



**End Caps, 101A011 to 094**

Raychem end caps provide optimum waterproofing and environmental protection for underwater, underground, or outdoor applications. The end caps are highly resistant to moisture, fungus, and weathering.

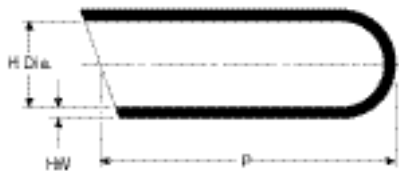
**Applications**

Use for protecting cables and pipes or capping unused outlets in transitions. Provides an environmental seal when used with adhesive.

As Supplied (a)



After Unrestricted Recovery (b)



**Product Dimensions**

Part No.	H		P Min. b	HW ±20% b
	Min. a	Max. b		
101A011	5.10 [.20]	2.00 [.08]	22.90 [.90]	1.02 [.04]
101A021	7.40 [.29]	3.30 [.13]	25.40 [1.00]	1.27 [.05]
101A031	10.20 [.40]	4.80 [.18]	30.50 [1.20]	1.52 [.06]
101A041	15.20 [.60]	6.40 [.25]	40.60 [1.60]	1.78 [.07]
101A052	20.60 [.81]	9.40 [.37]	61.00 [2.40]	2.03 [.08]
101A062	25.40 [1.00]	11.40 [.45]	68.80 [2.70]	2.29 [.09]
101A073	39.40 [1.56]	18.00 [.71]	91.40 [3.60]	2.54 [.10]
101A083	50.80 [2.00]	22.90 [.90]	101.60 [4.00]	2.79 [.11]
101A094	83.80 [3.30]	38.10 [1.50]	114.30 [4.50]	3.05 [.12]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Materials Available****Caps****End Caps, 101A011 to 094** (Continued)

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

Heat-Shrinkable End Caps

Product Facts

- Self-sealing for waterproofing (sealant-coated parts only)
- Electrical insulation to 1000 V
- Abrasion-resistance
- Mechanical protection
- Easy installation, requiring no special skills
- Operating temperature range of -40°C to 85°C [-40°F to 185°F]
- Minimum shrink temperature of 121°C [250°F]



Applications

These SSC heat-shrinkable end caps are made from a thermally stabilized, modified polyolefin, which makes them highly resistant to moisture, fungus, and weathering. The end caps also have excellent electrical properties. End caps coated with sealant are available for underwater

or underground applications with a pressure differential up to 20 psi between the inside of the cable and the outside environment. End caps may be used over lead, steel, aluminum, copper, polyethylene, polyolefin, EPR, and PVC jacketing materials.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

Specifications/Approvals

Caps

SSC (Continued)

Type	Raychem	Military/Commercial
SSC-XXX-FR	RWXXXX SSC-XX-FR specification control drawing	MIL-I-81765/1A
SSC-X and SSC-XTV	SSC specification control drawing	PPS-3011/6
S-1017	RT-1050/1	—
S-1297	RW-2019	—
102L0XX	RW-2024	—

Product Dimensions

Part No.	Inner Diameter* As Supplied (min.)	Part Length Recovered (max.)	Wall Thickness (nom.) Recovered ± 10 %	Recovered ± 20 %
SSC-1	10.00 [.390]	4.00 [.160]	33.50 [1.320]	2.00 [.080]
SSC-2	20.00 [.790]	7.50 [.300]	55.30 [2.180]	2.30 [.090]
SSC-3	35.00 [1.380]	15.00 [.590]	89.90 [3.540]	3.00 [.120]
SSC-4	55.00 [2.170]	25.00 [.980]	143.20 [5.640]	3.30 [.130]
SSC-5	75.00 [2.950]	32.00 [1.250]	150.10 [5.910]	3.30 [.130]
SSC-5M1	75.00 [2.950]	32.00 [1.250]	79.25 [3.120]	3.30 [.130]
SSC-6	100.00 [3.940]	45.00 [1.770]	162.50 [6.400]	4.00 [.160]
SSC-7	120.00 [4.720]	70.00 [2.760]	145.00 [5.710]	3.80 [.150]
			<b>± .25</b>	<b>± .010</b>
SSC-075-FR	19.05 [.750]	9.90 [.390]	76.20 [3.000]	2.03 [.080]
SSC-150-FR	38.10 [1.500]	20.06 [.790]	79.50 [3.130]	2.54 [.100]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

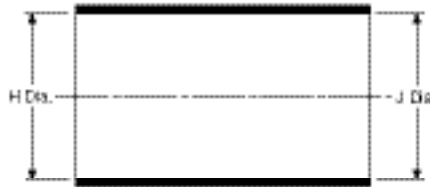
\*Adhesive is optional. As-supplied dimensions appearing in table are for uncoated parts. When adhesive is added, entry diameters will be reduced by 1.5 [.06] maximum.

Ordering Information

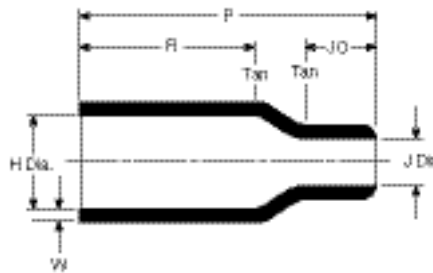
Military	
SSC-XTV	Sealing end cap with adhesive S-1017 and valve
SSC-X	Sealing end cap with adhesive S-1017
SSC-XU	End cap, uncoated
SSC-XXX-FR U	End cap, uncoated, round end
SSC-XXX-FR	Sealing end cap with adhesive S-1297, round end

**Straight Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use for mechanical protection and connector/cable strain relief. This family of boots has no lip, so that a boot can be installed directly onto the connector accessory thread.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H			J			P ±10% b	R ±10% b	JO Ref. b	W ±20% b
	Min.		Max. b	Min.		Max. b				
	-3,-4,-25 a	-12,-100 a		-3,-4,-25 a	-12,-100 a					
202A111	16.5 [.65]	16.5 [.65]	7.9 [.31]	16.5 [.65]	11.9 [.47]	3.8 [.15]	25.4 [1.00]	14.2 [.56]	5.8 [.23]	1.27 [.05]
202A121	24.6 [.97]	22.6 [.89]	9.9 [.39]	24.6 [.97]	17.8 [.70]	5.3 [.21]	38.1 [1.50]	21.8 [.86]	9.1 [.36]	1.52 [.06]
202A132	28.4 [1.12]	26.2 [1.03]	14.2 [.56]	28.4 [1.12]	20.3 [.80]	6.6 [.26]	51.3 [2.02]	27.9 [1.10]	13.0 [.51]	1.78 [.07]
202A142	31.0 [1.22]	31.0 [1.22]	17.8 [.70]	31.0 [1.22]	25.4 [1.00]	7.4 [.29]	66.8 [2.63]	35.6 [1.40]	17.8 [.70]	1.78 [.07]
202A153	36.1 [1.42]	36.1 [1.42]	21.9 [.86]	36.1 [1.42]	26.2 [1.03]	8.6 [.34]	73.7 [2.90]	41.4 [1.63]	16.0 [.63]	1.78 [.07]
202A163	42.7 [1.68]	42.7 [1.68]	27.4 [1.08]	42.7 [1.68]	27.2 [1.07]	9.4 [.37]	99.1 [3.90]	62.7 [2.47]	18.0 [.71]	2.03 [.08]
202A174	51.8 [2.04]	48.3 [1.90]	35.3 [1.39]	51.8 [2.04]	48.3 [1.90]	16.0 [.63]	130.0 [5.13]	64.8 [2.55]	41.9 [1.65]	3.30 [.13]
202A185	66.0 [2.60]	66.0 [2.60]	43.7 [1.72]	66.0 [2.60]	54.1 [2.13]	19.6 [.77]	161.3 [6.35]	90.2 [3.55]	47.8 [1.88]	3.81 [.15]
202A196	86.4 [3.40]	86.4 [3.40]	57.2 [2.25]	86.4 [3.40]	71.4 [2.81]	26.9 [1.06]	212.6 [8.37]	113.0 [4.45]	62.2 [2.45]	4.06 [.16]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

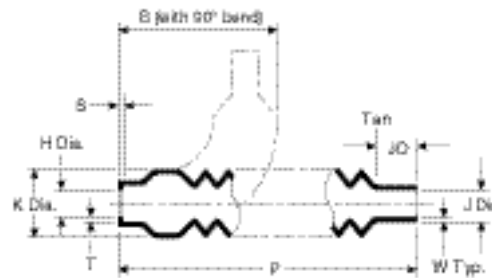
Available in:	Americas	Europe	Asia Pacific
	■	■	■

Uniboot

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use to provide abrasion protection for connectors. The flexibility of design allows a variety of cable outlet angles. When installed on a spin-coupling adapter, cold reentry to the

connector is possible by compressing the molded part. When used with adhesive it provides environmental sealing.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H			J			K Max. b	P ±10% b	JO ±10% b	S ±.03[0.76] b	T ±.03[0.76] b	W Min. b	B Nom. b
	Min. a-50, -51	Max. a-71	Max. b	Min. a-50, -51	Max. a-71	Max. b							
202C611	14.2 [.56]	17.5 [.69]	6.9 [.27]	11.2 [.44]	14.2 [.56]	4.8 [.19]	21.1 [.83]	120.7 [4.75]	17.5 [.69]	1.52 [.06]	1.27 [.05]	0.33 [.013]	62.5 [2.46]
202C621	22.4 [.88]	26.4 [1.04]	11.7 [.46]	17.8 [.70]	26.4 [1.04]	8.1 [.32]	26.7 [1.05]	133.4 [5.25]	19.0 [.78]	1.52 [.06]	1.27 [.05]	0.46 [.018]	67.8 [2.67]
202C632	34.0 [1.34]	38.1 [1.50]	17.5 [.69]	26.9 [1.06]	38.1 [1.50]	12.7 [.50]	32.8 [1.29]	146.1 [5.75]	22.4 [.88]	1.78 [.07]	1.27 [.05]	0.51 [.020]	73.4 [2.89]
202C642	44.2 [1.74]	47.8 [1.88]	22.4 [.88]	36.6 [1.44]	47.8 [1.88]	17.5 [.69]	37.8 [1.49]	158.8 [6.25]	25.4 [1.00]	1.78 [.07]	1.27 [.05]	0.61 [.024]	78.2 [3.08]
202C653	21.2 [53.8]	54.9 [2.16]	27.9 [1.10]	45.7 [1.80]	54.9 [2.16]	22.4 [.88]	42.9 [1.69]	171.5 [6.75]	28.4 [1.12]	1.78 [.07]	2.03 [.08]	0.61 [.024]	82.8 [3.26]
202C663	22.5 [57.2]	77.2 [3.04]	40.6 [1.60]	57.2 [2.25]	54.6 [2.15]	22.9 [.90]	62.2 [2.45]	236.2 [9.30]	35.1 [1.38]	2.03 [.08]	2.03 [.08]	0.66 [.026]	138.4 [5.45]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

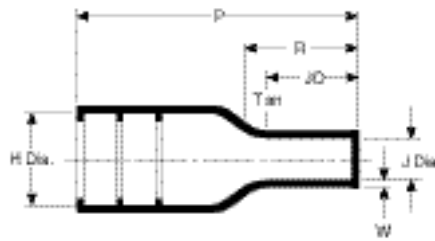
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Straight, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. Boot is compatible with all Raychem grooved adapters of appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J			P ±10% b	JO ±10% b	W ±20% b	RR ±10% b
	Min. a	Max. b	Min.		Max. b				
			-3, -4, -25 a	-12, -100 a					
202D121	23.3 [.92]	10.5 [.41]	23.3 [.92]	12.4 [.49]	5.6 [.22]	38.1 [1.50]	10.2 [.40]	1.78 [.07]	—
202D132	28.4 [1.12]	14.3 [.56]	28.4 [1.12]	14.7 [.58]	6.6 [.26]	54.9 [2.16]	16.5 [.65]	1.78 [.07]	21.6 [.85]
202D142	31.0 [1.22]	17.8 [.70]	31.0 [1.22]	16.0 [.63]	7.2 [.28]	66.8 [2.63]	17.8 [.70]	2.03 [.08]	24.5 [.96]
202D153	36.0 [1.42]	22.4 [.88]	36.0 [1.42]	18.5 [.73]	8.4 [.33]	80.0 [3.15]	20.8 [.82]	2.03 [.08]	29.7 [1.17]
202D163	42.7 [1.68]	28.2 [1.11]	42.7 [1.68]	22.0 [.87]	9.9 [.39]	103.6 [4.08]	24.6 [.97]	2.29 [.09]	36.7 [1.44]
202D174	51.8 [2.04]	35.1 [1.38]	51.8 [2.04]	35.3 [1.39]	15.8 [.62]	130.3 [5.13]	39.6 [1.56]	3.30 [.13]	53.8 [2.12]
202D185	66.0 [2.60]	44.5 [1.75]	66.0 [2.60]	45.7 [1.80]	20.4 [.80]	165.1 [6.50]	48.3 [1.90]	4.06 [.16]	65.6 [2.59]
202D196	81.7 [3.22]	57.6 [2.27]	81.7 [3.22]	57.1 [2.25]	25.4 [1.00]	177.8 [7.00]	47.8 [1.88]	4.06 [.16]	67.1 [2.64]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

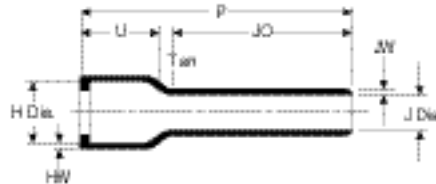
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Straight, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use with circular connectors and the appropriate Raychem backshell adapter to provide connector/cable strain relief. Boot is used on

open-wire-bundle airborne harnesses, or applications where the long tail replaces cable jacketing removed during termination.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J			P ±10% b	JO ±10% b	U ±10% b	HW ±20% b	JW ±20% b
	Min. a	Max. b	Min.		Max. b					
			-3, -4, -25 a	-12, -100 a						
202D211	22.4 [.88]	11.4 [.45]	22.4 [.88]	14.0 [.55]	6.4 [.25]	105.9 [4.17]	86.4 [3.40]	14.2 [.56]	1.52 [.06]	1.14 [.045]
202D221	25.7 [1.01]	15.0 [.59]	25.7 [1.01]	16.0 [.63]	7.4 [.29]	121.2 [4.77]	98.6 [3.88]	15.0 [.59]	1.52 [.06]	1.14 [.045]
202D232	29.5 [1.16]	18.8 [.74]	29.5 [1.16]	18.3 [.72]	8.4 [.33]	138.7 [5.46]	112.8 [4.44]	15.5 [.61]	1.78 [.07]	1.14 [.045]
202D242	34.0 [1.34]	22.9 [.90]	34.0 [1.34]	21.3 [.84]	9.7 [.38]	159.5 [6.28]	130.8 [5.15]	15.7 [.62]	1.78 [.07]	1.14 [.045]
202D253	37.3 [1.47]	29.5 [1.16]	37.3 [1.47]	23.1 [.91]	10.4 [.41]	177.8 [7.00]	142.2 [5.60]	18.0 [.71]	2.0 [.08]	1.14 [.045]
202D263	43.7 [1.72]	34.0 [1.34]	43.7 [1.72]	27.2 [1.07]	12.2 [.48]	203.2 [8.00]	163.1 [6.42]	19.8 [.78]	2.0 [.08]	1.14 [.045]
202D274	50.0 [1.97]	41.2 [1.62]	50.0 [1.97]	31.5 [1.24]	14.2 [.56]	203.2 [8.00]	157.7 [6.21]	20.8 [.82]	2.3 [.09]	1.40 [.055]
202D285	62.7 [2.47]	47.0 [1.85]	62.7 [2.47]	39.1 [1.54]	17.5 [.69]	203.2 [8.00]	153.2 [6.03]	23.4 [.92]	2.5 [.10]	1.40 [.055]
202D296	69.3 [2.73]	59.7 [2.35]	69.3 [2.73]	43.2 [1.70]	19.6 [.77]	203.2 [8.00]	143.3 [5.64]	23.6 [.93]	2.5 [.10]	1.40 [.055]
202D299	81.8 [3.22]	67.1 [2.64]	81.8 [3.22]	51.1 [2.01]	22.9 [.90]	203.2 [8.00]	138.4 [5.45]	31.2 [1.23]	2.5 [.10]	1.40 [.055]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

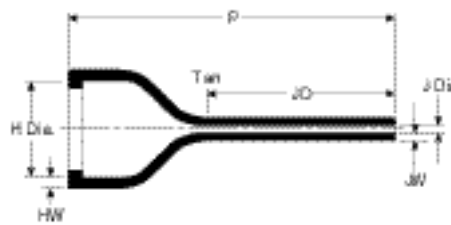


**Straight, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use with circular connectors and the appropriate Raychem backshell adapter to provide connector/cable strain relief. Boot is used in applications where only a small number of the available contacts are utilized, thus resulting in a high ratio between the adapter and cable diameters.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.  
 \*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J			P ±10% b	JO ±10% b	HW ±20% b	JW ±20% b
	Min. a	Max. b	Min.						
			-3, -4, -25 a	-12, -100 a	Max. b				
202D921	19.3 [.76]	13.0 [.51]	6.3 [.25]	4.5 [.18]	2.1 [.08]	60.2 [2.37]	37.6 [1.48]	1.52 [.06]	1.14 [.045]
202D932	26.1 [1.03]	19.1 [.75]	7.6 [.30]	5.5 [.22]	2.6 [.10]	74.2 [2.92]	45.0 [1.77]	1.78 [.07]	1.14 [.045]
202D953	34.2 [1.35]	26.0 [1.02]	9.6 [.38]	6.6 [.26]	3.1 [.12]	84.3 [3.32]	51.1 [2.01]	1.78 [.07]	1.14 [.045]
202D963	43.6 [1.72]	34.1 [1.34]	11.4 [.45]	7.8 [.31]	3.6 [.14]	99.6 [3.92]	57.7 [2.27]	1.78 [.07]	1.14 [.045]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

