



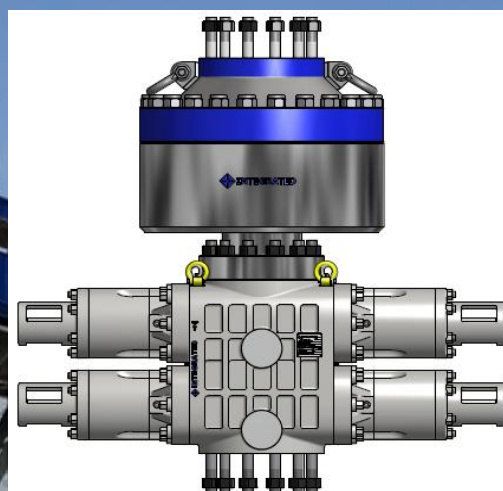
INTEGRATED®

OEM SPHERICAL ANNULAR ISA™ BOP CATALOG

INTEGRATED®

is an established OEM manufacturer of API Monogrammed Pressure Control Equipment and Spare Parts that meets or exceed industry Requirements. All products are designed, engineered, manufactured, and validated as per latest edition of API 6A, 16A, 20E & ASME Standards & Specifications.

INTEGRATED® ISA™ Spherical Annular Forged BOP is a compact design with only five major parts. Rugged reliable sealing capability that make it ideal for Snubbing (stripping) application.



INTEGRATED® is an API licensed Original Equipment Manufacturer (OEM) of Pressure and Flow Control Equipment for the Global Drilling, Workover, Snubbing, Rental and Production sectors of the Oil and Gas Industry

INTEGRATED® holds the following Manufacturing Licenses & Certifications:

API 6A | API 16A | API 16AR | API 16C | API 20E (BSL 1,2 & 3) | ASME U | CRN | NATIONAL BOARD | API Q1 (10th Edition) | ISO-9001-2015

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INTEGRATED® ORIGINAL EQUIPMENT MANUFACTURE (OEM) API Monogrammed Equipment & Product - Licenses and Certifications

API 6A-0851 | API 16A-0197 | API 16AR-0015 | API 16C-0564 | API 20E-0087 | ASME U-59670 | CE (European) | CRN (Canadian) | API Q1-4952 (10th Edition) | ISO 9001:2015-RQ91/4505

API 6A	API 6A	API 16A	API 16A	API 16C	API 20E	ASME U	API 16AR	API Q1 / ISO
PRESSURE CONTROL VALVES	PRESSURE MANIFOLDS WELLHEAD COMPONENTS	BLOWOUT PREVENTERS (RAM BOPS)	BLOWOUT PREVENTERS (ANNULAR BOPS)	WELL CONTROL CHOKES & BUFFER TANKS	EQUIPMENT BOLTING (BSL)	PULSATION DAMPENERS (PD)	REMANUFACTURING (Recertification)	EQUIPMENT & ELASTOMERS
IFC™ (Slab Gate Valve) 2-1/16" to 4-1/16"	Choke & Kill Manifolds	IUT™ Ram Forged BOP Single Double Shear & Non-Shear 7-1/16" to 21-1/4"	ISA™ Spherical Annular Forged BOP Studded Top x Flanged Bottom 7-1/16" to 21-1/4"	Well Control Chokes Positive Choke Adjustable Choke	Ram & Annular BOP Bolting (BSL1, 2 & 3)	IDDP™ Drilling Pulsation Damper 10 & 20 GALLON Up to 7,500 psi	Ram & Annular BOP Repair and/or Remanufacture All Major Brands	Certified Quality Management System (QMS)
IFLS™ (Slab Gate Valve) 2-1/16" to 7-1/16"	Standpipe & Managed Pressure Drilling Manifolds	IWS™ Ram Forged BOP Single Double 7-1/16" to 13-5/8"	IKT™ Annular Forged BOP Studded Top x Flanged Bottom 7-1/16" to 13-5/8" & 29" - MSP	Well Control Choke Actuators	Valve Bolting	IPPT™ Production Pulsation Damper 1 to 20 GALLON 285 to 6,180 psi	Choke & Kill Manifolds	Corporate ERP Manufacturing System (JDE)
AceFlow™ (Expanding Gate Valve) 2-1/16" to 4-1/16"	Cement Manifolds	IE™ Ram Forged BOP Single Double Triple 7-1/16" to 9"	ISA™ & IKT™ Annular Spare Parts	Choke & Kill Manifold Buffer Chambers (tanks)	Pulsation Damper Bolting	Pulsation Damper Diaphragm & Kits	API Valves FC & FLS Styles	Global System to connect all Manufacturing, Distribution & Services
Surface Safety Valves (SSV) (PSL 2 & 3)	Kill Wing Valve Manifold	IWP™ Ram Forged BOP Single Double 9"	ISA™ & IKT™ Packing Elements Natural (NR) Nitrile (NBR)		Customized Bolting	IDDP™ Drilling NBR HNBR FKM	Pulsation Dampeners Drilling & Production Only Major Brands	QMS for Pressure Control Elastomer Manufacturing as per API 16A
Ball Valves	Hydraulic Fail-Safe Surface Safety Valve Skid Manifold	IUT™ Ram Blocks & Assemblies CSO, Pipe, VBR, IFlex™ & SBR	ISA™ & IKT™ Seal Kits			IPPT™ Production NBR HNBR FKM Emasco Style PD45 PD55 PD55A NBR HNBR FKM PD Parts Stabilizers, Gaskets & Kits		
Plug Valves	Chokes	I70™ (IWS™) Ram Blocks Full Assemblies CSO, Pipe & Multi Ram						
Minor & Major Repair Kits	Tubing & Casing Spools	IE™ Ram Blocks Full Assemblies CSO, Pipe & IFlex™						
Ball Valves	Tubing & Casing Hangers	IWP™ Ram Blocks Full Assemblies CSO & Pipe						
	Adapter Spools	Ram Blocks - Forgings						
	Spacer Spools	IUT™ , IWS™ , IE™ & IWP™ Ram Spare Parts						
	Cross-Over Connectors	Ram Elastomers						
	Tree Caps	Front Packers, Top Seals, VBR, IFlex™, SBR, Door Seal & Seal Kits						
	Blind, Companion & Test PE Seals							

INTEGRATED's API Certified – Licensed OEM plants provide state-of-the-art manufacturing of our Engineered-Designed Pressure Control Equipment and Elastomeric Products.

