

Series 320



HOLZ
RUBBER COMPANY, INC.
1-800-285-1600 • Quality Since 1935

Quality • Value • Service

Rubber Expansion Joints

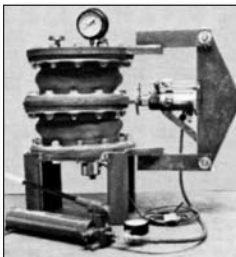


SERIES 320

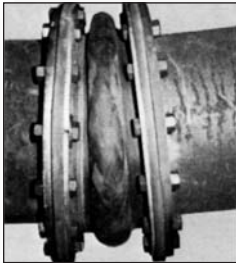
THE **HOLZ RUBBER 320 EXPANSION JOINT** APPLIES THE TECHNOLOGY OF THE TIRE INDUSTRY to the handbuilt pressure piping expansion joint. The use of polyester tire cord and the modified arch construction provides greater overall performance than previous designs.

- Greater Strength
- Greater Flexibility
- Longer Life Expectancy
- Increased Safety
- Lower Project Costs
- Greater Movement
- Lower Spring Rate
- Higher Pressure Capabilities
- Lighter Weight
- Conforms to ASTM Requirements

FORCE/MOVEMENT TESTING



LATERAL



ANGULAR

ENGINEERED FOR PERFORMANCE

The superior performance offered by the 320 Expansion Joint is the result of a three year program which thoroughly re-engineered the handbuilt expansion joint. This program studied the relationship between the pressure capability of the expansion joint and the media temperature. Holz Rubber engineers also studied concurrent movements and spring rates. As a result Holz Rubber can now provide expansion joint application guidelines which were unknown in the industry prior to the 320 Expansion Joint.

REINFORCEMENT

The 320 Expansion Joint incorporates woven polyester fabric and polyester tire cord in a fabric matrix bonded within the elastomeric tube and cover. The inherent strength of polyester tire cord allows the 320 Holz Rubber Expansion Joint to provide greater strength and higher pressure capabilities.

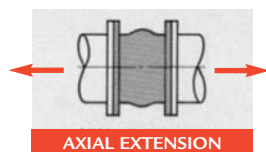
Holz Rubber engineers were the first to define the relationship between temperature and pressure as it applies to handbuilt, fabric reinforced, rubber expansion joints. By defining the exact relationship, Holz Rubber, with the 320 Expansion Joint, can now provide precise guidelines for pressure/vacuum capability at various temperatures.

GREATER MOVEMENTS

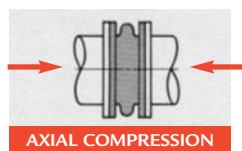
The unique arch design of the 320 Expansion Joint provides greater movement capabilities than the traditional handbuilt product, without increasing the face to face requirements. *Simply stated, the single arch 320 can provide movement capability equal to the traditional double arch product and the double arch 320 movement capabilities are equal to those of the standard quadruple arch product.* The Holz Rubber 320 Expansion Joint can solve piping movement problems without having to resort to long and expensive multiarch products. These movements are unmatched in the industry and enable Holz Rubber to provide an expansion joint that will satisfy a wide range of expansion joint needs.

LOWER FLANGE FORCES

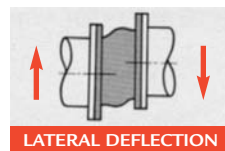
The unique arch design of the 320 Expansion Joint combined with a modified radial tire cord construction throughout the arch wall profile, results in lower flange forces. Lower forces mean less stress on the piping system components.



