}$ | **114** | | | | | | | | 34 |
| $10^{-4}$ | **157** | | | | | | | | 142 |
| $10^{-5}$ | | | | | | | | | |
| $10^{-6}$ | | | | | | | | | |
| $10^{-7}$ | | | | | | | | | |
| $10^{-8}$ | | | | | | | | | |



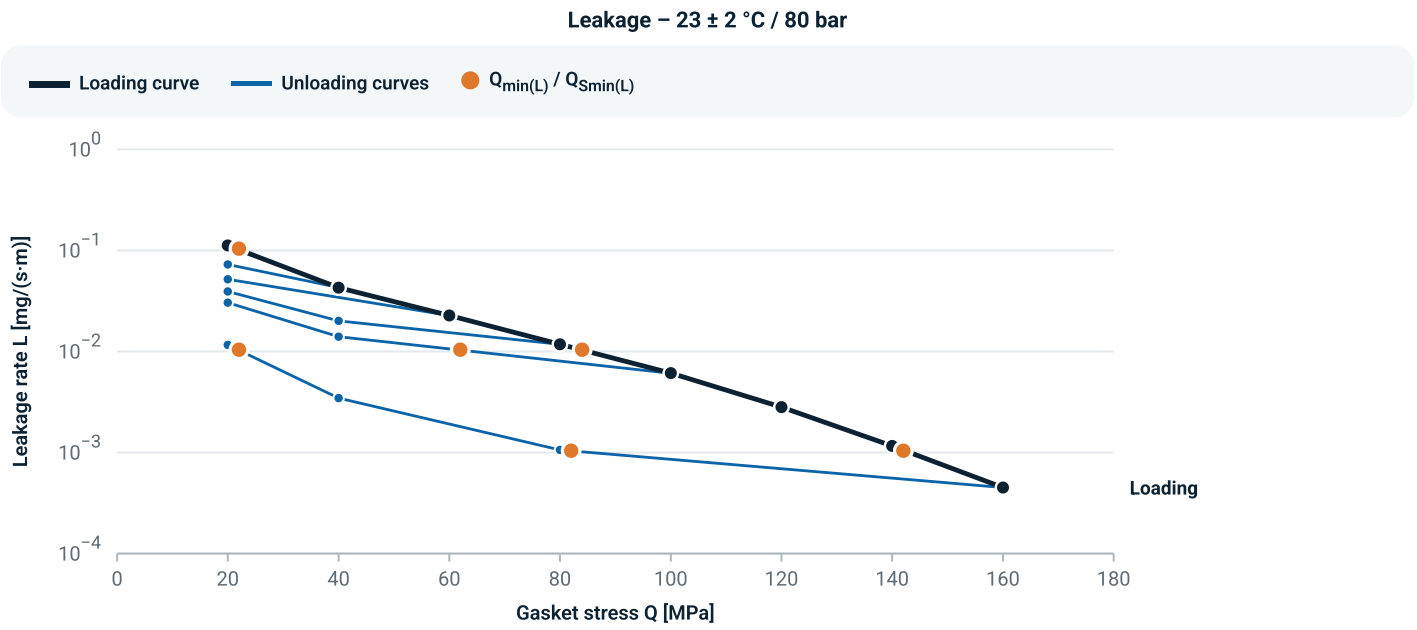

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# Gasket characteristics to EN 13555

Leakage at 80 bar internal pressure

## 3 Minimum gasket stress $Q_{min(L)}$ (at assembly) and $Q_{Smin(L)}$ (after unloading) for p = 80 bar (T = 23 ± 2 °C)

| L [mg/(s·m)] | $Q_{min(L)}$ [MPa] | $Q_{Smin(L)}$ [MPa] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | $Q_A$ = 20 [MPa] | $Q_A$ = 40 [MPa] | $Q_A$ = 60 [MPa] | $Q_A$ = 80 [MPa] | $Q_A$ = 100 [MPa] | $Q_A$ = 120 [MPa] | $Q_A$ = 140 [MPa] | $Q_A$ = 160 [MPa] |
| $10^0$ | **20** | | 21 | 21 | 21 | 21 | | | 21 |
| $10^{-1}$ | **22** | | 21 | 21 | 21 | 21 | | | 21 |
| $10^{-2}$ | **84** | | | | | 62 | | | 22 |
| $10^{-3}$ | **143** | | | | | | | | 83 |
| $10^{-4}$ | | | | | | | | | |
| $10^{-5}$ | | | | | | | | | |
| $10^{-6}$ | | | | | | | | | |
| $10^{-7}$ | | | | | | | | | |
| $10^{-8}$ | | | | | | | | | |




