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Westfield Fasteners Product Specification:

DIN 3021 - Spring band clamp

This product guide contains the specification for Spring Band Clamps, a series of standard parts available from Westfield Fasteners. The basis of this specification is the internationally recognised DIN standard DIN 3021.

Product Description

Spring band clamps are a one piece, bolt free hose clamp made from hardened spring steel. They are designed to be used with hose systems where temperatures can fluctuate significantly. The shape of the spring band clamp will allow the clamp to continue to apply an even and consistent radial clamping force, within a temperature range of -40°C to +120°C. These spring band clamps are suitable for heavy duty applications.

The clamp is opened by squeezing the two ears together. This can be done with pliers or there are specific tools available. The steel clamps are finished with layers of a black chrome (VI) free coating, which contains zinc.

Scope of the DIN Standard

DIN 3021 specifies the characteristics for this spring band clamp design, made from hardened spring steel for sizes from 13mm to 90mm in diameter. The diameter given (nominal diameter) is the optimum hose outside diameter. The nominal diameter will not be equivalent to the diameter shipped.

Table 1, with figure 1 gives part dimensions and relevant tolerances. Table 2 gives the 3 directional clamping forces of each clip, whilst table 3 gives the same forces in 4 directions.
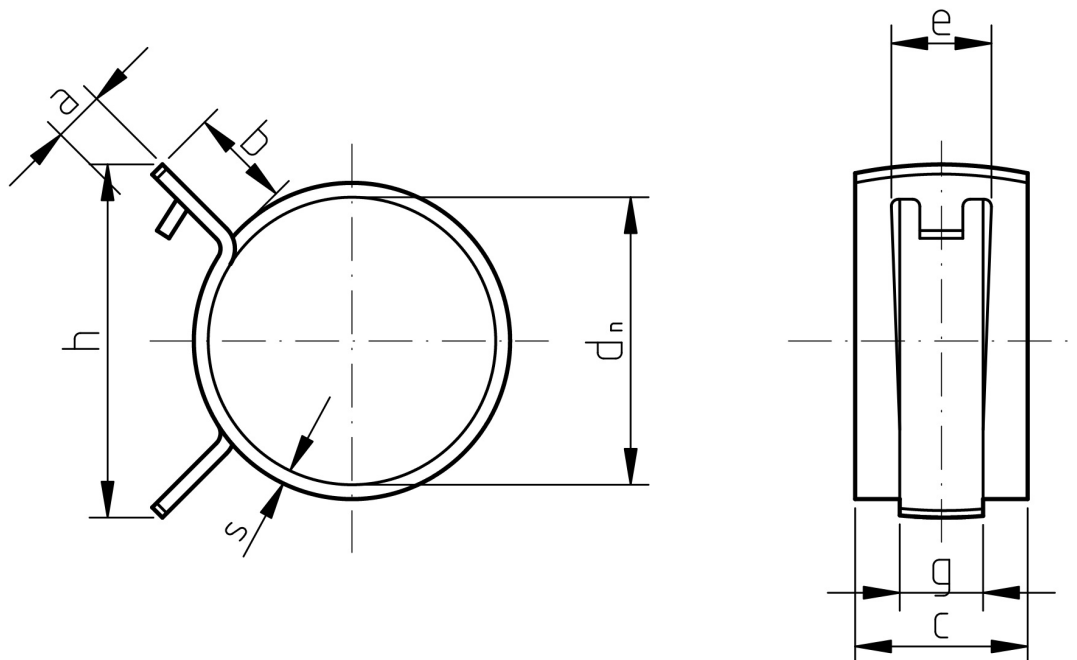

Figure 1: Spring band clamp

Table 1: Dimensions & Tolerances according to DIN 3021

Nominal Diameter, d_n	Delivery Diameter, d_a	Fully Open Diameter, d_0	Material Thickness, $s+/-0.4$	Clamp Width, $c+/-0.3$	a, max	b, max	e, +/-0.7	g, +/-0.7	h, max	Gap Size
13	12	14.2	0.8							
14	13.3	15.8	0.8							
15	14	16.5	0.8							
16	14.9	17.5	0.8							
17	15.6	18.5	0.8							
18	16	19	0.8							
19	17.8	20.2	1.3						40	
20	18.4	21.6	1.3							
21	19.4	22.5	1.3							
22	20.5	24.2	1.3							
23	21	24.7	1.3							
24	22	26	1.3							
25	23.5	26.8	1.3							0.09
26	24.3	28	1.7							
27	25.2	29	1.7							
28	26.1	30.2	1.7							
29	27	31.5	1.7							
30	28	32.5	1.7							
31	28.7	33.5	1.7	12	9	10	7	5.8		
32	29.5	34.5	1.7							
33	30	35.5	1.7							
34	30.6	36.4	1.7							
35	31.5	38	1.7							
36	32.5	39	1.7							
37	33.5	40.3	1.7						60	
38	34.5	41.5	1.7							
39	35	42	1.7							
40	35.5	42.5	1.7							
41	36.5	43.5	2.1							
42	37.5	44.5	2.1							
43	37.9	45.5	2.1							
44	38.5	46.5	2.1							
45	39.5	47.5	2.1							0.12
46	40.5	48.5	2.1							
47	41.5	50	2.1							
48	42	51	2.1							
49	42.5	52	2.1							
50	43.5	53	2.1						72	
51	44	54	2.1							

