
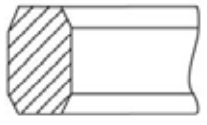

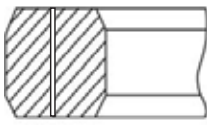


Ring Type Joints are primarily used by the oil, gas, petrochemical and offshore industries. They are also commonly used on valve, pipework assemblies and vessel joints. Ring Type Joints are used to seal flanged connections subject to high pressures and temperatures. These precision-made solid metal gaskets form a metal to metal seal with the flanges. The gasket cross-sections are designed to concentrate the bolt load over a small area to produce a high seating stress. The gasket metal must always be softer than the mating flanges. The high seating stress causes "plastic-flow" of the gasket into the flange faces to create the seal. The "RX" and "BX" gaskets are designed to be pressure activated by the sealed media which improves the efficiency of the seal as the internal pressure of the system increases.

| CROSS - SECTION | RING TYPE | STANDARD |
|--|---------------|----------------------------|
|  | "R" Oval | ASME B16.20 API STD. 6A |
|  | "R" Octagonal | MSS-SP-44 B.B. 1560 |
|  (Interchangeable with Octagonal "R" Gaskets) * RX 82-RX 91 incorporate a pressure balance hole | "RX" | API STD. 6A |
|  | "BX" | API STD. 6A |

- o "R" series Ring Type Joints can contain pressure up to 10,000 psi.
- o "RX" and "BX" series Ring Type Joints can contain pressure up to 20,000 psi.
- o The gaskets and flanges must be manufactured to precision dimensions, surface finishes and hardness.
- o All Ring Type Joints supplied are fully approved to API specification 6A - product specification level 4 – THE HIGHEST QUALITY RATING, and ASME B1620.

STYLE "R"

(Inches)

| RING NO. | PRESSURE CLASS RATINGS | | | | | | |
|----------|------------------------|---------|-------|-------|-------|-----------|--------|
| | ANSI, BS & MSS | | | | | API (psi) | |
| | 150 | 300/600 | 900 | 1500 | 2500 | 2000/3000 | 5000 |
| | NOMINAL PIPE SIZE | | | | | | |
| R11 | - | 1/2 | - | - | - | - | - |
| R12 | - | - | 1/2 | 1/2 | - | - | - |
| R13 | - | 3/4 | - | - | 1/2 | - | - |
| R14 | - | - | 3/4 | 3/4 | - | - | - |
| R15 | 1 | - | - | - | - | - | - |
| R16 | - | 1 | 1 | 1 | 3/4 | - | - |
| R17 | 1 1/4 | - | - | - | - | - | - |
| R18 | - | 1 1/4 | 1 1/4 | 1 1/4 | 1 | - | - |
| R19 | 1 1/2 | - | - | - | - | - | - |
| R20* | - | 1 1/2 | 1 1/2 | 1 1/2 | - | - | - |
| R21 | - | - | - | - | 1 1/4 | - | - |
| R22 | 2 | - | - | - | - | - | - |
| R23* | - | 2 | - | - | 1 1/2 | 2 1/16** | - |
| R24* | - | - | 2 | 2 | - | 2 1/16 | 2 |
| R25 | 2 1/2 | - | - | - | - | - | - |
| R26* | - | 2 1/2 | - | - | 2 | 2 9/16 | - |
| R27* | - | - | 2 1/2 | 2 1/2 | - | 2 9/16*** | 2 9/16 |
| R28 | - | - | - | - | 2 1/2 | - | - |
| R29 | 3 | - | - | - | - | - | - |
| R30+ | - | 3 | - | - | - | - | - |
| R31* | - | 3 | 3 | - | - | 3 1/8 | - |
| R32 | - | - | - | - | 3 | - | - |
| R33 | 3 1/2 | - | - | - | - | - | - |
| R34 | - | 3 1/2 | - | - | - | - | - |
| R35* | - | - | - | 3 | - | - | 3 1/8 |
| R36 | 4 | - | - | - | - | - | - |
| R37* | - | 4 | 4 | - | - | 4 1/16 | - |
| R38 | - | - | - | - | 4 | - | - |
| R39* | - | - | - | 4 | - | - | 4 1/16 |
| R40 | 5 | - | - | - | - | - | - |
| R41* | - | 5 | 5 | - | - | - | - |
| R42 | - | - | - | - | 5 | - | - |
| R43 | 6 | - | - | - | - | - | - |
| R44* | - | - | - | 5 | - | - | - |
| R45* | - | 6 | 6 | - | - | 7 1/16 | - |
| R46* | - | - | - | 6 | - | - | 7 1/16 |
| R47* | - | - | - | - | 6 | - | - |
| R48 | 8 | - | - | - | - | - | - |
| R49* | - | 8 | 8 | - | - | 9 | - |
| R50* | - | - | - | 8 | - | - | 9 |
| R51 | - | - | - | - | 8 | - | - |
| R52 | 10 | - | - | - | - | - | - |
| R53* | - | 10 | 10 | - | - | 11 | - |
| R54* | - | - | - | 10 | - | - | 11 |
| R55 | - | - | - | - | 10 | - | - |
| R56 | 12 | - | - | - | - | - | - |
| R57* | - | 12 | 12 | - | - | 13 5/8 | - |

