Ameriforge

An AFG Holdings Company

CofferLok™ Clamp Connector

Taper-Lok® and CofferLok™ Connection Systems

Ameriforge process piping, pipeline, riser and exchanger connection systems provide the solutions to chronic problems associated with standard ANSI and API flange connections.

Leak-Free Reliability

Our metal-to-metal seal ring technology offers leak-free reliability over traditional ANSI and API gaskets. Our seal rings offer welded joint integrity and can be used in critical and chronic leak areas.

Weight Savings

With weight savings of up to 80% in comparison to ANSI flanges, our connection systems can typically save up to 1 million lbs. of weight on an offshore floating platform.

Space Savings

Space savings of up to 82% with smaller O.D. and length dimensions compared to ANSI/API flanges. Pipe runs are closer together for more room for process equipment and future tie-backs. Ideal for small O.D. pull-in-head requirements.

External Loads

Our connectors are able to handle high fatigue and high bending moments. We can optimize the design of the connector as needed to meet project requirements.

Quick Assembly

Our connection systems typically use less and smaller bolts in comparison to ANSI or API flanges. Our catalog of connectors include clamps that only require four bolts and connectors that are self aligning.

Cost Savings

In many cases, our connector assemblies are less expensive to purchase than the corresponding ANSI or API flange assembly. Our leak-free seal rings save operational costs.

Misalignment Capability

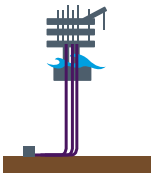
Ameriforge offers connection systems that are self-aligning and offer up to 20° of misalignment capability.

High Pressure/Temperature

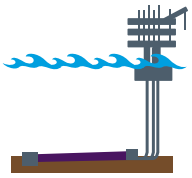
Our connector systems have applications in high pressure and/or high temperature where they out perform ANSI and API flanges in terms of reliability and leak free service.

Connector Applications

TOPSIDES

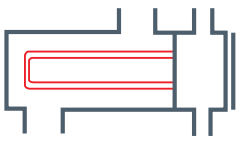


RISERS

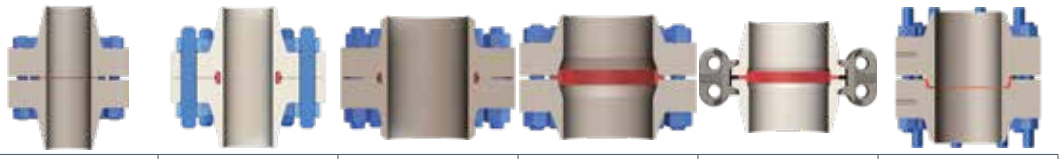


SUBSEA

REFINERY & PETROCHEMICAL



HEAT EXCHANGER RETROFITS



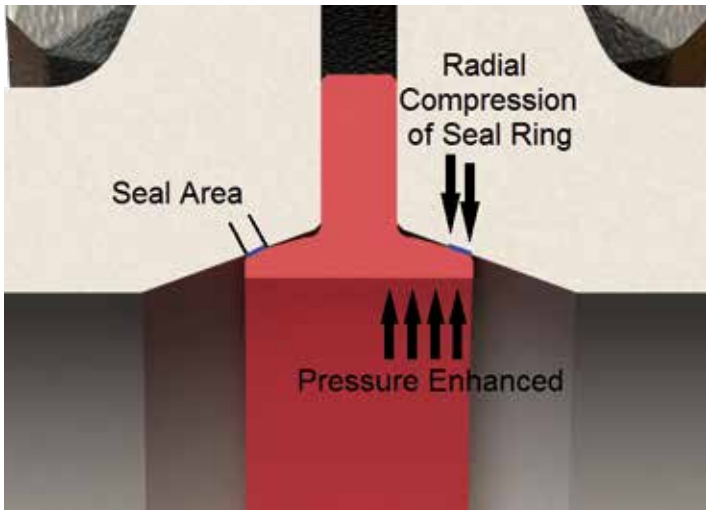
	ANSI / API Flanges	CofferLok Compact Flange (Economy)	CofferLok Compact Flange (NORSOK L-005) ISO 27509	CofferLok Compact Flange (Standard)	CofferLok Clamp Connector	Taper-Lok® Connector
Leak-Free Reliability						
Weight Savings						
Space Savings						
External Loads						
Quick Assembly						
Cost Savings						
Misalignment Capability						
High Pressure/ Temperature						

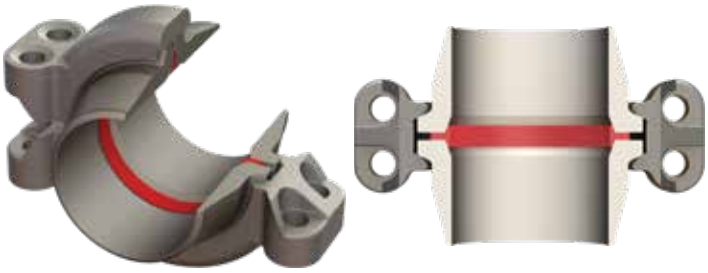
ICON RANK = 1 OK ⟷ 6 Superior

CofferLok™ Clamp Connectors

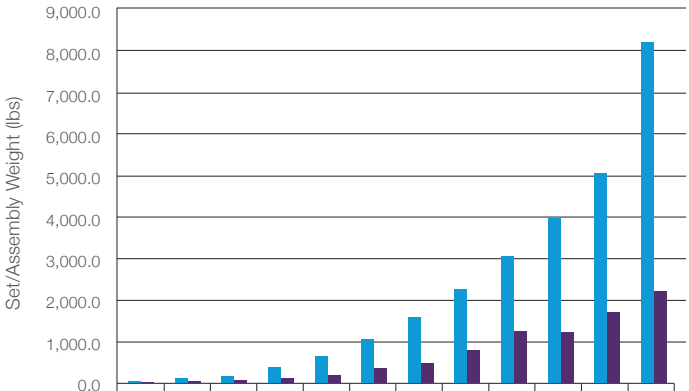
- Consists of (2) hubs, (1) seal ring, (1) clamp set with (4) bolts and (8) nuts
- Self energized, pressure enhanced metal seal ring
- Seal ring is designed to be reusable
- Clamp assembly is up to 75% lighter and requires less space compared to standard flanges
- Sizes from ½-in. to 36-in.*
- Pressures up to 20,000 psi*
- Available in all material grades
- The *CofferLok* Clamp Connector is interchangeable with other clamp connectors in the market

**Special designs available.*





1500# Class Comparison



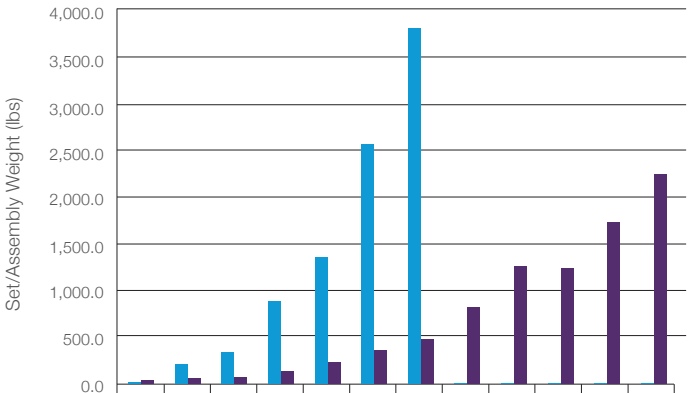
	2”	3”	4”	6”	8”	10”	12”	14”	16”	18”	20”	24”
ANSI	60.2	110.9	162.9	373.9	657.9	1,065	1,615	2,275	3,051	3,990	5,072	8,180
CofferLok CL	18.2	34.0	44.1	120.1	190.6	364.4	490.8	824.0	1,269	1,248	1,740	2,247

8-in. – 2500# ANSI Class Comparison

***CofferLok* Clamp Connector -238 lbs**

ANSI B16.5 -1,362 lbs.

2500# Class Comparison



	2”	3”	4”	6”	8”	10”	12”	14”	16”	18”	20”	24”
ANSI	9.9	220.5	344.1	890.0	1,362	2,568	3,797	0.0	0.0	0.0	0.0	0.0
CofferLok CL	39.3	53.7	74.3	135.7	238.2	364.4	490.8	824.0	1,269	1,248	1,740	2,247

Cofferlok Clamp Connector vs. ANSI/API Flanges

Advantages of *Cofferlok* Clamp Connector

— Self energized and pressure enhanced seal

— Seal ring is designed to be reusable

— Small relative movements between hubs can be accommodated by seal ring deflection

— Clamp assembly lighter and requires less space

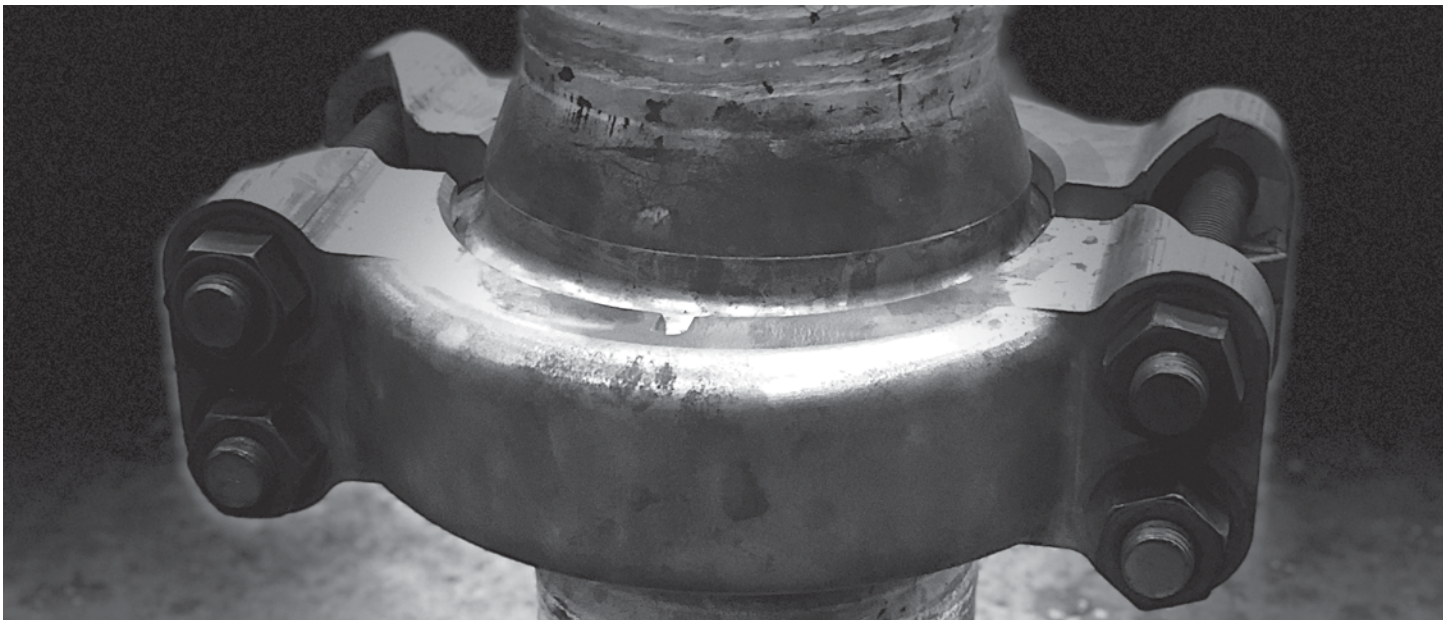
— Clamp bolts are oriented perpendicular to pressure end thrust and are not subjected to hydrostatic loading due to pressure