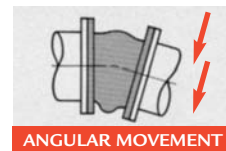
AXIAL EXTENSION



AXIAL COMPRESSION



LATERAL DEFLECTION

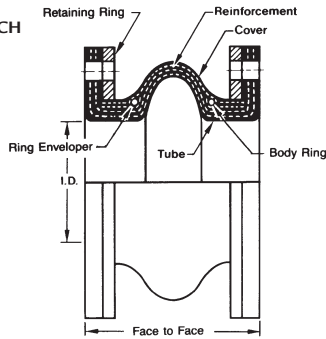


ANGULAR MOVEMENT

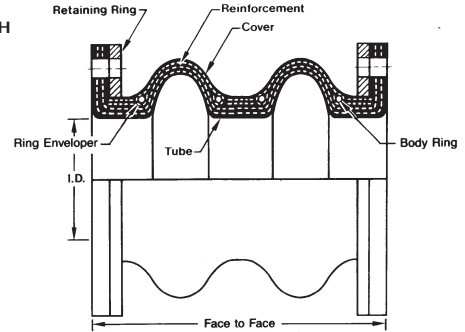
SERIES 320

OPEN ARCH

STYLE 320 SINGLE OPEN ARCH



STYLE 320-2 DOUBLE OPEN ARCH



CONSTRUCTION

TUBE

The 320 Expansion Joint has been designed with an extra thick elastomeric tube to yield superior performance in harsh applications. The tube elastomer can be compounded for a variety of service conditions such as chemical, petroleum, sewage, as well as gaseous and abrasive media.

BODY

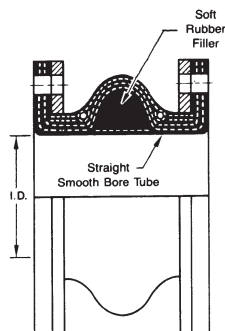
The polyester/elastomer reinforcement plies are bonded completely within the tube and cover materials for maximum joint integrity. High tensile steel body rings are held in place by exclusive ring enveloper system.

COVER

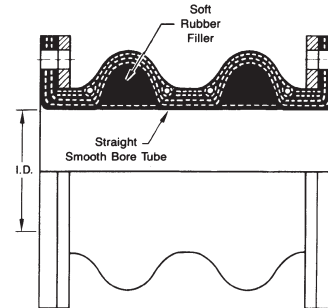
The cover elastomer protects the body materials from external conditions. A wide variety of cover elastomers are available to suit most applications.

FILLED ARCH

STYLE 320FA SINGLE FILLED ARCH



STYLE 320-2FA DOUBLE FILLED ARCH



FILLED ARCHES BUILT AS AN INTEGRAL PART of the expansion joint eliminate flow turbulence and collection of suspended solids. Filled arch joints are particularly suited for sewage, sludge, slurry, waste water and process lines in the pulp and paper, food and mining industries. Filled arch joints are also recommended for systems where high flow velocity and high abrasion conditions exist.

NOTES:

1. Internal metal flow liners and external metal protective shrouds are available.
2. Hydrostatic/vacuum testing is available.