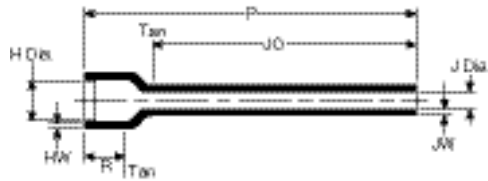
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Straight, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. Boot is compatible with all Raychem grooved adapters of the appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-50	Flexible Viton polymer blend	N/A	S-1125
-51	Flexible elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048

**Product Dimensions**

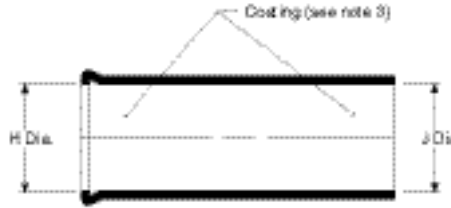
Part No.	H		J			P ±10% b	JO ±10% b	HW ±20% b	JW ±20% b
	Min. a	Max. b	Min.		Max. b				
			-3, -4, -25 a	-12, -100 a					
202F211	23.9 [ .94]	9.9 [ .39]	17.3 [ .68]	6.6 [ .26]	105.9 [4.17]	11.7 [ .46]	86.4 [3.40]	1.5 [ .06]	1.5 [ .06]
202F221	27.2 [1.07]	13.2 [ .52]	20.8 [ .82]	7.6 [ .30]	121.2 [4.77]	12.2 [ .48]	98.6 [3.88]	1.5 [ .06]	1.5 [ .06]
202F232	31.0 [1.22]	18.5 [ .73]	24.4 [ .96]	8.9 [ .35]	138.7 [5.46]	12.2 [ .48]	112.8 [4.44]	1.8 [ .07]	1.5 [ .06]
202F242	35.6 [1.40]	22.1 [ .87]	28.7 [1.13]	10.2 [ .40]	159.5 [6.28]	12.2 [ .48]	130.8 [5.15]	1.8 [ .07]	1.5 [ .06]
202F253	38.9 [1.53]	28.2 [1.11]	31.5 [1.24]	10.9 [ .43]	177.8 [7.00]	14.0 [ .55]	142.2 [5.60]	1.8 [ .07]	1.5 [ .06]
202F263	45.2 [1.78]	32.3 [1.27]	38.4 [1.51]	12.7 [ .50]	203.2 [8.00]	15.2 [ .60]	163.1 [6.42]	1.8 [ .07]	1.5 [ .06]
202F274	51.6 [2.03]	41.1 [1.62]	45.5 [1.79]	15.0 [ .59]	203.2 [8.00]	15.2 [ .60]	157.7 [6.21]	1.8 [ .07]	1.8 [ .07]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [ .06] max.

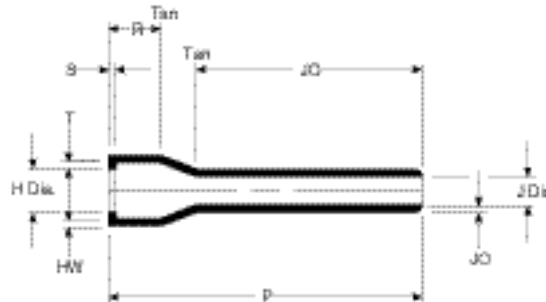
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Straight, Low Profile Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. This range of parts is compatible with all Raychem grooved adapters of appropriate shell or entry size. When used with adhesive it provides environmental sealing.

**Materials Available**

Material Dash No.	Material Description	Adhesive
-55	Fluoropolymer	S-1255-04

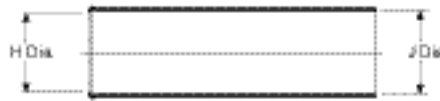
**Product Dimensions**

Part No.	H		J		P ±10% b	R ±10% b	S Ref. b	T Ref. b	JO ±10% b	HW Ref. b	JW Ref. b
	Min. a	Max. b	Min. a	Max. b							
202G211	23.9 [1.94]	9.9 [.39]	23.9 [1.94]	7.4 [.29]	105.9 [4.17]	11.7 [.46]	1.0 [.04]	1.3 [.05]	86.4 [3.40]	1.0 [.04]	0.7 [.03]
202G221	27.2 [1.07]	13.2 [.52]	27.2 [1.07]	8.4 [.33]	121.2 [4.77]	12.2 [.48]	1.0 [.04]	1.3 [.05]	87.4 [3.44]	1.0 [.04]	0.7 [.03]
202G232	31.0 [1.22]	18.5 [.73]	31.0 [1.22]	9.4 [.37]	138.7 [5.46]	12.2 [.48]	1.0 [.04]	1.3 [.05]	104.4 [4.11]	1.0 [.04]	0.7 [.03]
202G242	31.7 [1.25]	22.1 [.87]	31.7 [1.25]	10.7 [.42]	159.5 [6.28]	12.2 [.48]	1.0 [.04]	1.5 [.06]	124.5 [4.90]	1.0 [.04]	0.7 [.03]
202G253	38.9 [1.53]	28.2 [1.11]	38.9 [1.53]	11.9 [.47]	177.8 [7.00]	10.6 [.42]	1.3 [.05]	1.8 [.07]	143.5 [5.65]	1.3 [.05]	1.0 [.04]

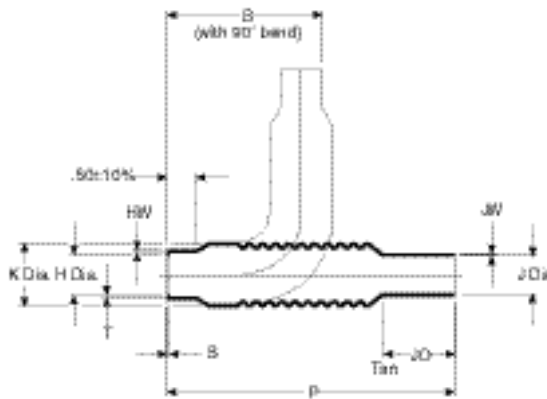
Available in:	Americas	Europe	Asia Pacific
	■	■	■

Uniboot

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use to provide abrasion protection for connectors. The flexibility of design allows a variety of cable outlet angles. When installed on a spin-coupling adapter, cold re-entry to the connector is possible by

unscrewing the adapter and compressing the molded part. When used with adhesive it provides environmental sealing.

**Materials Available**

Material Dash No.	Material Description	Adhesive
-55	Fluoropolymer	S-1255-04

**Product Dimensions**

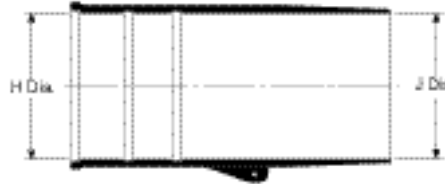
Part No.	H		J		K Max. b	P ±10% b	JO ±10% b	HW Ref. b	JW Ref. b	S Ref. b	T Ref. b	B Nom. b
	Min. a	Max. b	Min. a	Max. b								
202G611	14.2 [.56]	6.9 [.27]	11.2 [.44]	4.8 [.19]	21.1 [.83]	120.7 [4.75]	17.5 [.69]	1.0 [.04]	0.7 [.03]	1.0 [.04]	1.3 [.05]	62.5 [2.46]
202G621	26.6 [1.05]	11.7 [.46]	26.6 [1.05]	8.1 [.32]	26.6 [1.05]	133.8 [5.27]	19.9 [.78]	1.0 [.04]	0.7 [.03]	1.0 [.04]	1.3 [.05]	67.8 [2.67]
202G632	33.0 [1.30]	17.5 [.69]	33.0 [1.30]	12.7 [.50]	32.7 [1.29]	151.1 [5.95]	22.4 [.88]	1.0 [.04]	0.7 [.03]	1.0 [.04]	1.3 [.05]	73.4 [2.89]
202G642	35.5 [1.40]	22.3 [.88]	35.5 [1.40]	17.5 [.69]	37.8 [1.49]	157.2 [6.19]	25.4 [1.00]	1.3 [.05]	1.0 [.04]	1.3 [.05]	1.3 [.05]	78.2 [3.08]
202G653	42.6 [1.68]	27.9 [1.10]	42.6 [1.68]	22.4 [.88]	42.9 [1.69]	170.2 [6.70]	28.4 [1.12]	1.3 [.05]	1.0 [.04]	1.3 [.05]	1.5 [.06]	82.8 [3.26]

Available in:	Americas	Europe	Asia Pacific
	■	■	■

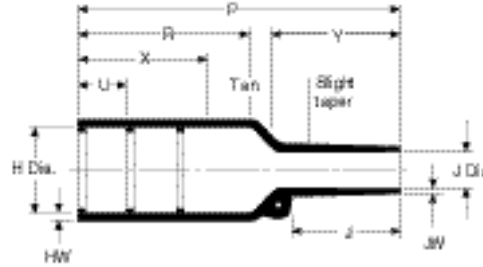
202K121 to 185

Straight, Lipped Boot

As Supplied (a)



After Unrestricted Recovery (b)



202K121 - 153 = 2 lips  
 202K163 - 185 = 3 lips  
 Mod 01 = 1 lip removed  
 Mod 02 = 2 lips removed  
 (only available in sizes 163, 174, 185).  
 For eyelet clip, order CS-1858 option.



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors.

Boot is compatible with all Raychem grooved adapters of the appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.  
 \*\*For more information, please see section 5.

**Product Dimensions**

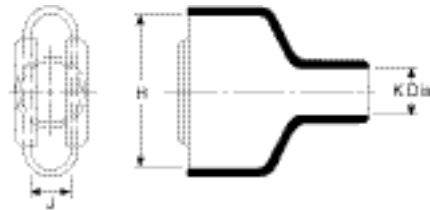
Part No.	H		J				P ±10% b	R ±10% b	U ±10% b	JO ±10% b	HW ±20% b	JW Min. b	X ±20% b	Y ±20% b
	Min. -3,-4,-12,-25 a	Max. b	Min. -3,-4,-25 a	-12 a	-100 a	Max. b								
202K121	24.0 [1.95]	10.4 [41]	24.0 [1.95]	13.0 [51]	14.0 [55]	5.6 [22]	38.0 [1.50]	21.0 [83]	12.0 [47]	8.5 [33]	1.6 [06]	.41 [016]	24.0 [94]	13.0 [51]
202K132	30.0 [1.18]	14.2 [56]	30.0 [1.18]	14.0 [55]	15.0 [59]	5.9 [23]	55.0 [2.17]	32.0 [1.26]	12.0 [47]	11.5 [45]	1.8 [07]	.81 [032]	24.0 [94]	18.0 [71]
202K142	31.0 [1.22]	18.0 [71]	31.0 [1.22]	16.0 [63]	18.0 [71]	7.1 [28]	67.0 [2.64]	35.0 [1.38]	20.0 [79]	17.0 [67]	1.8 [07]	.81 [032]	32.0 [1.26]	25.0 [98]
202K153	36.0 [1.42]	22.4 [88]	36.0 [1.42]	19.0 [75]	21.0 [83]	8.4 [33]	80.0 [3.15]	42.0 [1.65]	20.0 [79]	19.5 [76]	2.0 [08]	.81 [032]	32.0 [1.26]	30.0 [1.18]
202K163	43.0 [1.69]	28.2 [1.11]	43.0 [1.69]	22.0 [87]	25.0 [98]	9.9 [39]	99.0 [3.90]	61.0 [2.40]	20.0 [79]	21.0 [82]	2.2 [08]	.81 [032]	52.0 [2.05]	30.0 [1.18]
202K174	60.0 [2.36]	35.1 [1.38]	60.0 [2.36]	35.0 [1.38]	39.0 [1.54]	15.7 [62]	130.0 [5.12]	72.0 [2.83]	20.0 [79]	39.0 [1.53]	3.3 [13]	1.02 [040]	52.0 [2.05]	50.0 [1.97]
202K185	66.0 [2.60]	44.5 [1.75]	66.0 [2.60]	38.0 [1.50]	42.0 [1.65]	16.8 [66]	170.0 [6.69]	90.0 [3.54]	20.0 [79]	51.5 [2.02]	3.8 [15]	1.63 [064]	52.0 [2.05]	70.0 [2.76]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [06] max.

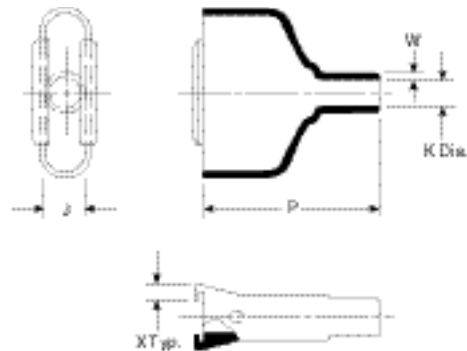
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**D-Subminiature, Straight Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

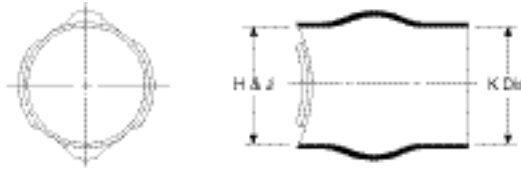
Part No.	H		J		K		P ±10% b	W ±20% b	X ±20% b	This Boot Fits	
	±5% a	±5% b	±5% a	±5% b	Min. a	Max. b				Cannon/ Cinch	Amphenol Series 17
214A011	20.3 [.80]	20.3 [.80]	10.7 [.42]	10.7 [.42]	7.9 [.31]	4.1 [.16]	33.3 [1.31]	1.0 [.04]	3.0 [.12]	DE-9	XX09X
214A021	28.2 [1.11]	28.2 [1.11]	10.7 [.42]	10.7 [.42]	10.2 [.40]	5.3 [.21]	38.9 [1.53]	1.0 [.04]	3.0 [.12]	DA-15	XX15X
214A032	42.2 [1.66]	42.2 [1.66]	10.7 [.42]	10.7 [.42]	14.0 [.55]	8.1 [.32]	45.0 [1.77]	1.0 [.04]	3.0 [.12]	DB-25	XX25X
214A042	58.7 [2.31]	58.7 [2.31]	10.7 [.42]	10.7 [.42]	17.3 [.68]	8.6 [.34]	53.3 [2.10]	1.0 [.04]	3.0 [.12]	DC-37	XX37X
214A052	57.9 [2.28]	57.9 [2.28]	13.7 [.54]	13.7 [.54]	19.1 [.75]	10.7 [.42]	61.0 [2.40]	1.0 [.04]	3.0 [.12]	DD-50	XX50X

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

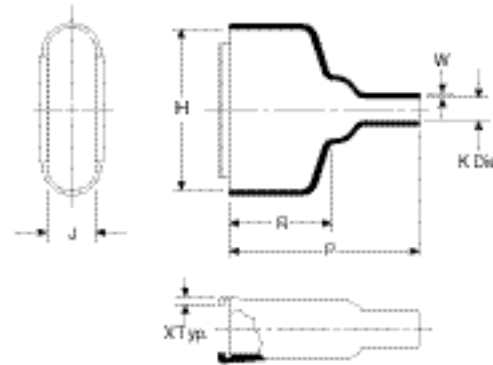
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**D-Subminiature, Straight Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-25	Fluid-resistant elastomer	/42 or /86	S-1017 or S-1048 or S-1125

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

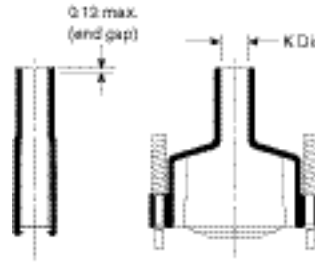
Part No.	H		J		K		P ±10% b	R ±10% b	W ±20% b	X ±20% b	This Boot Fits	
	±5% a	±5% b	±5% a	±5% b	Min. a	Max. b					Cannon/ Cinch	Amphenol Series 17
214A311	16.0 [.63]	20.3 [.80]	16.0 [.63]	10.7 [.42]	16.0 [.63]	4.1 [.16]	33.3 [1.31]	19.1 [.75]	1.02 [.04]	3.05 [.12]	DE-9	XX09X
214A321	19.1 [.75]	28.2 [1.11]	19.1 [.75]	10.7 [.42]	19.1 [.75]	5.3 [.21]	38.9 [1.53]	22.1 [.87]	1.02 [.04]	3.05 [.12]	DA-15	XX15X
214A332	29.2 [1.15]	42.2 [1.66]	29.2 [1.15]	10.7 [.42]	29.2 [1.15]	8.1 [.32]	45.0 [1.77]	25.4 [1.00]	1.02 [.04]	3.05 [.12]	DB-25	XX25X
214A342	34.3 [1.35]	58.7 [2.31]	34.3 [1.35]	10.7 [.42]	34.3 [1.35]	8.6 [.34]	53.3 [2.10]	28.4 [1.12]	1.02 [.04]	3.05 [.12]	DC-37	XX37X
214A352	37.6 [1.48]	57.9 [2.28]	37.6 [1.48]	13.7 [.54]	37.6 [1.48]	10.7 [.42]	61.0 [2.40]	31.8 [1.25]	1.02 [.04]	3.05 [.12]	DD-50	XX50X

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

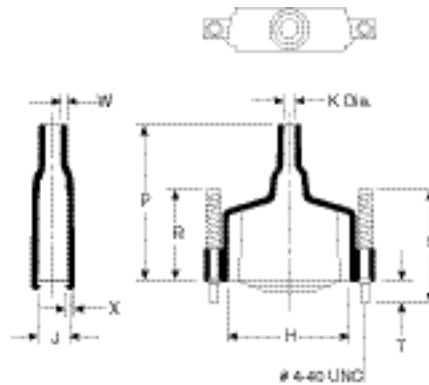
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**D-Subminiature, Straight Boot with Jack Screws**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description
-111-0	Semirigid polyolefin (black)
-111-8	Semirigid polyolefin (gray)

\*Contact Tyco Electronics for information on material properties.