— Small outside dimensions allow use in more congested areas

— Clamps can be conveniently rotated for desired bolt orientation

— Four bolt design has built in safety factor which allows for bolt failure without loss of sealing integrity

— The connectors method of sealing does not require precision bolt loading, thus easier to make up



Disadvantages of ANSI/API Flanges

— Larger and bulkier flange forging

— Often more and larger bolts

— Generally a crush type gasket

— High bolt torque required to seat and maintain contact pressure

— Poor adaptability to changing conditions (temperature)

— Even make-up required to avoid impingement of gasket

— Gasket is not reusable

— Gasket has to handle piping bending loads

— Performance not good in high vibration

— ANSI Flange design is over 100 years old and outdated technology

Cofferlok Clamp Connector Material Selection

HUB MATERIAL	SEAL RING MATERIAL	COATING OPTIONS	CLAMP MATERIAL	BOLTING OPTIONS
A105	AISI 4140	MoS2 or PTFE	AISI 4140	B7/2H or L7/7 or L7M/7M
A350 LF2				
A694 F52				
AISI 4130				
A350 LF2 with Alloy 625 overlay	Alloy 718			
A182 F304	Duplex or F316 or 17-4PH(630 SS) or Alloy 718	MoS2 or PTFE or Graphite	AISI 4140 or A 182 F304	B7/2H or B8/8
A182 F316				
A182 F321				
A182 F51	S-Duplex or 17-4PH(630 SS)	MoS2 or PTFE	AISI 4140	B7/2H or L7/7 or L7M/7M
Nickel Alloys	Alloy 718	MoS2 or PTFE or Graphite	AISI 4140 or A 182 F304	B7/2H or B8/8

Cofferlok Clamp Connector vs. ANSI/API Flanges

ANSI FLANGE CLASS / COFFERLOK CLAMP/HUB SIZE															
NOMINAL PIPE SIZE	600#			900#			1500#			2500#			4500#		
	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE
1”	1-in.	11	1.125”	1-in.	11	1.125”	1-in.	11	1.125”	1-in.	7	0.906”	1-in.	5	0.625”
1-1/2”	1.5-in.	14	1.160”	1.5-in.	14	1.160”	1.5-in.	14	1.160”	1.5-in.	14	1.610”	1.5-in.	14	1.125”
2”	2-in.	20	2.063”	2-in.	20	2.063”	2-in.	20	2.063”	2-in.	14	1.610”	2-in.	11	1.125”
3”	3-in.	31	3.250”	3-in.	31	3.250”	3-in.	25	2.672”	3-in.	23	2.375”	3-in.	20	2.063”
4”	4-in.	42	4.188”	4-in.	40	4.063”	4-in.	34	3.688”	4-in.	31	3.250”	4-in.	25	2.672”
5”	5-in.	52	5.313”	5-in.	52	5.313”	5-in.	47	4.875”	5-in.	42	4.188”	5-in.	31	3.250”
6”	6-in.	64	6.500”	6-in.	62	6.065	6-in.	52	5.313”	6-in.	47	4.875”	6-in.	34	3.688”
8”	8-in.	84	8.500”	8-in.	76	7.750”	H8-in.	72	7.250”	H8-in.	64	6.500”	H8-in.	47	4.875”
10”	H10-in.	97	9.875”	H10-in.	94	9.500”	H10-in.	87	8.875”	H10-in.	72	7.250”	H10-in.	62	6.065”
12”	H12-in.	122	12.250”	H12-in.	112	11.250”	H12-in.	106	10.750”	H12-in.	82	8.250”	H12-in.	72	7.250”
14”	L14-in.	134	13.500”	L14-in.	130	13.000”	L14-in.	112	11.250”	L14-in.	84	8.500”	H14-in.	76	7.750”
16”	L16-in.	152	15.250”	L16-in.	144	14.500”	H16-in.	120	12.000”	H16-in.	94	9.500”	H16-in.	84	8.500”
18”	L18-in.	170	17.000”	L18-in.	160	16.000”	L18-in.	122	12.250”	L20-in”	106	10.750”			
20”	L20-in.	192	19.250”	L20-in.	180	18.000”	L20-in.	144	14.500”						
24”	L24-in.	232	23.250”	H26-in.	192	19.250”									

TEMP. (°F)	MAXIMUM ANSI PRESSURE RATINGS (PSI)				
	600#	900#	1500#	2500#	4500#
-20 to 100	1500	2250	3750	6250	11250
200	1500	2250	3750	6250	11250
300	1455	2185	3640	6070	10925
400	1410	2115	3530	5880	10585
500	1330	1995	3325	5540	9965
600	1210	1815	3025	5040	9070
650	1175	1765	2940	4905	8825
700	1135	1705	2840	4730	8515

Notes 1. Maximum bore through connection is shown. For applications requiring a larger bore, contact AFGlobal.
2. The *CofferLok* size shown will meet or exceed the maximum ANSI Rantings for materials listed.
3. Ratings are with plain carbon steel clamps and hubs.

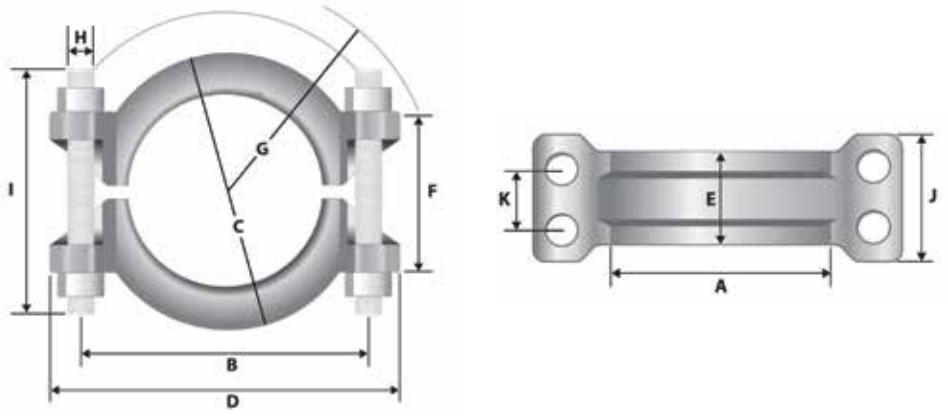
API FLANGE CLASS / COFFERLOK CLAMP/HUB SIZE															
NOMINAL BORE	2000 6B			3000 6B			5000 6B			10000 6BX			15000 6BX		
	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE	CLAMP	SEAL	MAX. BORE
1-13/16”										H2-in.	16	1-868”	H2-in.	16	1-868”
2-1/16”	H2-in.	20	2.063”	H2-in.	20	2.063”	H2-in.	20	2.063”	H2-in.	20	2.063”	H2-in.	20	2.063”
2-9/16”	H3-in.	25	2.672”	H3-in.	25	2.672”	H3-in.	25	2.672”	H3-in.	25	2.672”	H3-in.	25	2.672”
3-1/16”										H4-in.	27	3.063”	H4-in.	27	3.063”
3-1/8”	H4-in.	31	3.250”	H4-in.	31	3.250”	H4-in.	31	3.250”	H4-in.	31	3.250”	H4-in.	31	3.250”
4-1/16”	5-in.	40	4.063”	5-in.	40	4.063”	5-in.	40	4.063”	6-in.	40R	4.063”	6-in.	40R	4.063”
7-1/16”	H8-in.	72	7.250”	H8-in.	72	7.250”	H8-in.	72	7.250”	H10-in.	72R	7.250”	H10-in.	72R	7.250”
9”	H10-in.	91	9.125”	H10-in.	91	9.125”	H10-in.	91	9.125”	H12-in.	91	9.125”	H12-in.	91	9.125”
11”	H12-in.	112	11.250”	H12-in.	112	11.250”	H12-in.	112	11.250”	H16-in.	112	11.25	Non-Standard Size Available		
13-5/8”	Non-Standard Size Available			Non-Standard Size Available			H16-in.	137	13.875”	H20-in.	137	13.875”			
16-3/4”	H22-in.	170	17.000”	H22-in.	170	17.000”	H22-in.	170	17.000”	Non-Standard Size Available					
18-3/4”							Non-Standard Size Available			Non-Standard Size Available					
20-3/4”				H22-in.	170	17.000”									
21-1/4”	Non-Standard Size Available			L20-in.	180	18.000”	Non-Standard Size Available			Non-Standard Size Available					

Notes 1. 2000, 3000, 5000 Use 60 ksi min yield hub material.
2. 10000, 15000 Use 75 ksi min yield hub material.
3. 75 ksi min yield clamp material.

Cofferlok Clamp Assembly

Our ***CofferLok*** Clamps are manufactured as interchangeable segments and sold as a set with bolting included. Standard clamp materials are carbon steel (AISI 4130/4140) or stainless steel (ASTM A182 F304). Other materials are available on request.

