

Overview

Vertebrae Bend Restrictors (VBR) are crucial in the offshore industry, ensuring components maintain minimum bend radii during installation and operation. MPC offers traditional bolted VBRs and innovative boltless designs, using advanced thermoset polyurethane. While our bolted VBRs provide a familiar solution, our boltless design significantly reduces installation time and hardware requirements, streamlining assembly without compromising performance. Lightweight and nearly buoyant, our VBRs deliver superior efficiency and endure demanding offshore environments.



Benefits

- Significant weight reduction from traditional metallic alternatives
- Unmatched durability in harsh offshore environments
- Boltless design simplifies installation and reduces assembly time
- Provides superior corrosion resistance, no need for cathodic protection
- Versatile solutions and diameters for various offshore operational needs

Applications

MPC's traditional bolted VBRs and boltless designs are highly adaptable for a diverse range of offshore applications. The superior performance of our advanced polyurethane technologies makes them excel in mission-critical applications, such as:

- Offshore Drilling
- Subsea Pipeline Installation
- Deepwater Riser Systems
- Umbilical Protection

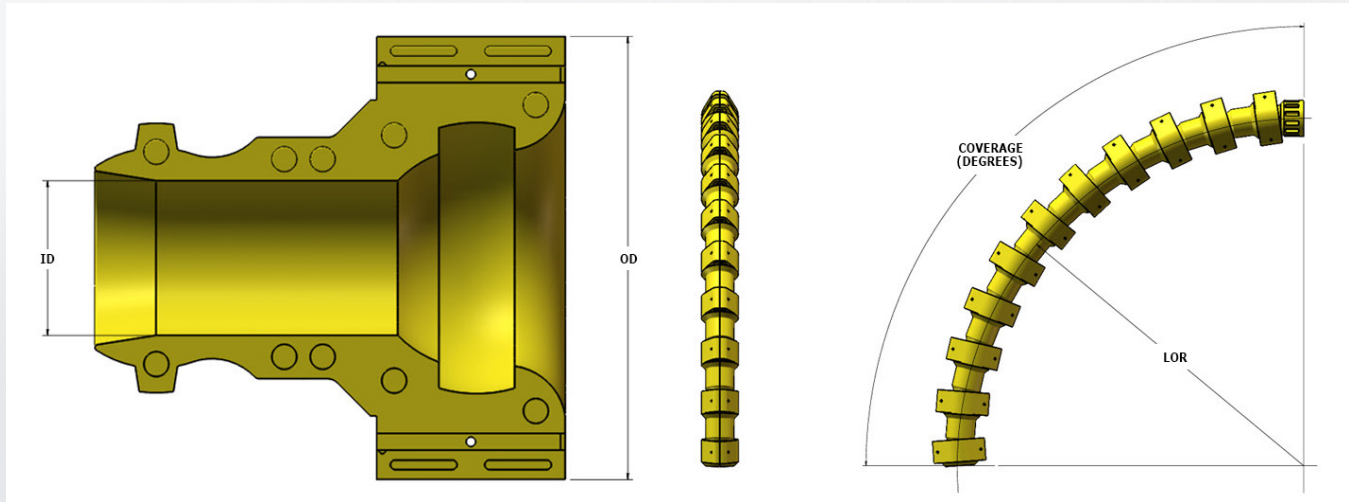


Specifications

Our traditional bolted VBRs and patented boltless designs, includes but not limited to:

- Size: 3 inches to 10 inches
- Weight: 4 to 90 pounds in air, 0.5 to 30 pounds in sea water
- Dimensions:
 - Inner diameters 3.16 to 10.38 inches
 - Outer diameters 6.59 to 20 inches
- Flange options: CL 300 configurations from 5 to 12 inches
- Lock Out Radius Options: Flexible to accommodate various umbilical bend radii
- Maximum Long Term, Short Term, & Ultimate Moments: Engineered for reliability

