

# **Water Supply and Sewerage Approved Products Manual - February 2006**

## **Pressure Sewerage Products – Maintenance Products**

### **Section SPO 03**

<b>SPECIFICATIONS</b>		<b>A</b>	
	SPO 03-S1A	MULTI-PURPOSE UNRESTRAINED MECHANICAL COUPLINGS	<b>A</b>
	SPO 03-3	MULTI-PURPOSE FLANGED ADAPTORS	<b>B</b>
	SPO 03-4	SINGLE PURPOSE RESTRAINED MECHANICAL COUPLING	<b>C</b>
	SPO 03-5	SINGLE PURPOSE UNRESTRAINED MECHANICAL COUPLINGS	<b>D</b>
	SPO 03-6	STAINLESS STEEL PLAIN REPAIR CLAMPS	<b>E</b>
<b>MECHANICAL COUPLINGS</b>		<b>1</b>	
	MULTI-PURPOSE UNRESTRAINED	<b>1</b>	
	MULTI-PURPOSE UNRESTRAINED FLANGED ADAPTORS	<b>1</b>	
	SINGLE PURPOSE RESTRAINED MECHANICAL COUPLINGS	<b>2</b>	
	SINGLE PURPOSE UNRESTRAINED MECHANICAL COUPLINGS	<b>3</b>	
<b>STAINLESS STEEL REPAIR CLAMPS</b>		<b>4</b>	
	SINGLE PART	<b>4</b>	
	DOUBLE PART	<b>7</b>	
	MULTI PART	<b>8</b>	

**SPO 03-S1A MULTI-PURPOSE UNRESTRAINED MECHANICAL COUPLINGS**

<b>STANDARD</b>	WSA 105: 2005 Unrestrained mechanical couplings					
<b>DESIGN</b>	Multi-purpose (or universal) unrestrained mechanical couplings are able to join a pipe of one material to many different material pipes without varying any of the coupling components. The couplings comprise two end rings with each retaining between a central sleeve an elastomeric ring seal. When tie bolts between the end rings are tightened, the wedge face of the ring seals are compressed against the raised ends of the central sleeve, thus deforming the seal downwards onto the outside wall of the adjoining pipes. The wedge design of the elastomeric seals and sleeve ends adjust sealing where adjoining pipes have wide variations in their respective outside diameters. Pipe nominal sizes normally have to be compatible but outside diameters do not. DI, CI, AC, PVC, GRP and steel pipes may be joined to each other.					
<b>MATERIALS</b>	<b>Sleeve (barrels):</b>	Ductile iron to AS 1831 grade 400-15 Carbon steel to AS/NZS 1594 grade HU 250 ABS to AS 3518.1 Stainless steel to ASTM A 240M grade 316L or 316				
	<b>End rings (flanges or clips):</b>	Ductile iron to AS 1831 grade 400-15 Carbon steel to AS/NZS 1594 grade HU 250 Gunmetal to AS 1565 grade C83600A Stainless steel to ASTM A 240M grade 316L or 316				
	<b>Bolts:</b>	Stainless steel to ASTM F593 grade 316				
	<b>Nuts:</b>	Stainless steel to ASTM AF594 grade 316				
	<b>Washers:</b>	Stainless steel ASTM F84 grade 316				
	<b>Joint seals:</b>	EPDM or NBR to AS 1646				
	<b>Coatings:</b>	Ductile iron and carbon steel components to have thermal bonded polymeric coating to AS/NZS 4158 on internal and external surfaces. Coating on fastener threads to be 50-75microns thick				
	<b>Anti galling:</b>	Stainless steel threads – Molybdenum disulphide or Teflon dry film lubricant				
<b>FASTENERS DESIGN</b>		<b>Bolts</b>	<b>Nuts</b>	<b>Washers</b>		
	<b>Stainless Steel:</b>	AS 1110.1 grade A	AS 1112.1 grade A	ISO 887 or ISO 7091 gr A		
		Bolt head to be captured in coupling end ring for single spanner operation				
<b>MINIMUM BARREL LENGTH (long series)</b>	<b>DN</b>	<b>Length(mm)</b>	<b>DN</b>	<b>Length(mm)</b>	<b>DN</b>	<b>Length(mm)</b>
	80	175	225	175	450	215
	100	175	250	175	525	215
	150	175	300	215	600	215
	200	175	375	215	750	215
<b>WORKING PRESSURE</b>	<b>PN16:</b>	1.6 MPa				
	<b>PN35:</b>	3.5 MPa				
<b>JOINT DEFLECTIONS</b>	DN 80-300: 6°	DN 375: 5°	DN 450, 500: 4°	DN 600, 750: 3°		
<b>COUPLING MARKINGS</b>	Manufacturer's name or trademark	*Pipe OD range as tested (mm), e.g. OD 109-133				
	Batch identification	*Pipe types & PN rating(s) for which coupling suitable				
	Nominal diameter (DN, e.g. DN100)	*Maximum angle of deflection				
		*The number of this standard, i.e. WSA 105				
<b>MARKING METHOD</b>	Legibly and durably marked or cast.	*legibly marked on adhesive label on body or printed on packaging. Do not apply labels to stainless steel.				