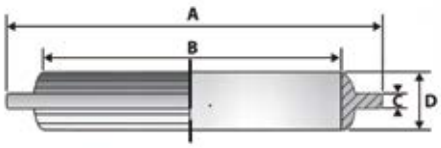
Bolting: Two studs are used in each ear of the clamp to provide redundancy in bolting strength. Bolting is provided with UNC/8UN thread series with spherical-faced heavy hex nuts. Bolt coating can be supplied based on customer requirements.



CLAMP SIZE	OPTIONAL CLAMP SIZE	A		B		C		D		E		F		G		H		I		J		K		CLAMP SET WEIGHT	
		INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG
STANDARD																									
1-in.	1GR	1.69	42.9	3.25	82.6	2.81	71.5	4.25	108.0	1.38	34.9	2.19	55.6	2.63	66.7	0.50	12.7	3.50	88.9	2.25	57.2	1.25	31.8	4.20	1.9
1.5-in.	1.5GR	2.69	68.2	5.00	127.0	4.50	114.3	6.50	165.1	2.00	50.8	3.25	82.6	4.00	101.6	0.63	15.9	5.00	127.0	3.13	79.4	1.63	41.3	9.90	4.5
2-in.	2GR	3.20	81.3	5.75	146.1	5.50	139.7	7.50	190.5	2.00	50.8	3.52	89.4	4.50	114.3	0.75	19.1	5.25	133.4	3.38	85.7	1.81	46.1	13.20	6.0
3-in.	3GR	4.38	111.1	7.50	190.5	6.88	174.6	9.25	235.0	2.38	60.3	4.60	116.8	5.25	133.4	0.75	19.1	6.50	165.1	3.38	85.7	1.81	46.1	23.60	10.7
4-in.	4GR	5.38	136.5	8.50	215.9	8.25	209.6	10.50	266.7	2.38	60.3	5.40	137.2	6.00	152.4	0.88	22.2	7.50	190.5	4.00	101.6	2.06	52.4	28.70	13.0
5-in.	5GR, E	6.88	174.6	10.25	260.4	9.88	250.8	12.38	314.3	3.13	79.4	6.13	155.6	7.25	184.2	1.00	25.4	8.25	209.6	4.50	114.3	2.31	58.8	41.00	18.6
6-in.	6GR, F, XF	8.38	212.7	12.63	320.7	12.00	304.8	15.25	387.4	3.75	95.3	6.88	174.6	8.75	222.3	1.13	28.6	10.63	269.9	5.25	133.4	2.44	61.9	70.30	31.9
8-in.	8GR, X8GR	10.63	269.9	15.25	387.4	14.50	368.3	18.50	469.9	3.75	95.3	7.88	200.0	9.88	250.8	1.25	31.8	12.00	304.8	5.75	146.1	2.88	73.0	110.20	50.0
HEAVY DUTY																									
		INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG
H2-in.	B	4.13	104.8	7.25	184.2	6.88	174.6	9.00	228.6	2.88	73.0	4.88	123.8	5.63	142.9	0.88	22.2	7.50	190.5	3.75	95.3	2.00	50.8	24.30	11.0
H3-in.	C	4.88	123.8	8.00	203.2	7.75	196.9	10.00	254.0	3.00	76.2	5.43	137.9	6.13	155.6	0.88	22.2	7.50	190.5	4.00	101.6	2.06	52.4	33.10	15.0
H4-in.	D	6.13	155.6	9.56	242.9	9.00	228.6	11.75	298.5	3.00	76.2	5.75	146.1	7.00	177.8	1.00	25.4	8.25	209.6	4.38	111.1	2.31	58.8	39.90	18.1
H8-in.	G, XG	10.13	257.2	16.00	406.4	14.75	374.7	18.63	473.1	4.50	114.3	7.75	196.9	10.75	273.1	1.38	34.9	12.00	304.8	5.88	149.2	3.13	79.4	138.00	62.6
H10-in.	10H, X10H	12.25	311.2	18.25	463.6	17.63	447.7	22.50	571.5	5.50	139.7	10.50	266.7	12.75	323.9	1.63	41.3	15.63	396.9	7.25	184.2	3.63	92.1	242.50	110.0
H12-in.	12M, X12M	14.63	371.5	21.00	533.4	20.38	517.5	25.00	635.0	5.75	146.1	11.25	285.8	14.25	362.0	1.75	44.5	17.00	431.8	7.50	190.5	3.75	95.3	319.70	145.0
H14-in.	P, 5P, R	17.13	435.0	24.75	628.7	23.00	584.2	29.25	743.0	6.13	155.6	11.25	285.8	16.25	412.8	1.88	47.6	17.25	438.2	8.25	209.6	4.25	108.0	429.90	195.0
H16-in.	S	19.69	500.1	29.25	743.0	27.19	690.6	34.25	870.0	7.63	193.7	13.50	342.9	19.13	485.8	2.25	57.2	22.00	558.8	9.63	244.5	5.00	127.0	683.40	310.0
H18-in.	T	20.69	525.5	29.25	743.0	27.69	703.3	34.25	870.0	7.63	193.7	14.00	355.6	19.63	498.5	2.25	57.2	22.00	558.8	9.63	244.5	5.00	127.0	650.40	295.0
H20-in.	U	23.69	601.7	32.00	812.8	30.38	771.5	37.63	955.7	7.50	190.5	18.00	457.2	21.50	546.1	2.25	57.2	26.00	660.4	10.00	254.0	5.00	127.0	859.80	390.0
H22-in.	V, 3V, 5V	24.69	627.1	32.00	812.8	32.25	819.2	37.63	955.7	7.50	190.5	18.00	457.2	21.50	546.1	2.25	57.2	26.00	660.4	10.00	254.0	5.00	127.0	815.70	370.0
H24-in.	W, 3W	28.19	716.0	36.00	914.4	36.13	917.6	40.50	1028.7	7.00	177.8	19.40	492.8	23.75	603.3	2.25	57.2	27.00	685.8	10.50	266.7	5.00	127.0	1047.20	475.0
H26-in.	Y, 3Y	29.94	760.4	38.75	984.3	37.85	961.4	46.50	1181.1	8.00	203.2	19.60	497.8	27.00	685.8	2.50	63.5	28.00	711.2	10.50	266.7	5.50	139.7	1155.20	524.0
LIGHT DUTY																									
		INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG
L14-in.	X14GR	16.38	415.9	22.25	565.2	21.50	546.1	26.00	660.4	5.00	127.0	10.88	276.2	14.75	374.7	1.63	41.3	17.00	431.8	7.38	187.5	3.63	92.1	275.6	125.0
L16-in.	X16GR	18.63	473.1	24.00	609.6	23.50	596.9	27.75	704.9	5.00	127.0	13.00	330.2	16.25	412.8	1.75	44.5	19.50	495.3	7.63	193.8	3.88	98.4	308.6	140.0
L18-in.	X18GR	20.88	530.2	25.75	654.1	26.00	660.4	29.50	749.3	5.00	127.0	14.38	365.1	17.50	444.5	1.88	47.6	21.50	546.1	8.00	203.2	4.13	104.8	352.7	160.0
L20-in.	X20GR	23.63	600.1	28.31	719.2	29.38	746.1	32.25	819.2	5.00	127.0	17.13	435.0	19.50	495.3	2.00	50.8	24.75	628.7	8.50	215.9	4.38	111.1	418.9	190.0
L24-in.	X24GR	28.31	719.2	34.25	870.0	34.75	882.7	38.88	987.4	6.25	158.8	18.38	466.7	22.50	571.5	2.25	57.2	27.00	685.8	9.50	241.3	5.00	127.0	661.4	300.0

