WARRANTY:
Products are guaranteed to be free from defects in workmanship and raw materials. Liability for breach of any and all warranties, expressed or implied, is limited to refunding the invoice price of the product, or, at our option, to the replacement of the product. Our products are not guaranteed: for any length of time, for any measure of service, or where used in a manner for which it is not intended, or for any specific purpose, notwithstanding any disclosure expressed or implied. This warranty is expressly in lieu of all other warranties and we assume no other liability for any other direct or consequential damages or losses of profit or defects, delay in delivery of merchandise or delay in repair of merchandise, or death or injury to persons.

FLANGE INSULATION

NPS (in.)	150 psi				300 psi			
	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)
1/4	3-3/8	4	1/2	2-1/4	3-3/8	4	1/2	2-1/4
1/2	3-1/2	4	1/2	2-3/8	3-3/4	4	1/2	2-5/8
3/4	3-7/8	4	1/2	2-3/4	4-5/8	4	5/8	3-1/4
1	4-1/4	4	1/2	3-1/8	4-7/8	4	5/8	3-1/2
1-1/4	4-5/8	4	1/2	3-1/2	5-1/4	4	5/8	3-7/8
1-1/2	5	4	1/2	3-7/8	6-1/8	4	3/4	4-1/2
2	6	4	5/8	4-3/4	6-1/2	8	5/8	5
2-1/2	7	4	5/8	5-1/2	7-1/2	8	3/4	5-7/8
3	7-1/2	4	5/8	6	8-1/4	8	3/4	6-5/8
3-1/2	8-1/2	8	5/8	7	9	8	3/4	7-1/4
4	9	8	5/8	7-1/2	10	8	3/4	7-7/8
5	10	8	3/4	8-1/2	11	8	3/4	9-1/4
6	11	8	3/4	9-1/2	12-1/2	12	3/4	10-5/8
8	13-1/2	8	3/4	11-3/4	15	12	7/8	13
10	16	12	7/8	14-1/4	17-1/2	16	1	15-1/4
12	19	12	7/8	17	20-1/2	16	1-1/8	17-3/4
14	21	12	1	18-3/4	23	20	1-1/8	20-1/4
16	23-1/2	16	1	21-1/4	25-1/2	20	1-1/4	22-1/2
18	25	16	1-1/8	22-3/4	28	24	1-1/4	24-3/4
20	27-1/2	20	1-1/8	25	30-1/2	24	1-1/4	27
24	32	20	1-1/4	29-1/2	36	24	1-1/2	32

NPS (in.)	400 psi				600 psi			
	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)
1/4	3-3/8	4	1/2	2-1/4	3-3/8	4	1/2	2-1/4
1/2	3-3/4	4	1/2	2-5/8	3-3/4	4	1/2	2-5/8
3/4	4-5/8	4	5/8	3-1/4	4-5/8	4	5/8	3-1/4
1	4-7/8	4	5/8	3-1/2	4-7/8	4	5/8	3-1/2
1-1/4	5-1/4	4	5/8	3-7/8	5-1/4	4	5/8	3-7/8
1-1/2	6-1/8	4	3/4	4-1/2	6-1/8	4	3/4	4-1/2
2	6-1/2	8	5/8	5	6-1/2	8	5/8	5
2-1/2	7-1/2	8	3/4	5-7/8	7-1/2	8	3/4	5-7/8
3	8-1/4	8	3/4	6-5/8	8-1/4	8	3/4	6-5/8
3-1/2	9	8	7/8	7-1/4	9	8	7/8	7-1/4
4	10	8	7/8	7-7/8	10-3/4	8	7/8	8-1/2
5	11	8	7/8	9-1/4	13	8	1	10-1/2
6	12-1/2	12	7/8	10-5/8	14	12	1	11-1/2
8	15	12	1	13	16-1/2	12	1-1/8	13-3/4
10	17-1/2	16	1-1/8	15-1/4	20	16	1-1/4	17
12	20-1/2	16	1-1/4	17-3/4	22	20	1-1/4	19-1/4
14	23	20	1-1/4	20-1/4	23-3/4	20	1-3/8	20-3/4
16	25-1/2	20	1-3/8	22-1/2	27	20	1-1/2	23-3/4
18	28	24	1-3/8	24-3/4	29-1/4	20	1-5/8	25-3/4
20	30-1/2	24	1-1/2	27	32	24	1-5/8	28-1/2
24	36	24	1-3/4	32	37	24	1-7/8	33