## 4 Creep relaxation factor $P_{QR}$ at stiffness C = 500 kN/mm

| Gasket stress | 23 ± 2 °C | | 200 °C | | 400 °C | |
|---|---|---|---|---|---|---|
| | $P_{QR}$ | $\Delta e_{Gc}$ [µm] | $P_{QR}$ | $\Delta e_{Gc}$ [µm] | $P_{QR}$ | $\Delta e_{Gc}$ [µm] |
| Stress level 1 [70 MPa] | 0.99 | 2 | 0.87 | 22 | 0.87 | 22 |
| Stress level 2 [180 MPa] | 1.00 | 2 | 0.94 | 26 | 0.92 | 36 |
| Stress level 3 [320 MPa] | 1.00 | 0 | 0.96 | 30 | 0.94 | 46 |
| $P_{QR}$ and $\Delta e_{Gc}$ at maximum permissible gasket stress $Q_{Smax}$ | | | | | | |
| $P_{QR}$ at $Q_{Smax}$ | 1.00 | 0 | 0.98 | 30 | 0.93 | 68 |
| $Q_{Smax}$ | 500 MPa | | 500 MPa | | 380 MPa | |

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# Gasket characteristics to EN 13555

Unloading modulus and gasket thickness

## 5 Secant unloading modulus of the gasket $E_G$ [MPa] and gasket thickness $e_G$ [mm]

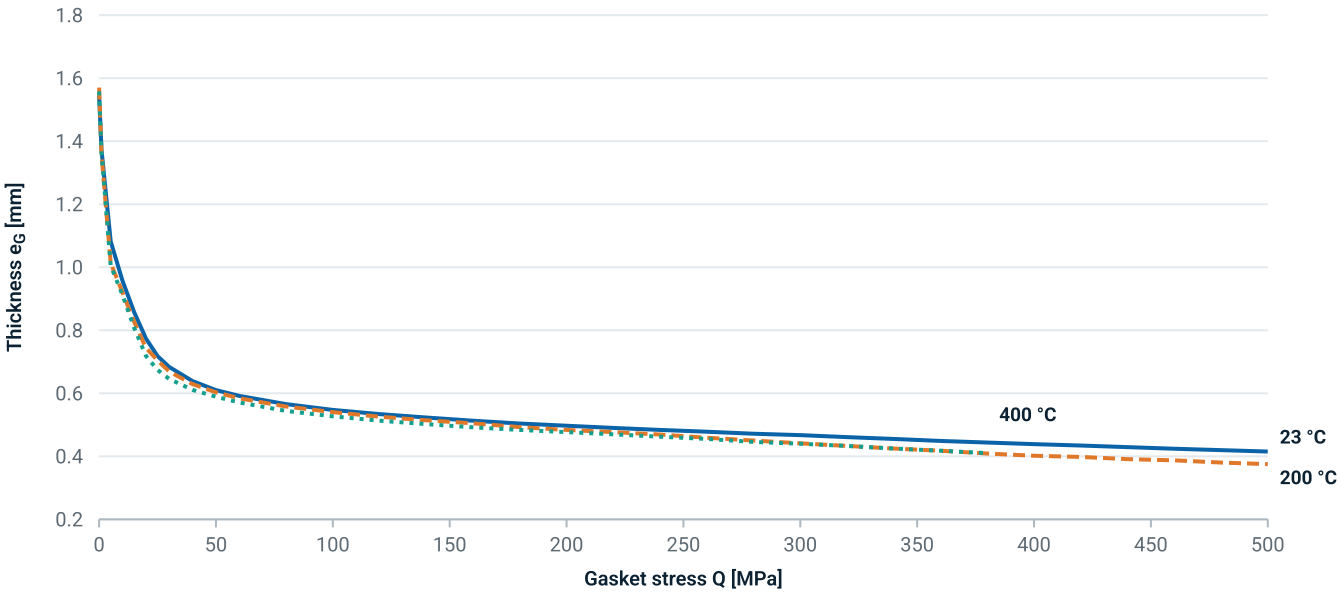
| Gasket stress [MPa] | 23 ± 2 °C | | 200 °C | | 400 °C | |
|---|---|---|---|---|---|---|
| | $E_G$ [MPa] | $e_G$ [mm] | $E_G$ [MPa] | $e_G$ [mm] | $E_G$ [MPa] | $e_G$ [mm] |
| 0 | 0 | 1.544 | 0 | 1.570 | 0 | 1.558 |
| 1 | 0 | 1.373 | 0 | 1.359 | 0 | 1.364 |
| 5 | 131 | 1.082 | 188 | 1.013 | 157 | 1.005 |
| 10 | 243 | 0.957 | 328 | 0.920 | 272 | 0.912 |
| 15 | 380 | 0.858 | 533 | 0.827 | 519 | 0.808 |
| 20 | 509 | 0.774 | 984 | 0.744 | 779 | 0.719 |
| 25 | 686 | 0.718 | 2,220 | 0.705 | 1,452 | 0.674 |
| 30 | 857 | 0.684 | 2,777 | 0.669 | 3,279 | 0.646 |
| 40 | 1,171 | 0.639 | 3,844 | 0.629 | 4,652 | 0.611 |
| 50 | 1,422 | 0.610 | 4,014 | 0.603 | 6,016 | 0.589 |
| 60 | 1,716 | 0.592 | 3,159 | 0.584 | 6,104 | 0.571 |
| 80 | 2,232 | 0.566 | 2,940 | 0.558 | 5,591 | 0.544 |