CofferLok Seal Rings

SEAL RING SIZE	A		B		C		D		SEAL RING WEIGHT	
	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG
4	1.000	25.4	0.500	12.7	0.125	3.2	0.375	9.5	0.03	0.01
5	1.094	27.8	0.625	15.9	0.125	3.2	0.375	9.5	0.03	0.01
7	1.375	34.9	0.906	23.0	0.125	3.2	0.375	9.5	0.04	0.02
8	1.625	41.3	1.000	25.4	0.125	3.2	0.375	9.5	0.04	0.02
11	1.750	44.5	1.125	28.6	0.125	3.2	0.375	9.5	0.06	0.03
13	2.375	60.3	1.500	38.1	0.125	3.2	0.375	9.5	0.11	0.05
14	2.625	66.7	1.609	40.9	0.250	6.4	0.563	14.3	0.28	0.13
16	2.750	69.9	1.868	47.4	0.250	6.4	0.625	15.9	0.28	0.13
20	3.250	82.6	2.063	52.4	0.250	6.4	0.750	19.1	0.45	0.2
23	3.500	88.9	2.375	60.3	0.250	6.4	0.750	19.1	0.48	0.22
25	4.000	102.0	2.672	67.9	0.250	6.4	0.750	19.1	0.62	0.28
27	4.250	108.0	3.063	77.8	0.250	6.4	0.750	19.1	0.62	0.28
31	4.500	114.0	3.250	82.6	0.250	6.4	0.750	19.1	0.69	0.31
34	5.000	127.0	3.688	93.7	0.250	6.4	0.750	19.1	0.80	0.36
40	5.500	140.0	4.063	103.0	0.250	6.4	1.000	25.4	1.13	0.51
42	6.375	162.0	4.188	106.0	0.250	6.4	1.000	25.4	1.68	0.76
46	6.250	159.0	4.750	121.0	0.250	6.4	1.000	25.4	1.34	0.61
52	6.625	168.0	5.313	135.0	0.250	6.4	1.000	25.4	1.33	0.6
54	6.812	173.0	5.500	140.0	0.250	6.4	1.000	25.4	1.57	0.71
56	7.500	191.0	5.750	146.0	0.250	6.4	1.000	25.4	1.82	0.83
62	7.875	200.0	6.065	154.0	0.375	9.5	1.375	34.9	3.13	1.42
64	8.625	219.0	6.500	165.0	0.375	9.5	1.375	34.9	3.80	1.72
67	8.750	222.0	6.875	175.0	0.375	9.5	1.375	34.9	3.61	1.64
72	9.500	241.0	7.250	184.0	0.375	9.5	1.375	34.9	4.40	2.00
76	10.000	254.0	7.750	197.0	0.375	9.5	1.375	34.9	4.67	2.12
82	10.125	257.0	8.250	210.0	0.375	9.5	1.375	34.9	4.26	1.93
84	11.125	283.0	8.500	216.0	0.375	9.5	1.375	34.9	5.79	2.63
87	11.375	289.0	8.875	225.0	0.375	9.5	1.375	34.9	5.77	2.62
91	11.500	292.0	9.125	232.0	0.375	9.5	1.375	34.9	5.66	2.57
92	11.625	295.0	9.250	235.0	0.375	9.5	1.375	34.9	5.78	2.62
94	11.750	298.0	9.500	241.0	0.375	9.5	1.375	34.9	5.61	2.54
97	12.000	305.0	9.875	251.0	0.375	9.5	1.375	34.9	5.55	2.52
102	12.250	311.0	10.250	260.0	0.375	9.5	1.375	34.9	5.48	2.49
106	12.750	324.0	10.750	273.0	0.375	9.5	1.375	34.9	5.72	2.59
112	14.125	359.0	11.250	286.0	0.625	15.9	1.625	41.3	12.33	5.59
116	14.125	359.0	11.750	298.0	0.375	9.5	1.375	34.9	7.21	3.27
120	13.875	352.0	12.000	305.0	0.375	9.5	1.375	34.9	6.04	2.74
122	14.125	359.0	12.250	311.0	0.375	9.5	1.375	34.9	6.16	2.79
124	14.625	371.0	12.500	318.0	0.375	9.5	1.375	34.9	7.10	3.22
130	15.000	381.0	13.000	330.0	0.500	12.7	1.500	38.1	8.47	3.84
134	15.500	394.0	13.500	343.0	0.500	12.7	1.500	38.1	8.78	3.98
137	16.500	419.0	13.875	352.0	0.625	15.9	1.625	41.3	13.70	6.21
140	16.500	419.0	14.000	356.0	0.500	12.7	1.500	38.1	10.98	4.98
144	17.000	432.0	14.500	368.0	0.500	12.7	1.500	38.1	11.35	5.15
152	17.750	451.0	15.250	387.0	0.500	12.7	1.500	38.1	11.89	5.39
160	18.500	470.0	16.000	406.0	0.500	12.7	1.500	38.1	12.44	5.64
170	19.438	494.0	17.000	432.0	0.500	12.7	1.750	44.5	13.84	6.28
180	20.500	521.0	18.000	457.0	0.500	12.7	1.750	44.5	14.61	6.63
185	21.250	540.0	18.625	473.0	0.500	12.7	1.750	44.5	16.37	7.43
192	22.000	559.0	19.250	489.0	0.500	12.7	1.750	44.5	17.16	7.78
200	22.750	578.0	20.000	508.0	0.500	12.7	1.750	44.5	17.80	8.07
210	24.000	610.0	21.000	533.0	0.500	12.7	2.000	50.8	21.36	9.69
220	25.000	635.0	22.000	559.0	0.500	12.7	2.000	50.8	22.32	10.12
225	25.750	654.0	22.625	575.0	0.500	12.7	2.000	50.8	24.19	10.97
232	26.375	670.0	23.250	591.0	0.500	12.7	2.000	50.8	24.29	11.02
240	27.500	699.0	24.000	610.0	0.500	12.7	2.000	50.8	27.42	12.44
244	27.750	705.0	24.500	622.0	0.500	12.7	2.000	50.8	26.34	11.95
254	28.875	733.0	25.500	648.0	0.500	12.7	2.000	50.8	28.20	12.79
264	30.000	762.0	26.500	673.0	0.500	12.7	2.000	50.8	30.12	13.66
274	31.125	791.0	27.500	699.0	0.500	12.7	2.000	50.8	32.31	14.66
284	32.250	819.0	28.500	724.0	0.500	12.7	2.000	50.8	34.36	15.59
292	32.250	819.0	29.250	743.0	0.5	12.7	2.000	50.8	29.30	13.29



CofferLok seal rings are available in a number of carefully selected materials and are coated to provide lubrication during makeup. Seal rings are typically made of 4140 or 17-4PH material and come with PTFE or MoS2 coating, but can be manufactured of other materials or coatings to meet specific service conditions.

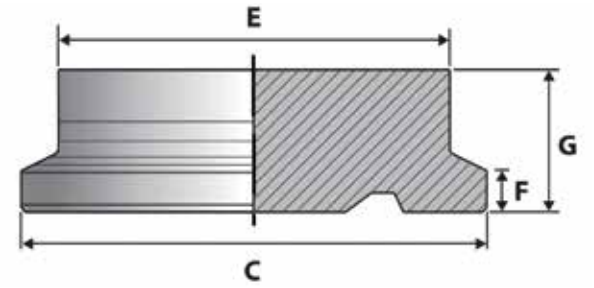
The *CofferLok* seal ring is a reusable solid metal double cone-shaped ring, designed for an interference load when installed in mating hubs or flanges.

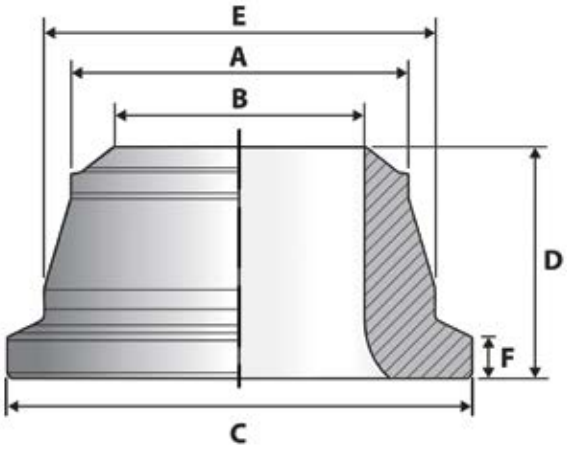
High loading combined with the strength of the seal material provides considerable stored energy in the seal. Since the seal is exposed to line pressure, the additional benefit of a pressure enhanced seal is obtained. The *CofferLok* seal ring will provide leak tight service in dynamic systems of vibration or thermal cycling where normal seals are inadequate.

Transition seal rings, Orifice seal rings and Blind seal rings are also available.

Seal Ring materials include: AISI 4130/4140, A182 F316, A182 F44, A564 630 (17-4PH), A182 F51, A182 F55, Alloy 718, 625 and X 750.

CofferLok Hubs - Standard





PIPE SIZE PIPE O.D. (A)	(DN)	PIPE SCHEDULE	COFFERLOK HUB DESIGNATION	B		C		D		E		F		G		BW HUB WEIGHT		BLIND HUB WEIGHT	
INS	(MM)			INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG	LBS	KG
1/2"	(DN 15)	40	1-in. 5	0.622	15.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.6	0.3	0.8	0.4
0.84	21.3	80	1-in. 5	0.546	13.9	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.6	0.3	0.8	0.4
		160	1-in. 4	0.466	11.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.6	0.3	0.8	0.4
		XXS	1-in. 4	0.252	6.4	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.7	0.3	0.8	0.4
3/4"	(DN 20)	40	1-in. 7	0.824	20.9	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.5	0.2	0.8	0.4
1.05	26.7	80	1-in. 7	0.742	18.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.6	0.3	0.8	0.4
		160	1-in. 5	0.614	15.6	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.7	0.3	0.8	0.4
		XXS	1-in. 4	0.434	11.0	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.7	0.3	0.8	0.4
1"	(DN 25)	40	1-in. 11	1.049	26.6	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.5	0.2	0.8	0.4
1.315	33.4	80	1-in. 11	0.957	24.3	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.5	0.2	0.8	0.4
		160	1-in. 7	0.815	20.7	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.6	0.3	0.8	0.4
		XXS	1-in. 5	0.599	15.2	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	1.313	33.4	0.7	0.3	0.8	0.4
1-1/2"	(DN 40)	40	1.5-in. 14	1.610	40.9	3.125	79.4	2.375	60.3	2.375	60.3	0.437	11.1	1.625	41.3	1.6	0.7	2.5	1.1
1.9	48.3	80	1.5-in. 13	1.500	38.1	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	1.625	41.3	1.9	0.8	2.6	1.2
		160	1.5-in. 13	1.338	34.0	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	1.625	41.3	2.0	0.9	2.6	1.2
		XXS	1.5-in. 11	1.100	27.9	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	1.625	41.3	2.4	1.1	2.6	1.2
2"	(DN 50)	40	2-in. 20	2.067	52.5	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	1.750	44.5	2.2	1.0	3.7	1.7
2.375	60.3	80	2-in. 20	1.939	49.3	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	1.750	44.5	2.5	1.1	3.7	1.7
		160	2-in. 16	1.689	42.9	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	1.750	44.5	3.0	1.4	3.8	1.7
		XXS	2-in. 14	1.503	38.2	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	1.750	44.5	3.4	1.5	3.8	1.7
3"	(DN 75)	40	3-in. 27	3.068	77.9	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	1.875	47.6	4.7	2.1	7.8	3.5
3.5	88.9	80	3-in. 27	2.900	73.7	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	1.875	47.6	5.2	2.4	7.8	3.5
		160	3-in. 25	2.624	66.6	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	1.875	47.6	6.3	2.9	7.8	3.5
		XXS	3-in. 23	2.300	58.4	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	1.875	47.6	7.4	3.3	7.8	3.6
4"	(DN 100)	40	4-in. 40	4.026	102.3	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	2.125	54.0	6.7	3.1	13.1	5.9
4.5	114.3	80	4-in. 40	3.826	97.2	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	2.125	54.0	7.7	3.5	13.1	5.9
		120	4-in. 34	3.624	92.0	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	2.125	54.0	9.2	4.2	13.2	6.0
		160	4-in. 34	3.438	87.3	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	2.125	54.0	10.0	4.5	13.2	6.0
		XXS	4-in. 31	3.152	80.1	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	2.125	54.0	11.5	5.2	13.2	6.0
5"	(DN 125)	40	5-in. 52	5.047	128.2	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	2.750	69.9	13.3	6.0	27.8	12.6
5.563	141.3	80	5-in. 52	4.813	122.3	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	2.750	69.9	14.8	6.7	27.8	12.6
		120	5-in. 46	4.563	115.9	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	2.750	69.9	17.8	8.1	27.8	12.6
		160	5-in. 46	4.313	109.6	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	2.750	69.9	19.2	8.7	27.8	12.6
		XXS	5-in. 40	4.063	103.2	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	2.750	69.9	21.9	9.9	27.9	12.6
6"	(DN 150)	40	6-in. 62	6.065	154.1	9.250	235.0	4.625	117.5	7.750	196.9	0.750	19.1	2.875	73.0	20.4	9.2	43.0	19.5
6.625	168.3	80	6-in. 56	5.761	146.3	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	2.875	73.0	24.9	11.3	43.6	19.8
		120	6-in. 54	5.501	139.7	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	2.875	73.0	27.7	12.6	43.6	19.8
		160	6-in. 52	5.189	131.8	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	2.875	73.0	30.7	13.9	43.6	19.8
		XXS	6-in. 52	4.897	124.4	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	2.875	73.0	32.7	14.8	43.6	19.8
8"	(DN 200)	40	8-in. 82	7.981	202.7	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	33.0	15.0	76.7	34.8
8.625	219.1	80	8-in. 76	7.625	193.7	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	40.3	18.3	76.7	34.8
		100	8-in. 76	7.439	189.0	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	42.4	19.2	76.7	34.8
		120	8-in. 72	7.189	182.6	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	47.8	21.7	76.7	34.8
		140	8-in. 72	7.001	177.8	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	49.9	22.6	76.7	34.8
		XXS	8-in. 67	6.875	174.6	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	52.9	24.0	76.8	34.8
		160	8-in. 67	6.813	173.1	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	3.188	81.0	53.6	24.3	76.8	34.8