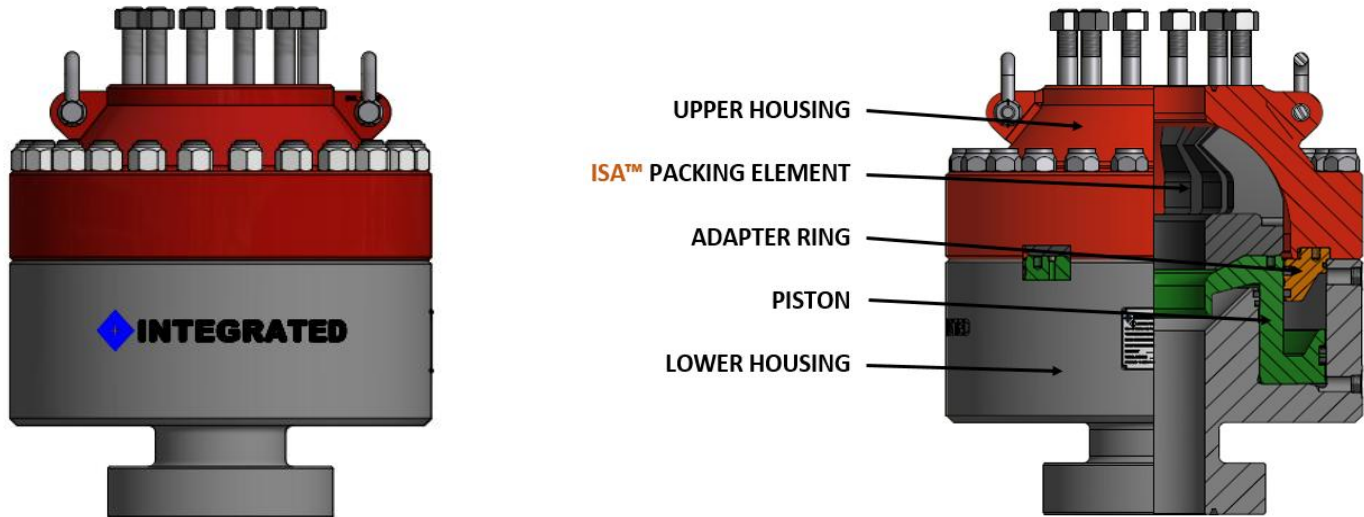


**INTEGRATED's
Oracle - JD
Edwards
Enterprise
Resource Planning
(ERP) system
integrates our
global
manufacturing,
distribution
facilities and
service centers**



INTEGRATED® OEM API 16A MONOGRAMMED TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER

The INTEGRATED® Model **ISA™** Spherical Annular Type Blowout Preventer is a hydraulic operated device designed for well pressure control during workover and drilling operations. Simplistic design, ease of maintenance and field proven reliability ... INTEGRATED's **ISA™** Packing Element can close on almost any shape or size tubing, casing, drill pipe, drill collars, tool joints, wireline, and coiled tubing in the well bore or completely seal off (CSO) of the open bore. It is ideal for stripping tubing, pipe, and wireline.



PRODUCT SPECIFICATIONS

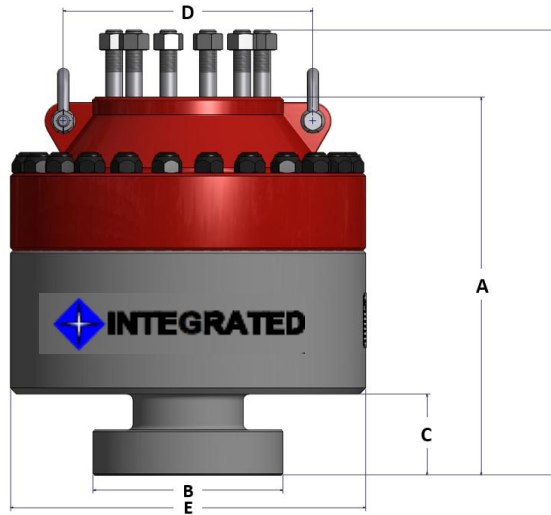
- Designed and manufactured to ISO 13533 (API 16A Latest Edition) for Drill-through equipment
- API 16A Monogrammed Latest Edition
- Designed as standard to ISO 15156-1 (NACE MR-0175) for use in hydrogen sulfide environments (H2S)
- Material: Fully Forged AISI 4130, 75k
- Temperature Class: T-20/250
- Quality Level: PR1 (PR2 is available on request)
- Non-Metallic Seal Temperature Rating: BGB
- Standard Packing Element Temperature (T20): 40°F to 180°F
- Xylan coated internals for operational performance and corrosion control
- All Botling is in full compliance with API 20E (BSL 1 or 2)
- Pressure Rating: 2,000 to 5,000
- Standard operation pressure of 1500 psi
- Ring Grooves are standard carbon steel. Other option is 625 Inconel Inlay.
- Standard connection configuration: Studded Top x Flanged Bottom.
- The INTEGRATED **ISA™** Spherical Annular Forged BOP can be operated with any normal hydraulic units having a separate pressure regulator valve for the annular blowout preventer and sufficient accumulator volume

PRODUCT FEATURES AND BENEFITS

- Spherical Annular Blowout Preventer consists of just five major components: Upper Housing, Lower Housing, Adapter Ring, Piston and Packing Element. The units come with bolted cover.
- Requires only two hydraulic connections (Open and Close)
- INTEGRATED **ISA™** Spherical Annular are approximately 15-20% shorter which is a major advance when space is limited.
- Wear Bands are utilized on moving parts to reduce metal to metal contact which will prolong the annular life
- ISA Sealing (Packing) Elements are designed with steel segments to assist in placement of the rubber during closing operations. Packing Element can be replaced without contaminating hydraulic operating system.