SERIES 320

MOVEMENTS SPRING RATES

NOM. I.D. (INCHES)	MAXIMUM MOVEMENTS ①								SPRING RATES ②			
	SINGLE OPEN ARCH ③ ④				DOUBLE OPEN ARCH ③ ④				ELONGATION (LBS/INCH)	COMPRESSION (LBS/INCH)	LATERAL (LBS/INCH)	ANGULAR (FT. LBS/DEGREE)
	ELONGATION (INCHES)	COMPRESSION (INCHES)	LATERAL (INCHES)	ANGULAR (DEGREES)	ELONGATION (INCHES)	COMPRESSION (INCHES)	LATERAL (INCHES)	ANGULAR (DEGREES)				
10	1.00	1.75	1.00	15.30	2.00	3.50	2.00	30.60	750	750	1334	16
12	1.00	1.75	1.00	12.90	2.00	3.50	2.00	25.80	800	800	1541	22
14	1.00	1.75	1.00	11.10	2.00	3.50	2.00	22.20	865	865	1748	45
16	1.00	1.75	1.00	9.80	2.00	3.50	2.00	19.60	933	933	1943	68
18	1.00	1.75	1.00	8.70	2.00	3.50	2.00	17.40	1000	1000	2150	90
20	1.00	1.75	1.00	7.80	2.00	3.50	2.00	15.60	1065	1065	2358	113
22	1.00	1.75	1.00	7.10	2.00	3.50	2.00	14.20	1135	1135	2553	136
24	1.00	1.75	1.00	6.60	2.00	3.50	2.00	13.20	1200	1200	2760	169
26	1.00	1.75	1.00	6.07	2.00	3.50	2.00	12.14	1265	1265	2990	175
28	1.00	1.75	1.00	5.63	2.00	3.50	2.00	11.26	1335	1335	3174	195
30	1.00	1.75	1.00	5.27	2.00	3.50	2.00	10.54	1400	1400	3381	218
32	1.00	1.75	1.00	4.93	2.00	3.50	2.00	9.96	1465	1465	3600	240
34	1.00	1.75	1.00	5.63	2.00	3.50	2.00	11.26	1535	1535	3795	262
36	1.25	2.25	1.00	5.73	2.50	4.50	2.00	11.46	1771	1771	4455	313
38	1.25	2.25	1.00	5.43	2.50	4.50	2.00	10.86	1843	1843	5097	337
40	1.25	2.25	1.00	5.17	2.50	4.50	2.00	10.34	1921	1921	5375	362
42	1.25	2.25	1.00	4.92	2.50	4.50	2.00	9.84	1992	1992	5625	384
44	1.25	2.25	1.00	4.70	2.50	4.50	2.00	9.40	2065	2065	5863	410
46	1.25	2.25	1.00	4.48	2.50	4.50	2.00	8.96	2142	2142	6116	435
48	1.25	2.25	1.00	4.30	2.50	4.50	2.00	8.60	2214	2214	6366	459
50	1.25	2.25	1.00	4.13	2.50	4.50	2.00	8.26	2286	2286	6603	486
52	1.25	2.25	1.00	3.97	2.50	4.50	2.00	7.94	2365	2365	6868	506
54	1.25	2.25	1.00	3.82	2.50	4.50	2.00	7.64	2435	2435	7121	531
56	1.25	2.25	1.00	3.68	2.50	4.50	2.00	7.36	2507	2507	7344	554
58	1.25	2.25	1.00	3.57	2.50	4.50	2.00	7.14	2585	2585	7622	578
60	1.25	2.25	1.00	3.45	2.50	4.50	2.00	6.90	2657	2657	7875	601
62	1.25	2.25	1.00	3.33	2.50	4.50	2.00	6.66	2834	2834	8377	647
66	1.25	2.25	1.00	3.13	2.50	4.50	2.00	6.26	2988	2988	8878	694
72	1.25	2.25	1.00	2.95	2.50	4.50	2.00	5.90	3210	3210	9632	767
78	1.25	2.25	1.00	2.65	2.50	4.50	2.00	5.30	3432	3432	10,387	836
84	1.25	2.25	1.00	2.47	2.50	4.50	2.00	4.94	3653	3653	11,086	908
90	1.25	2.25	1.00	2.30	2.50	4.50	2.00	4.60	3875	3875	11,838	980
96	1.25	2.25	1.00	2.15	2.50	4.50	2.00	4.13	4096	4096	12,620	1052

- ① Movements shown are non-concurrent. Contact Holz Rubber for concurrent movements.
- ② Spring rates are for single open arch at zero pressure conditions, therefore, should be considered only as approximate. Double Arch spring rate equals 50% of Single Arch spring rate. Filled Arch spring rate equals Open Arch spring rate multiplied by 4.2.
- ③ Filled arch construction reduces movements by 50%.
- ④ Not available in more than two arches. Tapers not available.
- 5. Contact Holz Rubber for sizes not shown up to 144" ID.
- 6. Available in Teflon lined.