CofferLok Hubs - Heavy Duty

PIPE SIZE PIPE O.D. (A)	(DN)	PIPE SCHEDULE	COFFERLOK HUB DESIGNATION	B		C		D		E		F		G		BW HUB WEIGHT		BLIND HUB WEIGHT	
INS	(MM)			INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	LBS	KG	LBS	KG
2"	(DN 50)	40	H2-in. 20	2.067	52.5	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	1.875	47.6	6.2	2.8	7.2	3.3
2.375	60.3	80	H2-in. 20	1.939	49.3	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	1.875	47.6	6.5	2.9	7.2	3.3
		160	H2-in. 16	1.689	42.9	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	1.875	47.6	7.1	3.2	7.2	3.3
		XXS	H2-in. 14	1.503	38.2	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	1.875	47.6	7.5	3.4	7.2	3.3
3"	(DN 75)	40	H3-in. 27	3.068	77.9	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	2.125	54.0	7.3	3.3	11.1	5.0
3.5	88.9	80	H3-in. 27	2.900	73.7	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	2.125	54.0	8.0	3.6	11.1	5.0
		160	H3-in. 25	2.624	66.6	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	2.125	54.0	9.2	4.2	11.1	5.0
		XXS	H3-in. 23	2.300	58.4	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	2.125	54.0	10.3	4.7	11.1	5.1
4"	(DN 100)	40	H4-in. 40	4.026	102.3	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	2.750	69.9	11.9	5.4	22.0	10.0
4.5	114.3	80	H4-in. 40	3.826	97.2	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	2.750	69.9	13.0	5.9	22.0	10.0
		120	H4-in. 34	3.624	92.0	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	2.750	69.9	14.6	6.6	22.2	10.1
		160	H4-in. 34	3.438	87.3	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	2.750	69.9	15.5	7.0	22.2	10.1
		XXS	H4-in. 31	3.152	80.1	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	2.750	69.9	17.2	7.8	22.2	10.1
6"	(DN 150)	80	H8-in. 56	5.761	146.3	11.500	292.1	5.000	127.0	9.500	241.3	1.063	27.0	3.188	81.0	64.5	29.3	75.7	34.3
6.625	168.3	120	H8-in. 54	5.501	139.7	11.500	292.1	5.000	127.0	9.500	241.3	1.063	27.0	3.188	81.0	67.1	30.4	75.7	34.3
		160	H8-in. 52	5.189	131.8	11.500	292.1	5.000	127.0	9.500	241.3	1.063	27.0	3.188	81.0	69.6	31.6	75.7	34.3
		XXS	H8-in. 52	4.897	124.4	11.500	292.1	5.000	127.0	9.500	241.3	1.063	27.0	3.188	81.0	71.1	32.3	75.7	34.3
8"	(DN 200)	40	H8-in. 82	7.981	202.7	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	31.6	14.3	74.6	33.8
8.625	219.1	80	H8-in. 76	7.625	193.7	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	38.3	17.4	74.6	33.9
		100	H8-in. 76	7.439	189.0	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	40.3	18.3	74.6	33.9
		120	H8-in. 72	7.189	182.6	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	45.4	20.6	74.7	33.9
		140	H8-in. 72	7.001	177.8	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	47.2	21.4	74.7	33.9
		XXS	H8-in. 67	6.875	174.6	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	50.1	22.7	74.7	33.9
		160	H8-in. 67	6.813	173.1	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	3.188	81.0	50.7	23.0	74.7	33.9
10"	(DN 250)	40	H10-in. 102	10.020	254.5	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	49.9	22.6	120.7	54.8
10.75	273.1	80	H10-in. 97	9.750	247.7	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	57.5	26.1	120.8	54.8
		80	H10-in. 97	9.564	242.9	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	60.7	27.6	120.8	54.8
		100	H10-in. 94	9.314	236.6	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	67.6	30.7	120.8	54.8
		120	H10-in. 91	9.064	230.2	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	74.0	33.6	120.8	54.8
		XXS 140	H10-in. 87	8.750	222.3	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	80.5	36.5	120.8	54.8
		160	H10-in. 84	8.500	215.9	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	3.500	88.9	86.2	39.1	120.9	54.8
12"	(DN 300)	40	H12-in. 120	12.000	304.8	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	77.1	35.0	194.5	88.2
12.75	323.9	40	H12-in. 120	11.938	303.2	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	78.8	35.8	194.5	88.2
		XS	H12-in. 116	11.750	298.5	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	85.4	38.7	194.5	88.2
		80	H12-in. 116	11.376	289.0	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	94.4	42.8	194.5	88.2
		100	H12-in. 112	11.064	281.0	16.000	406.4	6.625	168.3	14.000	355.6	1.250	31.8	4.000	101.6	104.3	47.3	192.9	87.5
		XXS 120	H12-in. 106	10.750	273.1	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	112.9	51.2	194.6	88.3
		140	H12-in. 106	10.500	266.7	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	118.3	53.7	194.6	88.3
		160	H12-in. 102	10.126	257.2	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	4.000	101.6	129.3	58.7	194.6	88.3
14"	(DN 350)	40	H14-in. 134	13.124	333.3	18.500	469.9	7.250	184.2	16.500	419.1	1.187	30.1	4.500	114.3	124.7	56.6	293.0	132.9
14	355.6	XS	H14-in. 130	13.000	330.2	18.500	469.9	7.250	184.2	16.500	419.1	1.187	30.1	4.500	114.3	133.2	60.4	293.1	132.9
		80	H14-in. 124	12.500	317.5	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	4.500	114.3	153.3	69.5	294.1	133.4
		100	H14-in. 124	12.124	307.9	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	4.500	114.3	163.8	74.3	294.1	133.4
		120	H14-in. 120	11.814	300.1	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	4.500	114.3	177.3	80.4	294.2	133.4
		140	H14-in. 116	11.500	292.1	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	4.500	114.3	187.2	84.9	294.2	133.4
		160	H14-in. 112	11.188	284.2	18.500	469.9	7.250	184.2	16.500	419.1	1.125	28.6	4.500	114.3	197.0	89.4	292.3	132.6
16"	(DN 400)	40	H16-in. 152	15.000	381.0	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	194.8	88.4	433.8	196.8
16	406.4	60	H16-in. 152	14.688	373.1	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	206.3	93.6	433.8	196.8
		80	H16-in. 144	14.314	363.6	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	229.1	103.9	433.9	196.8
		100	H16-in. 140	13.938	354.0	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	247.5	112.3	434.0	196.8
		120	H16-in. 137	13.564	344.5	21.000	533.4	7.875	200.0	19.000	482.6	1.625	41.3	5.000	127.0	260.5	118.2	432.8	196.3
		140	H16-in. 134	13.124	333.3	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	279.4	126.8	434.0	196.9
		160	H16-in. 130	12.812	325.4	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	5.000	127.0	293.9	133.3	434.1	196.9
18"	(DN 450)	40	H18-in. 170	16.876	428.7	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	176.0	79.8	477.8	216.7
18	457.2	60	H18-in. 170	16.500	419.1	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	191.7	86.9	477.8	216.7
		80	H18-in. 160	16.126	409.6	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	219.8	99.7	478.8	217.2
		100	H18-in. 160	15.688	398.5	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	238.1	108.0	478.8	217.2
		120	H18-in. 152	15.250	387.4	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	262.8	119.2	478.9	217.2
		140	H18-in. 152	14.876	377.9	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	276.4	125.4	478.9	217.2
		160	H18-in. 144	14.438	366.7	22.000	558.8	7.875	200.0	20.000	508.0	1.688	42.9	5.000	127.0	299.2	135.7	479.0	217.3
20"	(DN 500)	40	H20-in. 192	18.814	477.9	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	262.7	119.2	683.4	310.0
20	508	60	H20-in. 185	18.376	466.8	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	295.1	133.9	683.5	310.0
		80	H20-in. 180	17.938	455.6	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	327.6	148.6	683.6	310.1
		100	H20-in. 180	17.438	442.9	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	351.9	159.6	683.6	310.1
		120	H20-in. 170	17.000	431.8	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	386.5	175.3	683.7	310.1
		140	H20-in. 170	16.500	419.1	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	408.7	185.4	683.7	310.1
		160	H20-in. 160	16.064	408.0	25.000	635.0	8.750	222.3	23.000	584.2	1.625	41.3	5.500	139.7	440.3	199.7	684.8	310.6
22"	(DN 550)	40	H22-in. 210	20.750	527.1	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	219.8	99.7	732.6	332.3
22	558.8	60	H22-in. 210	20.250	514.4	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	247.0	112.0	732.6	332.3
		80	H22-in. 200	19.750	501.7	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	295.2	133.9	734.1	333.0
		100	H22-in. 192	19.250	489.0	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	333.3	151.2	734.2	333.0
		120	H22-in. 192	18.750	476.3	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	358.9	162.8	734.2	333.0
		140	H22-in. 185	18.250	463.6	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	391.8	177.7	734.3	333.1
		160	H22-in. 180	17.750	450.9	26.000	660.4	8.750	222.3	24.000	609.6	1.250	31.8	5.500	139.7	424.8	192.7	734.4	333.1
24"	(DN 600)	40	H24-in. 225	22.625	574.7	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	360.3	163.4	1041.2	472.3
24	609.6	60	H24-in. 220	22.064	560.4	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	409.6	185.8	1041.4	472.4
		80	H24-in. 220	21.564	547.7	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	441.6	200.3	1041.4	472.4
		100	H24-in. 210	20.938	531.8	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	496.8	225.4	1041.6	472.5
		120	H24-in. 210	20.376	517.6	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	527.4	239.2	1041.6	472.5
		140	H24-in. 200	19.876	504.9	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	573.0	259.9	1043.1	473.1
		160	H24-in. 200	19.314	490.6	29.500	749.3	9.000	228.6	27.500	698.5	1.250	31.8	6.000	152.4	600.1	272.2	1043.1	473.1
26"	(DN 650)	Std	H26-in. 254	25.250	641.4	31.250	793.8	10.000	254.0	29.250	743.0	1.625	41.3	6.500	165.1	360.8	163.7	1280.6	580.9
26	660.4	XS	H26-in. 254	25.000	635.0	31.250	793.8	10.000	254.0	29.250	743.0	1.625	41.3	6.500	165.1	382.2	173.3	1280.6	580.9

