



# 55HPWX - FILLED WIDE ARCH - LOW SPRING RATE

## MOVEMENT/SPRING RATE WITH FILLED WIDE ARCH DESIGN

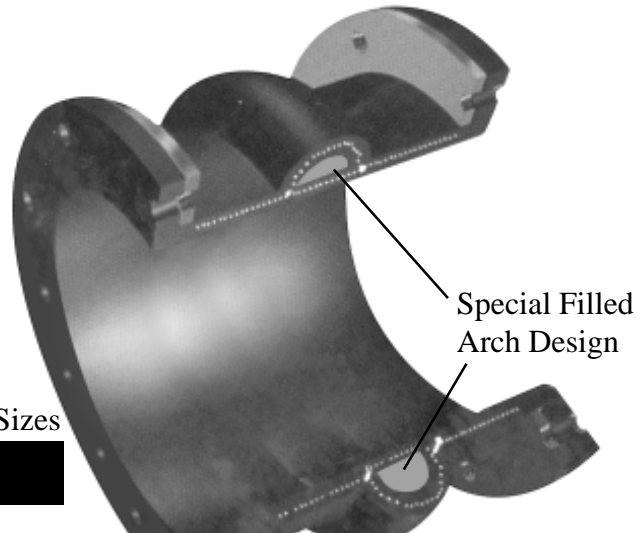
Thorburn's 55HPWX is a modified arch profile with a special filler compound to reduce the spring rate to 2X the 42HPW open arch rubber expansion joint.

### Advantages:

- 50% Less Force for Given Movement for Filled Arch
- 40% More Movement than a Standard Spool Type Arch
- Wide Variety of Elastomers
- Low Turbulance