**Product Dimensions**

Part No.	H ±5% b	J ±10% b	K		P ±10% b	R Ref. b	S Nom. b	T Nom. b	X ±20% b	W ±20% b	Fits Connector Size
	Min. a	Max. b	Min. a	Max. b	Min. a	Min. a	Min. a	Min. a	Min. a		
214P009-XXX	17.3 [.68]	12.0 [.47]	9.0 [.35]	3.8 [.15]	43.0 [1.69]	22.0 [.87]	29.0 [1.14]	6.4 [.25]	1.80 [.07]	1.5 [.06]	9 pin
214P015-XXX	25.2 [.99]	12.0 [.47]	10.5 [.41]	3.8 [.15]	44.0 [1.73]	23.0 [.90]	29.0 [1.14]	6.4 [.25]	2.03 [.08]	1.5 [.06]	15 pin
214P025-XXX	38.4 [1.51]	12.0 [.47]	12.0 [.47]	5.1 [.20]	49.0 [1.87]	25.0 [.98]	29.0 [1.14]	6.4 [.25]	2.16 [.085]	1.5 [.06]	25 pin
214P037-XXX	54.2 [2.13]	12.0 [.47]	12.0 [.47]	5.8 [.22]	55.0 [2.16]	25.0 [.98]	29.0 [1.14]	6.4 [.25]	2.26 [.089]	1.5 [.06]	37 pin

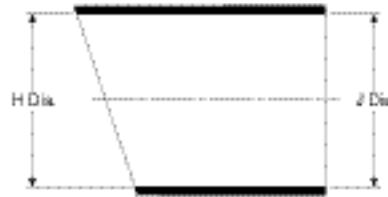
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

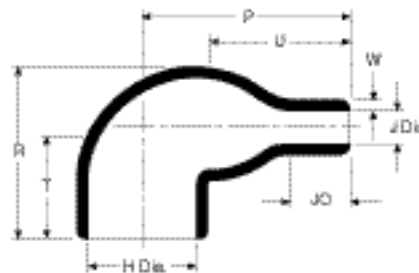


Right-Angled Boot

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use for mechanical protection and connector-cable strain relief. This family of boots has no lip, so a boot can be installed directly onto the connector access-ory thread.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

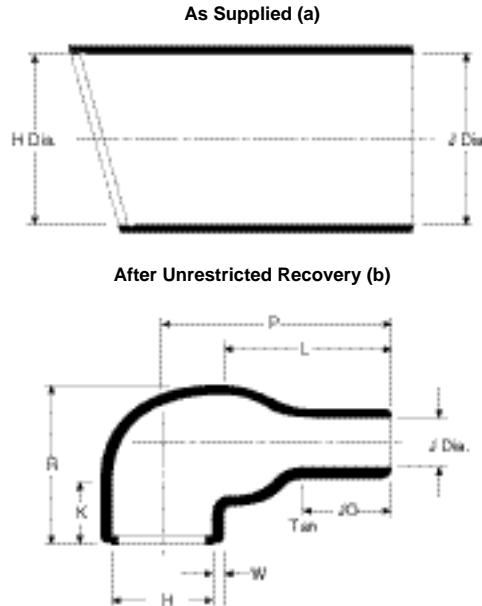
**Product Dimensions**

Part No.	H		J				P ±10% b	R ±10% b	T ±10% b	U ±10% b	JO ±10% b	W ±20% b
	Min. a	Max. b	-3,-4,-25 a	Min. -100 a	-12 a	Max. b						
222A111	17.8 [ .70]	7.9 [ .31]	17.8 [ .70]	10.9 [ .43]	9.9 [ .39]	3.8 [ .15]	17.3 [ .68]	20.1 [ .79]	—	11.4 [ .45]	4.3 [ .17]	1.02 [ .04]
222A121	24.9 [ .98]	10.2 [ .40]	24.9 [ .98]	16.0 [ .63]	18.0 [ .71]	5.3 [ .21]	21.3 [ .84]	22.6 [ .89]	—	14.7 [ .58]	5.8 [ .23]	1.27 [ .05]
222A132	30.0 [ 1.18]	14.2 [ .56]	30.0 [ 1.18]	21.1 [ .83]	20.6 [ .81]	6.4 [ .25]	26.9 [ 1.06]	26.7 [ 1.05]	19.1 [ .75]	17.8 [ .70]	7.1 [ .28]	1.52 [ .06]
222A142	32.5 [ 1.28]	17.3 [ .68]	32.5 [ 1.28]	22.9 [ .90]	22.9 [ .90]	6.9 [ .27]	36.6 [ 1.44]	30.5 [ 1.20]	19.1 [ .75]	24.9 [ .98]	10.2 [ .40]	1.78 [ .07]
222A152	36.1 [ 1.42]	21.8 [ .86]	36.1 [ 1.42]	27.4 [ 1.08]	26.4 [ 1.04]	8.4 [ .33]	43.7 [ 1.72]	35.1 [ 1.38]	19.1 [ .75]	30.0 [ 1.18]	12.7 [ .50]	1.78 [ .07]
222A163	43.9 [ 1.73]	27.4 [ 1.08]	43.9 [ 1.73]	28.4 [ 1.12]	27.4 [ 1.08]	9.4 [ .37]	53.6 [ 2.11]	43.9 [ 1.73]	19.1 [ .75]	34.0 [ 1.34]	17.3 [ .68]	2.03 [ .08]
222A174	53.1 [ 2.09]	33.8 [ 1.33]	53.1 [ 2.09]	48.3 [ 1.90]	46.7 [ 1.84]	15.0 [ .59]	75.7 [ 2.98]	52.8 [ 2.08]	25.4 [ 1.00]	53.3 [ 2.10]	32.0 [ 1.26]	3.30 [ .13]
222A185	67.6 [ 2.66]	44.2 [ 1.74]	67.6 [ 2.66]	58.4 [ 2.30]	54.4 [ 2.14]	20.3 [ .80]	97.5 [ 3.84]	66.0 [ 2.60]	25.4 [ 1.00]	71.1 [ 2.80]	40.6 [ 1.60]	3.81 [ .15]
222A196	87.6 [ 3.45]	55.4 [ 2.18]	87.6 [ 3.45]	68.8 [ 2.71]	63.0 [ 2.48]	23.4 [ .92]	128.0 [ 5.04]	79.2 [ 3.12]	25.4 [ 1.00]	87.6 [ 3.45]	56.4 [ 2.22]	4.57 [ .18]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [ .06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Right-Angled, Lipped Boot**



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. Boot is compatible with all Raychem grooved adapters of the appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.  
 \*\*For more information, please see section 5.

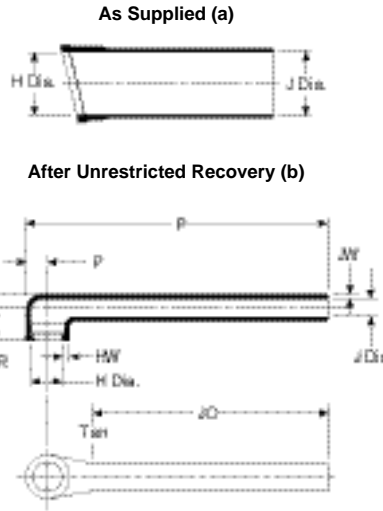
**Product Dimensions**

Part No.	H		J				P ±10% b	R Ref. b	JO ±10%	W ±20%	K ±10% b	L ±10% b
	Min. a	Max. a	-3,-4,-25 b	Min. -100 b	-12 b	Max. b						
222D121	23.4 [.92]	10.4 [.41]	23.4 [.92]	14.0 [.55]	12.4 [.49]	5.6 [.22]	21.3 [.84]	22.6 [.89]	5.8 [.23]	1.27 [.05]	15.2 [.60]	14.7 [.58]
222D132	28.4 [1.12]	14.2 [.56]	28.4 [1.12]	15.0 [.59]	14.7 [.58]	6.6 [.26]	33.8 [1.33]	27.2 [1.07]	15.5 [.65]	1.52 [.06]	19.1 [.75]	24.9 [.98]
222D142	31.0 [1.22]	17.8 [.70]	31.0 [1.22]	18.0 [.71]	16.0 [.63]	7.1 [.28]	36.6 [1.44]	31.0 [1.22]	12.7 [.50]	1.78 [.07]	19.1 [.75]	24.9 [.98]
222D152	36.0 [1.42]	22.4 [.88]	36.0 [1.42]	21.0 [.83]	18.5 [.73]	8.4 [.33]	43.7 [1.72]	35.1 [1.38]	14.5 [.57]	1.78 [.07]	19.1 [.75]	30.0 [1.18]
222D163	42.7 [1.68]	28.2 [1.11]	42.7 [1.68]	25.0 [.98]	22.1 [.87]	9.9 [.39]	53.6 [2.11]	43.9 [1.73]	17.5 [.69]	2.03 [.08]	19.3 [.76]	33.0 [1.30]
222D174	51.8 [2.04]	35.1 [1.38]	51.8 [2.04]	39.0 [1.54]	35.3 [1.39]	15.7 [.62]	78.0 [3.07]	52.8 [2.08]	33.5 [1.32]	3.30 [.13]	25.4 [1.00]	53.8 [2.12]
222D185	66.0 [2.60]	44.5 [1.75]	66.0 [2.60]	42.0 [1.65]	45.7 [1.80]	20.3 [.80]	97.5 [3.84]	66.0 [2.60]	40.1 [1.58]	3.81 [.15]	25.4 [1.00]	71.1 [2.80]
222D196	81.8 [3.22]	60.5 [2.38]	81.8 [3.22]	57.2 [2.25]	57.2 [2.25]	25.4 [1.00]	117.9 [4.64]	83.8 [3.30]	38.1 [1.50]	4.06 [.16]	25.4 [1.00]	80.0 [3.15]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 (.06) max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

Right-Angled, Lipped Boot



**Applications**

Provides strain relief and mechanical protection between cable and connector. Boot is usually used on open-wire-bundle airborne harnesses, or applications where the long tail replaces cable jacketing removed during termination.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

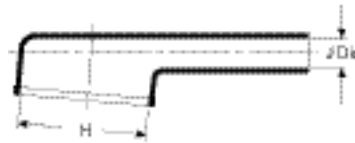
Part No.	H		J			P ±10% b	R Ref b	JO ±10% b	PP ±10% b	RR 10% b	HW ±20%	JW ±20%
	Min. a	Max. b	Min. -3,-4,-25 a	-12,-100 b	Max. b							
222D211	22.4 [.88]	11.4 [.45]	22.4 [.88]	14.0 [.55]	6.4 [.25]	105.2 [4.14]	18.5 [.73]	87.6 [3.45]	6.9 [.27]	12.4 [.49]	1.52 [.06]	1.14 [.045]
222D221	25.7 [1.01]	15.0 [.59]	25.7 [1.01]	16.0 [.63]	7.4 [.29]	124.0 [4.88]	19.8 [.78]	99.1 [3.90]	8.4 [.33]	15.0 [.59]	1.52 [.06]	1.14 [.045]
222D232	29.5 [1.16]	18.8 [.74]	29.5 [1.16]	18.3 [.72]	8.4 [.33]	146.3 [5.76]	20.8 [.82]	114.3 [4.50]	10.4 [.41]	15.5 [.61]	1.78 [.07]	1.14 [.045]
222D242	34.0 [1.34]	22.9 [.90]	34.0 [1.34]	21.3 [.84]	9.7 [.38]	172.2 [6.78]	21.8 [.86]	132.6 [5.22]	12.2 [.48]	15.7 [.62]	1.78 [.07]	1.14 [.045]
222D253	37.3 [1.47]	29.5 [1.16]	37.3 [1.47]	23.1 [.91]	10.4 [.41]	185.2 [7.29]	24.4 [.96]	143.8 [5.66]	15.5 [.61]	17.8 [.70]	2.03 [.08]	1.14 [.045]
222D263	43.7 [1.72]	34.0 [1.34]	43.7 [1.72]	27.2 [1.07]	12.2 [.48]	231.6 [8.41]	27.4 [1.08]	169.2 [6.66]	18.3 [.72]	19.8 [.78]	2.03 [.08]	1.14 [.045]
222D274	50.0 [1.97]	41.1 [1.62]	50.0 [1.97]	31.5 [1.24]	14.2 [.56]	224.5 [8.84]	29.5 [1.16]	173.2 [6.82]	21.1 [.83]	20.8 [.82]	2.29 [.09]	1.40 [.055]
222D285	62.7 [2.47]	47.0 [1.85]	62.7 [2.47]	39.1 [1.54]	17.5 [.69]	227.3 [8.95]	33.3 [1.31]	168.1 [6.62]	24.1 [.95]	23.4 [.92]	2.54 [.10]	1.40 [.055]
222D296	69.3 [2.73]	59.7 [2.35]	69.3 [2.73]	43.2 [1.70]	19.6 [.77]	233.4 [9.19]	35.1 [1.38]	157.2 [6.19]	30.0 [1.18]	23.6 [.93]	2.54 [.10]	1.40 [.055]
222D299	81.8 [3.22]	67.1 [2.64]	81.8 [3.22]	51.1 [2.01]	22.9 [.90]	237.0 [9.33]	44.5 [1.75]	151.1 [5.95]	33.3 [1.31]	31.2 [1.23]	2.54 [.10]	1.40 [.055]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

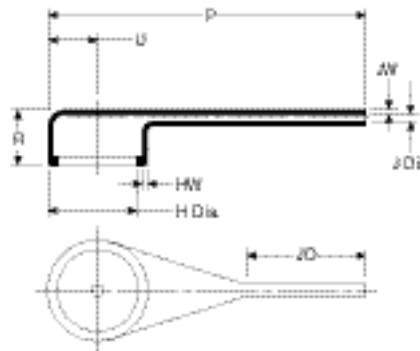
Available in:	Americas	Europe	Asia Pacific
	■	■	■

Right-Angled, Lipped Boot

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection between cable and connector. It is used in applications where only a small number of the available contacts are utilized, resulting in a high ratio between the adapter and cable diameters.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

**Product Dimensions**

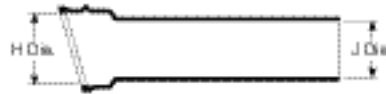
Part No.	H		J			P ±10% b	R Ref. b	U ±10% b	JO ±10% b	HW ±20% b	JW ±20% b
	Min. a	Max. b	Min.		Max. b						
			-3, -4, -25 a	-12, -100 a							
222D921	19.3 [.76]	13.0 [.51]	6.3 [.25]	4.5 [.18]	2.1 [.08]	44.5 [1.75]	16.3 [.64]	5.6 [.22]	21.8 [.86]	1.52 [.06]	1.14 [.045]
222D932	26.1 [1.03]	19.1 [.75]	7.6 [.30]	5.6 [.22]	2.6 [.10]	67.3 [2.65]	18.0 [.71]	8.4 [.33]	29.2 [1.15]	1.78 [.07]	1.14 [.045]
222D953	34.2 [1.35]	26.0 [1.02]	9.6 [.38]	6.6 [.26]	3.0 [.12]	81.3 [3.20]	18.8 [.74]	11.4 [.45]	36.3 [1.39]	1.78 [.07]	1.14 [.045]
222D963	43.6 [1.72]	34.1 [1.34]	11.4 [.45]	7.8 [.31]	3.6 [.14]	115.6 [4.55]	21.3 [.84]	15.5 [.61]	47.0 [1.85]	1.78 [.07]	1.14 [.045]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 mm [.06"] max.

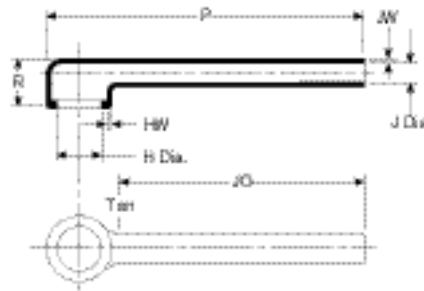
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Right-Angled, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. Boot is compatible with all Raychem grooved adapters of the appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J		P ±10% b	R ±10% b	JO ±10% b	HW +.06 to -.03 b	JW ±.03 b
	Min. a	Max. b	Min. a	Max. b					
222F211	23.9 [.94]	9.9 [.39]	17.3 [.68]	6.6 [.26]	105.2 [4.14]	18.5 [.73]	87.6 [3.45]	1.52 [.06]	1.52 [.06]
222F221	27.2 [1.07]	13.2 [.52]	20.8 [.82]	7.6 [.30]	124.0 [4.88]	19.8 [.78]	99.1 [3.90]	1.52 [.06]	1.52 [.06]
222F232	31.0 [1.22]	18.5 [.73]	24.4 [.96]	8.9 [.35]	146.3 [5.76]	20.8 [.82]	114.3 [4.50]	1.78 [.07]	1.52 [.06]
222F242	35.6 [1.40]	22.1 [.87]	28.7 [1.13]	10.2 [.40]	172.2 [6.78]	21.8 [.86]	132.6 [5.22]	1.78 [.07]	1.52 [.06]
222F253	38.9 [1.53]	28.2 [1.11]	31.5 [1.24]	10.9 [.43]	185.2 [7.29]	24.4 [.96]	143.8 [5.66]	1.78 [.07]	1.52 [.06]
222F263	45.2 [1.78]	32.3 [1.27]	38.4 [1.51]	12.7 [.50]	213.6 [8.41]	27.4 [1.08]	169.2 [6.66]	1.78 [.07]	1.52 [.06]
222F274	51.6 [2.03]	41.1 [1.62]	44.5 [1.75]	15.0 [.59]	224.5 [8.84]	29.5 [1.16]	173.2 [6.82]	1.78 [.07]	1.78 [.07]
222F285	62.7 [2.47]	42.9 [1.69]	47.2 [1.86]	17.5 [.69]	227.3 [8.95]	33.3 [1.31]	168.1 [6.62]	2.03 [.08]	1.78 [.07]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

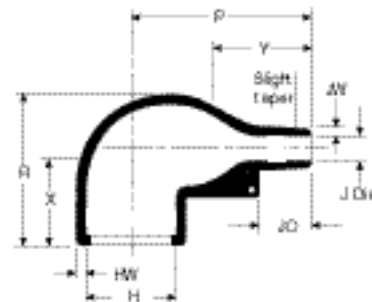
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Right-Angled, Lipped Boot**

As Supplied (a)



After Unrestricted Recovery (b)



For eyelet clip, order CS-1858 option.