CofferLok Clamp Connector Ratings for Carbon Steel - Standard

Conversion Factor

Multiply the base capacity of the A105 material by the factor below indicated to obtain the capacity of the ***Cofferlok*** Clamp Connector in different material grades.

Example: 2-in.20 in A105 has a max pressure rating of 6,150 psi at 100°F

Multiply 6,150 x .85 = 5,227.5 to get the max pressure rating for a 2-in.20 in A182 316 material at 100°F

(°F)	MATERIAL A182 F316
100°F	0.85
200°F	0.93
300°F	0.92
400°F	0.90
500°F	0.89
600°F	0.87

(°F)	MATERIAL A182 F51
100°F	1.27
200°F	1.24
300°F	1.19
400°F	1.15
500°F	1.12
600°F	1.09

(°F)	MATERIAL A182 F55
100°F	1.57
200°F	1.53
300°F	1.51
400°F	1.48
500°F	1.40
600°F	1.36

Note: Guide only, please confirm with Ameriforge

REFERENCE FOR HUB MATERIAL			A 105					
REFERENCE FOR CLAMP MATERIAL			AISI 4140					
NPS	*COFFERLOK*	PIPE SCHEDULE	PRESSURE RATINGS (PSI)					
			100°F	200°F	300°F	400°F	500°F	600°F
1”	1-in.11	40/80	4,250	4,032	3,916	3,814	3,626	3,379
	1-in. 7	160	8,615	8,035	7,861	7,614	7,281	6,744
	1-in. 5	XXS	14,228	12,502	12,285	11,908	11,356	10,501
1-1/2”	1.5-in. 14	40	7,629	6,817	6,672	6,483	6,164	5,714
	1.5-in. 11	XXS	12,807	12,198	11,893	11,545	10,921	10,167
2”	2-in. 20	40/80	6,150	5,831	5,700	5,540	5,265	4,859
	2-in. 16	160	8,369	7,876	7,731	7,498	7,107	6,643
	2-in. 14	XXS	11,676	10,602	10,370	10,066	9,558	8,847
3”	3-in. 27	40/80	4,801	4,293	4,177	4,047	3,873	3,582
	3-in. 25	160	8,195	7,426	7,266	7,034	6,701	6,237
	3-in. 23	XXS	11,705	10,225	10,022	9,660	9,195	8,572
4	4-in. 40	40/80	3,147	2,799	2,741	2,654	2,524	2,335
	4-in. 34	120/160	5,497	5,134	5,033	4,844	4,598	4,293
	4-in. 31	XXS	9,326	8,122	7,890	7,687	7,310	6,759
	4-in. 27		10,486	9,485	9,311	8,963	8,572	7,934
5”	5-in. 52	40/80	3,191	2,959	2,886	2,799	2,640	2,480
	5-in. 46	120/160	6,222	5,627	5,526	5,337	5,047	4,714
	5-in. 40	XXS	9,979	9,253	9,050	8,746	8,311	7,731
6”	6-in. 62	40	3,640	3,452	3,379	3,278	3,089	2,886
	6-in. 52	160	7,948	7,150	6,976	6,744	6,454	5,990
	6-in. 46	XXS	10,544	9,761	9,572	9,297	8,847	8,180
	6-in. 40		13,619	11,908	11,661	11,226	10,675	9,935
8”	8-in. 82	40	2,741	2,466	2,393	2,335	2,205	2,045
	8-in. 76	80	4,221	3,713	3,655	3,539	3,350	3,133
	8-in. 72	140	6,092	5,366	5,192	5,062	4,772	4,467
10”	H10-in. 94	100	5,236	4,699	4,206	3,945	3,640	3,466
	H10-in. 87	140	6,280	5,831	5,453	5,091	4,801	4,612
	H10-in. 84	160	6,614	6,063	5,889	5,743	5,468	5,062
12”	H12-in. 120	40	3,176	2,901	2,741	2,466	2,234	2,089
	H12-in. 112	100	4,119	3,974	3,756	3,568	3,365	3,075
	H12-in. 102	160	7,266	6,556	6,150	5,918	5,642	5,236
14”	L14-in.130	XS	2,712	2,640	2,524	2,495	2,292	2,147
	L14-in.120	120	4,801	3,945	4,366	4,250	3,989	3,713
	L14-in.112	160	5,366	5,004	4,946	4,844	4,743	4,554
16	L16-in.152	40	2,480	2,219	2,118	2,016	1,914	1,856
	L16-in.140	100	3,989	3,684	3,611	3,510	3,379	3,133
	L16-in.137	120	4,192	3,756	3,655	3,553	3,437	3,176
	L16-in.130	160	4,627	4,235	4,119	4,032	3,843	3,582
18”	L18-in.170	40	2,466	2,379	2,292	2,234	2,132	2,002
	L18-in.160	80/100	3,191	2,944	2,872	2,799	2,756	2,741
	L18-in.152	120/140	3,394	3,191	3,162	3,104	3,060	3,002
20”	L20-in.192	40	2,640	2,538	2,451	2,408	2,248	2,132
	L20-in.180	80/100	3,278	2,886	2,872	2,799	2,640	2,466
	L20-in.170	120/140	3,582	3,162	3,075	3,031	2,915	2,799
24”	L24-in.220	60/80	2,698	2,611	2,567	2,524	2,480	2,495
	L24-in.210	100/120	3,147	2,901	2,872	2,843	2,828	2,785

CofferLok Clamp Connector

Ratings for Carbon Steel - Heavy Duty

REFERENCE FOR HUB MATERIAL			A 105					
REFERENCE FOR CLAMP MATERIAL			AISI 4140					
NPS	COFFERLOK	PIPE SCHEDULE	PRESSURE RATINGS (PSI)					
			100°F	200°F	300°F	400°F	500°F	600°F
2”	H2-in. 20	40/80	11,661	11,081	10,791	10,443	9,964	9,282
	H2-in. 16	160	14,228	12,009	11,705	11,371	10,776	10,095
	H2-in. 14	XXS	13,851	13,155	12,923	12,430	11,864	11,052
3”	H3-in. 25	160	11,618	10,312	10,051	9,761	9,282	8,630
	H3-in. 23	XXS	13,213	11,603	11,284	10,994	10,457	9,703
	H3-in. 20		13,503	12,836	12,444	12,125	11,472	10,675
4”	H4-in. 34	160	9,689	8,833	8,630	8,340	7,963	7,382
	H4-in. 31	XXS	12,227	10,994	10,718	10,428	9,863	9,152
	H4-in. 27		12,343	11,632	11,342	10,965	10,428	9,689
6”	6-in. 56	80/120	10,153	9,007	8,383	7,745	7,353	6,933
	6-in .46	XXS	14,808	13,126	12,299	11,835	10,689	10,269
	6-in. 40		19,986	17,869	17,042	16,520	15,388	14,721
8”	8-in. 72	120/140	4,844	4,496	4,395	4,279	4,047	3,756
	8-in. 67	XXS	6,730	5,845	5,714	5,555	5,279	4,917
	8-in. 64		7,571	7,092	6,991	6,715	6,396	5,932
	8-in. 62		9,819	8,702	8,499	8,224	8,557	7,310
10”	H10-in. 97	80	2,683	2,480	2,422	2,350	2,234	2,074
	H10-in. 94	120/100	3,597	3,278	3,205	3,118	2,944	2,756
	H10-in. 87	XXS	5,091	4,859	4,757	4,627	4,366	4,090
	H10-in. 84	160	6,556	5,932	5,816	5,656	5,381	4,989
	H10-in. 82		7,208	6,614	6,469	6,280	5,976	5,540
12”	H12-in. 120	40	2,524	2,335	2,292	2,234	2,118	1,973
	H12-in. 112	100	4,264	3,727	3,611	3,539	3,350	3,118
	H12-in. 106	XXS	5,236	4,844	4,714	4,569	4,351	4,047
	H12-in. 102		6,744	6,048	5,889	5,700	5,410	5,033
14”	H14-in. 130	XS	4,409	3,916	3,829	3,742	3,553	3,307
	H14-in. 120	120	6,686	6,034	5,918	5,685	5,410	5,047
	H14-in. 112	160	8,079	7,542	7,353	7,078	6,759	6,309
	H14-in. 106		9,094	8,543	8,354	8,151	7,702	7,179
16”	H16-in. 152	40	4,395	3,931	3,814	3,713	3,524	3,292
	H16-in. 140	100	6,411	6,034	5,932	5,743	5,453	5,033
	H16-in. 137	120	6,962	6,251	6,121	5,947	5,613	5,250
	H16-in. 134	140	7,440	6,918	6,686	6,498	6,179	5,743
	H16-in. 130	130	8,543	7,745	7,556	7,368	7,005	6,483
	H16-in. 120		10,921	9,761	9,514	9,239	8,731	8,093
18”	H20-in. 170	40	5,091	4,424	4,264	4,061	3,829	3,640
	H20-in. 160	80	5,540	5,076	4,815	4,554	4,322	4,119
	H20-in. 152	120	6,280	5,511	5,236	4,975	4,612	4,395
20”	H22-in. 192	40	3,858	3,394	3,263	3,176	2,973	2,727
	H22-in. 180	80/100	4,975	4,467	4,366	4,221	4,003	3,713
	H22-in. 170	120/140	5,395	4,815	4,598	4,351	4,119	3,858
	H22-in. 160	160	6,019	5,410	5,105	4,902	4,656	4,395
24”	H26-in. 220	60/80	5,903	5,105	4,960	4,801	4,569	4,177
	H26-in. 210	100/120	6,875	6,324	6,208	6,005	5,613	5,163
	H26-in. 200	140/160	8,079	7,672	7,455	7,179	6,744	6,222
	H26-in. 192		8,615	7,832	7,556	7,368	7,136	6,440