INTEGRATED® OEM API 16A MONOGRAMMED TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER

ISA™ BOP GENERAL DIMENSIONS AND WEIGHTS



Bore Size		Pressure Rating		A		B		C		D		E		F		Weight	
(in.)	(mm)	psi	bar	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(lbs)	(kgs)
7-1/16	179	3000	207	29.70	754	15.00	381	5.40	137	20.39	518	29.00	737	33.80	859	2990	1356
7-1/16	179	5000	345	30.87	784	15.50	394	6.62	168	20.39	518	29.00	737	36.37	924	3042	1380
7-1/16	179	*5k 10k	345	32.20	818	18.88	480	7.87	200	20.42	519	29.00	737	37.70	958	3155	1431
9	229	3000	207	32.53	826	18.50	470	5.81	148	25.90	658	35.50	902	37.50	953	4622	2097
11	279	3000	207	33.18	843	21.50	546	6.37	162	26.74	679	40.00	1016	38.80	986	4288	1945
11	279	5000	345	42.26	1073	23.00	584	9.13	232	29.26	743	44.75	1137	50.00	1270	8956	4062
11	279	*5k 10k	345	43.13	1096	25.75	654	10.01	254	29.26	743	44.75	1137	50.88	1292	9254	4198
13-5/8	346	3000	207	43.80	1113	24.00	610	6.95	177	34.64	880	50.00	1270	49.10	1247	12487	5664
13-5/8	346	5000	345	45.28	1150	26.50	673	8.41	214	34.64	880	50.00	1270	51.53	1309	12805	5808
13-5/8	346	*5k 10k	345	48.00	1219	30.25	768	11.12	282	34.54	877	50.00	1270	54.25	1378	13318	6041
21-1/4	540	2000	138	46.57	1183	32.00	813	7.69	195	39.24	997	49.00	1245	52.41	1331	10619	4817

*Connection Pressure Rating: Studded Top – 5,000 psi | Flanged Bottom – 10,000 psi

Note: The 7-1/16", 11" and 13-5/8" – 5k (10k Btm Flg), ISA™ Spherical Annular BOPs are designed as 5,000 psi units

ISA™ SPHERICAL ANNULAR BOP OPERATING DATA AND FLUID REQUIREMENT

Bore Size		Pressure Rating		Maximum Operating Pressure Open or Close	Recommended Operating Pressure Open or Close	Volume of Fluid to Open		Volume of Fluid To Close	
(in.)	(mm)	(psi)	(bar)	(psi)	(psi)	(gals)	(liters)	(psi)	(liters)
7-1/16	179	3000	207	1500	1500	3.21	12.15	4.57	17.30
7-1/16	179	5000	345	1500	1500	3.21	12.15	4.57	17.30
7-1/16	179	*5k 10k	345	1500	1500	3.21	12.15	4.57	17.30
9	229	3000	207	1500	1500	5.03	19.04	7.23	27.37
11	279	3000	207	1500	1500	6.78	25.67	11.00	41.64
11	279	5000	345	1500	1500	14.59	55.23	18.67	70.67
11	279	*5k 10k	345	1500	1500	14.59	55.23	18.67	70.67
13-5/8	346	3000	207	1500	1500	17.41	65.90	23.58	89.26
13-5/8	346	5000	345	1500	1500	17.41	65.90	23.58	89.26
13-5/8	346	*5k 10k	345	1500	1500	17.41	65.90	23.58	89.26
21-1/4	540	2000	138	1500	1500	16.92	64.05	32.59	123.37

*Connection Pressure Rating: Studded Top – 5,000 psi | Flanged Bottom – 10,000 psi

ISA™ SPHERICAL ANNULAR BOP PAD EYE (Lug) LIFTING CAPACITY

BOP Bore Size	7-1/16" – 3/5k	9" – 3k	11" – 3k	11" – 5k	13-5/8" – 3/5k
Lifting Pad Capacity	26,000 lbs	34,000 lbs	34,000 lbs	68,000 lbs	100,000 lbs

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER**

ISA™ SPHERICAL ANNULAR BOP PART NUMBER | SUB-COMPONENT PART NUMBER

BOP Pressure Rating	BOP Size				
	7-1/16"	9"	11"	13-5/8"	21-1/4"
2,000 psi					
3,000 psi				5k (3k Btm)	
5,000 psi		3k (5k Btm)			
10,000 psi	5k (10k Btm)		5k (10k Btm)	5k (10k Btm)	

Available



Not Available



ISA™ SPHERICAL ANNULAR BOP PART NUMBER | SUB-COMPONENT PART NUMBER

Component Part Description	7-1/16" - 3000 psi Rating Studded Top 3k (R45) Flanged Bottom – 3k (R45)	7-1/16" - 5000 psi Rating Studded Top 5k (R46) Flanged Bottom – 5k (R46)	7-1/16" - 5000 psi Rating Studded Top 5k (R46) Flanged Bottom – 5k (R46)
<i>Assembled BOP Part Number</i>	95-0703-00000	72-251-200	95-0705-00013 (IFilter™)
ISA™ SPHERICAL ANNULAR SUB-COMPONENT PART NUMBERS			
Upper Housing	95-0703-00001	72-250-202	72-250-202
Lower Housing	95-0703-00002	72-250-201	72-250-201
Adaptor Ring	72-250-204	72-250-204	95-0705-00014
Piston	72-250-203	72-250-203	72-250-203

Component Part Description	7-1/16" - 5000 psi Rating Studded Top 5k (R45) Flanged Bottom – 10k (BX156)	9" - 3000 psi Rating Studded Top 3k (R49) Flanged Bottom – 3k (R49)	11" - 3000 psi Rating Studded Top 3k (R53) Flanged Bottom – 3k (R53)
<i>Assembled BOP Part Number</i>	70-0705-00069	72-301-200	95-05110320100
ISA™ SPHERICAL ANNULAR SUB-COMPONENT PART NUMBERS			
Upper Housing	72-250-202	72-300-002	95-05110320110
Lower Housing	70-0705-00071	72-300-001	95-05110320120
Adaptor Ring	72-250-201	72-300-004	95-05110320140
Piston	72-250-203	72-300-003	95-05110320130

