

# E.W. Howell Co., LLC

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## REQUEST FOR INFORMATION

No. 00032

**TITLE:** Gaskets Types

**DATE:** 11/19/2009

**PROJECT:** BNL CCWF-II

**JOB:**

**TO:** Attn: Alan Raphael  
Brookhaven National Laboratory  
Brookhaven Sciences Associates, LLC  
Project Modernization Office  
Upton, NY 11973-5000  
Phone: 631-344-5854

**STARTED:**

**COMPLETED:**

**REQUIRED:** 11/26/2009

### WORK

**IMPACT:** Unknown

### SCHEDULE

**IMPACT:** Unknown

### COST

**IMPACT:** Unknown

### QUESTION:

November 19, 2009  
Gaskets Types

Specifications list types of gaskets for systems as CS, NBR, RR, and CS,(GRAF). There is no indication in the specifications of what these nomenclatures mean. Please obtain exact specifications from the engineer. We would appreciate a quick response as we are preparing to install valves within the next two weeks.

CC: Bill Harrison, File

### PROPOSED SOLUTION:

### ANSWER:

*Attached pages 2 & 3 contain the specification definitions.  
Pages 4 & 5 contain recommended gasket types.  
Please submit your proposed gasket selection(s).*

*Alan Raphael 12/14/09*

**Requested By:** E.W. Howell Co., LLC

**Date:** \_\_\_\_\_

**Signed:** \_\_\_\_\_

Lauren Bergin

Re: RFI 032

November 19, 2009

**BNL CCWF Project Spec piping systems and gasket types specified per Section 15105:**

- Chilled Water, type RR, CPR, NBR (Master Spec. CPR)
- Condenser Water, type CS
- Instrument Air, type CS
- Non-potable Water, type RR (Master Spec. CPR)
- Potable Water, type RR
- Steam and Condensate, type CS, (GRAF) (Master Spec. SPW, graphite filled)

**Recommendation:**

Change project spec to conform to the Master Spec. See highlights below.

**Giffels Master Spec, Gasket Types are as follows:**

1.1 FLANGE GASKETS

- A. **TYPE CS:** General service compressed air, hot water service and where specified. Compressed non-asbestos composition sheet blend of synthetic fibers with SBR binder, non-stick coating, 1/16 inch thick. Shop drawing submitted shall include manufacturers recommended torque for specified general service and high strength bolts, for all pipe sizes based on maximum systems pressure/temperature encountered but not less than 150 PSIG at maximum service temperature of 366 degF and 1/16 inch thick gasket.
  1. Garlock, Blue Gard Style 3200 (Derated to 450 degF)
  2. Chesterton (617-438-4500) Style 192 (Derated to 700 degF)
- B. **TYPE RR:** Cold, non-deionized, non-process water service. Red rubber, full face, for up to 6 inch diameter pipe, 1/16 inch thick, per, ASTM D 2000, No. 2AA 705A13L16. For 6 inch and larger pipe, 1/8 inch thick, ASTM D 2000, No. 2AA 705813L16.
  1. Sepco (205-663-2251) "No. 20".
  2. John Crane Style 555 for pressures not exceeding 90 PSI or Style 666 reinforced for pressures not exceeding 140 PSI.
- C. **TYPE CPR:** For non-potable process water, petroleum oils, nitrogen, argon, chloroprene (neoprene) premium grade formulation, proposed product/service recommended by manufacturer, 1/16 inch thick, 70 Shore A Durometer, (225 degF maximum) (150 psig).
  1. John Crane Style 999
  2. Garlock Style 7986
  3. .
- D. **TYPE NBR [D]:** For water, glycol, Freon TF/PCA, nitrogen, soap solution, certain soluble oils,aromatics (toluene-xylene). Buna-N, premium grade formulation, proposed product/service recommended by manufacturer, 1/16 inch thick, 70 Shore A Durometer, (225 degF maximum).
  1. John Crane Style 900
  2. Galock Style 8495 (Prime)