**Applications**

Use in conjunction with Raychem adapters to provide strain relief for harness systems using circular connectors. Boot is compatible with all Raychem grooved adapters of the appropriate shell size.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H			J			P ±10% b	R ±10% b	JO ±10% b	HW ±20% b	JW ±20% b	X ±20% b	Y ±20% b
	Min. -3,-4,-25 a	Max. -100 a	Max. b	Min. -3,-4,-25 a	Max. -100 a	Max. b							
222K121	24.0 [.95]	24.0 [.95]	10.4 [.41]	24.0 [.95]	14.0 [.55]	5.6 [.22]	25.0 [.98]	25.0 [.98]	8.5 [.33]	1.3 [.05]	.41 [.016]	18.0 [.71]	16.0 [.63]
222K132	30.0 [1.18]	30.0 [1.18]	14.2 [.56]	30.0 [1.18]	15.0 [.59]	5.9 [.23]	32.0 [1.26]	27.0 [1.06]	8.5 [.33]	1.5 [.06]	.61 [.024]	18.0 [.71]	20.0 [.79]
222K142	31.0 [1.22]	31.0 [1.22]	18.0 [.71]	31.0 [1.22]	18.0 [.71]	7.1 [.28]	39.0 [1.54]	31.0 [1.22]	15.0 [.59]	1.8 [.07]	.81 [.032]	18.0 [.71]	20.0 [.79]
222K152	36.0 [1.42]	36.0 [1.42]	22.4 [.88]	36.0 [1.42]	21.0 [.83]	8.4 [.33]	46.0 [1.81]	38.0 [1.50]	18.0 [.63]	1.8 [.07]	.81 [.032]	25.0 [.98]	25.0 [.98]
222K163	43.0 [1.69]	43.0 [1.69]	28.2 [1.11]	43.0 [1.69]	25.0 [.98]	9.9 [.39]	55.0 [2.17]	45.0 [1.77]	17.5 [.69]	2.0 [.08]	.81 [.032]	25.0 [.98]	30.0 [1.18]
222K174	60.0 [2.36]	60.0 [2.36]	35.1 [1.38]	60.0 [2.36]	39.0 [1.54]	15.7 [.62]	80.0 [3.15]	54.0 [2.13]	32.0 [1.26]	3.3 [.13]	1.02 [.040]	25.0 [.98]	45.0 [1.77]
222K185	66.0 [2.60]	66.0 [2.60]	44.5 [1.75]	66.0 [2.60]	42.0 [1.65]	16.8 [.66]	108.0 [4.25]	68.0 [2.68]	48.0 [1.89]	3.8 [.15]	1.63 [.064]	35.0 [1.38]	70.0 [2.76]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

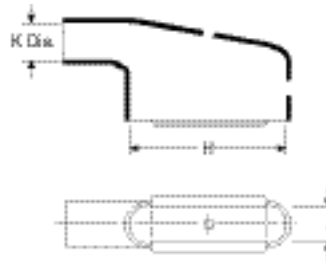
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**D-Subminiature,  
Right-Angled Boot**

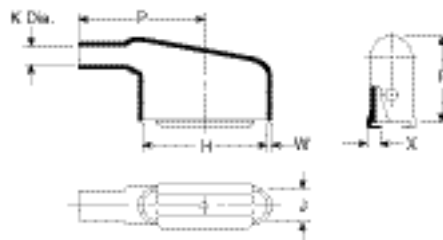
**Boots**

234A011 to 071

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

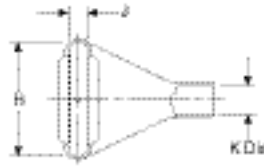
Part No.	H		J		K		P ±10% b	R ±10% b	W ±20% b	X ±20% b	This Boot Fits Cannon/Cinch
	±5% a	±5% b	±5% a	±5% b	Min. a	Max. b					
234A011	20.3 [.80]	20.3 [.80]	10.7 [.42]	10.7 [.42]	7.9 [.31]	4.1 [.16]	25.9 [1.02]	21.6 [.85]	1.02 [.04]	3.05 [.12]	DE-9
234A021	28.2 [1.11]	28.2 [1.11]	10.7 [.42]	10.7 [.42]	10.2 [.40]	5.3 [.21]	30.7 [1.21]	24.6 [.97]	1.02 [.04]	3.05 [.12]	DA-15
234A032	42.2 [1.66]	42.2 [1.66]	10.7 [.42]	10.7 [.42]	14.0 [.55]	7.4 [.29]	42.9 [1.69]	27.9 [1.10]	1.02 [.04]	3.05 [.12]	DB-25
234A042	58.7 [2.31]	58.7 [2.31]	10.7 [.42]	10.7 [.42]	17.3 [.68]	8.6 [.34]	53.3 [2.10]	30.5 [1.20]	1.02 [.04]	3.05 [.12]	DC-37
234A052	57.9 [2.28]	57.9 [2.28]	13.7 [.54]	13.7 [.54]	19.1 [.75]	10.7 [.42]	55.9 [2.20]	32.3 [1.27]	1.02 [.04]	3.05 [.12]	DD-50
234A061	20.3 [.80]	20.3 [.80]	10.7 [.42]	10.7 [.42]	7.9 [.31]	3.8 [.15]	25.9 [1.02]	18.5 [.73]	1.02 [.04]	3.05 [.12]	DE-9
234A071	28.2 [1.11]	28.2 [1.11]	10.7 [.42]	10.7 [.42]	10.2 [.40]	5.1 [.20]	30.7 [1.21]	19.8 [.78]	1.02 [.04]	3.05 [.12]	DA-15

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 (.06) max.

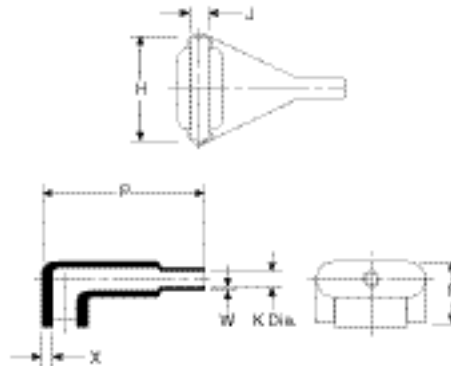
Available in:	Americas	Europe	Asia Pacific
	■	■	■

**D-Subminiature, Side-Entry Boot**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J		K		P	R	W	X	This Boot Fits Cannon/Cinch
	±5% a	±5% b	±5% a	±5% b	Min. a	Max. b	±10% b	±10% b	±20% b	±20% b	
234A111	20.3 [.80]	20.3 [.80]	10.7 [.42]	10.7 [.42]	7.9 [.31]	4.1 [.16]	27.9 [1.10]	18.5 [.73]	1.02 [.04]	3.05 [.12]	DE-9
234A121	28.2 [1.11]	28.2 [1.11]	10.7 [.42]	10.7 [.42]	10.2 [.40]	5.3 [.21]	35.1 [1.38]	18.8 [.74]	1.02 [.04]	3.05 [.12]	DA-15
234A132	42.2 [1.66]	42.2 [1.66]	10.7 [.42]	10.7 [.42]	14.0 [.55]	6.4 [.25]	47.5 [1.87]	20.1 [.79]	1.02 [.04]	3.05 [.12]	DB-25
234A142	58.7 [2.31]	58.7 [2.31]	10.7 [.42]	10.7 [.42]	17.3 [.68]	7.9 [.31]	59.7 [2.35]	20.1 [.79]	1.02 [.04]	3.05 [.12]	DC-37
234A152	57.9 [2.28]	57.9 [2.28]	13.7 [.54]	13.7 [.54]	19.1 [.75]	9.1 [.36]	63.2 [2.49]	26.4 [1.04]	1.02 [.04]	3.05 [.12]	DD-50

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

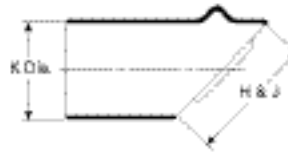


**D-Subminiature,  
90° End-Entry Boot**

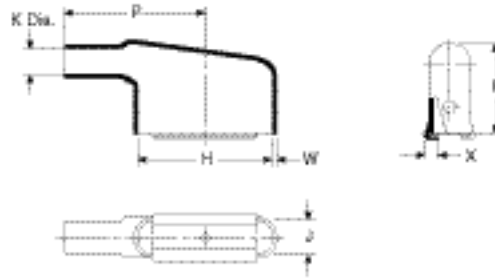
**Boots**

234A611 to 671

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on D-subminiature connector terminations.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-25	Fluid-resistant elastomer	/42 or /86	S-1017 or S-1048 or S-1125

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J		K		P ±10% b	R ±10% b	W ±20% b	X ±20% b	This Boot Fits Cannon/Cinch
	±5% a	±5% b	±5% a	±5% b	Min. a	Max. b					
234A611	16.0 [.63]	20.3 [.80]	16.0 [.63]	10.7 [.42]	16.0 [.63]	4.1 [.16]	25.9 [1.02]	21.6 [.85]	1.02 [.04]	3.05 [.12]	DE-9
234A621	19.1 [.75]	28.2 [1.11]	19.1 [.75]	10.7 [.42]	19.1 [.75]	5.3 [.21]	30.7 [1.21]	24.6 [.97]	1.02 [.04]	3.05 [.12]	DA-15
234A632	29.2 [1.15]	42.2 [1.66]	29.2 [1.15]	10.7 [.42]	29.2 [1.15]	7.4 [.29]	42.9 [1.69]	27.9 [1.10]	1.02 [.04]	3.05 [.12]	DB-25
234A642	34.3 [1.35]	58.7 [2.31]	34.3 [1.35]	10.7 [.42]	34.3 [1.35]	8.6 [.34]	53.3 [2.10]	30.5 [1.20]	1.02 [.04]	3.05 [.12]	DC-37
234A652	37.6 [1.48]	57.9 [2.28]	37.6 [1.48]	13.7 [.54]	37.6 [1.48]	10.7 [.42]	55.9 [2.20]	32.3 [1.27]	1.02 [.04]	3.05 [.12]	DD-50
234A661	16.0 [.63]	20.3 [.80]	16.0 [.63]	10.7 [.42]	16.0 [.63]	3.8 [.15]	25.9 [1.02]	18.5 [.73]	1.02 [.04]	3.05 [.12]	DE-9
234A671	19.1 [.75]	28.2 [1.11]	19.1 [.75]	10.7 [.42]	19.1 [.75]	5.1 [.20]	30.7 [1.21]	19.8 [.78]	1.02 [.04]	3.05 [.12]	DA-15

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

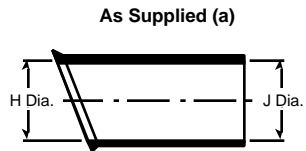
Available in:	Americas	Europe	Asia Pacific
	■	■	■

## 242W042 to 63

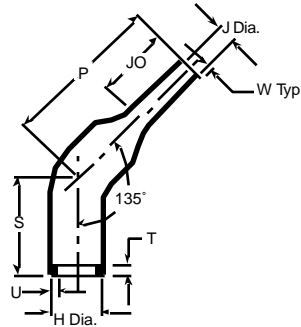
### 45° Angled Boot

#### Applications

Designed for use in the aggressive environments found adjacent to engines in automotive, aerospace and military applications, heat-shrinkable molded parts provide rugged protection, strain relief and a full 360° environmental seal. The introduction of the 45° option means there is now a choice of three routes to the connector for closer positioning and greater design freedom.



After Unrestricted Recovery (b)



#### Compatibility Chart

Material Dash Number	Material Description	Precoating No.	Adhesive Part No.
-3	Polyolefin, semirigid	/42, /86	S-1017 or S-1048
-4	Polyolefin, flexible	/42, /86	S-1017 or S-1048
-25	Elastomer, fluid-resistant	/42, /86, /225	S-1017, S-1125 or S-1048
-130	Polyolefin, commercial flexible	/42, /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-100	Polyolefin, Zerohal	/180	S-1030

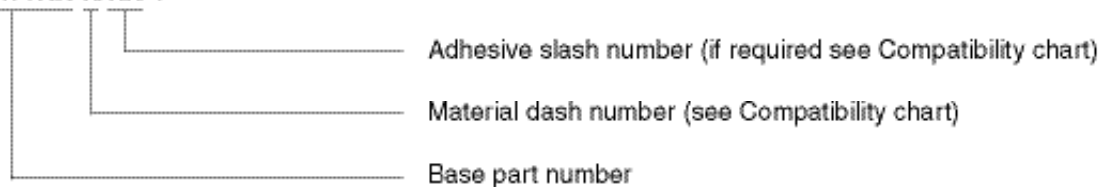
#### Product Dimensions

Part No.	H		J		P ± 10% b	S ± 10% b	T ± 10% b	U ± 10% b	JO ± 10% b	W ± 20% b	
	Min. a	Max. b	Min. a	Max. b							
242W042	31.0 [1.22]	7.9 [0.31]	18.0 [0.71]	31.0 [1.22]	7.0 [0.28]	55.0 [2.17]	35.0 [1.38]	3.5 [0.14]	2.0 [0.08]	25.0 [0.98]	1.8 [0.07]
242W053	36.0 [1.42]	2.1 [0.08]	21.0 [0.83]	36.0 [1.42]	8.4 [0.33]	60.0 [2.36]	40.0 [1.58]	3.5 [0.14]	2.0 [0.08]	30.0 [1.18]	2.0 [0.08]
242W063	43.0 [1.69]	7.9 [0.31]	25.0 [0.99]	43.0 [1.69]	9.9 [0.39]	65.0 [2.56]	45.0 [1.77]	3.5 [0.14]	2.0 [0.08]	35.0 [1.38]	2.2 [0.09]

As supplied dimensions are for uncoated parts, when coating is added, entry diameters will reduce by 1.5 [0.06] max.

#### Ordering Information

242W0XX-X/XX-0

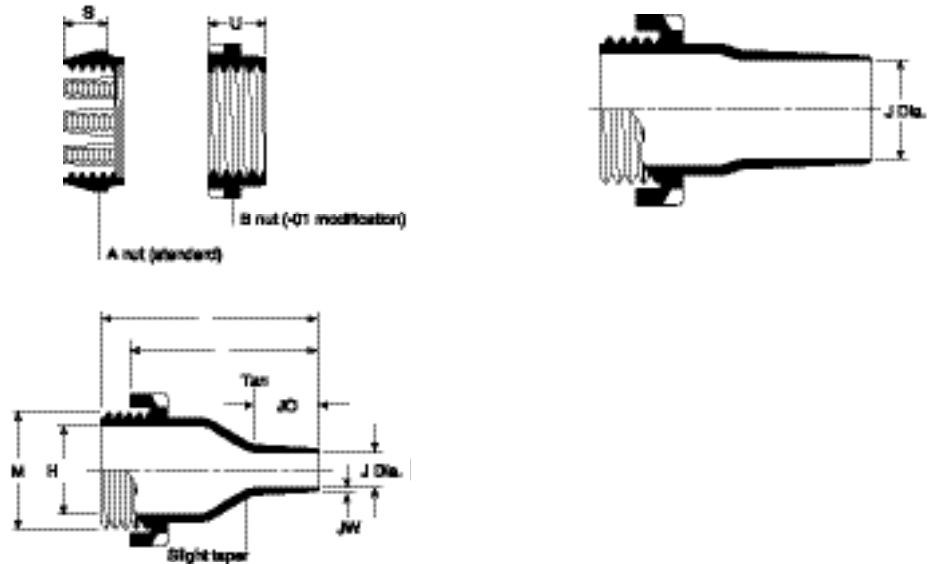


Available in:	Americas	Europe	Asia Pacific
	■	■	■

**Two-Part Feedthrough**

After Unrestricted Recovery (b)

As Supplied (a)



**Applications**

Use for strain relief and abrasion protection when cables pass through equipment boxes or panels.