SERIES 320

PRESSURES TEMPERATURES

NOMINAL I.D. RANGE (INCHES)	FACE TO FACE (SINGLE ARCH) (INCHES)	MAXIMUM SYSTEM PRESSURE (PSI) VS MEDIA TEMPERATURE ①				MAXIMUM VACUUM RATING (IN. OF HG.) VS MEDIA TEMPERATURE ①			
		180°F	212°F	250°F	300°F	180°F	212°F	250°F	300°F
10 thru 14	8	225	200	180	120	28	26	23	20
	10	225	200	180	120	28	26	23	20
	12	200	180	160	110	28	26	23	18
	14	200	170	150	80	26	24	21	16
	16 ②	185	157	140	75	26	22	19	14
16 thru 18	8	160	145	125	85	28	26	23	20
	10	160	145	125	85	28	26	23	20
	12	135	120	108	75	28	26	23	18
	14	135	115	100	55	26	24	21	16
	16 ②	120	102	90	45	25	21	18	14
20 thru 24	8	130	117	104	72	28	26	23	20
	10	130	117	104	72	28	26	23	20
	12	120	108	96	64	28	26	23	18
	14	120	102	90	48	26	24	21	16
	16 ②	110	94	83	40	25	21	18	14
26 thru 28	8	110	94	83	40	24	20	17	12
	10	110	100	88	60	28	26	23	20
	12	105	95	84	58	28	26	23	18
	14	105	90	79	42	26	23	20	15
	16 ②	100	85	75	35	25	20	18	13
30 thru 34	18	100	85	75	35	23	19	17	11
	10	95	86	76	52	28	26	23	19
	12	90	81	72	50	27	25	22	17
	14	90	77	68	36	26	23	20	14
	16 ②	85	72	64	34	25	20	17	12
36 thru 48	18	80	68	60	32	23	19	16	10
	10	90	81	72	50	28	26	23	19
	12	90	81	72	50	27	25	22	17
	14	87	74	65	45	26	23	20	14
	16	83	72	62	42	25	20	17	12
50 thru 72	18 ②	78	66	58	30	23	19	16	10
	20	78	66	58	30	22	17	15	9
	12	85	81	72	40	29	27	24	20
	14	85	74	65	32	29	27	24	20
	16	85	71	62	30	29	26	22	16
74 thru 96	18 ②	80	66	58	28	29	26	22	14
	20	80	66	58	26	29	25	20	12
	12	80	76	70	35	29	27	23	18
	14	80	72	63	30	29	27	23	18
	16	80	70	60	25	29	25	21	14
18 ②	75	65	56	20	28	25	21	12	
	20	75	65	54	20	28	24	19	10

- ① Specific temperature ratings of an expansion joint will vary from above data dependent upon the specific elastomer or fabric utilized in construction.
- ② Double arch "minimum" face to face dimension.

SERIES 320

NOMINAL I.D. RANGE (INCHES)	FACE TO FACE (INCHES)	STYLES		
		320HP	320XHP	320XHPMOD
MAXIMUM SYSTEM PRESSURE (PSI)				
10 thru 14	8	250	285	325
	10	250	285	325
	12	250	285	325
	14	250	285	325
	16 ②	250	285	325
16 thru 20	8	200	285	300
	10	200	285	300
	12	200	285	300
	14	200	285	300
	16 ②	200	285	300
22 thru 26	10	150	225	300
	12	150	225	300
	14	150	225	300
	16 ②	150	225	300
	18	150	225	300
28 thru 34	10	125	225	300
	12	125	225	300
	14	125	225	300
	16	125	225	300
	18 ②	125	225	300
36 thru 48	10	115	150	175
	12	115	150	175
	14	115	150	175
	16	115	150	175
	18 ②	115	150	175
50 thru 66	12	105	115	125
	14	105	115	125
	16	105	115	125
	18 ②	105	115	125
	20	105	115	125
68 thru 96	12	95	105	115
	14	95	105	115
	16	95	105	115
	18 ②	95	105	115
	20	95	105	115

SPRING RATES

320 Spring rates plus 15% (1.15 multiplier).

NOTES:

- ① Style 320HPs are rated for 30 in. Hg vacuum up to 300°F. Specific temperature ratings of an expansion joint will vary from above data dependent upon the specific elastomer or fabric utilized in construction.
- ② Double arch "minimum" face to face dimensions.