| 100 | 2,648 | 0.547 | 2,724 | 0.540 | 4,687 | 0.527 |
| 120 | 2,951 | 0.534 | 2,832 | 0.526 | 3,675 | 0.513 |
| 140 | 3,253 | 0.523 | 2,660 | 0.514 | 3,036 | 0.502 |
| 160 | 3,363 | 0.513 | 3,018 | 0.505 | 2,960 | 0.492 |
| 180 | 3,454 | 0.504 | 2,930 | 0.493 | 3,157 | 0.484 |
| 200 | 3,539 | 0.497 | 2,913 | 0.484 | 3,204 | 0.477 |
| 220 | 3,701 | 0.490 | 3,244 | 0.477 | 3,134 | 0.470 |
| 240 | 3,827 | 0.484 | 3,240 | 0.469 | 3,240 | 0.462 |
| 260 | 3,820 | 0.478 | 3,104 | 0.459 | 3,217 | 0.455 |
| 280 | 3,884 | 0.472 | 3,241 | 0.450 | 3,023 | 0.446 |
| 300 | 3,907 | 0.467 | 3,264 | 0.441 | 3,226 | 0.440 |
| 320 | 3,982 | 0.461 | 3,360 | 0.433 | 3,267 | 0.433 |
| 340 | 3,932 | 0.455 | 3,365 | 0.425 | 3,171 | 0.425 |
| 360 | 3,921 | 0.449 | 3,492 | 0.418 | 3,322 | 0.418 |
| 380 | 3,975 | 0.444 | 3,329 | 0.409 | 3,212 | 0.410 |
| 400 | 3,969 | 0.439 | 3,487 | 0.402 | | |
| 420 | 4,032 | 0.434 | 3,599 | 0.398 | | |
| 440 | 3,983 | 0.429 | 3,485 | 0.391 | | |
| 460 | 4,024 | 0.424 | 3,734 | 0.387 | | |
| 480 | 4,029 | 0.420 | 3,665 | 0.380 | | |
| 500 | 4,048 | 0.415 | 3,942 | 0.375 | | |

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# Gasket characteristics to EN 13555

Gasket thickness $e_G$

### 6 Gasket thickness $e_G$ vs. gasket stress at 23, 200 and 400 °C




Shaded cells: not determined or not required. Rev. no.: 1 · Test report issued: 2017-09-06 · Center of Sealing Technologies, Bürgerkamp 3, 48565 Steinfurt, Germany


BOLTED FLANGE JOINT CALCULATION

**Based on these characteristics, we calculate your bolted flange joint to EN 1591-1 – free of charge.**


All data are typical values and do not replace a case-specific design. Subject to technical change.