**Materials Available**

Material Dash Number	Material Description	Precoating No.	Adhesive Part No.
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

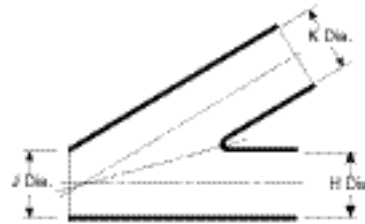
**Product Dimensions**

Part No.	H Ref. b	J		Max. b	JO Max. b	M Thread b	P ±10% b	R ±10% b	S ±10% b	U ±10% b	JW ±20% b	Hole Dia. ±.51 (.02)
		Min. -3,-4,-12, -25 a	-100 a									
207W213	11.9 [.47]	9.9 [.39]	8.5 [.33]	4.1 [.16]	15.2 [.60]	20.1 [.79]	62.0 [2.44]	49.0 [1.93]	13.0 [.51]	9.9 [.39]	1.3 [.05]	23.9 [.94]
207W223	20.1 [.79]	18.0 [.71]	16.5 [.65]	7.1 [.28]	19.3 [.76]	30.0 [1.18]	71.9 [2.83]	58.9 [2.32]	16.0 [.63]	9.9 [.39]	1.8 [.07]	34.0 [1.34]
207W234	30.1 [1.22]	27.9 [1.10]	26.5 [1.04]	11.9 [.47]	26.9 [1.06]	41.9 [1.65]	87.1 [3.43]	73.9 [2.91]	18.0 [.71]	9.9 [.39]	2.03 [.08]	47.0 [1.85]
207W245	45.0 [1.77]	41.9 [1.65]	40.5 [1.59]	18.0 [.71]	32.0 [1.26]	55.9 [2.20]	102.1 [4.02]	88.9 [3.50]	18.0 [.71]	9.9 [.39]	3.05 [.12]	60.5 [2.38]
207W256	68.1 [2.68]	64.0 [2.52]	64.5 [2.54]	30.0 [1.18]	39.1 [1.54]	80.0 [3.15]	121.9 [4.80]	109.0 [4.29]	18.0 [.71]	9.9 [.39]	3.05 [.12]	85.1 [3.35]

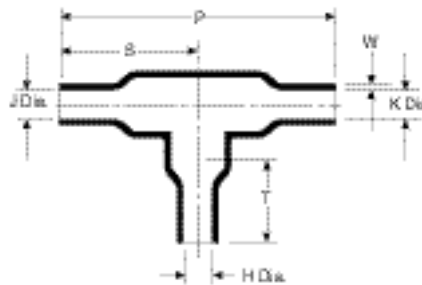
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

T Transition

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material Dash Number	Material Description	Precoating No.	Adhesive Part No.
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86, /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H, J & K		P ±10% b	S ±10% b	T ±10% b	W ±30% b
	Min. a	Max. b				
301A011	6.6 [.26]	3.6 [.14]	29.7 [1.17]	15.1 [.59]	—	1.02 [.04]
301A022	13.2 [.52]	6.9 [.27]	58.7 [2.31]	29.5 [1.16]	17.5 [.69]	1.52 [.06]
301A028	20.0 [0.79]	10.2 [.40]	90 [3.54]	45 [1.77]	30 [1.18]	2.0 [.08]
301A034	26.9 [1.06]	13.5 [.53]	120.1 [4.73]	60.2 [2.37]	35.6 [1.40]	2.29 [.09]
301A048	55.6 [2.19]	30.2 [1.19]	246.4 [9.70]	123.2 [4.85]	70.9 [2.79]	3.05 [.12]

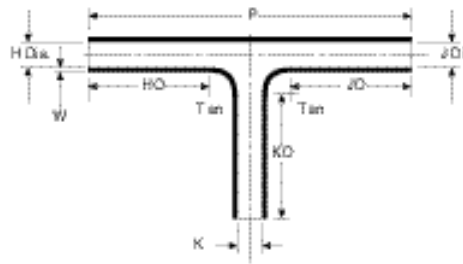
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Slimline T Transition

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material Dash Number	Material Description	Precoating No.	Adhesive Part No.
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-125	Fluoropolymer	N/A	S-1255-04

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J & K		HO, JO, & KO ±10% b	W Nom. b	P Nom. b
	Min. a	Max. b	Min. a	Max. b			
301A511	19.8 [.78]	6.6 [.26]	13.2 [.52]	6.6 [.26]	25.4 [1.00]	1.02 [.04]	80.8 [3.18]
301A512	34.3 [1.35]	11.4 [.45]	22.9 [.90]	11.4 [.45]	41.1 [1.62]	1.27 [.05]	120.4 [4.74]
301A513	60.2 [2.37]	20.1 [.79]	40.1 [1.58]	20.1 [.79]	63.5 [2.50]	1.52 [.06]	175.8 [6.92]
301A514*	83.3 [3.28]	33.3 [1.31]	54.9 [2.16]	33.3 [1.31]	88.9 [3.50]	1.78 [.07]	242.3 [9.54]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

\*301A514 is not available in -125 Fluoropolymer material.

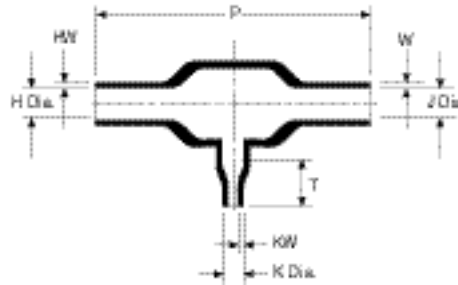
#### 322A112 to 158

#### T Transition

As Supplied (a)



After Unrestricted Recovery (b)



#### Applications

Provides strain relief and mechanical protection on cable harness assemblies.

#### Materials Available

Material Dash Number	Material Description	Precoating No.	Adhesive Part No.
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Modified elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	-100	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

#### Product Dimensions

Part No.	H & J		K		P ±10% b	T ±10% b	HW & W ±20% b	KW ±20% b
	Min. a	Max. b	Min. a	Max. b				
322A112	13.2 [.52]	5.8 [.23]	6.6 [.26]	3.0 [.12]	52.3 [2.06]	—	1.52 [.06]	1.02 [.04]
322A123	26.9 [1.06]	12.4 [.49]	6.6 [.26]	3.0 [.12]	83.3 [3.28]	10.7 [.42]	2.54 [.10]	1.02 [.04]
322A134	26.9 [1.06]	12.7 [.50]	13.2 [.52]	5.8 [.23]	107.7 [4.24]	20.3 [.80]	2.54 [.10]	1.52 [.06]
322A148	55.6 [2.19]	25.4 [1.00]	13.2 [.52]	5.8 [.23]	180.6 [7.11]	25.4 [1.00]	4.57 [.18]	1.52 [.06]
322A158	55.6 [2.19]	25.4 [1.00]	26.9 [1.06]	12.4 [.49]	222.3 [8.75]	38.1 [1.50]	4.57 [.18]	2.54 [.10]

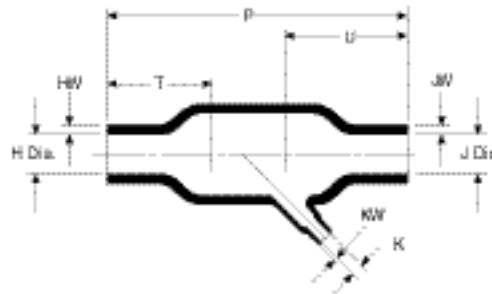
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

**45° Side-Breakout Transition**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	-100	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

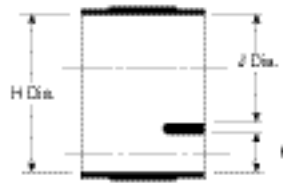
**Product Dimensions**

Part No.	H & J		K		P ±10% b	T ±10% b	U ±10% b	HW & JW ±20% b	KW ±20% b
	Min. a	Max. b	Min. a	Max. b					
342A012	13.2 [.52]	6.9 [.27]	6.6 [.26]	3.6 [.14]	49.3 [1.94]	19.6 [.77]	19.6 [.77]	1.52 [.06]	1.02 [.04]
342A024	26.9 [1.06]	12.7 [.50]	6.6 [.26]	3.6 [.14]	92.5 [3.64]	31.8 [1.25]	39.6 [1.56]	2.54 [.10]	1.02 [.04]
342A034	26.9 [1.06]	13.7 [.54]	13.2 [.52]	6.1 [.24]	144.8 [5.70]	50.8 [2.00]	50.8 [2.00]	2.54 [.10]	1.52 [.06]
342A048	55.6 [2.19]	26.9 [1.06]	13.2 [.52]	6.9 [.27]	184.9 [7.28]	63.5 [2.50]	63.5 [2.50]	4.57 [.18]	1.52 [.06]
342A058	55.6 [2.19]	26.9 [1.06]	26.9 [1.06]	13.7 [.54]	203.5 [8.01]	66.0 [2.60]	66.0 [2.60]	4.57 [.18]	2.54 [.10]

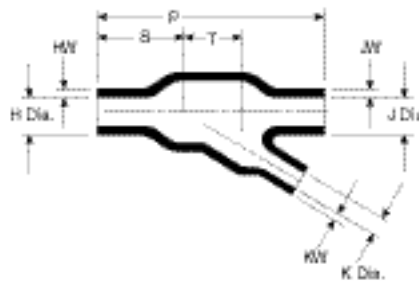
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

**30° Side-Breakout Transition**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/86 or /180	S-1048 or S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

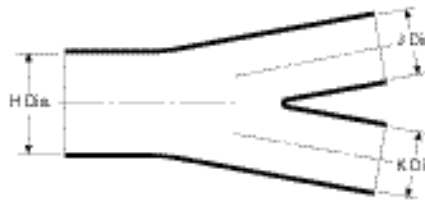
Part No.	H & J		K		P ±10% b	S ±10% b	T ±10% b	HW & JW ±20% b	KW ±20% b
	Min. a	Max. b	Min. a	Max. b					
362A014	30.5 [1.20]	15.7 [.62]	20.3 [.80]	10.7 [.42]	82.6 [3.25]	31.8 [1.25]	21.1 [.63]	2.54 [.10]	1.78 [.07]
362A024	35.6 [1.40]	18.3 [.72]	15.2 [.60]	8.6 [.34]	63.5 [2.50]	19.1 [.75]	22.4 [.88]	2.54 [.10]	1.52 [.06]
362A114	35.6 [1.40]	18.8 [.74]	10.2 [.40]	5.3 [.21]	61.0 [2.40]	19.1 [.75]	21.3 [.84]	2.79 [.11]	1.52 [.06]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

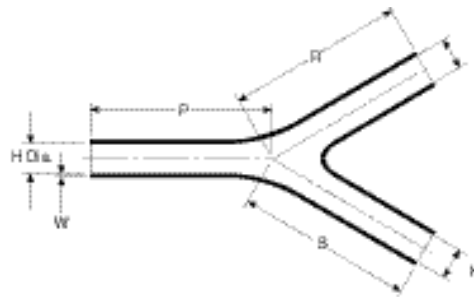


Slimline Y Transition

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-125	Fluoropolymer	—	S-1255-04

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J & K		W Nom. b	P Nom. b	R & S Nom. b
	Min. a	Max. b	Min. a	Max. b			
381A301	19.8 [.78]	6.6 [.26]	13.2 [.52]	6.6 [.26]	1.0 [.04]	40.6 [1.60]	40.6 [1.60]
381A302	34.3 [1.35]	11.4 [.45]	22.9 [.90]	11.4 [.45]	1.3 [.05]	63.0 [2.48]	63.0 [2.48]
381A303	60.2 [2.37]	20.1 [.79]	40.1 [1.58]	20.1 [.79]	1.5 [.06]	94.7 [3.73]	94.7 [3.73]
381A304*	83.3 [3.28]	33.3 [1.31]	54.9 [2.16]	33.3 [1.31]	1.8 [.07]	133.9 [5.27]	133.9 [5.27]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

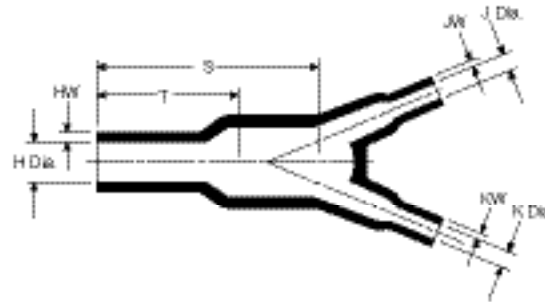
\*381A304 is not available in -125 Fluoropolymer material.

Y Transition

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	-100	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

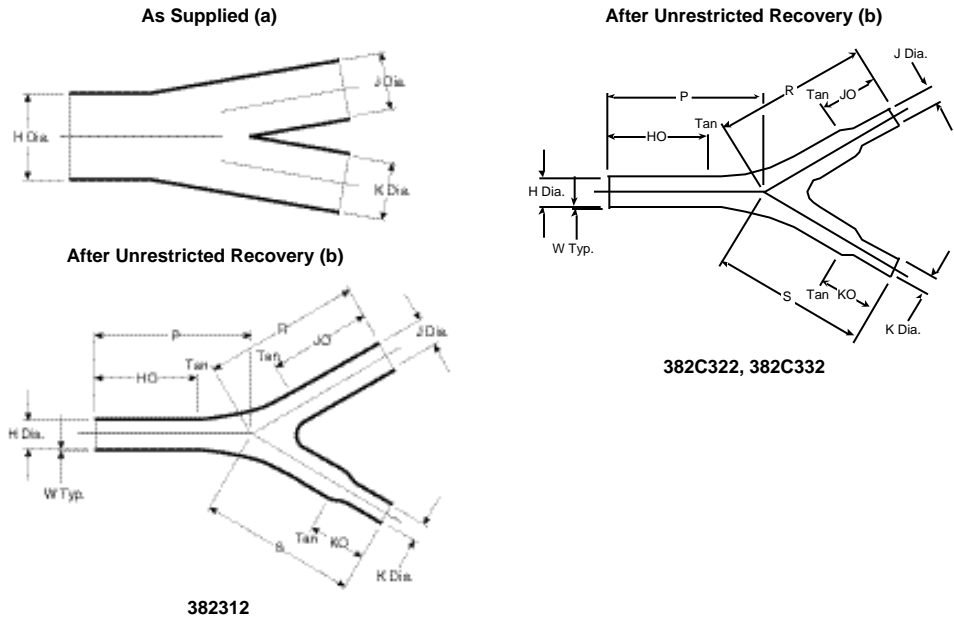
**Product Dimensions**

Part No.	H		J & K		S	T	HW	JW & KW
	Min. a	Max. b	Min. a	Max. b	±10% b	±10% b	±20% b	±20% b
382A012	13.2 [.52]	6.1 [.24]	6.6 [.26]	3.3 [.13]	23.9 [.94]	15.5 [.61]	1.52 [.06]	1.02 [.04]
382A023	26.9 [1.06]	12.4 [.49]	13.2 [.52]	6.1 [.24]	53.3 [2.10]	33.0 [1.30]	2.54 [.10]	1.52 [.06]
382A034	38.6 [1.52]	18.0 [.71]	26.9 [1.06]	12.4 [.49]	78.7 [3.10]	55.9 [2.20]	3.05 [.12]	2.54 [.10]
382A046	55.6 [2.19]	25.9 [1.02]	26.9 [1.06]	12.7 [.50]	111.8 [4.40]	71.1 [2.80]	4.57 [.18]	2.54 [.10]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

**Slimline Y Transition**

**382C312, 322 and 332**



**Applications**

Provides strain relief and mechanical protection at two into one Y junctions in cable harness assemblies.

When used with adhesive it provides environmental sealing. These parts are based on the 382A3 range. They have the branched

outlet(s) reduced in size to accommodate smaller cable diameters without the need for packing or shimming.

**Materials Available**

Material	Material Description	Precoating No.	Adhesive Part No.
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-125	Fluoropolymer	N/A	S-1255-04

**Product Dimensions**

Part No.	H		J		K		P, R & S Nom. b	KO ±15% b	HO & JO ±15% b	W Nom b
	Min. a	Max. b	Min. a	Max. b	Min. a	Max. b				
382C312	1.20 [30.5]	.45 [11.4]	.90 [22.9]	.45 [11.4]	.60 [15.2]	.30 [7.6]	2.48 [63.0]	.85 [21.6]	1.62 [41.1]	.04 [1.0]

Part No.	H		J & K		P, R & S Nom. b	HO ±15% b	JO & KO ±15% b	W Nom. b
	Min. a	Max. b	Min. a	Max. b				
382C322	.90 [22.9]	.45 [11.4]	.40 [10.2]	.20 [5.1]	2.48 [63.0]	1.62 [41.1]	.85 [21.6]	.04 [1.0]

Part No.	H		J & K		P, R & S Nom. b	HO ±15% b	JO & KO ±15% b	W Nom. b
	Min. a	Max. b	Min. a	Max. b				
382C332	1.00 [25.4]	.45 [11.4]	.60 [15.2]	.30 [7.5]	2.48 [63.0]	1.62 [41.1]	.85 [21.6]	.04 [1.0]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

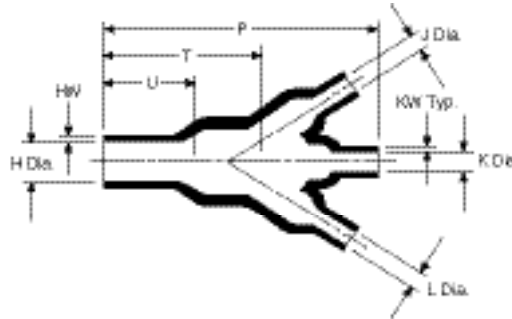
462A011 to 060

Transition, One to Three Cables

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	-100	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J, K&L		P ±10% b
	Min. a	Max. b	Min. a	Max. b	
462A011	13.2 [.52]	6.6 [.26]	6.6 [.26]	3.6 [.14]	46.2 [1.82]
462A023	26.9 [1.06]	13.2 [.52]	13.2 [.52]	6.9 [.27]	93.2 [3.67]
462A034	38.6 [1.52]	18.8 [.74]	19.3 [.76]	9.7 [.38]	135.1 [5.32]
462A046	55.6 [2.19]	25.4 [1.00]	26.9 [1.06]	12.4 [.49]	192.0 [7.56]
462A060	91.4 [3.60]	54.6 [2.15]	45.7 [1.80]	27.4 [1.08]	390.4 [15.37]

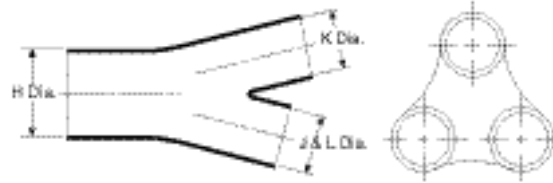
Part No.	T ±10% b	U ±10% b	HW ±20% b	KW ±10% b
462A011	30.5 [1.20]	15.7 [.62]	1.52 [.06]	1.02 [.04]
462A023	57.2 [2.25]	33.0 [1.30]	2.54 [.10]	1.52 [.06]
462A034	88.9 [3.50]	45.7 [1.80]	3.05 [.12]	1.78 [.07]
462A046	121.9 [4.80]	71.1 [2.80]	4.57 [.18]	3.05 [.12]
462A060	254.0 [10.00]	127.0 [5.00]	7.11 [.28]	4.57 [.18]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