CofferLok™ Clamp Connector Interchangeability

Fully interchangeable with *Grayloc® connectors

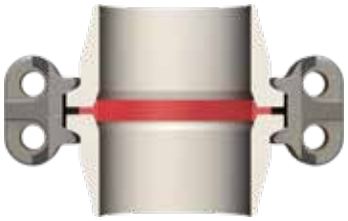
The Ameriforge ***CofferLok*** clamp connector is an equal alternative to *Grayloc® or other clamp connector manufacturers' products.

This clamp connector has successfully undergone interchangeability testing with the equivalent *Grayloc® hub, clamp and seal ring parts as witnessed by the American Bureau of Shipping (ABS). Proper sizing can be matched by using the cross-reference chart below.


ABS Group

DAILY SUMMARY REPORT

The ***CofferLok*** clamp connector is designed to offer the strength and sealing technology of a welded joint and versatility of a mechanical joint. It serves the same purpose as a bolted flange assembly, with added advantages of being more easily installed (only 4 bolts) and up to 75 percent lighter and smaller by comparison to ANSI or API flanges. The connector consists of: 2 hubs, 1 seal ring, 1 clamp set with 4 bolts and 8 nuts.



All materials available.

Clamp Connector Cross-reference Tables

STANDARD CLAMP SERIES			
CLAMP SIZE		GR STANDARD SIZE	GR OPTIONAL SIZE
1-in.	=	1 GR	
1-1/2-in.	=	1.5 GR	
2-in.	=	2 GR	
3-in.	=	3 GR	
4-in.	=	4 GR	
5-in.	=	5 GR	E
6-in.	=	6 GR	F, XF
8-in.	=	8 GR	X8GR

Note: Light Duty Series Available

CROSS-REFERENCE EXAMPLE
6-in. 52 = 6 GR 52
6-in. = hub and clamp size
52 = seal ring size

HEAVY DUTY CLAMP SERIES			
HEAVY DUTY CLAMP SIZE		GR HEAVY DUTY SIZE	GR OPTIONAL HD SIZE
H2-in.	=	B	
H3-in.	=	C	
H4-in.	=	D	
H8-in.	=	G	XG
H10-in.	=	10H	X10H
H12-in.	=	12M	X12M
H14-in.	=	P	5P, R
H16-in.	=	S	
H18-in.	=	T	
H20-in.	=	U	
H22-in.	=	V	3V, 5V
H24-in.	=	W	3W
H26-in.	=	Y	3Y

**Grayloc® is a registered trademark owned by Oceaneering International.*

Cofferlok Clamp Connector Installation Procedures

1. Verify Component Compatibility

The correct size, part number and material type of all parts MUST be verified before assembly.

2. Clean and Examine Components

Using a solvent and/or nonabrasive soft cloth, clean all components to remove grease and dirt. Special care should be taken on the sealing surfaces, as shown in **Figure 1** (label "**A**").

Sealing surfaces shall be free from leak path scratches, damage marks, rust and other surface irregularities. Polish off any small scratches on the sealing surfaces with a fine emery cloth in the circumferential direction only (see **Figure 2**). Polish at least one third of the circumference to ensure a uniform blending of the re-worked area. Do not polish in the axial direction.

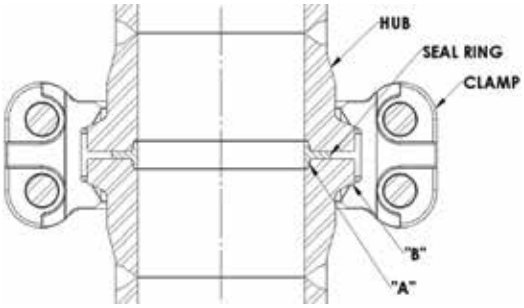


Figure 1: Critical Surfaces

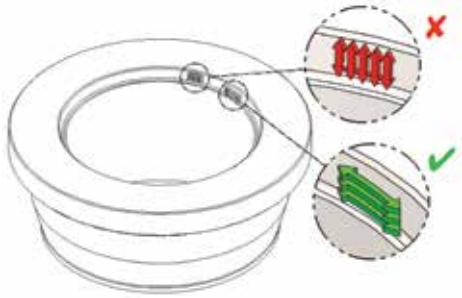


Figure 2: Polish in Circumferential Direction, not Axial

3. Measure Seal Ring Stand-Off Gap

Lubricate the Seal Ring and Hub sealing surfaces (label "**A**" in **Figure 1**). Place the seal ring into the hub, rock it by pressing on the rib per **Figure 3**, and compare the stand-off gap to the gap dimensions given in **Table 1**.

Table 1: Seal Ring Standoff

SEAL RING	MINIMUM STANDOFF	
	(IN)	(MM)
4	0.007	0.18
5	0.007	0.18
7	0.009	0.22
11	0.011	0.27
13	0.011	0.27
14	0.010	0.25
16	0.010	0.26
20	0.010	0.26
23	0.011	0.28
25	0.013	0.32
27	0.014	0.35
31	0.014	0.36
34	0.017	0.42
40	0.018	0.45
42	0.019	0.48
46	0.023	0.59
52	0.023	0.58
54	0.024	0.61

SEAL RING	MINIMUM STANDOFF	
	(IN)	(MM)
56	0.025	0.63
62	0.035	0.89
64	0.037	0.95
67	0.039	1.00
72	0.042	1.07
76	0.045	1.14
82	0.048	1.21
84	0.049	1.24
87	0.052	1.32
91	0.053	1.35
92	0.054	1.37
94	0.055	1.41
97	0.058	1.46
102	0.060	1.51
106	0.062	1.59
112	0.065	1.66
116	0.068	1.73
120	0.069	1.76

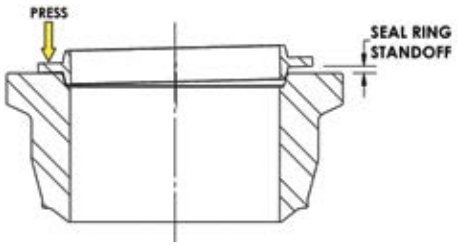


Figure 3: Seal Ring Standoff

Cofferlok Clamp Connector Installation Procedures

4. Assembly

4.1 Install Seal Ring

Hubs should be concentric (see **Figure 4**) so that the Seal Ring can be installed properly in between the Hubs. Correct any hub misalignment prior to installing Seal Ring and tightening the Clamps.

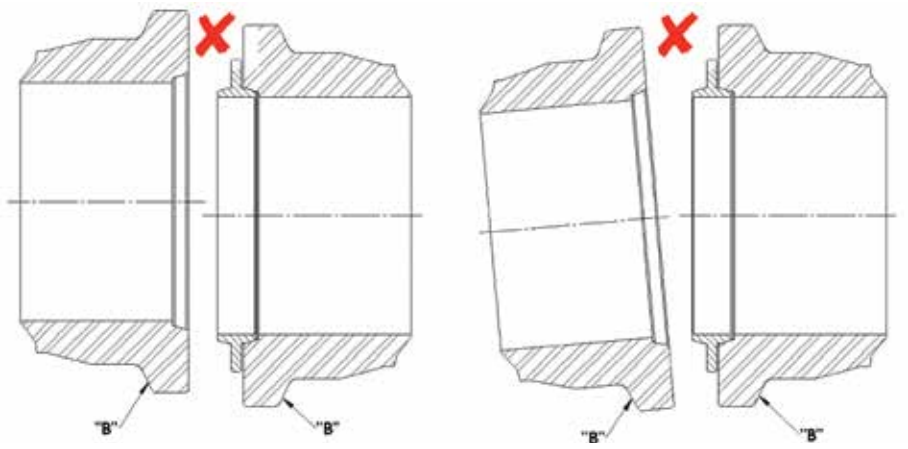


Figure 4: Hubs & Seal Ring have to be Concentric

4.2 Lubricate

— 4.2.1 Apply lubricant to the Hub/Clamp contact areas (label "**B**" in **Figure 4**), the nut faces, and the bolt threads.

— 4.2.2 Place the clamps around the Hubs and insert stud/nuts. The spherically faced nuts shall sit into the spherical seats of the clamps.

4.3 Tighten Bolts

Bolting should be tightened while keeping the spacing between Clamp halves approximately equal. Clamp segments may be shocked with suitable soft faced hammer to aid assembly.

Using the torque values from **Table 2**, follow the cross pattern bolt-tightening sequence for the following rounds:

— **Round 1:** Tighten to 20%-30% of target torque. Check gap between the Clamps for uniformity and make appropriate adjustments through selective tightening.

— **Round 2:** Tighten to 50%-70% of target torque. Check gap between the Clamps for uniformity and make appropriate adjustments through selective tightening.

— **Round 3:** Tighten to 100% of target torque. Check gap between the Clamps for uniformity and make appropriate adjustments through selective tightening.

— **Round 4:** Continue tightening the nuts until no further nut rotation occurs at 100% of the target torque value.