NPS (in.)	900 psi				1500 psi			
	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)
1/2	4-3/4	4	3/4	3-1/4	4-3/4	4	3/4	3-1/4
3/4	5-1/8	4	3/4	3-1/2	5-1/8	4	3/4	3-1/2
1	5-7/8	4	7/8	4	5-7/8	4	7/8	4
1-1/4	6-1/4	4	7/8	4-3/8	6-1/4	4	7/8	4-3/8
1-1/2	7	4	1	4-7/8	7	4	1	4-7/8
2	8-1/2	8	7/8	6-1/2	8-1/2	8	7/8	6-1/2
2-1/2	9-5/8	8	1	7-1/2	9-5/8	8	1	7-1/2
3	9-1/2	8	7/8	7-1/2	10-1/2	8	1-1/8	8
4	11-1/2	8	1-1/8	9-1/4	12-1/4	8	1-1/4	9-1/2
5	13-3/4	8	1-1/4	11	14-3/4	8	1-1/2	11-1/2
6	15	12	1-1/8	12-1/2	15-1/2	12	1-3/8	12-1/2
8	18-1/2	12	1-3/8	15-1/2	19	12	1-5/8	15-1/2
10	21-1/2	16	1-3/8	18-1/2	23	12	1-7/8	19
12	24	20	1-3/8	21	26-1/2	16	2	22-1/2
14	25-1/4	20	1-1/2	22	29-1/2	16	2-1/4	25
16	27-3/4	20	1-5/8	24-1/2	32-1/2	16	2-1/2	27-3/4
18	31	20	1-7/8	27	36	16	2-3/4	30-1/2
20	33-3/4	20	2	29-1/2	38-3/4	16	3	32-3/4
24	41	20	2-1/2	35-1/2	46	16	3-1/2	39

NPS (in.)	2500 psi			
	Dia. of Flange (in.)	No. of Bolts	Dia. of Bolts (in.)	Bolt Circle (in.)
1/2	5-1/4	4	3/4	3-1/2
3/4	5-1/2	4	3/4	3-3/4
1	6-1/4	4	7/8	4-1/4
1-1/4	7-1/4	4	1	5-1/8
1-1/2	8	4	1-1/8	5-3/4
2	9-1/4	8	1	6-3/4
2-1/2	10-1/2	8	1-1/8	7-3/4
3	12	8	1-1/4	9
4	14	8	1-1/2	10-3/4
5	16-1/2	8	1-3/4	12-3/4
6	19	8	2	14-1/2
8	21-3/4	12	2	17-1/4
10	26-1/2	12	2-1/2	21-1/4
12	30	12	2-3/4	24-3/8
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FLANGE INSULATION FOR SUPERIOR CATHODIC PROTECTION

GASKETS

Corrosion has long been nature's most destructive element, but with flange insulation products this costly profit robbing item can be all but eliminated.

These engineered insulation products, of consistent high quality, can be used to control and confine electrolytic corrosion in almost every piping system.

Insulation products are manufactured from materials for superior high dielectric strength, low-water absorption and chemical stability to maintain the high quality required in refinery and chemical plant applications. Hydrocarbon exposure, weathering and saltwater are no problem for nsulating materials.

Quality assurance and high production rate allow our customers to economically protect the service life of equipment with little or no downtime due to electrolytic corrosion.