*Ring number specified in API 6A
***3000 Class rating only

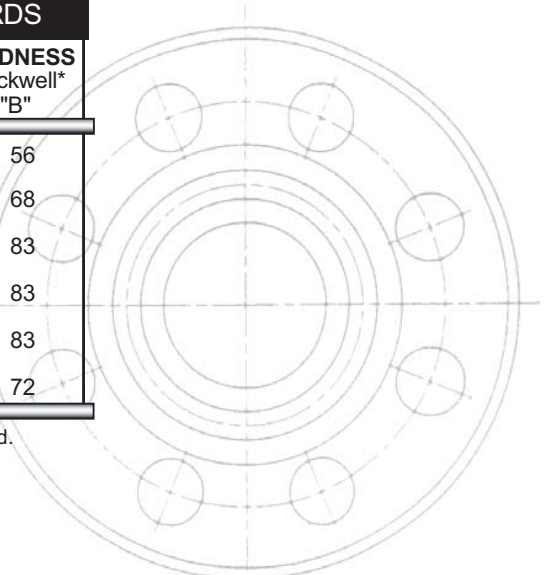
**2000 Class rating only
†Suitable for lapped flanges only

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STANDARD METAL SPECIFICATIONS FOR RING JOINTS IN ACCORDANCE WITH API 6A & ASME B16.20 STANDARDS

| METAL | IDENTIFICATION | MAXIMUM HARDNESS | | |
|--------------------------------------|---------------------|---------------------------------|------------------|----|
| | | Brinell [†] 3000 Kg | Rockwell* "B" | |
| Soft Iron | *Zinc-Plated Yellow | D | 90 | 56 |
| Low-Carbon Steel | *Zinc-Plated Yellow | S | 120 | 68 |
| Type 304 SS (18% Chrome, 8% Nickel) | | S304 | 160 | 83 |
| Type 316 SS (18% Chrome, 12% Nickel) | | S316 | 160 | 83 |
| Type 321 SS (18% Chrome, 10% Nickel) | | S321 | 160 | 83 |
| Type 502 SS (4.6% Chrome, 0.5% Moly) | | F5 | 130 | 72 |

[†] Measured with 3000 kg load except Soft Iron, which is measured with a 500 kg load.
* Measured with a 100 kg load and xxx diameter Indentor Ball.



STYLE "R" continued

(Inches)

| RING NO. | PRESSURE CLASS RATINGS | | | | | |
|----------|------------------------|---------|-----|------|------|-----------|
| | ANSI, BS & MSS | | | | | API (psi) |
| | 150 | 300/600 | 900 | 1500 | 2500 | 2000/3000 |
| | NOMINAL PIPE SIZE | | | | | |
| R58 | - | - | - | 12 | - | - |
| R59 | 14 | - | - | - | - | - |
| R60 | - | - | - | - | 12 | - |
| R61 | - | 14 | - | - | - | - |
| R62 | - | - | 14 | - | - | - |
| R63* | - | - | - | 14 | - | - |
| R64 | 16 | - | - | - | - | - |
| R65* | - | 16 | - | - | - | 16 3/4** |
| R66* | - | - | 16 | - | - | 16*** |
| R67 | - | - | - | 16 | - | - |
| R68 | 18 | - | - | - | - | - |
| R69* | - | 18 | - | - | - | - |
| R70* | - | - | 18 | - | - | 18*** |
| R71 | - | - | - | 18 | - | - |
| R72 | 20 | - | - | - | - | - |
| R73* | - | 20 | - | - | - | 21 1/4** |
| R74* | - | - | 20 | - | - | 20 3/4*** |
| R75 | - | - | - | 20 | - | - |
| R76 | 24 | - | - | - | - | - |
| R77 | - | 24 | - | - | - | - |
| R78 | - | - | 24 | - | - | - |
| R79 | - | - | - | 24 | - | - |
| R80 | 22 | - | - | - | - | - |
| R81 | - | 22 | - | - | - | - |
| R82* | - | - | - | - | - | - |
| R84* | - | - | - | - | - | - |
| R85* | - | - | - | - | - | - |
| R86* | - | - | - | - | - | - |
| R87* | - | - | - | - | - | - |
| R88* | - | - | - | - | - | - |
| R89* | - | - | - | - | - | - |
| R90* | - | - | - | - | - | - |
| R91* | - | - | - | - | - | - |
| R92 | - | - | - | - | - | - |
| R93 | - | 26 | - | - | - | - |
| R94 | - | 28 | - | - | - | - |
| R95 | - | 30 | - | - | - | - |
| R96 | - | 32 | - | - | - | - |
| R97 | - | 34 | - | - | - | - |
| R98 | - | 36 | - | - | - | - |
| R99* | - | - | - | - | - | - |
| R100 | - | - | 26 | - | - | - |
| R101 | - | - | 28 | - | - | - |
| R102 | - | - | 30 | - | - | - |
| R103 | - | - | 32 | - | - | - |
| R104 | - | - | 34 | - | - | - |
| R105 | - | - | 36 | - | - | - |