- E. TYPE SPW: Conforming to API 601/607. Low seating stress, spiral wound; dead-soft TYPE 316 stainless steel, unless otherwise specified or recommended by manufacturer for specific product/service; 0.175 inch thick, with 0.125 inch thick external centering and internal rings. For frequently temperature/pressure cycled low pressure process loops, use Type SPW/ Flexitallic LSI gaskets. For internal combustion engine exhaust provide AISI TYPE 321/347 construction with Mica fill, rated for not less than 1600 degF. For manufacturer recommended, process specific, general and certain chemical service, service to 1000 degF, use graphite fill, typically: natural gas; steam and condensate. For manufacturer recommended, process specific, chemical service, service to 400 degF, use Teflon or graphite fill or Mica fill. Apply 30,000 psi bolt stress, unless otherwise application recommended. Provide samples upon request. Submit shop drawings with manufacturer's materials/compatibility/construction/gasket stress/initial-final bolt stress/bolt torque recommendations for each process application. Proposed Low Stress Internal ring gaskets which are not Base Bid manufacture shall be submitted per requirements for proposed deviation to prove equivalency.
1. Flexitallic (713.356.3600) STYLE LSI (Low Stress) for Class 150 and Class 300 flanges; STYLE CGI for Class 600 and up: Base Bid.
  2. Fluorocarbon, Metallic Gasket Div. (713-458-5830) For Class 600 flanges and up, unless otherwise approved.
  3. Lamons Gasket Co. (713-222-0284) (905.871.0600): STYLE WRI: For Class 600 flanges and up, unless otherwise approved.
  4. Manville Spirotallic: For Class 600 flanges and up, unless otherwise approved.
  5. Metallo Gasket Co. (201-545-7223) For Class 600 flanges and up, unless otherwise approved.

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December 7, 2009  
Re: Section 15105 Above Ground Piping Systems  
Flange Gaskets

Giffels/IBI Group

Service	Gasket Type	Flange	Manufacture
Chilled Water	RR, CPR, NBR <sup>5</sup> should be CS	RF	Garlock 3200
Condenser Water	CS	RF	Garlock 3200
Instrument Air	CS	RF	Garlock 3200
Non-potable Water	RR should be CNA	RF	Garlock 3000
	RR	FF	Garlock Style 22 or 3760 Multi-swell
Potable Water	RR should be CNA	RF	Garlock 3000 or Garlock 3545
	RR	FF	Garlock Stress Saver XP or 98206 EPDM
	CS, (Graf) should be SPW	RF	Flexitalic LSI

**General Notes:**

1. Use ring gaskets for RF flanges.
2. Use full-face gaskets for FF flanges.
3. Compressed fiber gasket thickness 1/16" for pipe size less than or equal to 10" and 1/8" for pipe sizes 12" and larger.
4. Rubber gasket thickness shall be 1/8" for all pipe sizes.
5. Gasket types RR, CPR, NBR are for FF flanges only.
6. The Flexitalic LSI is a spiral wound 316SS, graphite filled, low compression gasket with 316SS inner ring and carbon steel outer centering ring, suitable for Class 150 and Class 300 applications. Gasket shall be 0.175 inch thick, with 0.125 inch thick inner ring and outer centering ring.
7. Typical for all gaskets, gasket and bolt stress required for tight sealing shall not bend Class 150 or Class 300 flanges. Bolt type and torque shall be per the gasket manufacturer's recommendations.

**Service Pressures:**

Service	Pipe	Max. Operating Pressure
Chilled Water	BCS-150	175 psig if pumps are at shut-off head
Condenser Water	BCS-150	52 psig
Instrument Air	BCS-150	115 psig
Non-potable Water	GCS-150	65 psig
Potable Water	GCS-150	65 psig
Steam/Condensate	BCS-150HS	125 psig

**Gasket Pressure Ratings:**

Garlock 3200	1,200 psi
Garlock 3000	1,000 psi
Garlock Style 22	250 psi
Garlock 3760 Multi-swell	500 psi

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**Gasket Pressure Ratings – Continued:**

Garlock 3545	1,200 psi
Garlock Stress Saver XP	250 psi
Garlock 98206 EPDM	150 psi
Flexitalic LSI	Class 150 and Class 300 applications

**Discussion:**

1. The Garlock 3000 for RF flanges is a non-asbestos, blend of aramid fibers, fillers and a nitrile rubber binder.
2. The more expensive 3760 Multi-swell is not needed for RF flanges. The product was made for FF flanges.
3. The 3760 Multi-swell is preferred over the Garlock Style 22 for FF flanges, but is more expensive.
4. Garlock does not have a NSF-61 approved gasket for RF flanges. The Garlock 3545 Teflon based gasket does meet FDA requirements. The Garlock 3000 is a nitro rubber binder, compressed fiber gasket.
5. The Garlock Stress Saver XP and 98206 EPDM are both NSF-61 approved. The 98206 EPDM is new this year and the Stress Saver XP is more readily available.
6. The Flexitalic LSI is a spiral wound 304SS (1,000F) or 316SS (1,500F), graphite filled, low compression gasket with 316SS inner ring and carbon steel outer centering ring. The 316SS is more readily available. The compression is 5,000 psi compared to 10,000 psi for the standard Flexitalic CGI spiral wound gasket. The LSI is intended for Class 150 and Class 300 applications.

**References:**

1. Garlock, Dave Burgess 315.597.3386, dave.burgess@garlock.com.
2. Flexitalic, Narvis, 281.604.2427.