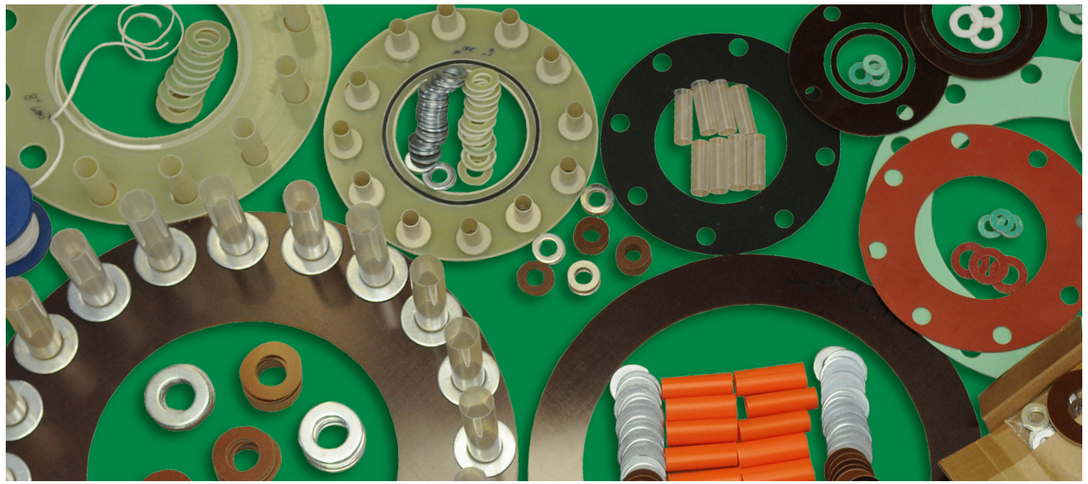
Vendors manufacture a full line of standard flange insulation sets including type F (Ring) gaskets, type E (Full Face) gaskets, and type D (API Ring Joint) gaskets.

Type F and type E gaskets are manufactured from 1/8" thick fabric based phenolic (Nema Grade CE) sheet with either no coating (plain faced) or a Nitrile rubber coating on both faces

Compressed Non-Asbestos sheet with superior electrical insulation qualities are available on request.

It is recommended that a 1/16" thick service gasket be used on each side of the plane face phenolic gasket to obtain an effective seal.

Either polyethylene or phenolic sleeves are available with these insulating sets. Polyethylene sleeves are standard and will be furnished unless otherwise specified. PTFE gaskets or envelopes are manufactured to the same exacting high standards and are available for high temperature or chemical corrosion damage prevention.



Type F gaskets are designed to fit the raised face portion of flanges. The outside diameter of the gasket is slightly smaller than the inside diameter of the bolt hole circle. The outside diameter is designed for alignment by the insulating sleeves. The central gaskets are available in the same materials as type E.
Type SF gaskets are the same as F type gaskets, but include a sealing element.

Type E gaskets are designed for full protection of flanges, and have the same outside diameter as the flange. Each gasket has precision-located bolt holes. All type E gaskets are easily centered with the flange inside diameter. Gaskets with slightly larger outside diameters are available upon request.
Type SE gaskets are the same as E type gaskets, but include a sealing element.

To Order Type (S)F / Type (S)E Gasket Sets Specify:

ASA (Amercian Standard Association Rating)
ANSI (American National Standards Institute)

Gasket
- F- Plain faced Phenolic or G-10 (Fabric base)
- SF- Plain faced Phenolic or G-10
- FN- Nitrile rubber faced phenolic (Fabric Base)
- FRD- Non Asbestos
- E- Plain faced Phenolic or G-10 (Fabric base)
- SE- Plain faced Phenolic or G-10
- EN- Ntrile rubber faced phenolic (Fabric Base)
- ERD- Non Asbestos

Washers
- SW - Single Washer Set. Includes one phenolic insulating washer and one flat steel washer bolt.
- DW - Double Washer Set. Two phenolic insulating washers and two flat steel washers per bolt.