STYLE "RX"

(Inches)

| RING NO. | PRESSURE CLASS RATINGS (psi) | | |
|----------|------------------------------|--------|----------------|
| | 2000 | 3000 | 5000 |
| | NOMINAL PIPE SIZE | | |
| RX20 | - | - | - |
| RX20° | - | - | 2 1/16 |
| RX23 | 2 1/16 | - | - |
| RX24 | - | 2 1/16 | 2 1/16 |
| RX25° | - | - | 3 1/8 |
| RX26 | 2 9/16 | - | - |
| RX27 | - | 2 9/16 | 2 9/16 |
| RX31 | 3 1/8 | 3 1/8 | - |
| RX35 | - | - | 3 1/8 |
| RX37 | 4 1/16 | 4 1/16 | - |
| RX39 | - | - | 4 1/16 |
| RX41 | - | - | - |
| RX44 | - | - | - |
| RX45 | 7 1/16 | 7 1/16 | - |
| RX46 | - | - | 7 1/16 |
| RX47 | - | - | - |
| RX49 | 9 | 9 | - |
| RX50 | - | - | 9 |
| RX53 | 11 | 11 | - |
| RX54 | - | - | 11 |
| RX57 | 13 5/8 | 13 5/8 | - |
| RX63 | - | - | - |
| RX65 | 16 3/4 | - | - |
| RX66 | - | 16 3/4 | - |
| RX69 | - | - | - |
| RX70 | - | - | - |
| RX73 | 21 1/4 | - | - |
| RX74 | - | 20 3/4 | - |
| RX82 | - | - | - |
| RX84 | - | - | - |
| RX85 | - | - | - |
| RX86 | - | - | - |
| RX87 | - | - | - |
| RX88 | - | - | - |
| RX89 | - | - | - |
| RX90 | - | - | - |
| RX91 | - | - | - |
| RX99* | - | - | - |
| RX201° | - | - | 1 3/8 |
| RX205*° | - | - | 1 13/16 |
| RX210*° | - | - | 2 9/16 |
| RX215* | - | - | 4 1/16 |
| RX215*° | - | - | 4 1/16 X 4 1/4 |

* API allows more liberal tolerances on RX201-215
° API Ring Joint Gaskets for segmented flanges for dual completions to API Standard 6A.

STYLE "BX"

(Inches)

| RING NO. | PRESSURE CLASS RATING (psi) | | | |
|-----------|-----------------------------|---------|---------|---------|
| | 5000 | 10000 | 15000 | 20000 |
| | NOMINAL PIPE SIZE | | | |
| BX150 | - | - | - | - |
| BX151 | - | 1 13/16 | 1 13/16 | 1 13/16 |
| BX152 | - | 2 1/16 | 2 1/16 | 2 1/16 |
| BX153 | - | 2 9/16 | 2 9/16 | 2 9/16 |
| BX154 | - | 3 1/16 | 3 1/16 | 3 1/16 |
| BX155 | - | 4 1/16 | 4 1/16 | 4 1/16 |
| BX156 | - | 7 1/16 | 7 1/16 | 7 1/16 |
| BX157 | - | 9 | 9 | 9 |
| BX158 | - | 11 | 11 | 11 |
| BX159 | - | 13 5/8 | 13 5/8 | 13 5/8 |
| BX160 | 13 5/8 | - | - | - |
| BX161 | - | - | - | - |
| BX162 | 16 3/4 | 16 3/4 | - | - |
| BX163 | 18 3/4 | - | - | - |
| BX164 | - | 18 3/4 | 18 3/4 | - |
| BX165 | 21 1/4 | - | - | - |
| BX166 | - | 21 1/4 | - | - |
| BX167* | - | - | - | - |
| BX168** | - | - | - | - |
| BX169*** | - | - | - | - |
| BX170 | - | - | - | - |
| BX171 | - | - | - | - |
| BX172 | - | - | - | - |
| BX303**** | - | - | - | - |