Boltless Vertebrae Bend Restrictor Specifications

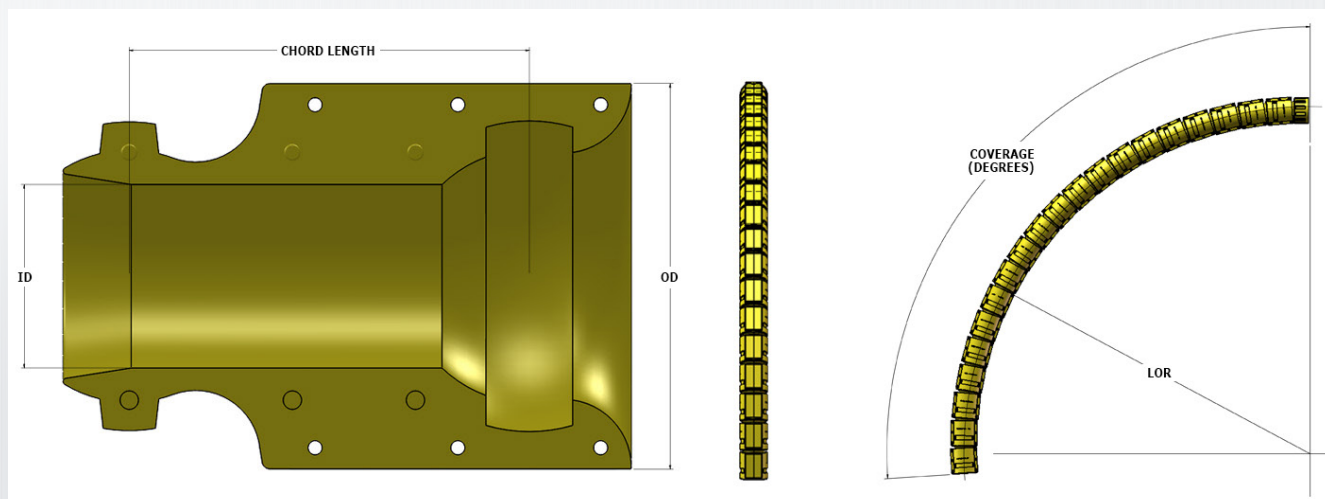


Size	Segment Weight	Segment Weight	Segment I.D.	Segment O.D.	Flange	Lock Out Radius	Max Long Term	Max Short Term	Ultimate Break
	Air (Lb)	Sea Water (Lb)	IN	IN	Options	IN'	Ft-Lb	Ft-Lb	Ft-Lb
4.25 clip	13.1	2	4.25	11.79	6" - CL 300	42, 48, 90	2687	3345	4031
6.18 clip	55.9	8	6.18	17.7	6" - CL 300	82, 114, 171, 185, 204, 212, 219	9700	12075	14548

Specifications are based on a 80D Ester Based Polyurethane Material

¹The LOR should be roughly 10% larger than the MBR of the umbilical to accommodate flex under load

Bolted Vertebrae Bend Restrictor Specifications



Size	Segment Weight	Segment Weight	Segment I.D.	Segment O.D.	Flange	Lock Out Radius	Max Long Term	Max Short Term	Ultimate Break
	Air (Lb)	Sea Water (Lb)	IN	IN	Options	IN'	Ft-Lb	Ft-Lb	Ft-Lb
3	4	0.5	3.16	6.59	5" - CL 300	38	820	1021	1231
5	22	4	5.18	10.79	8" - CL 300	47, 58	3695	4600	5543
5.94	51	9	5.94	12.5	6" - CL 300	114, 162	7095	8834	10643
7	50	8	7.18	14.54	8" - CL 300 10" - CL 300	65, 75, 82	9938	12373	14907
8	84	15	8.31	17.39	10" - CL 300	78	19107	23789	28661
8.84	82	14	8.84	20	12" - CL 300	83, 157	32974	41053	49461
9.34	86.1	15	9.34	20	-	83	27907	34744	41860
10	90	30	10.38	19.56	12" - CL 300	100	35474	44165	53211

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