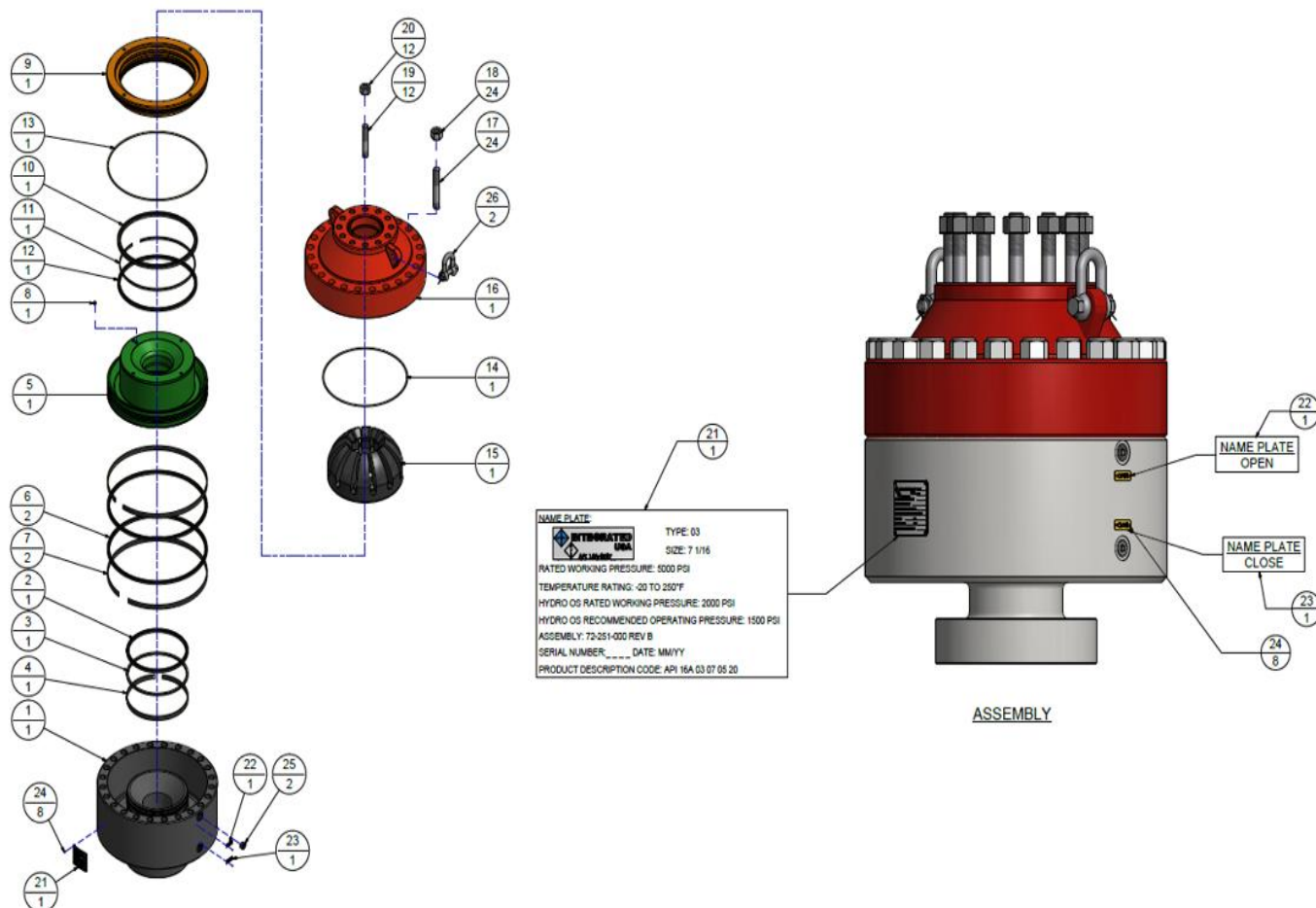
Component Part Description	11" - 5000 psi Rating Studded Top 5k (R54) Flanged Bottom – 5k (R54)	11" - 5000 psi Rating Studded Top 5k (R54) Flanged Bottom – 10k (BX158)	13-5/8" - 3000 psi Rating Studded Top 3k (R57) Flanged Bottom – 3k (R57)
<i>Assembled BOP Part Number</i>	95-05110520100	95-1105-00000	95-1303-00000
ISA™ SPHERICAL ANNULAR SUB-COMPONENT PART NUMBERS			
Upper Housing	95-05110520110	95-05110520110	95-1303-00001
Lower Housing	95-05110520120	95-1105-00001	95-1303-00002
Adaptor Ring	95-05110520140	95-05110520140	95-06130520140
Piston	95-05110520130	95-05110520130	95-06130520140

Component Part Description	13-5/8" - 5000 psi Rating Studded Top 5k (BX160) Flanged Bottom – 5k (BX160)	13-5/8" - 5000 psi Rating Studded Top 5k (BX160) Flanged Bottom – 10k (BX159)	21-1/4" - 2000 psi Rating Studded Top 2k (R73) Flanged Bottom – 2k (R73)
<i>Assembled BOP Part Number</i>	95-06130520100	95-1305-00000	95-2102-00012
ISA™ SPHERICAL ANNULAR SUB-COMPONENT PART NUMBERS			
Upper Housing	95-06130520110	95-06130520110	95-2102-00006
Lower Housing	95-06130520120	95-1305-00001	95-2102-00013
Adaptor Ring	95-06130520140	95-06130520140	95-2102-00001
Piston	95-06130520130	95-06130520130	95-2102-00017