Style 320LP LOW PRESSURE

The 320LP Expansion Joint is the low pressure adaptation of the standard 320 design. The 320LP has the same exclusive arch design and tire cord construction as the standard 320 Expansion Joint. *The 320LP offers the same spring rates and movement capabilities as the standard 320.* The 320LP is an economical expansion joint for all low pressure/limited vacuum applications.

NOMINAL I.D. RANGE (INCHES)	MAXIMUM SYSTEM PRESSURE (PSI)	MAXIMUM VACUUM RATING (In. of Hg.)
10-96	25	15

NOTES:

1. Ratings are based on 180°F maximum continuous operating temperature.
2. Single Arch face to face range and Double Arch "Minimum" face to face dimensions are same as shown for standard 320.
3. Contact Holz Rubber for sizes not shown up to 144 in. ID.

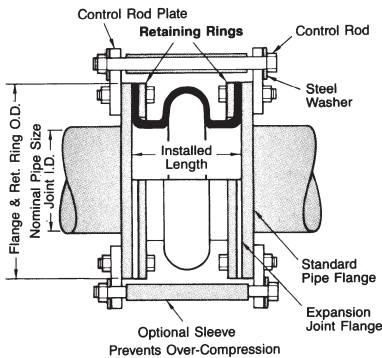
SERIES 320

DIMENSIONS						WEIGHTS			
NOM. I.D. (INCHES)	FLANGE O.D. (INCHES)	FLANGE THICKNESS (INCHES)	BOLT CIRCLE (INCHES)	NUMBER OF HOLES	L.D. OF HOLES (INCHES)	SIZE (L.D. X F/F)	EXPANSION JOINT (LBS./EACH)	RETAINING RING (LBS./SET)	CONTROL ROD (LBS./UNIT)
10	16	3/4	14 1/4	12	1	10 x 8	27	18	16
12	19	3/4	17	12	1	12 x 8	31	25	16
14	21	3/4	18 3/4	12	1 1/8	14 x 8	38	27	20
16	23 1/2	3/4	21 1/4	16	1 1/8	16 x 8	44	33	20
18	25	3/4	22 3/4	16	1 1/4	18 x 8	49	33	21
20	27 1/2	3/4	25	20	1 1/4	20 x 8	53	38	21
22	29 1/2	3/4	27 1/4	20	1 3/8	22 x 10	54	44	32
24	32	3/4	29 1/2	20	1 3/8	24 x 10	64	48	32
26	34 1/4	3/4	31 3/4	24	1 3/8	26 x 10	73	57	32
28	36 1/2	3/4	34	28	1 3/8	28 x 10	81	62	32
30	38 3/4	3/4	36	28	1 3/8	30 x 10	84	66	32
32	41 3/4	3/4	38 1/2	28	1 5/8	32 x 10	95	75	43
34	43 3/4	3/4	40 1/2	32	1 5/8	34 x 10	103	78	43
36	46	7/8	42 3/4	32	1 5/8	36 x 10	110	81	43
38	48 3/4	7/8	45 1/4	32	1 5/8	38 x 10	119	95	43
40	50 3/4	7/8	47 1/4	36	1 5/8	40 x 10	125	106	43
42	53	7/8	49 1/2	36	1 5/8	42 x 12	155	116	44
44	55 1/4	7/8	51 3/4	40	1 5/8	44 x 12	165	127	44
46	57 1/4	7/8	53 3/4	40	1 5/8	46 x 12	178	132	44
48	59 1/2	7/8	56	44	1 5/8	48 x 12	187	138	44
50	61 3/4	15/16	58 1/4	44	1 7/8	50 x 12	200	154	87
52	64	15/16	60 1/2	44	1 7/8	52 x 12	213	157	87
54	66 1/4	15/16	62 3/4	44	1 7/8	54 x 12	224	160	87
56	68 3/4	15/16	65	48	1 7/8	56 x 12	237	174	87
58	71	15/16	67 1/4	48	1 7/8	58 x 12	250	182	87
60	73	15/16	69 1/4	52	1 7/8	60 x 12	262	190	87
62	75 3/4	15/16	71 3/4	52	1 7/8	62 x 12	275	212	87
66	80	15/16	76	52	1 7/8	66 x 12	305	236	87
72	86 1/2	15/16	82 1/2	60	1 7/8	72 x 12	350	278	87
78	93	1	89	64	2 1/8	78 x 12	394	296	103
84	99 3/4	1	95 1/2	64	2 1/8	84 x 12	438	336	113
90	106 1/2	1	102	68	2 3/8	90 x 12	481	400	183
96	113 1/4	1	108 1/2	68	2 3/8	96 x 12	526	480	183