Sleeves
- Integral (One piece construction sleeve & washer)
- Polyethylene (Standard unless otherwise specified)
- Other (specify)

Nomex	Phenolic
Mylar	G-10

Seals

Nitrile	PTFE
Flouropolymer	EPDM

QUANTITY:_____
PIPE SIZE:_____
MIN./MAX. TEMP
_____
SERVICE:_____
(For Type F)

QUANTITY:_____
PIPE SIZE:_____
MIN./MAX. TEMP
_____
SERVICE:_____
(For Type F)

Type D gaskets are insulating ring joint gaskets made to fit the ring groove of Ring Type Joint flanges. The type D central gasket is made of medium weave fabric-reinforced phenolic, manufactured to ASA (ANSI) gasket dimensions. Properties are similar to those of phenolic flat central gaskets and are available in the basic octagonal shapes. Oval shapes can be ordered by special request. When installing type D gaskets, it is also recommended that tape be wrapped around the outside of the flange to prevent foreign material from lodging between the exposed portions and causing "shorting out" of the flanges. Alignment pins should be used whenever possible to assure proper alignment of flanges when installing all flange insulation sets. Pins should be a minimum of 3/32" (2.38mm) larger than the bolt size.



GASKETS



API Oval

Oval: The oval cross-section is the original ring joint design. (NOT STANDARD.)



API Octogonal

Octagonal: The octagonal cross-section is a modification of the oval design and provides better sealing performance. (STANDARD.)

To Order Type D Gasket Sets Specify:

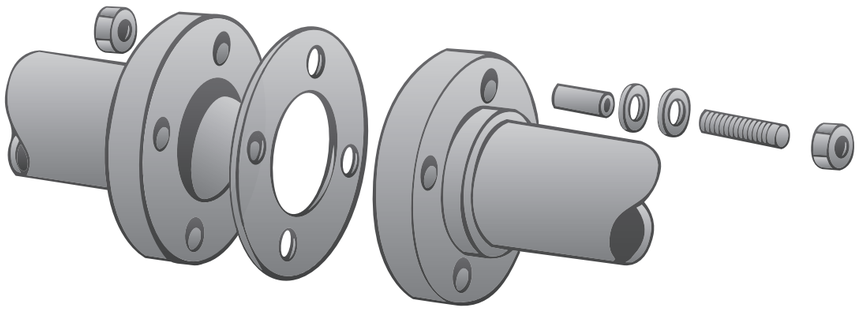
ASA (American Standard Association Rating)
ANSI (American National Standards Institute)

Sleeves

- ❑ **Integral** (One piece construction sleeve & washer)
- ❑ **Phenolic**
- ❑ **Polyethylene** (Standard unless otherwise specified)
- ❑ **Other** (Specify)

Washers

- ❑ **SW - Single Washer Set.** Unless specified, sets are furnished with one phenolic insulating washer and one flat steel washer per bolt.
- ❑ **DW - Double Washer Set.** Two phenolic and two flat steel washers per bolt.



Insulation Set

Flange insulating sets are packaged for one flanged joint, including gasket, sleeves and washers. Each flange set is securely packaged in a cardboard box, clearly labeled as to size, ASA rating, style and material.

Recommended Installation

Type E gasket minimizes possibility of foreign material making electrical contact between flanges. The above illustration is a properly installed Type E gasket flange insulation set with single washers. Gasket I.D. should be same or smaller than I.D. of flange. Washers should be installed on unprotected side of flange yielding complete protection for studs and bolts in buried flanges. Alignment pins recommended when possible and should be a minimum of 3/32” (2.381 mm) larger than bolt size. Make sure to test flanges after each installation. Replace any broken or cracked sleeves or washers, as they will eventually result in an electrical short of the complete insulation.

The physical (or chemical) properties of Gasket Materials represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. The indicated minimum values are shown. This information is supplied as a technical service and is subject to change without notice. Check the HMS office to assure current information.