**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER**

ISA™ SPHERICAL ANNULAR BOP COMPONENT BREAKDOWN - STANDARD

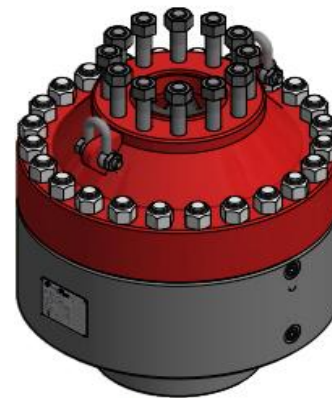
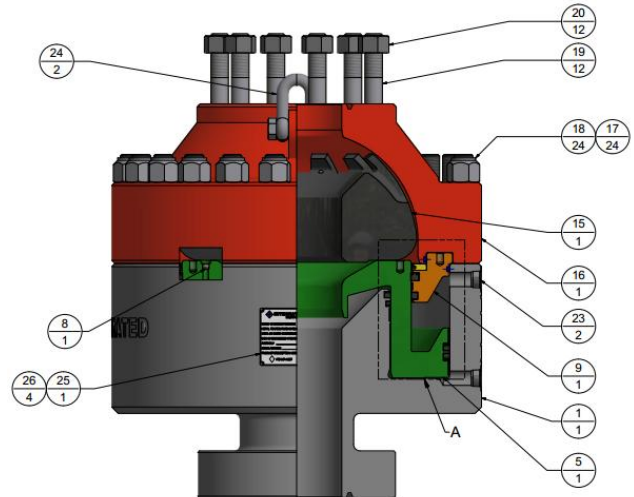
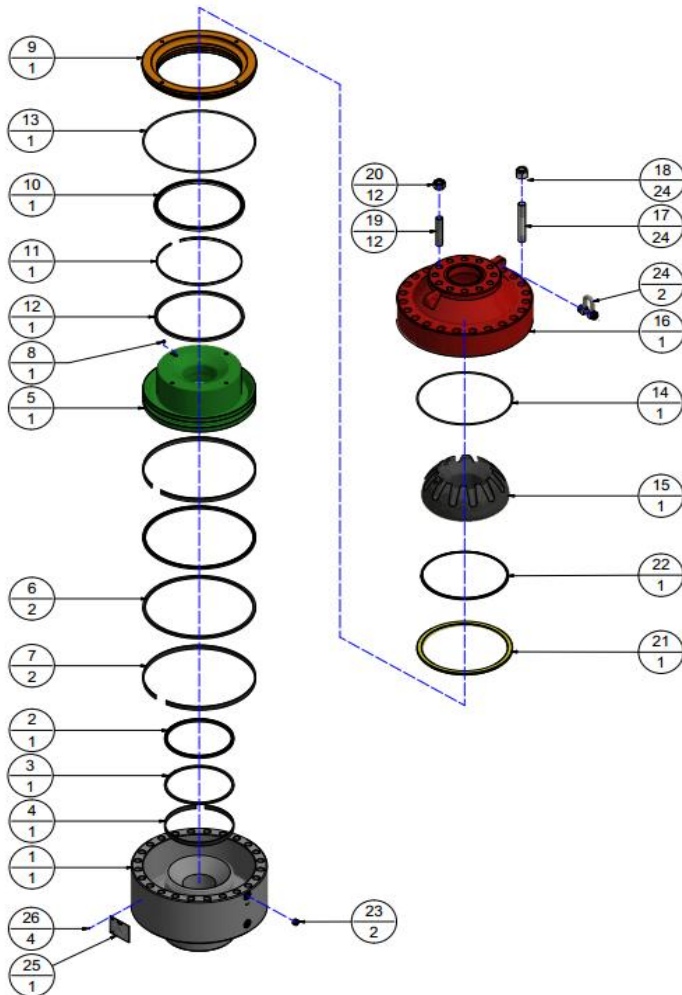


ISA™ SPHERICAL ANNULAR PARTS LIST – STANDARD

Item	Qty	Part Description	Item	Qty	Part Description
1	1	Lower Housing (ASTM A487 GR4D)	14	1	Top OD Adapter Seal
2	1	Upper ID Piston Seal	15	1	Integrated ISA™ Spherical Packing Unit
3	1	Lower ID Piston Seal	16	1	Upper Housing (ASTM A487 GR 4D)
4	1	Lower Housing Wear Band	17	24	Tap Ends, Pad Stud (SA 193 GR B7)
5	1	Piston (ASTM A487 GR4D)	18	24	Heavy Hex Nut (SA 194 GR 2H)
6	2	OD Piston Seal	19	16	Tap Ends, Pad Stud (SA 193 GR B7)
7	2	Piston Wear Band	20	16	Heavy Hex Nut (SA 194 GR 2H)
8	1	Pipe Plug, Socket Head ¼ NPT	21	1	Name Plate BOP (Data) SS 304
9	1	Adapter Ring (ASTM A487 GR4D)	22	1	Name Plate BOP (Open) SS 304
10	1	Upper ID Adapter Seal	23	1	Name Plate BOP (Close) SS 304
11	1	Adapter Ring Wear Band	24	8	Rivet (0.125 x 20 Ling (Aluminum))
12	1	Lower ID Adapter Seal	25	2	Pipe Plug, Socket Head – 1.0” NPT
13	1	OD Adapter Seal	26	2	Bolt Type Chain Shackle

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER**

ISA™ SPHERICAL ANNULAR BOP COMPONENT BREAKDOWN – IFILTER™ SEAL



ASSEMBLY

ISA™ SPHERICAL ANNULAR PARTS LIST – IFILTER™

Item	Qty	Part Description	Item	Qty	Part Description
1	1	Lower Housing (ASTM A487 GR4D)	14	1	Top OD Adapter Seal
2	1	Upper ID Piston Seal	15	1	Integrated ISA™ Spherical Packing Unit
3	1	Lower ID Piston Seal	16	1	Upper Housing (ASTM A487 GR 4D)
4	1	Lower Housing Wear Band	17	24	Tap Ends, Pad Stud (SA 193 GR B7)
5	1	Piston (ASTM A487 GR4D)	18	24	Heavy Hex Nut (SA 194 GR 2H)
6	2	OD Piston Seal	19	12	Tap Ends, Pad Stud (SA 193 GR B7)
7	2	Piston Wear Band	20	12	Heavy Hex Nut (SA 194 GR 2H)
8	1	Pipe Plug, Socket Head ¼ NPT	21	1	Holder I-Filter
9	1	Adapter Ring (ASTM A487 GR4D)	22	1	I-Filter Seal
10	1	Upper ID Adapter Seal	23	2	Pipe Plug, Socket Head
11	1	Adapter Ring Wear Band	24	2	Bolt Type Chain Shackle
12	1	Lower ID Adapter Seal	25	1	Name Plate BOP (Data)
13	1	OD Adapter Seal	26	4	Nail, Easy-Drive