Table 2: Bolt Torque Data

CLAMP SIZE	BOLT SIZE	TPI	BOLT PRE-LOAD		BOLT TORQUE		NOTES
(IN)	(IN)		(LBF)	(KN)	(FT-LBS)	(NM)	
1	.500	13 UNC-2A	2,844	12.7	17	23	a & c
1½	.625	11 UNC-2A	4,766	21.2	35	48	b & c
2	.750	10 UNC-2A	6,516	29.0	55	75	b & c
3	.750	10 UNC-2A	7,476	33.3	65	88	b & c
4	.875	9 UNC-2A	9,946	44.2	100	136	b & c
5	1.000	8 UNC-2A	13,986	62.2	160	217	b & c
6	1.125	8 UN-2A	16,032	71.3	210	285	b & c
8	1.250	8 UN-2A	20,887	92.9	300	407	b & c
10	1.625	8 UN-2A	39,722	177.0	700	949	b & c
12	1.750	8 UN-2A	47,340	211.0	900	1,220	b & c

Notes:
a. For 900 lb systems and above, increase bolt torque/preload by 1.5.
b. For 900 lb-1500 lb systems, increase bolt torque/preload by 1.5; for 2500 lb (incl. 5K) systems and above increase bolt torque/preload by 2.0.
c. Increased bolt torques/preload values in points a & b above are meant for Low Alloy steel clamps with B7/B7M bolting (or equivalent). Do not use for Stainless Steel clamps.

4.4 Final Check

After bolt tightening, check for an equal gap between the two Hubs and between the Clamp halves.

5. Disassembly

This section describes the process to follow to make a proper disconnection. **Always check, never take it for granted that the line has been de-pressurized.**

5.1 Slacken Nuts

Gradually run the nuts back along the bolts until just loose, but do not remove the nuts from the bolts (see **Figure 6**). If Clamp segments remain bound onto Hubs, then both segments must be slackened by hitting the inner face (see **Figure 6**) of the Clamp lugs with a suitable soft-faced hammer.

5.2 Continue Slacking Process

Continue loosening the nuts and re-slacken both Clamp segments until the maximum nut travel is reached. This should relieve Seal Ring contact pressure, causing any residual pressure to be released.

Disassembly can be completed only when Clamps are slack and free to rock/rotate.

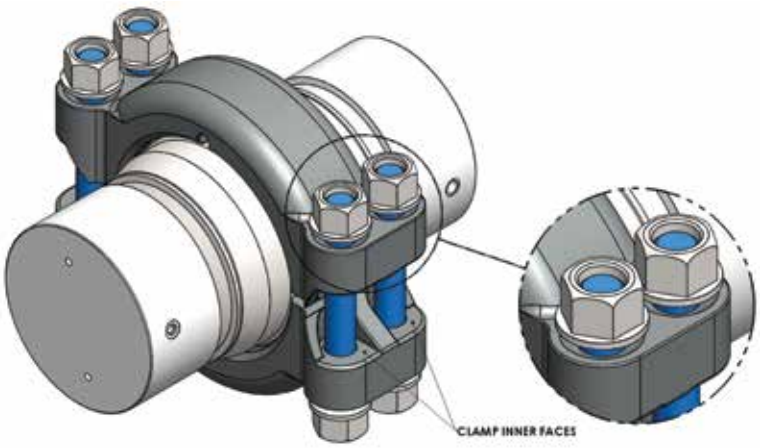


Figure 6: Nuts loosened to ends of studs

CofferLok™ Compact Flanges (Standard)

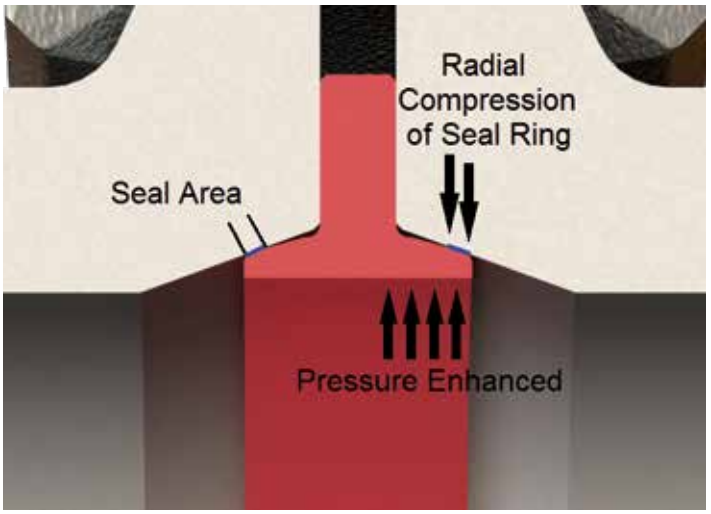
— The *CofferLok* Compact Flange (standard) is lighter, smaller and easier to install than an ANSI raised face or ring joint flanges

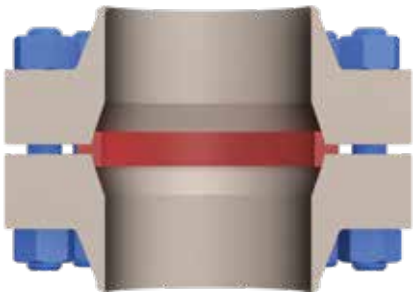
— The *CofferLok* Compact Flange (standard) is available in all sizes/pressure classes and designed to offer improved sealing integrity while saving weight, space and cost

— Design codes under ANSI/ASME, API and can meet customer's specific requirements

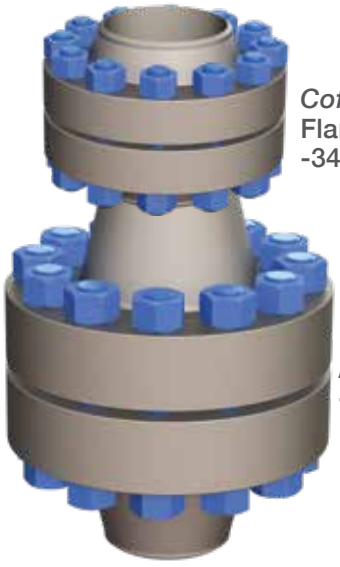
— Achieves extremely high levels of performance by incorporating the three most important concepts in piping connector design

1. Seal at the smallest possible diameter (to reduce separation loads)
2. Use the *CofferLok* pressure-enhanced metal seal (to reduce make-up load requirements)
3. Isolates the seal from piping loads (to maintain performance under changing conditions)





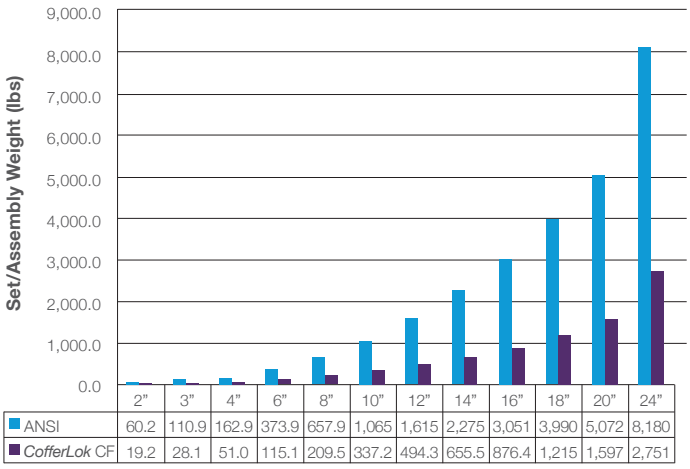
8-in. – 2500# ANSI Class Comparison



***CofferLok* Compact Flange (Standard) -340 lbs.**

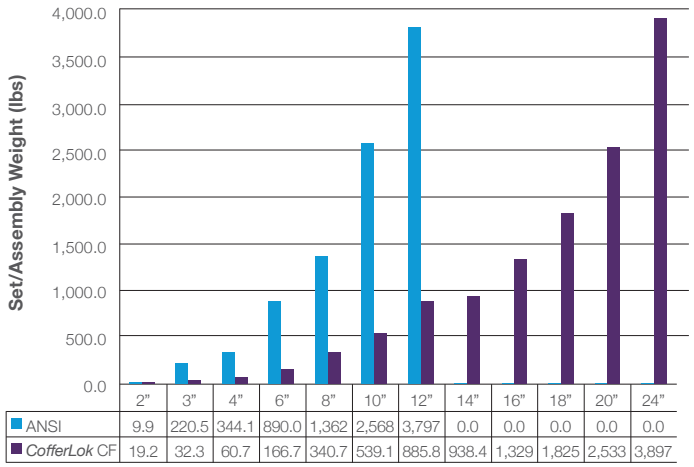
ANSI B16.5 -1,362 lbs.

1500# Class Comparison



	2”	3”	4”	6”	8”	10”	12”	14”	16”	18”	20”	24”
ANSI	60.2	110.9	162.9	373.9	657.9	1,065	1,615	2,275	3,051	3,990	5,072	8,180
CofferLok CF	19.2	28.1	51.0	115.1	209.5	337.2	494.3	655.5	876.4	1,215	1,597	2,751

2500# Class Comparison



	2”	3”	4”	6”	8”	10”	12”	14”	16”	18”	20”	24”
ANSI	9.9	220.5	344.1	890.0	1,362	2,568	3,797	0.0	0.0	0.0	0.0	0.0
CofferLok CF	19.2	32.3	60.7	166.7	340.7	539.1	885.8	938.4	1,329	1,825	2,533	3,897

ANSI Flanges

ANSI FLANGES		ANSI SPECIALTY FLANGES	
			
DIAMETER	½-in. to 200-in.	**DIAMETER**	½-in. to 200-in.
PRESSURE CLASS	CL 150 psi to CL 2500 psi	**PRESSURE CLASS**	CL 150 psi to CL 2500 psi
FACES	Multiple facing configurations with other combinations of diameter and pressure class available up to 200-in. OD	**FACES**	Multiple facing configurations with other combinations of diameter and pressure class available up to 200-in. OD
MATERIALS GRADES	Stainless, Nickel Alloys, Carbon and Alloy, Precipitation Hardening	**MATERIALS GRADES**	Stainless, Nickel Alloys, Carbon and Alloy, Precipitation Hardening
TRUSTED BRANDS: AMERIFORGE • COFFER • FVC • MAASS • TMW			

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Ameriforge

An AFG Holdings Company

19450 State Hwy. 249, Suite 500 | Houston, Texas 77070 USA | 713-393-4200

1 B Tebay Road, | Bromborough, Wirral CH62 3AB United Kingdom | +44(0) 1744884881

ameriforge.com