**SPO 03-3 MULTI-PURPOSE FLANGED ADAPTORS**

<b>STANDARD</b>	WSA 105: 2005 Unrestrained mechanical couplings					
<b>DESIGN</b>	Multi-purpose (or universal) unrestrained flanged adaptors comprise a multi-purpose flange connector at one end and a multi-purpose coupler the other. The multi-purpose flange connects to a variety of flange specifications. The multi-purpose coupler can join to many different material pipe spigots without altering coupler components; it comprises a retaining end ring ahead of a short sleeve (sleeve and multi-purpose flange are one piece). When tie bolts holding the multi-coupler end ring are tightened, the wedge face of the ring seal is compressed against the raised end of the sleeve to deform the seal down onto the inserted pipe. The multi-coupler end can join to DI, CI, AC, PVC, GRP and steel pipe spigots.					
<b>MATERIALS</b>	<b>Sleeve with multi-purpose flange:</b>	Ductile iron to As 1831 grade 400-15 Carbon steel to AS/NZS 1594 grade HU 250 ABS to AS 3518 Stainless steel ASTM A 240M grade 316L or 316				
	<b>End-ring (or clip):</b>	Ductile iron to As 1831 grade 400-15 Carbon steel to AS/NZS 1594 grade HU 250 Gunmetal to AS 1565 grade C83600 Stainless steel to ASTM A 240M grade 316L or 316				
	<b>Bolts:</b>	Stainless steel grade AS 2837/304 or 316				
	<b>Nuts:</b>	Stainless steel to ASTM AF594 grade 316				
	<b>Washers:</b>	Stainless steel ASTM F84 grade 316				
	<b>Joint seals:</b>	Approved elastomer to AS 1646 or BS 2494				
	<b>Sleeve/flange coating</b>	Ductile iron and carbon steel components to have thermal bonded polymeric coating to AS/NZS 4158 on internal and external surfaces. Coating on fastener threads to be 50-75microns thick				
	<b>Anti galling:</b>	Stainless steel threads – Molybdenum disulphide or teflon dry film lubricant				
<b>FASTENERS DESIGN</b>		<b>Bolts</b>	<b>Nuts</b>	<b>Washers</b>		
	<b>Stainless Steel:</b>	AS 1110.1 grade A	AS 1112.1 grade A	ISO 887 or ISO 7091 gr A		
	Bolt head to be captured in coupling end ring for single spanner operation					
<b>MINIMUM SEALING LENGTH</b>	<b>DN</b>	<b>Length(mm)</b>	<b>DN</b>	<b>Length(mm)</b>	<b>DN</b>	<b>Length(mm)</b>
	80	55	225	90	450	120
	100	65	250	100	525	130
	150	75	300	110	600	135
	200	85	375	110		
<b>JOINTING</b>	Flange to AS 4087 or equivalent					
<b>WORKING PRESSURE</b>	1.6 MPa (allowable operating pressure)					
<b>JOINT DEFLECTIONS</b>	DN 80-300: 6°	DN 375: 5°	DN 450, 500: 4°	DN 600, 750: 3°		
<b>COUPLING MARKINGS</b>	Manufacturer's name or trademark Nominal size and pressure rating Pipe types for which coupling is designed Year of manufacture			Pipe diameter tolerance range (optional) Allowable operating pressure (working pressure) Maximum angle of deflection Type of use, e.g. potable water (optional)		
<b>MARKING METHOD</b>	Legibly and durably marked or cast.					