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER**

ISA™ SPHERICAL ANNULAR BOP SEAL KITS

Part Description	Size	Pressure	Part Number	Weight Per Unit	
				lbs	kg
7-1/16" - 3/5k Spherical Annular ISA™ Seal Kit	7-1/16"	5k	82-221-55079	7.00	3.18
7-1/16" - 3/5k Spherical Annular ISA™ Seal Kit w/Wear Band	7-1/16"	5k	82-221-55079-WB	10.00	4.54
7-1/16" - 3/5k, Spherical Annular ISA™ Seal Kit w/I-Filter™ Seal	7-1/16"	5k	82-221-55079-WPR	7.00	3.18
7-1/16" - 3/5k, Spherical Annular I-Filter™ Seal	7-1/16"	5k	95-0705-00012	0.00	0.00
9" - 3k Spherical Annular ISA™ Seal Kit	9"	3k	82-221-55077	7.00	3.18
9" - 3k Spherical Annular ISA™ Seal Kit w/Wear Band	9"	3k	82-221-55077-WB	10.00	4.54
11" - 3k Spherical Annular ISA™ Seal Kit	11"	3k	82-221-55075	13.00	5.90
11" - 3k Spherical Annular ISA™ Seal Kit w/Wear Band	11"	3k	82-221-55075-WB	15.00	6.80
11" - 5k Spherical Annular ISA™ Seal Kit	11"	5k	82-221-55030	14.00	6.35
11" - 5k Spherical Annular ISA™ Seal Kit w/Wear Band	11"	5k	82-221-55030-WB	16.00	7.26
13-5/8" - 3/5k Spherical Annular ISA™ Seal Kit	13-5/8"	5k	82-221-55070	20.00	9.07
13-5/8" - 3/5k Spherical Annular ISA™ Seal Kit w/Wear Band	13-5/8"	5k	82-221-55070-WB	23.00	10.43
21-1/4" - 2k Spherical Annular ISA™ Seal Kit	21-1/4"	2k	82-221-55067	28.00	12.70
21-1/4" - 2k Spherical Annular ISA™ Seal Kit w/Wear Band	21-1/4"	2k	82-221-55067-WB	31.00	14.06

ISA™ SPHERICAL ANNULAR SEAL KIT PART BREAKDOWN

Seal Description	Qty	7-1/16" - 3/5k	9" - 3k	11" - 3k	11" - 5k	13-5/8" - 3/5k	21-1/4" - 2k
Complete Carded Seal Kit Part Number		82-221-55079-WB	82-221-55077-WB	82-221-55075-WB	82-221-55030-WB	82-221-55070-WB	82-221-55067-WB
INDIVIDUAL SEALS / WEAR BANDS IN EACH COMPLETE CARDED KIT							
Piston I.D. Upper Seal	1	82-221-31105	82-221-31110	95-05110320173	95-05110320173	95-06130520173	30-000022
Piston I.D. Lower Seal	1	82-221-31000	82-221-31002	95-05110320174	95-05110320174	95-06130520174	30-000023
Piston O.D. Seal	2	82-221-30780	82-221-31012	95-05110320175	95-05110320175	95-06130520175	30-000019
Piston Skirt Seal	1	Not Required	Not Required	Not Required	Not Required	Not Required	30-000050
Adapter I.D. Upper Seal	1	82-221-31104	82-221-31109	95-05110320176	95-05110320176	95-06130520178	30-000026
Adapter I.D. Lower Seal	1	82-221-31002	82-221-31037	95-05110320177	95-05110320177	95-06130520177	30-000024
Adapter O.D. Seal	1	82-221-30408	82-221-30784	95-05110320181	95-05110320181	95-06130520181	30-000027
Adapter Top Seal	1	82-221-30405	82-221-31145	95-05110320182	95-05110320182	95-06130520176	30-000020
Adapter IFilter® Seal	1	95-0705-00012	Upon Request	Upon Request	Upon Request	Upon Request	Upon Request
Wear Band	2	95-05110520172	95-05110520172	95-05110520172	95-05110520172	95-05110520172	95-05110520172
- Lower Housing							
1" Wide x .093" Thickness		48" Length	64" Length	66" Length	72" Length	76" Length	88" Length
Wear Band	1	95-05110520172	95-05110520172	95-05110520172	95-05110520172	95-05110520172	95-05110520172
- Piston							
1" Wide x .093" Thickness		76" Length	95" Length	106" Length	119" Length	126" Length	136" Length
Wear Band	1	95-05110520180	95-05110520180	95-05110520180	95-05110520180	95-05110520180	95-05110520180
- Adapter							
1/2" Wide x .093" Thickness		58" Length	77" Length	86" Length	85" Length	99" Length	115" Length

Note: The Adapter *IFilter*™ Seal (T Style Seal) was designed for Snubbing applications. We currently offer this in our 7-1/16" - 3/5k, Spherical Annular Forged ISA™ BOP. Our *IFilter*™ Seal can be offer in our 9", 11" and 13-5/8" Spherical Annular Forged ISA™ BOPs upon request.

INTEGRATED® OEM API 16A MONOGRAMMED TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER

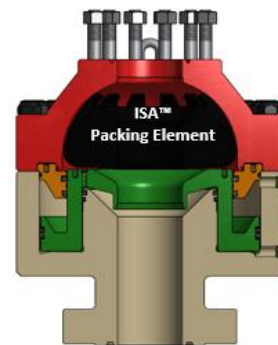
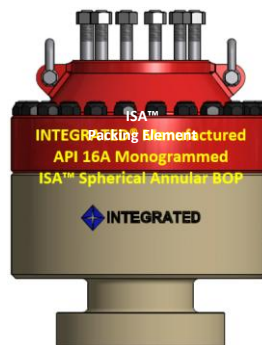
ISA™ SPHERICAL ANNULAR PACKING ELEMENTS



NR (Natural)



NBR (Nitrile)