SLEEVES AND WASHERS

SINGLE WASHER KITS:



DOUBLE WASHER KITS:



Material	Dielectric Strength volts/mil	Water Absorption %	Max. Continuous Operating Temp.
Integral	450	0.90	300ºF / 148ºC
Mylar®	4,000	0.80	300ºF / 149ºC
Nomex®*	720	---	450ºF / 232ºC
Phenolic**	140	2.00	225ºF / 107ºC
Polyethylene***	400-500	0.01	180°F / 82°C

Note
* Available on special request for high temperature applications.
** Made of NEMA (National Electrical Manufacturers Association) grade laminated phenolic.
*** Low moisture permeability and absorption rate make sleeves excellent for wet application.

Insulating Washers

Material	Dielectric Strength volts/mil	Compressive Strength (Flatwise) psi	Flexural Strength (Flatwise with grain) psi	Max. Continuous Operating Temp.
Non-Asbestos	400	---	3,000	450ºF / 232ºC
Phenolic	200	39,000	22,000	225ºF / 107ºC
G-10	550	50,000	60,000	302ºF / 150ºC

Flat insulating washers, placed on the studs between the flange and flat steel washers, manufactured from the customer’s choice of either: 1/8” (3.175mm) thick fabric-reinforced, laminated phenolic or non asbestos. These washers may be used with polyethylene or phenolic sleeves. Note: If not specified, washers will be plain faced phenolic.

Steel Back-Up Washers

Steel washers fit between the nut and the insulating washer to prevent damage to the insulating washer. The outside diameter is sized to fit within the bolt facing on ASA standard flanges. Steel washers are 1/8” (3.175mm) thick for extra strength. Insulating washers are not necessary on both sides of the flange, but it is a good practice. For high temperature applications of these products, consult a representative or your distributor for recommendations.

FLANGE INSULATION SPECIFICATIONS

ULTIMATE STRENGTH

Description of Material	"Water Absorption in Percent"	"Hardness Rockwell M"	"Tensile With Grain psi"	"Compression Flatwise psi"	"Flexural Flat W/Grain psi"	"Dielectric Strength VPM"	"Dielectric Constant"	"Max. Cont. Operating Temp."	Nema Grade
Plain Faced Phenolic	2.0%	85	13,000	39,000	22,000	200	4.5	"225°F 107°C"	CE
Nitrile Face Phenolic	0.45%		13,000	39,000	22,000	200	4.5	"175°F 79.5°C"	
Non-Asbestos					3,000	400		"450°F 232°C"	None
G-10	.05%	115	50,000	50,000	60,000	550		"150°F 350°C"	G-10

