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GS HYDRO BONDED SEALS

Literature

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Figure 1 GS Hydro Bonded Seals

Introduction:

GS Bonded Seal is used in pipeline systems and is designed according to the International Standard Organization (ISO) standards 6162-2 and 6164. The seal comprises a rubber seal (NBR) and metallic ring joined together. They are majorly used in piping systems with no welding option and applied in offshore, marine, and mining systems. GS Bonded Seals are made in various sizes ranging from 1/2 inches to 8 inches and made from SS302.

GS Bonded Seals are designed to work with a maximum pressure within 350 to 450 bars, however, an order for an increase in the working pressure can be made available and the seal will work with maximum pressure up to 690 bars. Generally, GS Bonded Seals are suitable for use in high-pressure applications and systems.

Materials:

GS Bonded Seals are seals made from natural rubber (NBR) and a metallic ring made from SS302 material.

Nitrile Rubber also called NBR is an elastomer material. This elastomer material is the most used in the seal field. The material has great benefits, hence, its wide popularity and usage. NBR material can withstand temperature levels between -35^{0}C to +120^{0}C (-30^{0}F to +250^{0}F). Also, NBR has great resistance to petroleum products, flame retarded fluids (HFC, HFA, HFB), wear and tear, abrasion, and compression. Although Nitrile rubber has a low resistance to sunlight, and other climatic conditions, manufacturers have developed a way to boost its resistance through compounding. Generally, Nitrile Rubber (NBR) is an acceptable material for hydraulic components and pneumatics.

Stainless steel is an excellent material widely used in the production of various tools and equipment. Stainless steel material contains about 10% Chromium and this gives it an excellent resistance against corrosion over other types. Thus, stainless steel is suitable to be used in different weather conditions without any damages. Stainless steel has several variations and SS302 is a type of variation. SS302 comprises about 18% and 8% of chromium and nickel elements respectively. Also, SS302 has increased carbon content. Aside from the increased resistance to corrosion, SS302 is also resistant to other substances like chemicals, acids, solvents, and many more. The table below shows the chemical composition of SS302:

Elements	Content (%)
Chromium (Cr)	18.2
Manganese (Mn)	1.6
Carbon (C)	0.06
Iron (Fe)	Balance
Nickel (Ni)	8.5
Silicon (Si)	0.5

Sizes available:

GS Bonded is available for pipes in Metric Sizes, ANSI 36.10, and ANSI 36.19 sizes.

The table below shows the bonded seal dimensions for Metric pipe sizes according to the ISO 6162-2 standards:

Size	SS Part No	STD Part No	D	D1	S
1/2”	0823SS	0823	23.80	17.28	2.03
3/4”	1213SS	1213	33.27	24.26	2.34
1”	1629SS	1629	34.93	27.05	2.34
1 1/4”	2030SS	2030	42.90	33.89	3.25
1 1/2”	2432SS	2432	52.38	42.93	3.25
2”	3219SS	3219	63.50	51.69	3.25
2 1/2”	4037SS	4037	75.00	64.39	3.25
3”	4839SS	4839	90.17	76.08	3.25

The table below shows the GS Bonded Seal dimensions for ANSI 36.10 and ANSI 36.19 pipes according to the ISO 6162-2 standards:

Size	SS Part No	STD Part No	D	D1	S
1/2”	0821SS	0821	15.88	10.37	2.00
3/4”	0823SS	0823	23.80	17.28	2.03
1”	1633SS	1633	28.58	21.54	2.34
1 1/4”	2042SS	2042	39.00	31.00	3.25
1 1/2”	2448SS	2448	44.45	35.94	3.25
2”	3260SS	3260	55.50	46.50	3.25
2 1/2”	4073SS	4073	69.85	54.89	3.25
3”	4888SS	4888	83.90	70.00	4.00

The next table shows the Bonded Seal dimensions for Metric pipe sizes according to ISO 6164 standards:

Size	SS Part No	STD Part No	D	D1	S
2”	3291SS	3291	63.50	51.69	3.25
2 1/2”	4037SS	4037	75.00	64.39	3.25
3”	4839SS	4839	90.17	76.08	3.25
4”	5644SS	5644	110.00	95.00	4.00
4 1/2”	6000SS	6000	126.00	35.94	4.00
5”	6455SS	6455	143.70	127.00	5.00
6”	8001SS	8001	181.0	155.0	8.00
8”	9600SS	9600	240.0	205.0	9.00

The table below shows the GS Bonded Seal dimensions for ANSI 36.10 and ANSI 36.19 pipes according to the ISO 6162-2 standards:

Size	SS Part No	STD Part No	D	D1	S
2”	3260SS	3260	55.50	46.50	3.25
2 1/2”	4073SS	4073	69.85	54.89	3.25
3”	4888SS	4888	83.80	70.00	4.00
4”	5644SS	5644	110.00	95.00	4.00

Materials combinations for GS Hydro Bonded Seal:

GS Hydro Bonded Seal can be used with several material combinations which are shown in the table below:

This table shows the material combinations for flare flange connections:

Description	Part Code	Component Code	Material
Standard Assembly	320/38X4FC	- 320F Flange - 20/38X4FC Insert Cone - 20/38F Sleeve - 2030 Bonded Seal - OR30X1.0 O-ring	- Electric zinced carbon steel - Electric zinced carbon steel - Electric zinced carbon steel - Electric zinced carbon steel/NBR - NBR, Shore 90 A
Stainless Steel	320/38X4FCSS	- 320FSS Flange - 20/38x4FCSS Insert Cone - 20/38FCSS Sleeve - 2030SS Bonded Seal - OR30X1.0 O-ring	- AISI 316 - AISI 316 - AISI 316 - AISI 316/NBR - NBR, Shore 90 A
Stainless steel + electric zinced carbon steel flanges	320/38X4FCSS/ ZN	- 320 F Flange - 20/38X4FCSS Insert Cone - 20/38FCSS Sleeve - 20/38FCSS Bonded Seal - OR30x1.0 O-ring	- Electric zinced carbon steel - AISI 316 - AISI 316 - AISI 316/NBR - NBR, Shore 90 A
Stainless steel + hot dip galvanized carbon steel flanges	320/38X4FCSS/ HDG	- 320FDHG Flange - 20/38X4FCSS Insert Cone - 20/38FSS Sleeve - 2030SS Bonded Seal - OR30X1.0 O-ring	- Hot-dip galvanized steel - AISI 316 - AISI 316 - AISI 316/NBR - NBR, Shore 90 A

How is the GS Bonded Seal applied in connection components?

GS Bonded Seals are very easy to use. However, to ensure an effective and tight connection, the users must be exposed to the operation's seal mode. Please follow the steps below to use the GS Bonded Seal rightly:

STEP 1

Lubricate the GS Bonded Seal with Gleitmo 805 grease or any other seal type. Ensure the pipe ends are compatible and perfectly aligned before sealing.

STEP 2

Based on the connection end type used, either nut or thread, lubricate the bolt head compression face or flange side as the case may be.

STEP 3

Tighten the bolt or nut using the right torque value.

STEP 4

The bolts are to be tightened diagonally slowly till the right torque value is reached.

Figure 2 GS Hydro Bonded Seals

Also note that:

- The bolts should be tightened immediately after the ends have been lubricated.
- Crosswise tightening using 30% of the torque value, then 70% till it reaches 100% of the recommended torque value. This step can be repeated (min 2 full cycles) till the bolts are well tightened and torque fully in place.

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