3S
SUPERIOR SEALING SERVICES

THE EXTRA RECOVERY GASKET

# THE NEXT GENERATION IN SUPERIOR GASKET COMPRESSION & RECOVERY

THE EXTRA RECOVERY GASKET PATENT PENDING

3S launches the XRG, an innovative newly developed gasket that offers greater sealing properties when compared to other semi-metallic gaskets. The XRG performs consistently providing high compression and recovery at varying gasket stresses and temperatures.

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# What Makes the XRG Unique?

THE EXTRA RECOVERY GASKET

## PROPERTIES

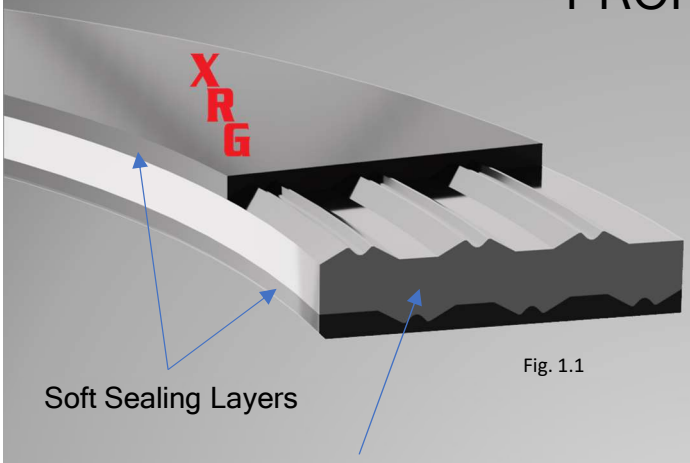



Fig. 1.1

- A newly developed gasket that offers greater sealing properties when compared to other semi-metallic gaskets.
- Provides high compression and recovery at varying gasket stresses and temperatures.
  The compression, recovery and leakage properties are achieved from.
- Profile offset
- Precisely machine flats (length of flats) in between the raised sections.
- Tested and qualified angles on the raised sections of XRG.
- The precisely machined gasket core design.

## TESTING XRG

Fig 1.2 details the thickness change of XRG and a Spiral Wound Gasket (SWG). The gasket stress is increased and reduced at three different temperature.
As can be seen the compression and recovery is very good at the three temperatures for XRG and stays consistent as the stress increases. This illustrates ability of the gasket to still compress and recover at high loads.

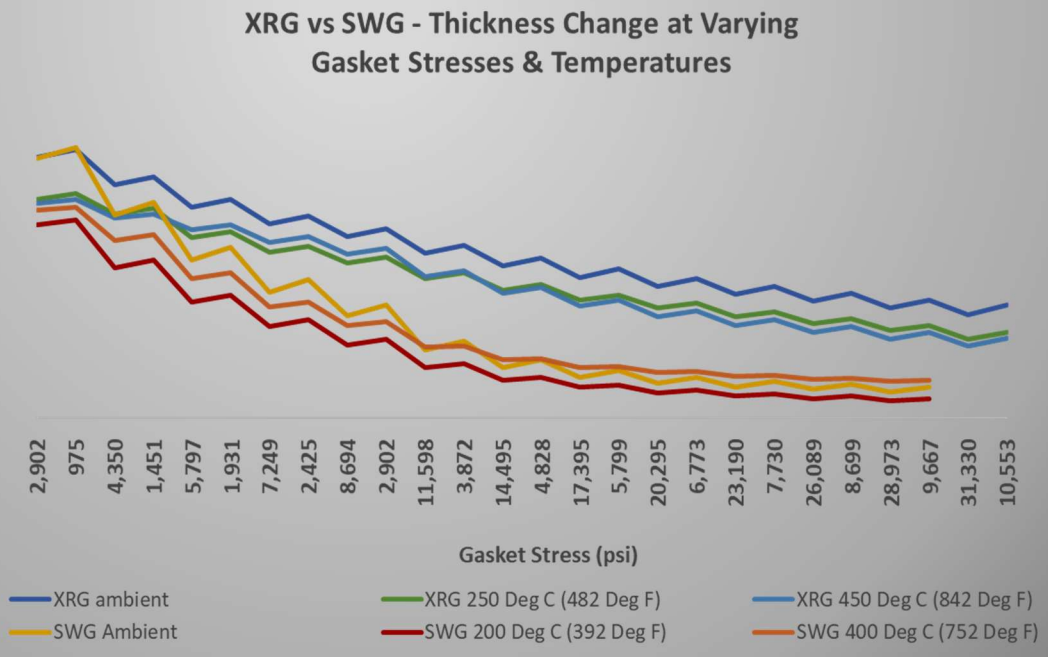



Fig.1-2

## Test Results Fig 1.2

- XRG demonstrates consistent recovery throughout the gasket stress range.
- The consistency of XRG remains even at the different temperatures.
- The SWG simply compresses to the guide ring then fails to recovery after compression.