			Gaskets				Sleeves		Washers	
Flange Size	I.D. Inches	ASA ANSI Lb. Class	"E" O.D. Inches	"F" O.D. Inches	"D" RTJ ASA Ring No.	Bolts Number and Size	ID (inches)	Length (inches)	ID (inches)	OD (inches)
1	1	150	4-1/4	2-7/16	R15	4-1/2	1/2	1-5/16	9/16	1-3/32
		300	4-7/8	2-11/16	R16	4-5/8	5/8	1-9/16	11/16	1-5/16
		400, 600	4-7/8	2-11/16	R16	4-5/8	5/8	2-1/16	11/16	1-5/16
		900, 1500	5-7/8	2-15/16	R16	4-7/8	7/8	2-13/16	15/16	1-3/4
		2500	6-1/4	3-3/16	R18	4-7/8	7/8	3-7/16	15/16	1-3/4
1-1/4	1-1/4	150	4-5/8	2-13/16	R17	4-1/2	1/2	1-7/16	9/16	1-3/32
		300	5-1/4	3-1/16	R18	4-5/8	5/8	1-11/16	11/16	1-5/16
		400, 600	5-1/4	3-1/16	R18	4-5/8	5/8	2-5/16	11/16	1-5/16
		900, 1500	6-1/4	3-5/16	R18	4-7/8	7/8	2-15/16	15/16	1-3/4
		2500	7-1/4	3-15/16	R21	4-1	1	3-11/16	1-1/16	2
1-1/2	1-1/2	150	5	3-3/16	R19	4-1/2	1/2	1-9/16	9/16	1-3/32
		300	6-1/8	3-9/16	R20	4-3/4	3/4	1-13/16	13/16	1-17/32
		400, 600	6-1/8	3-9/16	R20	4-3/4	3/4	2-3/16	13/16	1-17/32
		900, 1500	7	3-11/16	R20	4-1	1	3-3/16	1-1/16	2
		2500	8	4-7/16	R23	4-1-1/8	1-1/8	4-3/16	1-3/16	2-3/16
2	2	150	6	3-15/16	R22	4-5/8	5/8	1-11/16	11/16	1-5/16
		300	6-1/2	4-3/16	R23	8-5/8	5/8	1-15/16	11/16	1-5/16
		400, 600	6-1/2	4-3/16	R23	8-5/8	5/8	2-11/16	11/16	1-5/16
		900, 1500	8-1/2	5-7/16	R24	8-7/8	7/8	3-11/16	15/16	1-3/4
		2500	9-1/4	5-9/16	R26	8-1	1	4-11/16	1-1/16	2
2-1/2	2-1/2	150	7	4-11/16	R25	4-5/8	5/8	1-15/16	11/16	1-5/16
		300	7-1/2	4-15/16	R26	8-3/4	3/4	2-3/16	13/16	1-17/32
		400, 600	7-1/2	4-15/16	R26	8-3/4	3/4	2-15/16	13/16	1-17/32
		900, 1500	9-5/8	6-5/16	R27	8-1	1	3-15/16	1-1/16	2
		2500	10-1/2	6-7/16	R28	8-1-1/8	1-1/8	5-3/16	1-3/16	2-3/16
3	3	150	7-1/2	5-3/16	R29	4-5/8	5/8	2-1/16	11/16	1-5/16
		300	8-1/4	5-11/16	R31	8-3/4	3/4	2-7/16	13/16	1-17/32
		400, 600	8-1/4	5-11/16	R31	8-3/4	3/4	3-3/16	13/16	1-17/32
		900	9-1/2	6-7/16	R31	8-7/8	7/8	3-11/16	15/16	1-3/4
		1500	10-1/2	6-11/16	R35	8-1-1/8	1-1/8	4-7/16	1-3/16	2-3/16
		2500	12	7-9/16	R32	8-1-1/4	1-1/4	5-15/16	1-5/16	2-13/32
3-1/2	3-1/2	150	8-1/2	6-3/16	R33	8-5/8	5/8	2-1/16	11/16	1-5/16
		300	9	6-5/16	R34	8-3/4	3/4	2-9/16	13/16	1-17/32
		400, 600	9	6-3/16	R34	8-7/8	7/8	3-1/16	15/16	1-3/4
4	4	150	9	6-11/16	R36	8-5/8	5/8	2-1/16	11/16	1-5/16
		300	10	6-15/16	R37	8-3/4	3/4	2-11/16	13/16	1-17/32
		400	10	6-15/16	R37	8-7/8	7/8	3-7/16	15/16	1-3/4
		600	10-3/4	7-7/16	R37	8-7/8	7/8	3-11/16	15/16	1-3/4
		900	11-1/2	7-15/16	R37	8-1-1/8	1-1/8	3-13/16	1-3/16	2-3/16
		1500	12-1/4	8-1/16	R39	8-1-1/4	1-1/4	4-15/16	1-5/16	2-13/32
		2500	14	9-1/16	R38	8-1-1/2	1-1/2	6-11/16	1-9/16	2-27/32
5	5	150	10	7-9/16	R40	8-3/4	3/4	2-1/16	13/16	1-17/32
		300	11	8-5/16	R41	8-3/4	3/4	2-15/16	13/16	1-17/32
		400	11	8-3/16	R41	8-7/8	7/8	3-11/16	15/16	1-3/4
		600	11	9-5/16	R41	8-1	1	4-3/16	1-1/16	2
		900	13-3/4	9-9/16	R41	8-1-1/4	1-1/4	4-11/16	1-5/16	2-13/32
		1500	14-3/4	9-13/16	R44	8-1-1/2	1-1/2	6-7/16	1-9/16	2-27/32
		2500	16-1/2	10-13/16	R42	8-1-3/4	1-3/4	7-15/16	1-13/16	3-9/32