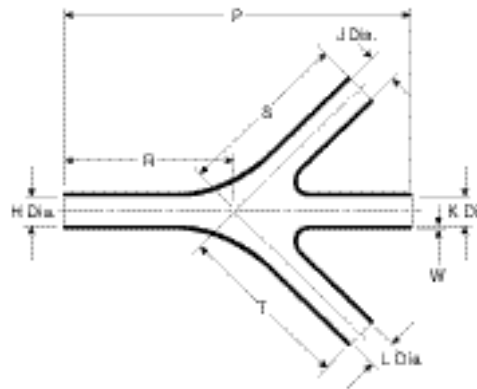
462A421 to 424

**Slimline Transition, One to Three Cables**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-50	Viton polymer blend	N/A	S-1125
-51	Elastomer polymer blend	/164	S-1124
-71	Flexible polyolefin	/42 or /86	S-1017 or S-1048

**Product Dimensions**

Part No.	H		J, K & L		W Nom. b	P Nom. b	R, S & T Nom. b
	Min. a	Max. b	Min. a	Max. b			
462A421	19.8 [.78]	6.6 [.26]	13.2 [.52]	6.6 [.26]	1.0 [.04]	85.9 [3.38]	42.9 [1.69]
462A422	34.3 [1.35]	11.4 [.45]	20.6 [.81]	11.4 [.45]	1.3 [.05]	135.6 [5.34]	67.8 [2.67]
462A423	60.2 [2.37]	20.1 [.79]	36.1 [1.42]	20.1 [.79]	1.5 [.06]	207.3 [8.16]	103.6 [4.08]
462A424	99.8 [3.93]	33.3 [1.31]	54.9 [2.16]	33.3 [1.31]	1.8 [.07]	207.2 [8.16]	103.6 [4.08]

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-125	Fluoropolymer	—	S-1255-04

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

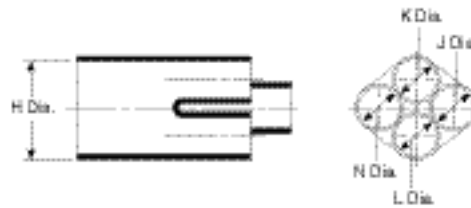
**Product Dimensions**

Part No.	H		J, K & L		W Nom. b	P Nom. b	R, S & T Nom. b
	Min. a	Max. b	Min. a	Max. b			
462A421	19.8 [.78]	6.6 [.26]	13.2 [.52]	6.6 [.26]	1.0 [.04]	85.9 [3.38]	42.9 [1.69]
462A422	34.3 [1.35]	11.4 [.45]	20.6 [.81]	11.4 [.45]	1.3 [.05]	135.6 [5.34]	67.8 [2.67]
462A423	60.2 [2.37]	20.1 [.79]	36.1 [1.42]	20.1 [.79]	1.5 [.06]	207.3 [8.16]	103.6 [4.08]

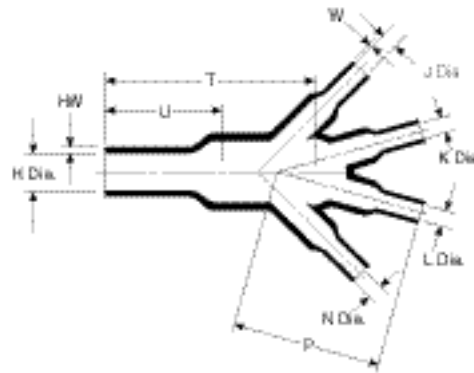
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

**Transition, One to Four Cables**

As Supplied (a)



After Unrestricted Recovery (b)



**Applications**

Provides strain relief and mechanical protection on cable harness assemblies.

**Materials Available**

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86 or /225	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	-100	S-1030

\*For more information, please see the appropriate material page in this section.

\*\*For more information, please see section 5.

**Product Dimensions**

Part No.	H		J, K, L & N		P ±10% b	T ±10% b	U ±10% b	HW ±20% b	W ±20% b
	Min. a	Max. b	Min. a	Max. b					
562A011	13.2 [.52]	6.9 [.27]	6.6 [.26]	3.4 [.14]	24.1 [.95]	43.9 [1.73]	18.0 [.71]	1.52 [.06]	1.02 [.04]
562A022	19.3 [.76]	9.7 [.38]	9.4 [.37]	5.3 [.21]	35.6 [1.40]	43.2 [1.70]	23.1 [.91]	1.78 [.07]	1.02 [.04]
562A032	19.3 [.76]	9.7 [.38]	13.2 [.52]	6.9 [.27]	49.3 [1.94]	50.5 [1.99]	25.4 [1.00]	1.78 [.07]	1.52 [.06]
562A043	26.9 [1.06]	13.0 [.51]	13.2 [.52]	6.9 [.27]	49.3 [1.94]	65.8 [2.59]	33.5 [1.32]	2.54 [1.0]	1.52 [.06]
562A054	38.6 [1.52]	18.5 [.73]	19.3 [.76]	9.7 [.38]	71.9 [2.83]	95.3 [3.75]	46.5 [1.83]	3.05 [1.2]	1.78 [.07]
562A067	55.6 [2.19]	26.7 [1.05]	26.9 [1.06]	13.0 [.51]	101.6 [4.00]	135.1 [5.32]	65.5 [2.58]	4.57 [1.8]	2.54 [1.0]

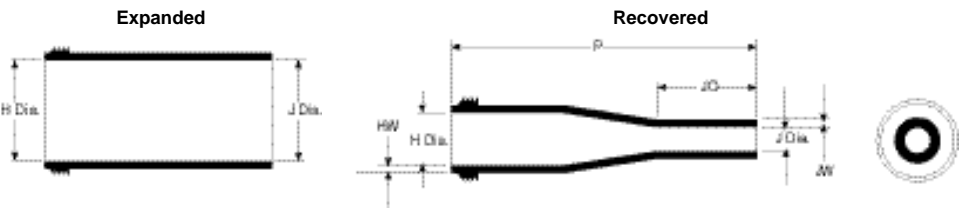
Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

### Configurable Heat-Shrink Transition

#### Product Facts

- Configurable heat-shrink transition
- Low cost commercial polyolefin
- 80°C [176°F] shrink temperature
- High shrink ratio
- Specially engineered easy-to-use crimp tool

### QFT



#### Applications

QFT heat-shrinkable transitions form a watertight seal protecting cable splices from corrosion and mechanical abuse while providing excellent electrical insulating properties. QFT products use special crimps that allow

them to be employed as 1:2, 1:3, and even 1:4 transitions. With their high shrink ratio and crimps the configurable QFT product line can accommodate almost all of your transition needs with only 3 product sizes.

#### Operating Temperature Range

-20°C to 70°C  
[-4°F to 158°F]

#### Specifications/Approvals

Raychem RW 2008

#### Temperature Ratings

Operating temperature range	-20°C to 70°C [-4°F to 158°F] (125°C [257°F] without sealant)
Minimum recovery temperature	55°C [131°F]
Maximum storage temperature	40°C [104°F]

#### Dimensions Table

	H		J		P +/- 10%	JO +/- 10%	HW +/- 20%	JW +/- 20%
	Min.	Max.	Min.	Max.				
QFT1	31.0 [1.22]	9.0 [.35]	31.0 [1.22]	4.4 [.17]	60.0 [2.36]	12.0 [.47]	1.5 [.06]	1.0 [.039]
QFT2	43.0 [1.69]	14.0 [.55]	43.0 [1.69]	7.0 [.28]	75.0 [2.95]	18.0 [.71]	1.8 [.07]	1.0 [.039]
QFT3	57.0 [2.24]	24.0 [.95]	57.0 [2.24]	12.0 [.47]	90.0 [3.53]	25.0 [.98]	1.8 [.07]	1.0 [.039]

Typical QFT Performance

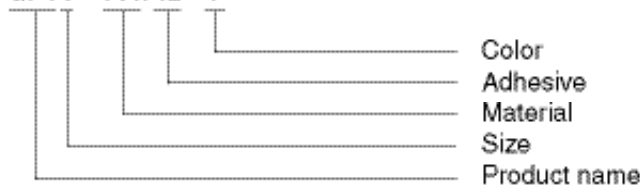
Transitions

QFT (Continued)

	Property	Performance	Test method
Physical	Tensile strength	10 MPa (1500psi) minimum	ISO 37
	Ultimate elongation	250% minimum	ISO 37
	Longitudinal change	0 to -20% maximum	ISO 1183
	Specific gravity	1.4 maximum	ISO 1183
	Heat aging 168 hours at 120°C [248°F]	Minimum 200% ultimate elongation Tensile Strength 10 MPa min.	ISO 188 ISO 37
	Heat shock 4 hours at 105°C	No cracking, dripping or flowing	ASTM D 2671
Electrical	Dielectric strength	8MV/m minimum	IEC 243-1
	Fluid resistance 1 Engine Oil	(24 +/- 2h immersion at 23C+/- 2C) (SAE 20W/50)	ISO 1817 —
Chemical	Hydraulic Fluid Tensile Strength	10 MPa minimum	ISO 37
	Ultimate Elongation	200% minimum	—
	Fluid resistance 2	(30 +/- 3m immersion at 23C+/- 2C)	ISO 1817
	Automotive gasoline	(BS 4040)	—
	Diesel fuel	(BS 2869)	—
	Cleaning fluid	(TL6850-07)	—
	Antifreeze	(Ethylene Glycol/Water 50/50 v/v)	—
	Engine cleaning fluid Tensile strength	(Gunk) 10 MPa minimum	ISO 37
	Ultimate elongation	200% minimum	—

Part Numbering System

QFT3 - 130/42 - 0\*



\*Available in bulk pack, part number QFT3-130/42-0-B500 (US and UK).

Ordering Information

Color	Standard Code	Black (-0) 0
Packaging	Standard	10 pieces per bag, 30 clips
	Bulk pack	500 pieces per box and 500 clips per bag (clips ordered separately) - contact Tyco Electronics for details
Crimp tool	QFT-Crimp-Tool-Manual (069172-000)	—



### Chem-X Heavy Duty Breakout Boots

#### Product Facts

- Watertight
- Easy installation, requiring no special skills
- Compatibility with polyethylene, PVC, lead, steel, aluminum, standard Navy cable jackets, and copper wire and cable
- Four configurations and twelve sizes
- Minimum shrink temperature of 121°C [250°F]
- Type approval by:
  - ABS (American Bureau of Shipping)
  - DNV (Det Norske Veritas)
  - Lloyd's (Lloyd's Register of Shipping)



#### Applications

These flame-retardant heat-shrinkable transitions are especially designed for shipboard applications and meet or exceed all of the U.S. Navy specifications described in MIL-I-81765/1A (as of 5/02). The transitions are made of a rugged, thermally stabilized, modified polyolefin and factory-

coated with a thermoplastic adhesive sealant. As a result, they offer excellent water sealing, mechanical abrasion-protection, corrosion-resistance, weatherproofing, and electrical insulation. The transitions replace tapes, epoxies, and grease in applications involving cable breakouts, transitions, and terminations.

**SSB, T, F to 8S** (Continued)

Commercial	Military
RW-2024	MIL-STD-2003
	MIL-I-81765/1A

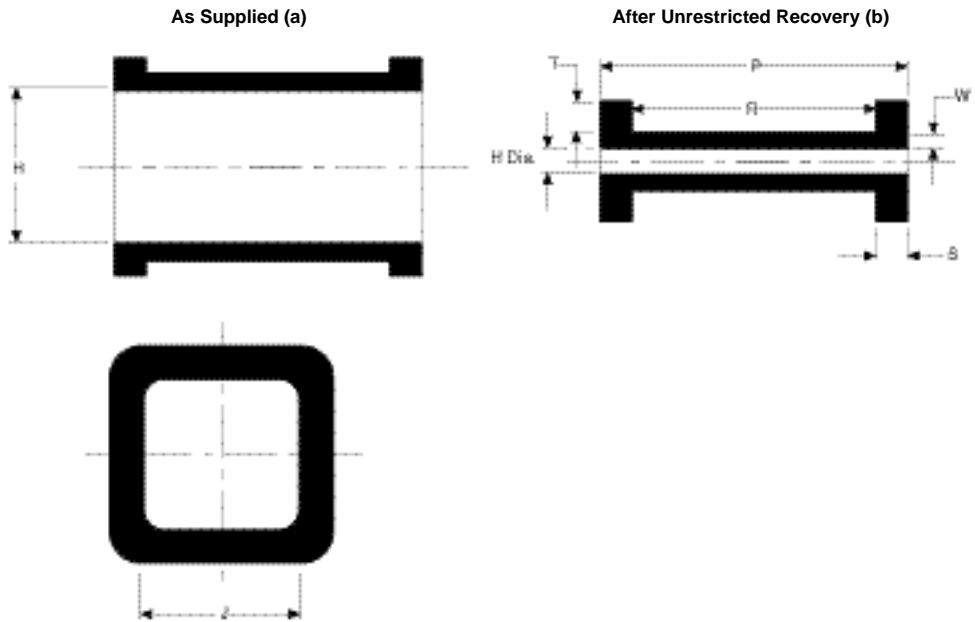
Product Dimensions

Description	Number of Legs	ID Base		ID legs		Leg	Length Body
		Min. Exp.	Max. Rec.	Min. Exp.	Min. Rec.		
SSB-1202 FR	2	40.64[1.60]	11.43 [0.45]	13.97[0.55]	3.81[0.15]	36.83[1.45]	62.23[2.45]
SSB-2002 FR	2	50.8[2.00]	35.56[1.40]	19.05[0.75]	8.89[0.35]	69.85[2.75]	88.90[3.50]
D3-9 FR	2	20.32[0.80]	9.39[0.37]	8.38[0.33]	2.79[0.11]	17.78[0.7]	50.8[2]
D14-30 FR	2	30.48[1.2]	15.24[0.6]	12.7[0.5]	4.32[0.17]	25.4[1]	63.5[2.5]
D50-100 FR	2	48.26[1.9]	22.86[0.9]	19.05[0.75]	7.62[0.3]	30.48[1.2]	76.2[3]
D200-400 FR	2	76.2[3]	38.1[1.5]	36.83[1.45]	12.7[0.5]	38.1[1.5]	88.9[3.5]
T3-9 FR	3	22.86[0.9]	9.14[0.36]	8.38[0.33]	2.29[0.09]	19.05[0.75]	50.80[2.0]
T14-23 FR	3	30.48[1.2]	17.78[0.70]	12.70[0.5]	4.57[0.18]	25.4[1]	60.96[2.40]
T14-50 FR	3	38.1[1.5]	12.7[0.5]	16.51[0.65]	4.06[0.16]	30.48[1.2]	76.2[2.3]
T42-100 FR	3	43.18[1.7]	22.86[0.9]	20.32[0.8]	4.83[0.19]	30.48[1.25]	57.15[2.25]
T150-300 FR	3	60.96[2.4]	35.56[1.4]	30.48[1.25]	12.70[0.5]	40.6[1.6]	88.90[3.50]
T400 FR	3	81.28[3.2]	50.8[2]	35.56[1.4]	17.78[0.7]	40.6[1.6]	88.9[3.5]
T500-600 FR	3	124.46[4.90]	58.93[2.32]	50.8[2]	22.86[0.9]	50.8[2]	187.96[7.40]
F3-9 FR	4	22.86[0.9]	10.92[0.43]	7.11[0.28]	2.79[0.11]	19.05[0.75]	50.8[2]
F-23 FR	4	31.75[1.25]	20.32[0.8]	12.7[0.5]	5.08[0.2]	27.94[1.1]	63.50[2.50]
F42-60 FR	4	44.45[1.75]	25.4[1]	20.32[0.8]	8.13[0.32]	30.48[1.25]	63.50[2.50]
F75-100 FR	4	59.69[2.35]	25.4[1]	25.4[1]	8.89[0.35]	43.18[1.7]	165.1[6.5]
F133-200 FR	4	67.31[2.65]	35.56[1.4]	30.48[1.2]	10.92[0.43]	38.1[1.5]	91.44[3.6]
F150-400 FR	4	133.35[5.25]	76.2[3]	34.29[1.35]	13.97[0.55]	76.2[3]	152.4[6]
6S100-200 FR	6	60.96[2.4]	36.83[1.45]	20.32[0.8]	8.89[0.35]	69.85[2.75]	86.36[3.4]
8S23-75 FR	8	35.56[1.4]	21.59[0.85]	10.16[0.4]	3.3[0.13]	30.48[1.25]	50.8[2]
8S14-50 FR	8	57.15[2.25]	21.59[0.85]	14.22[0.56]	3.3[0.13]	30.48[1.25]	50.8[2]
8S42-100 FR	8	63.50[2.50]	21.59[0.85]	22.1[0.87]	3.3[0.13]	30.48[1.25]	50.8[2]

**Heat-Shrink Bobbins**

**Product Facts**

- Fast installation
- Temperature range of -40°C to 105°C [-40°F to 221°F]
- Fits range of diameters
- Low cost, high volume installation
- Shrinks onto hose/pipe/ wire harnesses
- Good mechanical, thermal and chemical properties
- Good abrasion resistance
- Excellent location, cushioning and protection of cable or hoses from P clips and wire ties
- Stays in place when heated.
- Suits most hoses/pipes/wire harnesses
- No expensive tooling required under body solution
- Engine area solution



Square expanded = -130 material  
 Circular expanded = -12 and -25 material  
 -3, -4