Table 1: Dimensions & Tolerances according to DIN 3021 Continued

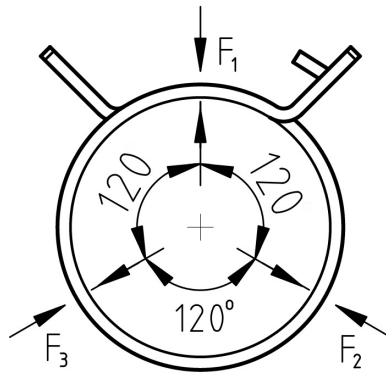| Nominal Diameter, d_n	Delivery Diameter, d_a	Fully Open Diameter, d_0	Material Thickness, s+/-0.4	Clamp Width, c+/-0.3	a, max	b, max	e, +/-0.7	g, +/-0.7	h, max	Gap Size
52	45	54.9	2.1						72	0.12
53	46	55.8								
54	46.5	56.9								
55	47	58								
60	51.5	63	2.6	12	9	10	7	5.8		0.15
65	57.5	68								
70	61.5	73								
75	66	78								
80	70	83								
85	74	88							110	
90	79	93								

Figure 2: 3-Channel Clamping Force FORM A

Table 2: 3-Channel Clamping force for FORM A with width of c=12

Nominal Diameter D_n mm	F-3 point N Min
13	100
14	
15	130
16	160
17	
18	200
19	
20	
21	
22	
23	230
24	

Table 2: 3-Channel Clamping force for FORM A with width of c=12 Continued

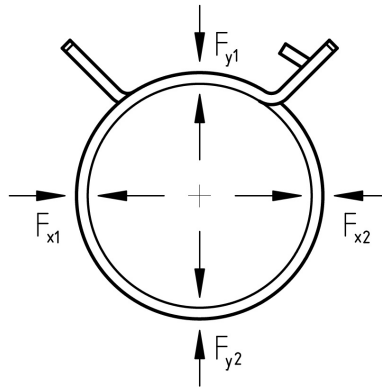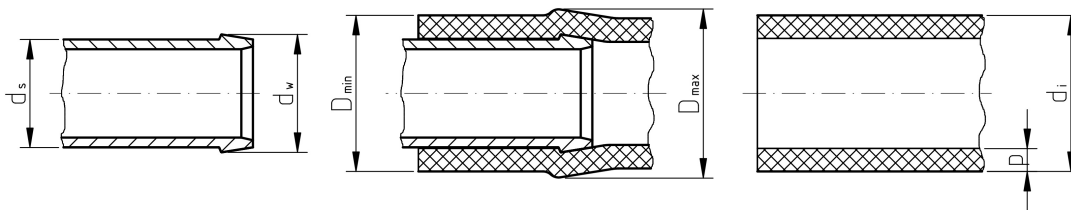| Nominal Diameter D_n mm	F-3 point N Min
25	250
26	
27	280
28	300
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	340
42	
43	
44	
45	350
46	
47	
48	410
49	
50	
51	
52	
53	
54	430
55	
60	
65	370
70	
75	330
80	300
85	
90	

Figure 3: 4-Channel Clamping Force FORM A

Table 3: 4-Channel Clamping force for FORM A with width of c=12

Nominal Diameter D_n mm	F_x N min	F_y N min	$\Delta F = F_x - F_y$ N
13			
14			
15	220	170	-10 to 140
16			
7			
18			
19			
20			
21	350	280	-10 to 180
22			
23			
24			
27			
28			
29			
30			
31			
32			
33			
34	440	390	0 to 220
35			
36			
37			
38			
39			
40			

Table 3: 4-Channel Clamping force for FORM A with width of c=12 Continued

Nominal Diameter D_n mm	F_x N min	F_y N min	$\Delta F = F_x - F_y$ N
13	220	170	-10 to 140
14			
15			
16			
7			
18	350	280	-10 to 180
19			
20			
21			
22			
23			
24			
27	440	390	0 to 220
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

Legend

D_{max}	maximum mounting diameter	d_s	nozel diameter
D_{min}	minimum mounting diameter	d_w	bead diameter
d_i	hose inside diameter	p	wall thickness of hose

Figure 4: Pre-Selection of the Nominal Diameter

$$D_{min} = \sqrt{d_{s\,min}^2 + 4\,p_{max} \times (d_{i\,min} + p_{min})} + 0.2\,mm$$

$$D_{max} = \sqrt{d_{w\,min}^2 + 4\,p_{max} \times (d_{i\,max} + p_{max})} - 0.2\,mm$$

Figure 5: Area of Application Equation for Calculating the D$_{min}$ and for D$_{Max}$

For further details, please refer to the DIN standard document for this item.