*Note: These values represent standard ATSM conditions and should not be used to design parts that function under different conditions. Since they are average values, they should not be used for design specifications.

			Gaskets				Sleeves		Washers	
Flange Size	I.D. Inches	ASA ANSI Lb. Class	"E" O.D. Inches	"F" O.D. Inches	"D" RTJ ASA Ring No.	Bolts Number and Size	ID (inches)	Length (inches)	ID (inches)	OD (inches)
6	6	150	11	8-9/16	R43	8-3/4	3/4	2-3/16	13/16	1-17/32
		300	12-1/2	9-11/16	R45	12-3/4	3/4	3-1/16	13/16	1-17/32
		400	12-1/2	9-9/16	R45	12-7/8	7/8	3-9/16	15/16	1-3/4
		600	14	10-5/16	R45	12-1	1	4-7/16	1-1/16	2
		900	15	11-3/16	R45	12-1-1/8	1-1/8	5-1/16	1-3/16	2-3/16
		1500	15-1/2	10-15/16	R46	12-1-3/8	1-3/8	7-3/16	1-7/16	2-5/8
		2500	19	12-5/16	R47	8-2	2	9-3/16	2-1/16	2-23/32
8	8	150	13-1/2	10-13/16	R48	8-3/4	3/4	2-7/16	13/16	1-17/32
		300	15	11-15/16	R49	12-7/8	7/8	3-7/16	15/16	1-3/4
		400	15	11-13/16	R49	12-1	1	4-7/16	1-1/16	2
		600	16-1/2	12-7/16	R49	12-1-1/8	1-1/8	5-1/16	1-3/16	2-3/16
		900	18-1/2	13-15/16	R49	12-1-3/8	1-3/8	5-11/16	1-7/16	2-5/8
		1500	19	13-11/16	R50	12-1-5/8	1-5/8	7-15/16	1-11/16	3-1/16
		2500	21-3/4	15-1/16	R51	12-2	2	10-11/16	2-1/16	3-23/32
10	10	150	16	13-3/16	R52	12-7/8	7/8	2-9/16	15/16	1-3/4
		300	17-1/2	14-1/16	R53	16-1	1	3-15/16	1-1/16	2
		400	17-1/2	13-15/16	R53	16-1-1/8	1-1/8	4-15/16	1-3/16	2-3/16
		600	20	15-9/16	R53	16-1-1/4	1-1/4	5-11/16	1-5/16	2-13/32
		900	21-1/2	16-15/16	R53	16-1-3/8	1-3/8	6-3/16	1-7/16	2-5/8
		1500	23	16-15/16	R54	12-1-7/8	1-7/8	9-3/16	1-15/16	3-15/32
		2500	26-1/2	18-9/16	R55	12-2-1/2	2-1/2	13-11/ 16	2-9/16	4-19/32
12	12	150	19	15-15/16	R56	12-7/8	7/8	2-11/16	15/16	1-3/4
		300	20-1/2	16-7/16	R57	16-1-1/8	1-1/8	4-3/16	1-3/16	2-3/16
		400	20-1/2	16-5/16	R57	16-1-1/4	1-1/4	5-3/16	1-5/16	2-13/32
		600	22	17-13/16	R57	20-1-1/4	1-1/4	5-9/16	1-5/16	2-13/32
		900	24	19-7/16	R57	20-1-3/8	1-3/8	6-9/16	1-7/16	2-5/8
		1500	26-1/2	20-5/16	R58	16-2	2	10-7/16	2-1/16	3-23/32