# XRG Performance Relating to Leakage

THE EXTRA RECOVERY GASKET

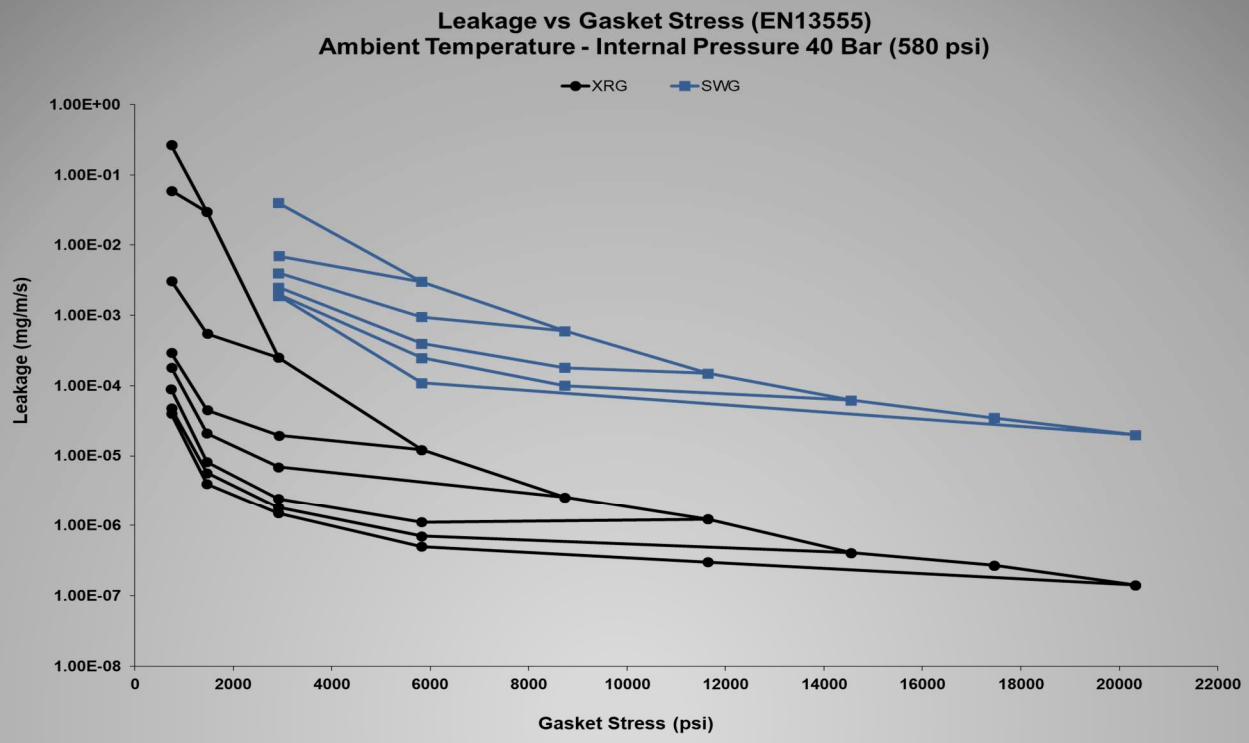
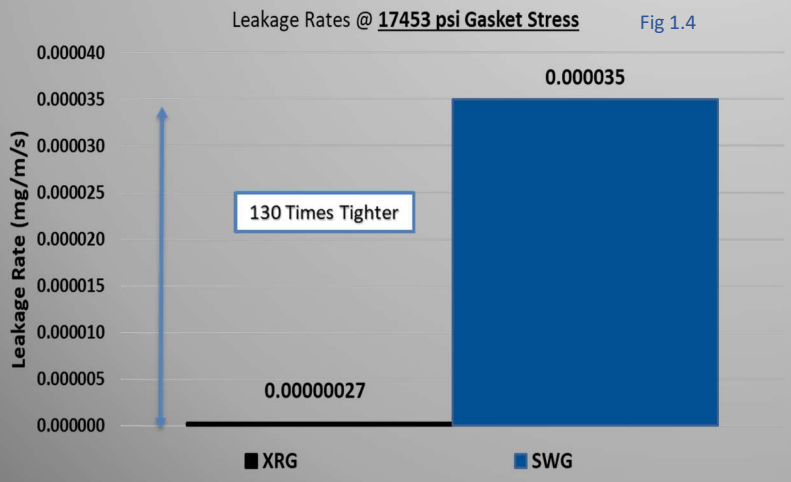



Fig 1.3

Fig. 1.3 Illustrates the leakage rate at increasing gasket stresses in according with EN13555.