**Materials Available**

**Accessories**

**202W302 to 342** (Continued)

Material	Material Description	Precoating No.	Adhesive Part No.
-3	Polyolefin, semi-rigid	/42, /86	S-1017, S-1048
-4	Polyolefin, flexible	/42, /86	S-1017, S-1048
-12	Viton	N/A	S-1255-04
-25	Fluid resistant elastomer	/86 or /225	S-1017 or S-1048 or S-1125
-130	Flexible polyolefin	/42, /86	S-1017

**Product Dimensions**

Part No.	H		J Min. a	P ±10% b	R ±10% b	S ±10% b	T ±10% b	W ±20% b	Recommended Hose Sizes	
	Min. a	Max. b							Min.	Max.
202W302	29.0 [1.142]	9.5 [.374]	29.0 [1.142]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	1.5 [.059]	11.0 [.433]	25.0 [.984]
202W312	39.0 [1.535]	12.7 [.500]	39.0 [1.535]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	2.0 [.079]	14.0 [.551]	34.0 [1.339]
202W321	10.0 [.394]	3.0 [.118]	10.0 [.394]	29.0 [1.142]	23.0 [.906]	3.0 [.118]	3.0 [.118]	1.5 [.059]	4.0 [.157]	8.0 [.315]
202W331	19.0 [.748]	6.4 [.252]	19.0 [.748]	29.0 [1.142]	24.0 [.945]	2.5 [.098]	2.0 [.079]	1.5 [.059]	8.0 [.315]	17.0 [.669]
202W342	54.0 [2.126]	18.0 [.709]	54.0 [2.126]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	2.0 [.079]	20.0 [.787]	48.0 [1.889]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

400W242

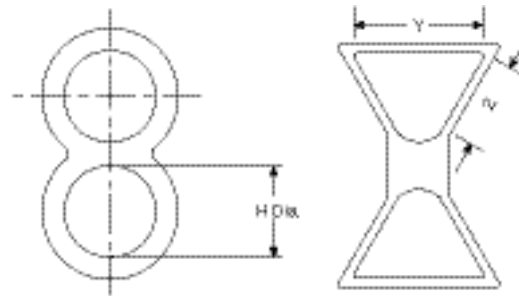
### Heat-Shrink Positioning Ring

#### Product Facts

- Easy to install
- Close fit to hose/pipe
- Fits range of diameters due to high expansion
- Low cost, high volume installation
- Shrinks onto hose/pipe
- Minimum distance between substrates
- Good mechanical, thermal and chemical properties
- Push on fit to hose/pipe
- Stays in place when installed
- No expensive tooling required
- Positions where needed
- Keeps hoses/pipes together, optimizing space
- Under body solution
- Engine area solution
- Twinning two hoses/pipes rationalizes part descriptions
- Hose/pipe can be orientated correctly for ease of fitting to vehicle



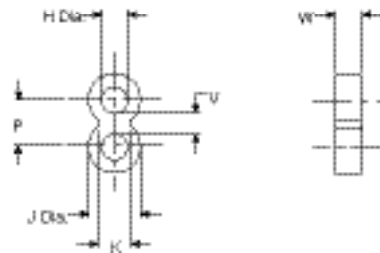
As Supplied (a)



-3, -4, -25, -100

-130

After Unrestricted Recovery (b)



**Materials Available**

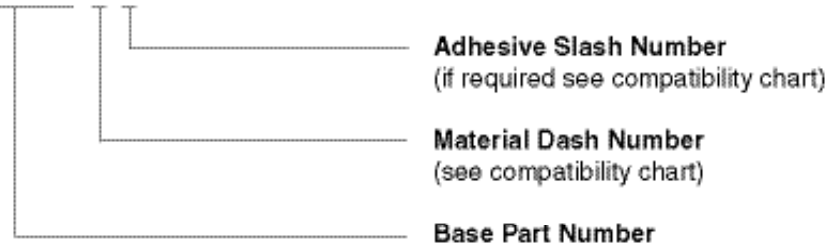
**400W242** (Continued)

Material	Material Description	Precoating no.	Adhesive part no.
-3	Polyolefin, semi-rigid	/42, /86	S-1017 or S-1048
-4	Polyolefin, flexible	/42, /86	S-1017 or S-1048
-25	Elastomer, fluid resistant	/86, /225	S-1017 or S-1048
-100	Polyolefin, Zerohal	-100-CS1972 (S1030 tape supplied in bag)	S-1030
-130	Flexible polyolefin	/42, /86	S-1017

As supplied dimensions are for uncoated parts, when coating is added, entry diameters will reduce by 1.5 [.06] max.

**Part Numbering System**

**400W242 -\*\*/\*\*-0**



**Product Dimensions**

Part No.	H		J	K	P	V	W	Y*	Z*
	Min. a	Max. b	Max. b	± 1.2 b	± 1.7 b	± 0.45 b	± 1 b	± 2 a	± 2 a
400W242	28 [1.102]	10.2 [.402]	19.3 [.760]	12 [.472]	17 [.669]	7.0 [.276]	10 [.394]	29 [1.142]	25 [.984]

\*Applicable for -130 only.

### Chem-X Heat-Shrinkable Cable Entry Seals

#### Product Facts

- Comes in many sizes and configurations
- Seals multicable openings
- Meets or exceeds MIL-I-81765/1A
- Seals per U.S. Coast Guard HQ 3774 in wet, dry, and corrosive locations



#### Applications

Raychem Chem-X Heat-Shrinkable Cable-Entry Seals (CESs) provide a watertight, fume-tight seal where cables enter connection boxes, bulkheads, or other enclosures.

CESs are available in two basic types: standard and threaded. The standard CES for thin-wall enclosures consists of a three-part assembly — a rigid plastic

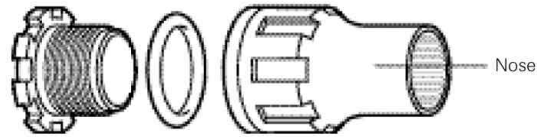
nylon nut, an O-ring, and a heat-shrinkable molded area. The CES for threaded-hole applications is a one-part assembly that combines a tapered national pipe thread (NPT) in rigid plastic nylon with a heat-shrinkable molded area.

All CESs are available with the molded area configured with one opening for a single wire or cable entry or with two, three, or four legs

of equal size to seal multiple wires or cables at the entry to enclosures and/or bulkheads. To meet sealing requirements, all CESs have factory-applied adhesive that provides the seal to wire and cable jackets. When armored cable is being sealed it may be necessary to use additional sealants, such as G.E. RTV 112 or Dow Corning RTV 732, to form the water seal.

CES (Continued)

Standard CES



Temperature

Temperature rating	-55°C to 90°C [-67°F to 194°F]
Minimum shrink temperature	121°C [250°F]

Specifications

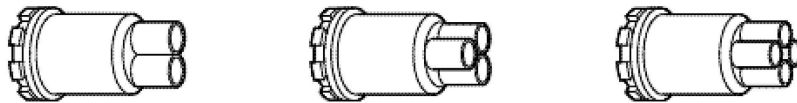
Type	Raychem	
Molded heat-shrink nose	RT-301	Flame retardant polyolefin
Adhesive	RW-2019	Hot melt adhesive

Product Dimensions

Part No.	No. of Legs	Overall Nom. Recommended Length	Min. Expanded I.D. Nose	Max. Recovered I.D. Nose	Max. I.D. of Part	Drill Size	Max. O.D. of Nut
CES-1	1	69.85 [2.75]	12.70 [0.50]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.410]
CES-2	1	69.85 [2.75]	19.05 [0.75]	6.35 [0.25]	19.05 [0.75]	25.40 [1.00]	35.81 [1.410]
CES-3	1	95.25 [3.75]	28.45 [1.12]	12.70 [0.50]	27.94 [1.10]	35.05 [1.38]	48.31 [1.902]
CES-4	1	114.30 [4.50]	40.64 [1.60]	19.05 [0.75]	39.62 [1.56]	50.80 [2.00]	69.09 [2.720]
CES-4S*	1	114.30 [4.50]	50.80 [2.00]	19.05 [0.75]	53.34 [2.10]	59.94 [2.36]	85.09 [3.350]
CES-5	1	177.80 [7.00]	69.85 [2.75]	36.32 [1.43]	73.66 [2.90]	88.90 [3.50]	103.38 [4.070]

\*Part configuration may be different than depicted in figure. Contact Tyco Electronics for specification.

Breakout CES



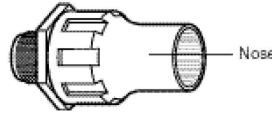
Product Dimensions

Part No.	No. of Legs	Overall Nom. Recommended Length	Min. Expanded I.D. (Each Leg)	Max. Recovered I.D. (Each Leg)	Max. I.D. of Part	Drill Size	Max. O.D. of Nut
CES-2-D1A	2	69.85 [2.75]	15.24 [0.60]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-T1	3	69.85 [2.75]	10.16 [0.40]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-T1B	3	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-F1A	4	69.85 [2.75]	10.16 [0.40]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-F1	4	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-3-D1	2	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-3-T1	3	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-3-F1	4	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-4-D3	2	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-4-T1	3	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-4-F1	4	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-5-T4	3	127.00 [5.00]	31.75 [1.25]	12.70 [0.50]	73.66 [2.90]	63.50 [2.50]	103.38 [4.07]
CES-5-F4	4	127.00 [5.00]	31.75 [1.25]	12.70 [0.50]	73.66 [2.90]	63.50 [2.50]	103.38 [4.07]



CES (Continued)

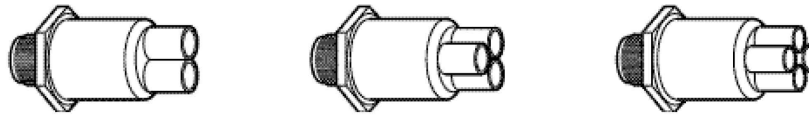
Threaded CES



Part No.	Overall Nom. Recommended Length	Min. Expanded I.D. Nose	Max. Recovered I.D. Nose	National Adapter I.D.	Pipe Thread Size
CES-2-A50	83.82 [3.30]	19.05 [0.75]	6.35 [0.25]	12.70 [0.50]	1/2-14
CES-2-A75	83.82 [3.30]	19.05 [0.75]	6.35 [0.25]	19.05 [0.75]	3/4-14
CES-2-A100	83.82 [3.30]	19.05 [0.75]	6.35 [0.25]	19.05 [0.75]	1-11 1/2
CES-3-A100	111.00 [4.37]	28.45 [1.12]	12.70 [0.50]	25.40 [1.00]	1-11 1/2
CES-3-A150	117.35 [4.62]	28.45 [1.12]	12.70 [0.50]	27.94 [1.10]	1 1/2-11 1/2
CES-4A-A150*	127.00 [5.00]	50.80 [2.00]	19.05 [0.75]	35.56 [1.40]	1 1/2-11 1/2
CES-5-A250*	152.40 [6.00]	69.85 [2.75]	25.40 [1.00]	60.96 [2.40]	2 1/2-10

\* Not illustrated - refer to Specification Control Drawing for details.

Threaded Breakout CES



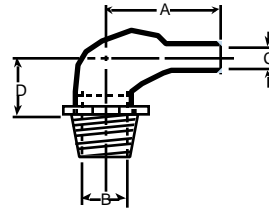
Product Dimensions

Part No.	No. of Legs	Overall Nom. Recommended Length	Min. Expanded I.D. (Each Leg)	Max. Recovered I.D. (Each Leg)	Max. I.D. of Part	Pipe Thread Size (NPT)
CES-2A-T1	3	95.25 [3.75]	10.16 [0.4]	2.79 [0.11]	12.70 [0.50]	1/2-14
CES-2A-F1	4	95.25 [3.75]	10.16 [0.4]	2.79 [0.11]	12.70 [0.50]	1/2-14
CES-2A-D1	2	95.25 [3.75]	15.24 [0.6]	2.79 [0.11]	19.05 [0.75]	3/4-14
CES-2A-T2	3	95.25 [3.75]	10.16 [0.4]	2.79 [0.11]	19.05 [0.75]	3/4-14
CES-2A-F2	4	95.25 [3.75]	10.16 [0.4]	2.79 [0.11]	19.05 [0.75]	3/4-14
CES-3A-D1	2	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	25.40 [1.00]	1-11 1/2
CES-2A-T3	3	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	25.40 [1.00]	1-11 1/2
CES-3A-F1	4	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	25.40 [1.00]	1-11 1/2
CES-3A-D2	2	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	27.94 [1.10]	1 1/2-11 1/2
CES-3A-T2	3	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	27.94 [1.10]	1 1/2-11 1/2
CES-3A-F2	4	95.25 [3.75]	15.24 [0.6]	4.32 [0.17]	27.94 [1.10]	1 1/2-11 1/2
CES-4A-D3	2	95.25 [3.75]	22.86 [0.9]	7.62 [0.30]	37.34 [1.47]	1 1/2-11 1/2
CES-4A-T3	3	95.25 [3.75]	22.86 [0.9]	7.62 [0.30]	37.34 [1.47]	1 1/2-11 1/2
CES-4A-F3	4	95.25 [3.75]	22.86 [0.9]	7.62 [0.30]	37.34 [1.47]	1 1/2-11 1/2

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

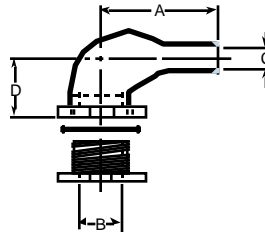
CES (Continued)

Right-Angle Threaded CES



Part No.	Min. Exp. ID	Max. Rec. ID	ID Min	Length		NPT Size
				D	A	
CES-2R-A50	13.97 [0.55]	7.11 [0.28]	12.70 [0.50]	35.56 [1.4]	25.40 [1.00]	1/2-14
CES-2R-A75	19.05 [0.75]	8.38 [0.33]	19.05 [0.75]	43.18 [1.7]	27.94 [1.10]	3/4-14
CES-3R-A100	27.94 [1.10]	9.65 [0.38]	25.40 [1.00]	53.34 [2.1]	33.78 [1.33]	1-11 1/2
CES-3R-A150	40.64 [1.60]	15.75 [0.62]	27.94 [1.10]	78.74 [3.1]	39.62 [1.56]	1 1/2-11 1/2

Right-Angle Breakout CES



Part No.	Min. Exp. ID	Max. Rec. ID	ID Min	Length		Drill Size
				D	A	
CES-1R	13.97 [0.55]	7.11 [0.28]	12.70 [0.50]	35.56 [1.4]	42.67 [1.68]	25.40 [1.00]
CES-2R	19.05 [0.75]	8.38 [0.33]	19.05 [0.75]	43.18 [1.7]	44.96 [1.77]	25.40 [1.00]
CES-3R	27.94 [1.10]	9.65 [0.38]	27.94 [1.10]	53.34 [2.1]	58.42 [2.30]	34.80 [1.37]
CES-4R	40.64 [1.60]	15.75 [0.62]	40.64 [1.60]	78.74 [3.1]	71.12 [2.80]	50.80 [2.00]

### Roll-On Sealing Sleeve

#### Product Facts

- A Raychem heatless sealing solution
- Re-useable sealing solution
- Roll-on to seal, roll-off to re-enter
- Enhanced sealing with gel strips
- Protection of connectors and splices against corrosion
- Available in many conveniently packaged kits



### RayOLOn Kits



#### Applications

RayOLOn re-useable roll-on sealing sleeves are a family of products designed to protect connectors, electrical cable splices, and other cylindrical substrates from harsh environmental elements like salt spray and water moisture. RayOLOn sleeves are a part of Raychem's "heatless" sealing products that require no

heat guns or torches. This is useful in the areas where the use of motorized heat sources or open flames are prohibited or undesirable.

RayOLOn sealing sleeves provide the sealing of the substrates by simply rolling the sleeve over the area to be protected. If the substrate requires servicing, the sleeve can be rolled off to provide access to the

component under the sleeve. After the service is completed, the sleeve can be rolled on the part again to provide the protection. This operation may be done many times throughout the life of the sleeve providing time and material cost savings.