		2500	30	21-7/16	R60	12-2-3/4	2-3/4	15-3/16	2-13/16	5-1/32
14	13-1/4	150	21	17-9/16	R59	12-1	1	2-15/16	1-1/16	2
		300	23	18-15/16	R61	20-1-1/8	1-1/8	4-7/16	1-3/16	2-3/16
		400	23	18-13/16	R61	20-1-1/4	1-1/4	5-7/16	1-5/16	2-13/32
		600	23-3/4	19-3/16	R61	20-1-3/8	1-3/8	6-3/16	1-7/16	2-5/8
		900	25-1/4	20-5/16	R62	20-1-1/2	1-1/2	7-7/16	1-9/16	2-27/32
		1500	29-1/2	22-9/16	R63	16-2-1/4	2-1/4	11-3/16	2-5/16	4-5/32
16	15-1/4	150	23-1/2	20-1/16	R64	16-1	1	3-1/16	1-1/16	2
		300	25-1/2	21-1/16	R65	20-1-1/4	1-1/4	4-11/16	1-5/16	2-13/32
		400	25-1/2	20-5/16	R65	20-1-3/8	1-3/8	5-11/16	1-7/16	2-5/8
		600	27	22-1/16	R65	20-1-1/2	1-1/2	6-11/16	1-9/16	2-27/32
		900	27-3/4	22-7/16	R66	20-1-5/8	1-5/8	7-11/16	1-11/16	3-1/16
		1500	32-1/2	25-1/16	R67	16-2-1/2	2-1/2	12-3/16	2-9/16	4-19/32
18	17-1/4	150	25	21-7/16	R68	16-1-1/8	1-1/8	3-5/16	1-3/16	2-3/16
		300	28	23-5/16	R69	24-1-1/4	1-1/4	4-15/16	1-5/16	2-13/32
		400	28	23-3/16	R69	24-1-3/8	1-3/8	5-15/16	1-7/16	2-5/8
		600	29-1/4	23-15/16	R69	20-1-5/8	1-5/8	7-3/16	1-11/16	3-1/16
		900	31	24-15/16	R70	20-1-7/8	1-7/8	8-11/16	1-15/16	3-15/32
		1500	36	27-9/16	R71	16-2-3/4	2-3/4	13-7/16	2-13/16	5-1/32
20	19-1/4	150	27-1/2	23-11/16	R72	20-1-1/8	1-1/8	3-9/16	1-3/16	2-3/16
		300	30-1/2	25-9/16	R73	24-1-1/4	1-1/4	5-3/16	1-5/16	2-13/32
		400	30-1/2	25-5/16	R73	24-1-1/2	1-1/2	6-3/16	1-9/16	2-27/32
		600	32	26-11/16	R73	24-1-5/8	1-5/8	7-11/16	1-11/16	3-1/16
		900	33-3/4	27-5/16	R74	20-2	2	9-3/16	2-1/16	2-23/32
		1500	38-3/4	29-9/16	R75	16-3	3	14-11/16	3-1/16	5-15/32
24	23-1/4	150	32	28-1/16	R76	20-1-1/4	1-1/4	3-15/16	1-5/16	2-13/32
		300	36	30-5/16	R77	24-1-1/2	1-1/2	5-11/16	1-9/16	2-27/32
		400	36	30-1/16	R77	24-1-3/4	1-3/4	6-11/16	1-13/16	3-9/32
		600	37	30-15/16	R77	24-1-7/8	1-7/8	8-11/16	1-15/16	3-15/32
		900	41	32-13/16	R78	20-2-1/2	2-1/2	11-11/16	2-9/16	4-19/32
		1500	46	35-5/16	R79	16-3-1/2	3-1/2	16-11/16	3-9/16	6-11/32

**Dimensions shown are for full length sleeves. Half sleeves available upon request.