"BX" Gaskets can only be used in API 6BX Flanges. All BX Gaskets incorporate a pressure balance hole to equalize any pressure trapped in the Flange Grooves.
* BX167 is suitable for 26 3/4 Nominal Pipe Size 2,000 psi rating.
** BX168 is suitable for 26 3/4 Nominal Pipe Size 3,000 psi rating.
*** BX169 is suitable for 5 3/4 Nominal Pipe Size 10,000 psi rating.
**** BX303 is suitable for 30 Nominal Pipe Size 2,000 and 3,000 psi ratings.



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ARMSTRONG ENERGY

MAXIMUM TEMPERATURE LIMITATION

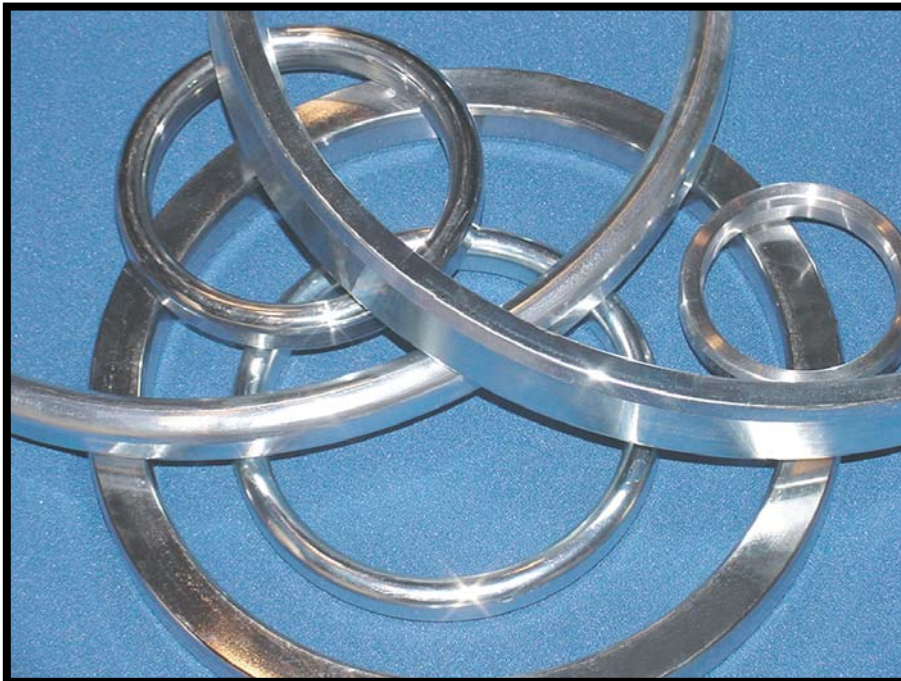
WHEN ORDERING, PLEASE SUBMIT THE FOLLOWING:

- Relevant Ring number or Nominal Pipe Size and Pressure Rating.
- Metal required.
- Whether Oval or Octagonal shape for "R" series Gaskets.
- Non-Standard Metals and Dimensions (to customers' special requirements) are available on request. Please supply drawing describing any non-standard dimensions.

SUGGESTED MAXIMUM SERVICE TEMPERATURE IN AIR

| Type | Temp. °C | Temp. °F |
|-----------------|----------|----------|
| Carbon Steel | 536 | 997 |
| 304 SS | 925 | 1697 |
| 309 SS | 1095 | 2003 |
| 310 SS | 1150 | 2102 |
| 316 SS | 925 | 1697 |
| 321 SS | 925 | 1697 |
| 347 SS | 925 | 1697 |
| 410 SS | 705 | 1301 |
| 430 SS | 815 | 1499 |
| 501 SS | 649 | 1200 |
| Alloy 20 | 815 | 1499 |
| Aluminum | 427 | 801 |
| Brass | 260 | 500 |
| Copper | 260 | 500 |
| Hastelloy B & C | 1095 | 2003 |
| Inconel 600 | 1095 | 2003 |
| Incolloy 800 | 871 | 1600 |
| Monel | 815 | 1499 |
| Nickel | 760 | 1400 |
| Phosphor Bronze | 260 | 500 |
| Tantalum | 1649 | 3000 |
| Titanium | 1095 | 2003 |

Maximum temperature limitations are set by the metals used to construct the gasket, flanges, pipelines and system apparatus. The presence of contaminating fluids and cyclic conditions reduce the maximum temperatures.



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ARMSTRONG ENERGY