#### Operating Temperature Range

-40°C to 70°C  
[-40°F to 158°F]

#### Specifications and Approvals

Raychem RW 3031

#### Temperature Ratings

Continuous operating temperature range	-40°C to 70°C [-40°F to 158°F]
Short term temperature exposure	-63°C to 90°C [-81°F to 194°F]
Minimum installation	-25°C [-13°F]

#### Sleeve Dimensions Inches (millimeters)

Base Part No.	Available Kits	Dimensions (Reference)		Recommended Use Range	Connection Length
		Diameter	Lengths		
LNCL-11-125	GK	0.51 [13.0]	4.92 [125]	0.22 - 0.68 [6 - 17]	3.00 [75]
LNCL-11-205	GK	0.51 [13.0]	8.07 [205]	0.22 - 0.68 [6 - 17]	6.00 [150]
LNCL-12-140	GK, CK-N	0.56 [14.2]	5.51 [140]	0.48 - 0.90 [12 - 23]	4.00 [100]
LNCL-12-240	GK, CK-N	0.56 [14.2]	9.45 [240]	0.48 - 0.90 [12 - 23]	7.00 [175]
LNCL-13-155	GK, TK-8	0.75 [19.0]	6.10 [155]	0.69 - 1.20 [18 - 30]	4.00 [100]
LNCL-13-305	GK	0.75 [19.0]	12.00 [305]	0.69 - 1.20 [18 - 30]	9.00 [225]
LNCL-14-185	GK, TK-7	1.02 [25.9]	7.28 [185]	0.96 - 1.50 [25 - 38]	5.00 [125]
LNCL-14-355	GK	1.02 [25.9]	14.00 [355]	0.96 - 1.50 [25 - 38]	10.0 [250]
LNCL-15-185	GK, TK-1, TK-5, TK-6	1.45 [36.8]	7.28 [185]	1.40 - 2.00 [36 - 46]	5.00 [125]
LNCL-15-260	GK, SS	1.45 [36.8]	10.2 [260]	1.40 - 2.00 [36 - 46]	7.50 [190]
LNCL-15-450	GK, SS	1.45 [36.8]	17.72 [450]	1.40 - 2.00 [36 - 46]	12.0 [300]

Refer to Raychem specification control drawing LNCL-XX-125 thru LNCL-XX-450 for more details.  
\*Tyco Electronics Gel and Sealant product information available at [www.tycoelectronics.com](http://www.tycoelectronics.com)

**Typical RayOLOn Roll-On Sealing Sleeve Properties**

**Accessories**

**RayOLOn Kits (Continued)**

	Property	Performance	Test method
Physical/ Chemical	Tensile strength	8.3 MPa (1200 psi) minimum	ASTM D 2671
	Ultimate elongation	100 % minimum	ASTM D 412
	Density	1.1 g/cm <sup>3</sup> maximum	ASTM D 792
	Water absorption 24 hours at 23°C [73°F]	0.5 % maximum	ASTM D 570
	Flammability	40 mm/min maximum	ASTM D 635
Electrical	Dielectric strength	90 kV/cm (225 V/mil) minimum	ASTM D 149
	Volume resistivity	1x10 <sup>12</sup> -cm	ASTM D 257

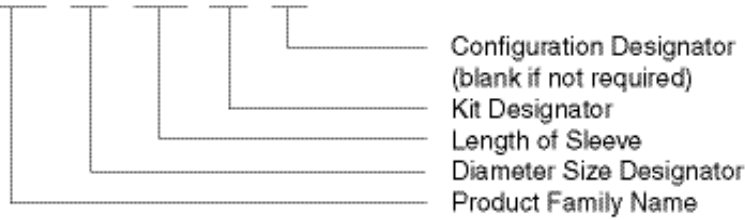
Refer to Raychem specification RW3031 for more requirements and performance information.

Notes:

1. The sleeve is not intended to be heated during the installation process.
2. DO NOT CUT LNCL roll-on sealing sleeve.
3. In case of a conflict between this data sheet and RW3031, RW3031 takes precedence.
4. Not recommended for extended exposure to hydrocarbon based fuel or fluids.

**Part Numbering System**

**LNCL - XX - XXX - XX - XX**



**Kits**

GK—General kit:	Roll-on sleeve, gel strip, cable tie, core tube, installation instruction
CK—Connector sealing kit:	Roll-on sleeve, cable tie, connector flange cover, gel strip, installation instruction
TK—Panel boot sealing kit:	Roll-on sleeve, ferrule, gel strip, cable tie, installation instruction
SS—Ship-or-shore kit:	Roll-on sleeve, connection shield, installation instruction

Note: Not all sizes and lengths are available for all kit combinations. Please refer to the table on the previous page.

**Cable Clamp Heat-Shrink Grommet**

**Product Facts**

- Less assembly time
- Superior strain-relief
- Fewer errors — less rework
- Rework made easier
- No build-up taping or feeding wire through grommet
- Typical installation in just 10-20 seconds
- Re-expandable I.D. allows wire addition to a cable bundle

**shrinkHOoP**



**Applications**

shrinkHOoP grommet (URHR) is an ultra high ratio heat-shrinkable-strain-relief grommet that can be placed over the cable assembly after the connector pinning operation is completed. The ultra-high expansion ratio material conveniently fills the space between the clamp type connector accessory and the cable. (When clamped into position, shrinkHOoP grommet provides strain relief that is more consistent and convenient than many conventional practices — for example, taping, grommet, or tape/grommet combination). The high ratio conformity of shrinkHOoP grommets will match most

typical cable configurations from single conductor to the high density multiple conductor arrangements.

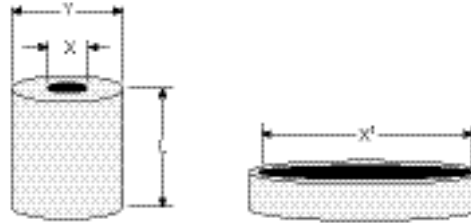
With shrinkHOoP grommet, repairs and rework are a snap – simply heat the grommet until soft, slide a NON-METALLIC probe through the center of the wire bundle (enlarging the grommet I.D.). Once cooled, the grommet will remain open allowing wires to be added, removed or reworked. The system can then be checked, the grommet reheated (shrinking it down again), positioned, and clamped in place.

**Operating Temperature Range**

-55°C to 135°C  
[-67°F to 275°F]

shrinkHOoP (Continued)

RW



Product Dimensions  
Inches (millimeters)

Part No.	I.D. Expanded (X1) min.	I.D. Recovered (X) max.	O.D. (Y) Ref.	Length (L) Ref.	Wt. (gm) Ref.	Notes
URHR-1	1 [25]	.08 [2.1]	0.25 [6]	0.5 [13]	0.75	
URHR-2	1.23 [31]	.10 [2.6]	0.375 [10]	0.5 [13]	1	
URHR-3	1.44 [37]	.14 [3.6]	0.5 [13]	0.5 [13]	1.5	
URHR-4	1.85 [47]	0.18 [4.7]	0.562 [14]	0.75 [19]	3.5	
URHR-5	2 [51]	0.20 [5.1]	0.812 [21]	0.75 [19]	5	

a) Recovered length will allow for 1.91 [0.075] either side of the collar, minimum in most cases.

Typical shrinkHOoP Grommet Performance

Property	Performance	Test Method	
Physical	Tensile strength	1500 psi (10.3 Mpa)	ASTM D-412
	Ultimate elongation	250% minimum	ASTM D-412
	Specific gravity	1.4 maximum	ASTM D-792
	Water absorption	0.5 % maximum	ASTM D-570 A
	Flammability	Pass	ASTM D-635
	Corrosion resistance	Pass	ASTM D-2671 A
	Low temperature flex 4 hours at - 55+/-1°C [67+/-2°F]	Pass	ASTM D-2671 C
	Heat resistance	200% ultimate elongation, minimum	ASTM D-2671
	168 hrs at 175+/-1°C [347+/-2°F]	1200 psi (8.3 Mpa) tensile strength, minimum	
	Heat shock 4 hrs at 225+/-2°C [437+/-5°F]	No cracking, dripping or flowing	ASTM D 2671
Elastic Memory	—	275% minimum expansion to 4 inch (10 cm) of a fully recovered test specimen, and 93% recovery of expanded specimen after oven conditioning for 1 minute at 150+/-2°C[302 +/- 4°F]	—
Electrical	Dielectric strength	200 v/mil (7880 v/mm) minimum	ASTM D-876
	Volume resistivity	10 14 ohm-cm minimum	ASTM D-257
Chemical Fluid Resistance	—	200% ultimate Elongation, minimum 1200 psi (8.3 Mpa) tensile strength, minimum	ASTM F-146

Selection chart

shrinkHOoP (Continued)

Connector Series	Connector Size				
	8 (9)	10, 12 (11, 13)	14, 16 (15, 17)	18, 20 (19, 21)	22, 24, 28*
<b>MIL-C-5015</b>					
MS3451, 52, 56, 59	1	2	3	4	5
MS3450	2	3	4	5	*
<b>MIL-C-26500**</b>					
MS24266	1	2	3	4	5
MS24264, 265	2	3	4	5	*
<b>MIL-C-26482</b>					
MS3120, 21, 22, 26	1	2	3	4	5
MS3470, 71, 74, 75, 76	1	2	3	4	5
MS3124, MS3472	2	3	4	5	*
<b>MIL-C-83723 Series I</b>					
M83723/01 & 02, 05 & 06	1	2	3	4	5
07 & 08, 13 & 14, 23 & 24	1	2	3	4	5
M83723/03 & 04	2	3	4	5	*
<b>MIL-C-83723 Series II</b>					
M83723/17 & 18, 23 & 24	1	2	3	4	5
M83723/12 & 20, 21 & 22	2	3	4	5	*
<b>MIL-C-83723 Series III</b>					
M83723/71 & 72 thru 97 & 98	1	2	3	4	5
M83723/66, 67, 68 & 69	2	3	4	5	*
<b>MIL-C-38999 Series I</b>					
MS27469	1	2	3	4	5
MS27466, 68, 96, 27505, 27656	2	3	4	5	*
<b>MIL-C-38999 Series II</b>					
MS27472, 97, 98, 27508, 27513	1	2	3	4	5
MS27473, 84, 27474	2	3	4	5	*
<b>MIL-C-38999 Series III</b>					
38999/26	1	2	3	4	5
38999/20, 24	3	4	5	5	*
<b>Boeing</b>					
BACC45, F, M, N, P, R, S, T	—	2	3	4	5
BACC 63X	—	3	4	5	*
<b>Boeing</b>					
DC39, 31, 34, 35, 50-57	1	2	3	4	5
DC32, 33, 36, 37, 60, 61, 62, 63	2	3	4	5	*

\* Consult Tyco Electronics for availability of larger sizes.

\*\* Note: cable support clamp I.D. may effect the size of shrinkHOoPgrommet selected.

Tyco Electronics Corporation has acquired XL Technologies. Use the information in the following table to convert the XL part number into the new Tyco Electronics Raychem product description.



## Ordering Information

Description	Convert to
XL Part No.	Description
080EK025	SSC-2/239
080EK025-woA	SSC-2/U
137EK050	SSC-3/239
137EK050-woA	SSC-3/U
1-8117-2A	CES-2A-D1
1-8117-3A	CES-2A-T1
1-8117-4A	CES-2A-F1
200EK075	SSC-4/239
200EK075-woA	SSC-4/U
20432242	CES-4/HR-3
2-8115-2A	CES-2-D1A
2-8115-2AOE	CES-2-D1A
2-8115-2B	CES-2-D1
2-8115-3A	CES-2-T1
2-8115-3B	CES-2-T1B
2-8115-4A	CES-2-F1A
2-8115-4B	CES-2-F1
2-8117-2A	CES-2A-D1
2-8117-2AOE	CES-2A-D1
2-8117-3A	CES-2A-T2
2-8117-4A	CES-2A-F2
2-8118-3A	CES-2-T1
2S-8115-2A	CES-2-D1A
2S-8115-3A	CES-2-T1
2S-8115-4A	CES-2-F1A
380EK150	SSC-6/239
380EK150woA	SSC-6/U
3-8115-2B	CES-3-D1
3-8115-3B	CES-3-T1
3-8115-4B	CES-3-F1
3-8118-4B	CES-3-F1
3A-8117-2B	CES-3A-D1
3A-8117-3B	CES-2A-T3
3A-8117-4B	CES-3A-F1
4-8115-2C	CES-4-D3
4-8115-3C	CES-4-T1
4-8115-4C	CES-4-F1
4-8117-2B	CES-3A-D2
4-8117-3B	CES-3A-T2
4-8117-4B	CES-3A-F2
4A-8117-2C	CES-4A-D3
4A-8117-3C	CES-4A-T3
4A-8117-4C	CES-4A-F3
52451-2X12A	91385-2/12
5-8115-3D	CES-5-T4
8114-1	CES-1
1/2/14	CES-1-2
8114-1-49R	CES-1R
8114-2	CES-2
8114-2-50R	CES-2R
8114-2S	CES-2
8114-2V	CES-2V
8114-2VL	CES-2V
8114-3	CES-3
8114-3-51R	CES-3R
8114-3L	CES-3L
8114-3S	CES-3S
8114-4	CES-4
8114-4-54R	CES-4R
8114-4N	CES-4
8114-4S	CES-4S

Description	Convert to
XL Part No.	Description
8114-4S/C	CES-4S
8114-5	CES-5
8116-1	CES-2-A50
8116-1-49R	CES-2R-A50
8116-1A	CES-2-A50
8116-2	CES-2-A75
8116-2-50R	CES-2R-A75
8116-3	CES2-A100
8116-3-51R	CES-3R-A100
8116-3A	CES-3-A100
8116-4	CES-3-A150
8116-4-52R	CES-3R-A150
8116-4A	CES-4A-A150
8116-5	CES-5-A250
8118-2	CES-2
91342-1	D3-9 FR
91342-12	D3-30 FR
91342-2	D14-30 FR
91342-23	D14-100 FR
91342-3X2.5	D50-200 FR
91342-3	D50-100 FR
91342-34	D50-400 FR
91342-4	D200-400 FR
91343-1	T3-9 FR
91343-2	T14-23 FR
91343-2A	T14-50 FR
91343-3	T42-100 FR
91343-4	T150-300 FR
91343-5	T-400 FR
91343-5678	T3-100 FR
91343-6	T500-600 FR
91343-910	T150-400 FR
91344-1	F3-9 FR
91344-1213	F3-23 FR
91344-1415	F42-100 FR
91344-1617	F75-200 FR
91344-2	F-23 FR
91344-3	F42-60 FR
91344-4	F75-100 FR
91344-5	F133-200 FR
91344-6	F150-400 FR
91346-3	6S100-200 FR
91346-30	202A111-3-0
91346-31	202A111-3/42-0
91346-32	202A111-3/86-0
91347-30	202A121-3-0
91347-31	202A121-3/42-0
91347-32	202A121-3/86-0
91348-1	8S23-75 FR
91348-2	8S14-50 FR
91348-3	8S42-100 FR
91348-30	202A132-3-0
91348-31	202A132-3/42-0
91348-32	202A132-3/86-0
91349-30	202A142-3-0
91349-31	202A142-3/42-0
91349-32	202A142-3/86-0
91350-30	202A153-3-0
91350-31	202A153-3/42-0
91350-32	202A153-3/86-0
91351-30	202A163-3-0



**Ordering Information** (Continued)

Description XL Part No.	Convert to Description
91351-31	202A163-3/42-0
91351-32	202A163-3/86-0
91352-30	202A174-3-0
91352-31	202A174-3/42-0
91352-32	202A174-3/86-0
91353-30	202A185-3-0
91353-31	202A185-3/42-0
91353-32	202A185-3/86-0
91354-30	202A196-3-0
91354-31	202A196-3/42-0
91354-32	202A196-3/86-0
913L87-30	202D921-3/-0
913L87-31	202D921-3/42-0
913L87-32	202D921-3/86-0
91387-30	202A921-3/-0
91387-31	202A921-3/42-0
913L47-30	202D121-3/-0
913L47-31	202D121-3/42-0
913L47-32	202D121-3/86-0
913L48-30	202D132-3/-0
913L48-31	202D132-3/42-0
913L48-32	202D132-3/86-0
913L49-30	202D142-3/-0
913L49-31	202D142-3/42-0
913L49-32	202D142-3/86-0
913L50-30	202D153-3-0
913L50-31	202D153-3/42-0
913L50-32	202D153-3/86-0
913L51-30	202D163-3-0
913L51-31	202D163-3/42-0
913L51-32	202D163-3/86-0
913L52-30	202D174-3-0
913L52-31	202D174-3/42-0
913L52-32	202D174-3/86-0
913L53-30	202D185-3-0
913L53-31	202D185-3/42-0
913L53-32	202D185-3/86-0
913L54-30	202D196-3-0
913L54-31	202D196-3/42-0
913L54-32	202D196-3/86-0
913L66-30	202D211-3-0
913L66-31	202D211-3/42-0
913L66-32	202D211-3/86-0
913L67-30	202D221-3-0
913L67-31	202D221-3/42-0
913L67-32	202D221-3/86-0
913L68-30	202D232-3-0
913L68-31	202D232-3/42-0
913L68-32	202D232-3/86-0
913L69-30	202D242-3-0
913L69-31	202D242-3/42-0
913L69-32	202D242-3/86-0
913L70-30	202D253-3-0
913L70-31	202D253-3/42-0

Description XL Part No.	Convert to Description
913L70-32	202D253-3/86-0
913L87-30	202D921-3-0
913L87-31	202D921-3/42-0
913L87-32	202D921-3/86-0
913R48-30	222A132-3-0
913R48-31	222A132-3/42-0
913R48-32	222A132-3/86-0
913R49-30	222A142-3-0
913R49-31	222A142-3/42-0
913R49-32	222A142-3/86-0
913R50-30	222A152-3-0
913R50-31	222A152-3/42-0
913R50-32	222A152-3/86-0
913R51-30	222A163-3-0
913R51-31	222A163-3/42-0
913R51-32	222A163-3/86-0
913R52-30	222A174-3-0
913R52-31	222A174-3/42-0
913R52-32	222A174-3/86-0
913RL48-30	222D132-3-0
913RL48-31	222D132-3/42-0
913RL48-32	222D132-3/86-0
913RL49-30	222D142-3-0
913RL49-31	222D142-3/42-0
913RL49-32	222D142-3/86-0
913RL50-30	222D152-3-0
913RL50-31	222D152-3/42-0
913RL50-32	222D152-3/86-0
913RL51-30	222D163-3-0
913RL51-31	222D163-3/42-0
913RL51-32	222D163-3/86-0
913RL52-30	222D174-3-0
913RL52-31	222D174-3/42-0
913RL52-32	222D174-3/86-0
913Y95-30	381A301-71/-0
913Y95-31	381A301-71/42-0
913Y95-32	381A301-71/86-0
913Y96-30	381A302-71/-0
913Y96-31	381A302-71/42-0
913Y96-32	381A302-71/86-0
HHW-1.3/6A	SST-6-13FR/97-0
HHW-13/6A	SST-6-13FR/97-0
HHW-15/12	SST-12-15FR/97-0
HHW-15/6	SST-6-15FR/97-0
HHW-15/9	SST-9-15FR/97-0
HHW-20/9	SST-9-20FR/97-0
HRSR-1	URHR-1
HRSR-2	URHR-2
HRSR-3	URHR-3
HRSR-4	URHR-4
HRSR-5	URHR-5
XHTA	RHW
XHTU	RHW
XMTA	RPRD

4  
Molded Parts