- XRG has superior (lower)?? leakage rates over SWG.
- As gasket stress is reduced, superior recovery is again demonstrated as the XRG the displays no significant leakage.




| L [mg/(s*m)] | Qmin/L (psi) | |
|---|---|---|
| | XRG (Ambient) | SWG (Ambient) |
| 1 | | 2901 |
| 0.1 | 1015 | 2901 |
| 0.01 | 1740 | 4206 |
| 0.001 | 2466 | 7687 |
| 0.0001 | 3771 | 12328 |
| 0.00001 | 6237 | |
| 0.000001 | 12183 | |

Fig 1.4 Highlights that XRG is many times tighter ( seal??) compared to SWG.
Explanation: Qmin/L (psi) the amount of gasket stress needed to achieve a certain leakage rate in assembly. For example, to achieve a leakage rate of 1.0E-03 in assembly XRG requires a gasket stress of 2466 psi, whereas; SWG requires 7687 psi -- more than 3 times higher, making XRG a more exceptional gasket choice.

*All test results for XRG in accordance with EN13555 leakage and compression are available. Leakage rates at different temperatures and internal pressures were also tested. All data shown for SWG obtained from available public information.*

# XRG
# CONSTANTS & SUMMARY

THE EXTRA RECOVERY GASKET

## CONSTANTS

### ROTT Data

| XRG | | |
|---|---|---|
| Gb | 392 | psi |
| a | 0.317 | |
| Gs | 0.604 | psi |
| S100 | 1686 | psi |
| S1000 | 3498 | psi |
| S10000 | 7258 | psi |
| Tpmin | 1383 | |
| Tpmax | 77799 | |

### m & y Values

| XRG | | |
|---|---|---|
| m | 2.0 | |
| y | 2500 | psi |

### Materials

| Maximum Temperature (Filler) | |
|---|---|
| 3S Inhibited Graphite | 850˚F (454˚C) |
| Super Inhibited Graphite | 975˚F (524˚C) |
| PTFE | 500˚F (260˚C) |
| Mica | 1800˚F (982˚C) |
| HTG | 1500˚F (815˚C) |
| Ceramic | 2000˚F (1093˚C) |
| **Maximum Temperature (Alloys)** | |
| 304 / 304L SS | 1400˚F (760˚C) |
| 316 SS | 1400˚F (760˚C) |
| 316L SS | 1400˚F (760˚C) |
| 321 SS | 1500˚F (815˚C) |
| 347 SS | 1500˚F (815˚C) |
| Monel | 1500˚F (815˚C) |
| Inconel 600 | 2000˚F (1093˚C) |
| Carbon Steel | 900˚F (482˚C) |

## XRG Summary

- Extremely low leakage rates as shown in EN13555 & ROTT testing.
- Consistently low leakage rates at different temperatures and pressures.
- Low modulus of elasticity values at varying temperatures.
- High compression and recovery values at varying temperatures across a wide gasket stress range.
- Performs under minimal gasket stress due to its unique design.

### Specs

| XRG Thickness | XRG Diameter | XRG Width |
|---|---|---|
| Standard 3/32” | Minimum 2” OD | Minimum 3/8” |
| Other 1/8” | Maximum 140” OD | Maximum 2” |

*Facing thickness as standard = 0.020” (0.5mm) each side. This is not included in the above “XRG Thickness”*

XRG

XRG-O

| ROTT DATA COMPARISON | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Gb** | **a** | **Gs** | **S100** | **S1000** | **S10000** | **Tpmin** | **Tpmax** | **m** | **y** |
| **XRG** | **392** | **0.317** | **0.604** | **1686** | **3498** | **7258** | **1383** | **77799** | **2** | **2500** |
| CMG | 315 | 0.36 | 1855 | 1653 | 3787 | | | | 2.5 | 6400 |
| Kammprofile | 387 | 0.334 | 14 | 1802 | 3888 | | | 55000 | 2 | 2500 |
| SWG | 365 | 0.413 | 5.52 | 2445 | 6328 | 16378 | 213 | 17362 | 3 | 10000 |

All 3S Gaskets have full material traceability through the MTR # etched on the guide ring and inner ring if applicable, the MTR can be retrieved through the 3S website.

**For more information contact: technical@3sgaskets.com**