Item No.	Packing Element Size		Pressure Rating		Element Material	Part Number	Weight Per Unit	
	in.	mm	psi	bar			lbs	kgs
2.01.01	7-1/16	180	3/5k	207 345	NR (Natural Rubber) - Snubbing	82-221-735-01	116	53
2.01.02	7-1/16	180	3/5k	207 345	NBR (Nitrile Buna-N)	82-221-735-02	116	53
2.01.03	7-1/16	180	10k	689	NR (Natural Rubber) - Snubbing	82-221-710-01	In Development	
2.01.04	7-1/16	180	10k	689	NBR (Nitrile Buna-N)	82-221-710-02		
2.01.05	9	229	3/5k	207 345	NR (Natural Rubber) - Snubbing	82-221-903-01	250	113
2.01.06	9	229	3/5k	207 345	NBR (Nitrile Buna-N)	82-221-903-02	250	113
2.01.07	11	279	3k	207	NR (Natural Rubber) - Snubbing	82-221-113-01	310	141
2.01.08	11	279	3k	207	NBR (Nitrile Buna-N)	82-221-113-02	310	141
2.01.09	11	279	5k	345	NR (Natural Rubber) - Snubbing	82-221-115-01	435	197
2.01.10	11	279	5k	345	NBR (Nitrile Buna-N)	82-221-115-02	435	197
2.01.11	13-5/8	346	3/5k	207 345	NR (Natural Rubber) - Snubbing	82-221-135-01	565	256
2.01.12	13-5/8	346	3/5k	207 345	NBR (Nitrile Buna-N)	82-221-135-02	565	256
2.01.13	20-3/4	527	3k	207	NR (Natural Rubber) - Snubbing	82-221-203-01	945	429
2.01.14	20-3/4	527	3k	207	NBR (Nitrile Buna-N)	82-221-203-02	945	429
2.01.15	21-1/4	540	2k	138	NR (Natural Rubber) - Snubbing	82-221-212-01	945	429
2.01.16	21-1/4	540	2k	138	NBR (Nitrile Buna-N)	82-221-212-02	945	429

ISA™ SPHERICAL ANNULAR BOP PACKING ELEMENT MATERIAL:

POLYISOPRENE (ASTM D1418 Designation – NR):

- Natural Rubber features high tensile strength, high resilience, high abrasion and high tear resistance properties, with a good friction surface and excellent adhesion to metals. Until the invention of synthetic elastomers in the 1930's, Natural Rubber was the only polymer available for O-ring manufacture. Natural Rubber features good resistance to organic acids and alcohols, with moderate resistance to aldehydes.

ACRYLONITRILE BUTADIENE POLYMER (ASTM D1418 Designation – NBR)

- Nitrile rubber (NBR) is the general term for acrylonitrile butadiene copolymer. The acrylonitrile content of nitrile sealing compounds varies considerably (18% to 50%) and influences the physical properties of the finished material. The higher the acrylonitrile content, the better the resistance to oil and fuel. At the same time, elasticity and resistance to compression set is adversely affected. In view of these opposing realities, a compromise is often drawn, and a medium acrylonitrile content selected. NBR has good mechanical properties when compared with other elastomers and high wear resistance. NBR is not resistant to weathering and ozone.

HYDROGENATED ACRYLONITRILE BUTADIENE POLYMER (ASTM D1418 Designation – HNBR)

- HNBR is widely used in oil industry and maintains excellent resistance to motor oils, sour gas, amine/oil mixtures, oxidized fuels, and lubricating oils. HNBR is resistant to mineral oil-based hydraulic fluids, animal and vegetable fats, diesel fuel, ozone, sour gas, dilute acids and bases. It also resists new bio-oils (biological oils). It is suitable for high dynamic loads and has a good abrasion resistance.

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ELASTOMER MATERIAL COMPATIBILITY GUIDE:

Application	Natural Rubber (NR)	Nitrile (NBR)	Hydrogenated Nitrile (HNBR)
Intermittent Service - Temperature (°F) – Static Condition	- 65 to 180	- 40 to 250	Over 3000
Continuous Service - Temperature (°F)	140	200	40 - 90
Tensile Strength (Psi)	Over 3000	Over 2000	Excellent
Hardness (Shore A)	30 - 90	40 - 90	Good
Adhesion to metals	Excellent	Excellent	Good
Adhesion to fabrics	Excellent	Good	Excellent
Tear Resistance	Good	Fair	Good
Abrasion Resistance	Excellent	Good	Good
Compression Set	Excellent	Good	Good
Resilience - Hot	Excellent	Fair	Good
Resilience - Cold	Excellent	Fair	Good
Dielectric Strength	Excellent	Poor	Excellent
Electrical Insulation	Good to Excellent	Poor	Good
Impermeability to Gases	Good	Excellent	Good
Acid Resistance - Dilute	Fair to Good	Good	Excellent
Acid Resistance - Concentrated	Fair to Good	Good	Excellent
Solvent Resistance – Aliphatic Hydrocarbons	Poor	Excellent	Excellent
Solvent Resistance – Aromatic Hydrocarbons	Poor	Good	Good
Solvent Resistance – Oxygenated	Poor	Poor	Excellent
Solvent Resistance – Lacquer	Poor	Fair	Excellent
Solvent Resistance – Lubricating Oils	Poor	Good	Good
Resistance – Oil & Gas	Poor	Excellent	Excellent
Resistance – Water Absorption	Good	Good	Excellent
Resistance - Oxidation	Good	Good	Fair
Resistance - Ozone	Poor	Poor	Fair
Resistance – H2S	Poor	Poor	Excellent
Resistance – CO2	Poor	Poor	Excellent
Resistance – Sunlight Aging	Poor	Poor	Good
Resistance – Heat Aging	Fair	Good	Good
Resistance – Low Temperature	Good	Fair	Good
Resistance - Flame	Poor	Poor	Over 3000
Resistance – Chlorinated Hydrocarbons	Poor	Fair	40 - 90

ELASTOMER RECOMMENDED OPERATING TEMPERATURE

Elastomer Material (Packing Elements)	Recommended Operating Range			
	Low Temperature		High Temperature	
	°C	°F	°C	°F
Natural (NR)	4	40	82	180
Carboxylated Nitrile Rubber (XNBR)	4	40	82	200 (Rams)
Nitrile Rubber (NBR)	4	40	82	180 (Elements) 200 (Rams)
Hydrogenated Nitrile Butadiene Rubber (HNBR)	4	40	107	225

ELASTOMER PACKAGING CODE SYSTEM (as per API 16A Latest Edition)

Example of Product Code on Elastomer Packing: AA BBBB CCCC DDDD EEE FFF

Table 42 (API 16A Edition 4) – Code System for Non-Metallic Sealing Materials

CODE	DESCRIPTION
AA	Compound hardness (durometer)
BBBB	Elastomer Compound Marking Code (see Table 43 and ASTM D 1418)
CCCC	Date of manufacture (see 8.4.2.5)
DDDD	Lot / Serial number (in accordance with manufacturer's specifications)
EEE	Temperature class (see Table 4)
FFF	Date of expiration

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER****ELASTOMER STORAGE AND AGE CONTROL GUIDELINES**

The following outlines the proper storage of elastomeric products to achieve maximum acceptable condition and their storage shelf life as defined in Table A & B. ISO 2230:2002 provides guidelines for the storage and for determining the shelf life of vulcanized rubber products.