NOTE: 1. Flange dimensions shown are in accordance with 125/150 lb. standards of ANSI B16.1, B16.5; AWWA C-207 Table 3 Class E; AWWA C-207 Table 1 and 2 Class D. Retaining ring thickness is 3/8" all sizes. Flange thickness is Holz Rubber's standard.

Control Rods (Limit Rods)

PREVENT OVER-EXTENSION



NOTES:

1. Calculations are based on 65% of yield of the rod.
2. Control unit assemblies are not recommended for all applications. To ensure correct length, customer should provide width of mating flange or flange specification.
3. FSA recommended minimum number of rods for indicated pipe size.

NOM. I.D.	DIMENSIONS			NUMBER CONTROL ROD UNITS REQUIRED MAX. DESIGN OR TEST PRESSURE OF SYSTEM - PSIG				
	PLATE O.D. (INCHES)	ROD DIAMETER (INCHES)	PLATE THICKNESS (INCHES)	2	3	4	6	8
10	21 1/2	7/8	3/4	163	244	325	488	—
12	24 3/16	1	3/4	160	240	320	481	—
14	26 7/8	1	3/4	112	167	223	335	—
16	29 5/8	1 1/8	3/4	113	170	227	340	453
18	31 1/16	1 1/8	3/4	94	141	187	281	375
20	33 7/16	1 1/8	3/4	79	118	158	236	315
22	36 11/16	1 1/4	1	85	128	171	256	342
24	38 7/8	1 1/4	1	74	110	147	221	294
26	41 1/4	1 1/4	1	62	93	124	186	248
28	43 1/2	1 3/8	1 1/4	65	98	130	195	261
30	45 1/2	1 1/2	1 1/4	70	105	141	211	281
32	48 1/2	1 1/2	1 1/4	63	94	125	188	251
34	50 9/16	1 5/8	1 1/2	72	107	143	215	286
36	53	1 3/4	1 1/2	69	103	138	207	276
38	57 3/4	1 3/4	1 1/2	63	94	125	188	251
40	57 3/4	1 1/2	1 1/2	—	63	85	127	169
42	60	1 5/8	1 1/2	—	72	96	144	192
44	63 3/4	1 5/8	1 1/2	—	66	88	133	177
46	65 3/4	1 5/8	1 1/2	—	61	82	122	163
48	66 3/4	1 3/4	1 1/2	—	60	81	121	161
50	70 3/4	1 3/4	1 1/2	—	56	75	112	150
52	73	1 3/4	1 1/2	—	53	70	105	140
54	76 3/8	2	1 1/2	—	64	86	128	171
56	78 3/4	2	1 1/2	—	60	80	120	160
58	81	2	1 1/2	—	56	75	113	150
60	82 7/8	2	1 3/4	—	53	71	106	141
62	85 3/4	2	1 3/4	—	—	66	100	133
66	89 5/8	2	1 7/8	—	—	59	89	119
72	96 1/8	2	1 7/8	—	—	50	75	101
78	101	2 1/4	2	—	—	56	84	112
84	108 7/8	2 1/4	2 1/4	—	—	49	73	98
90	115 5/8	2 1/2	2 1/2	—	—	53	79	106
96	123	2 3/4	2 1/2	—	—	58	86	115