Full Vacuum for all Sizes

Available in sizes up to 144 inches



Nominal Pipe Size Exp. Jt. I.D.	"Face to Face" Minimum Recommended Length			Working Pressure @ 180°F (psi)	Single Filled Arch Non-Concurrent Movement Capability					Spring Rates Zero Pressure Conditions					Thrust Factor Filled Arch Area (sq.in)
	Single Arch	Two Arch	Three Arch		Axial compression (in)	Axial extension (in)	Lateral deflection (in)	Angular movement (deg)	Torsional Rotation (deg)	Compression (lb/in)	Extension (lb/in)	Lateral deflection (lb/in)	Angular (ft*lb/deg)	Torsional (ft*lb/deg)	
1	6	10	14	150	0.5	0.25	0.25	25.1	1.0	352	456	526	0.06	0.06	0.79
1 1/4	6	10	14	150	0.5	0.25	0.25	21.9	1.0	440	574	658	0.15	0.15	1.23
1 1/2	6	10	14	150	0.5	0.25	0.25	19.3	1.0	528	688	786	0.226	0.226	1.77
2	6	10	14	150	0.5	0.25	0.25	17.1	1.0	636	828	1050	0.46	0.46	3.14
2 1/2	6	10	14	150	0.5	0.25	0.25	14.25	1.0	796	1034	1144	0.76	0.76	4.91
3	6	10	14	150	0.5	0.25	0.25	12.2	1.0	952	1242	1236	1.2	1.2	7.07
4	6	10	14	150	0.5	0.25	0.25	9.1	1.0	1272	1656	1428	2.8	2.8	12.56
5	6	10	14	150	0.5	0.25	0.25	7.6	1.0	1588	2064	1638	5.6	5.6	19.63
6	6	10	16	150	0.5	0.25	0.25	6.4	1.0	1906	2478	1852	9.6	9.6	28.27
8	8	12	16	150	0.5	0.25	0.375	4.85	1.0	2118	2756	2260	19.0	19.0	50.26
10	8	12	16	150	0.625	0.375	0.375	4.55	1.0	2648	3444	2428	36.4	36.4	78.53
12	8	12	16	150	0.625	0.75	0.375	3.8	1.0	3178	4132	2844	63.2	63.2	113.08
14	8	12	20	150	0.625	0.375	0.375	3.25	1.0	2780	3616	3352	88.8	88.8	153.91
16	8	12	20	150	0.625	0.375	0.375	2.85	1.0	3178	4132	3858	114	114	201.02
18	8	12	20	150	0.625	0.375	0.375	2.55	1.0	3574	4652	4260	160	160	254.42
20	8	12	20	150	0.625	0.375	0.375	2.8	1.0	3974	5160	4764	228	228	314.10
22	10	14	22	150	0.625	0.375	0.5	2.6	1.0	4370	5676	4944	308	308	380.06
24	10	14	22	150	0.875	0.375	0.5	2.4	1.0	4764	5970	5118	412	412	452.30
26	10	14	22	75	0.875	0.375	0.5	2.2	1.0	4590	6196	5486	438	438	530.83
28	10	14	22	75	0.875	0.375	0.5	2.05	1.0	4944	6430	5856	574	574	615.64
30	10	14	22	75	0.875	0.375	0.5	1.9	1.0	5298	6892	6226	656	656	706.73
32	10	14	22	75	0.875	0.375	0.5	1.8	1.0	5654	7348	7314	834	834	804.10
34	10	14	22	75	0.875	0.375	0.5	1.7	1.0	6004	8404	8404	968	968	907.75
36	10	14	22	75	0.875	0.375	0.5	1.6	1.0	6358	8268	9492	1266	1266	1017.68
40	10	14	22	75	0.875	0.375	0.5	1.5	1.0	7062	9186	10014	1564	1564	1256.40
42	12	14	24	75	1	0.375	0.5	1.45	1.0	6678	8674	10270	1744	1744	1385.18
48	12	14	24	75	1	0.375	0.5	1.4	1.0	7630	9912	11598	2738	2738	1809.22
50	12	14	24	75	1	0.375	0.5	1.35	1.0	7950	10326	12036	2952	2952	1963.13
54	12	14	24	75	1	0.375	0.5	1.3	1.0	8586	11152	12910	3208	3208	2289.79
56	12	14	24	75	1	0.375	0.5	1.25	1.0	8904	11576	13344	3462	3462	2462.54
60	12	14	24	75	1	0.375	0.5	1.15	1.0	9540	12402	14208	5306	5306	2826.90
66	12	14	24	75	1	0.375	0.5	1.05	1.0	10494	13642	15324	6004	6004	3420.55
72	12	14	24	75	1	0.375	0.5	0.95	1.0	11448	14884	16430	8522	8522	4070.74

**Special notes on movement capability:** 1) Thorburn's 55HPWX filled wide arch design movements represent a 50% reduction in movement compared to Thorburn's 42HPW single open arch design. 2) To calculate movement of multiple arch type for compression extension, lateral, angular and torsional movements, take movement shown in the above table and multiply by the number of arches. 3) The degree of angular movement is based on the maximum extension shown. 4) Movement capability shown is non-concurrent percentage used in one movement position must be deducted from the other movement position so that sum of movements don't exceed 100%. 5) Movements shown are based on proper installation practices. See Thorburn installation maintenance guide for details.

**Special notes on force Pounds / Spring Rates:** 1) Forces required to move Thorburn Mighty-Spool Model 55HPWX are based on zero pressure conditions and room temperature in the pipeline. 2) These forces should be considered only as approximates, compensation must be made for more accurate forces based on materials of construction and actual service conditions. 3) Filled arch spring rates for 55HPWX are approximately 2 times that of 42HPW. 4) Multi-arch spring rates are equal to single arch divided by number of arches.

Movement Interaction Formula:

$$\left( \frac{C_{DES}}{C_{MAX}} \text{ OR } \frac{E_{DES}}{E_{MAX}} \right) + \frac{L_{DES}}{L_{MAX}} + \frac{S_{DES}}{S_{MAX}} + \frac{ST_{DES}}{ST_{MAX}} \# 1 \quad \text{If } > 1, \text{ Increase number of arches}$$