TEMPERATURE:

- The optimum temperature for the storage of rubber products is between 50°F (10°C) and 80°F (27°C). Higher temperatures cause a gradual hardening of the rubber and accelerate the deterioration of rubber products, so sources of heat in storage rooms should be arranged such that the temperature of stored items never exceeds 100°F (38°C).
- Elastomers parts undergo several kinds of change when they are exposed to low temperatures. In temperatures of -20°F (-20°C), the rubber becomes brittle and will shatter when dropped or handled roughly. Some changes occur immediately, others after prolonged exposure. All are reversible; the rubber regains its original properties when it is returned to 65°F (18°C) or room temperature.

HUMIDITY:

- All elastomer products shall be stored in moisture proof bags, if not the relative humidity level shall be less than 65%. Condensation should not be allowed to occur.

LIGHT:

- All elastomeric products must be protected from Ultraviolet radiation (either indoor lighting and/or sunlight). Polyethylene (PE) bags stored in large cardboard containers and polyethylene lined craft bags offer good protection against light. Integrated elastomer recommends 4 mil minimum thickness, opaque, polyethylene plastic wrap and/or sealed as far as practical.

OZONE (O3) AND OXYGEN (O2):

- Integrated parts must be stored in airtight containers to protect them from circulating air. Or else this will cause cracks, which can be formed in many different elastomers (Natural rubber, polybutadiene, Styrene-butadiene rubber and NBR) by ozone attack and causes a breaking of the carbon backbone polymer chain into smaller chains. This weakens the rubber by lowering its molecular weight, and cracks start to grow in the regions affected.

DEFORMATION:

- All elastomeric products should be stored in a relaxed state, free from tension, compression, or other deformation since these may lead to cracking or change of shape. Packing element should not be stored on pegs as this may cause severe deterioration.

EXPOSURE TO CHEMICALS:

- Chemical degradation can change polymers properties due to a chemical reaction such as breaking its double bonds (rubber more brittle followed by crack) or swelling of rubber. This can reduce product's overall functional life. So, all elastomer products shall not come in contact with any chemicals unless these materials are by design an integral part of the component or Integrated Elastomer's packaging.

STRUCTURAL DAMAGE TO PRODUCT:

- Permanent deformations (folds, wrinkles or flattening areas)
- Mechanical damage (cuts, cracks, worn or dissolved areas)
- Changes to the surface (stiffening, softness, stickiness, discoloration or dirtiness)

The variations in size, composition and function of the rubber parts prevent defining a precise shelf life. Large rubber parts might suffer the same amount of deterioration as small parts and still be usable, whereas small parts become useless and should be thrown away. Both Natural and Synthetic rubber parts are susceptible to deterioration from various solvents such as oilfield liquid hydrocarbons, which causes swelling or shrinkage. In the final analysis, ownership judgement determines whether a rubber part should be used. If there is doubt, replace the part.

INTEGRATED® OEM API 16A MONOGRAMMED TYPE ISA™ SPHERICAL ANNULAR FORGED BLOWOUT PREVENTER

TABLE A: STORAGE CONDITIONS FOR RUBBER AND ELASTOMERIC PRODUCTS

Storage Parameter	Recommended Storage	Minimum Acceptable	Unacceptable Storage
Temperature	Less than 80°F (27°C)	Less than 120°F (49°C)	Greater than 120°F (49°C)
Light	Complete Darkness	Indirect Light	Direct Light
Stress	Separate Packages	Sacks of Loose Parts	Pinched, Stretched, Creased
Environment	Clean Dry Air	Humid Air	Oil, Grease and / or Water
Oxygen and Ozone	Sealed Package	Open Air	Near Electric Motors / Arcs

TABLE B: RUBBER AND ELASTOMERIC PRODUCTS STORAGE LIFE LIMITS

Type of Components	Type of Elastomer	Maximum Total Storage Life
Annular BOP Packing Elements	Nitrile (NBR)	6 Years
Annular BOP Packing Elements	Natural Rubber (NR)	6 Years
Annular BOP Packing Elements	Hydrogenated Nitrile (HSN & XHSN)	7 Years
BOP Ram Block Elements	Nitrile (NBR and XNBR)	6 Years
BOP Ram Block Elements	Hydrogenated Nitrile (HSN & XHSN)	7 Years
Annular BOP Square Seals, Lip Seals, Headers	Nitrile (NBR)	5 Years
Annular BOP O-Ring Cross Sections	Nitrile (NBR)	5 Years
BOP Ram Block Top and Lateral Seals	Nitrile (NBR and XNBR)	5 Years
BOP Ram Block Top and Lateral Seals	Hydrogenated Nitrile (HSN & XHSN)	6 Years
Ram BOP Bonnet Seals	Nitrile (NBR and XNBR)	5 Years
Ram BOP Bonnet Seals	Hydrogenated Nitrile (HSN & XHSN)	6 Years
Polypack, Wipers, etc.	Polyurethanes and combinations with Nitriles (NBR, HSN and U)	6 Years
Drill Stem Valve Seals (Packing and Molded Lip Seals)	Nitrile (NBR)	6 Years
Pulsation Dampeners, PD	Fluoropolymers (FKM)	10 Years
Pulsation Dampeners, PD	Other Elastomeric Materials	6 Years
Pipe Wipers	Natural Rubber (NR)	5 Years
Seal Kits, Annular & Ram BOPs	Nitrile (NBR)	5 Years
Stripper Rubbers & Red Wipers	Natural Rubber (NR) and Neoprene (CR)	5 Years
Bladders & Diaphragms	Natural Rubber (NR)	5 Years
Bladders & Diaphragms	Hydrogenated Nitrile (HSN)	6 Years

Maximum Total Storage life specified in Table B is applicable only if minimum acceptable storage conditions are maintained as per Table A.

REFERENCED DOCUMENTS

API 6A – 20TH Edition | API 16A – 4th Edition | ISO 2230:2002



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