**SPO 03-4 SINGLE PURPOSE RESTRAINED MECHANICAL COUPLING**

Specification under revision

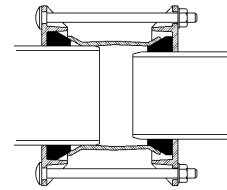
**SPO 03-5 SINGLE PURPOSE UNRESTRAINED MECHANICAL COUPLINGS**

Specification under revision

**SPO 03-6 STAINLESS STEEL PLAIN REPAIR CLAMPS**

<b>STANDARD</b>	AS 4181: 1999 Stainless steel clamps for waterworks purposes	
<b>DESIGN</b>	Stainless steel plain repair clamps are designed for repair of holed or weak pipe. Repair clamps have limited ability to accommodate axial deflection and as such are not to be used to join pipes. They may be used however for repair of full pipe breaks where pipe ends are considered stable. Each clamp nominal size can cover a wide diameter range making them suitable for a number of pipe materials. The clamp is required to be self aligning and locking in its assembly prior to tightening of the retaining system. No contact between the stainless steel clamp and ferrous pipe material is allowed. Clamps may be designed to comprise of one, two or three stainless steel band parts. The clamp elastomeric seal is to be one continuous strip. The clamp design is required to eliminate any crevices between the gasket and mating stainless steel surfaces after tightening. Where applicable the clamp elastomeric seal is to be continuously and uniformly bonded to the inner surface of the clamp band.	
<b>MATERIALS</b>	<b>Band, bolts, nuts, washers:</b>	Specification under review
	<b>Clamp seal:</b>	Specification under review
<b>FASTENING SYSTEM</b>	Specification under review	
<b>ALLOWABLE OPERATING PRESSURE</b>	1.6 MPa	(WS20 has 2 MPa for DN 300 and less and 1.2 MPa for above DN300 – this is based on superceded AS 4181 and is now a redundant reqt )
<b>MARKINGS</b>	Manufacturer's name or trademark Diameter range Allowable operating pressure	StandardsMark certification mark on clamp body. Traceability code (not in AS 4181)
<b>MARKING METHOD</b>	Adhesive labels shall not be used	
<b>COMPATIBLE PIPE OD's</b>	Ductile iron (class K9 or K12), PVC Series 1, GRP (Hobas), grey cast iron (class B), grey cast iron (class C), asbestos cement (class A and B), asbestos cement (class C and D)	

**MULTI-PURPOSE UNRESTRAINED  
MECHANICAL COUPLINGS**  
(FOR DI/ CI/ AC/ PVC)

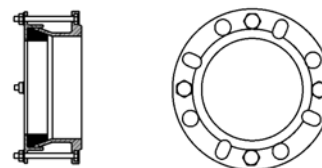


Nominal Size	Viking (Maxifit)			Tyco (Vari-Gib)			AVK (Series 601)		
DN	Clamp Range ID (mm)	No of Bolts	Sleeve Length (mm)	Clamp Range ID (mm)	No of Bolts	Sleeve Length (mm)	Clamp Range ID (mm)	No of Bolts	Sleeve Length (mm)
80							84-106	4	175
100	109.6-127.8	4	245	109-133	3	176	109-133	4	175
150	159.2-181.6	4	245	158-182	3	176	157-183	4	175
200	218.1-235.0	4	245	214-238	5	176	218-242	4	175
225	250.0-267.0	6	185	240-264	5	176	242-268	6	175
250	272.0-289.0	6	185	264-288	5	176	266-292	6	175
250				272-296	6	176			
300				310-334	6	216			
300				330-354 <sup>1</sup>	6	216	324-350 <sup>1</sup>	6	215
375	394.3-411.3 <sup>1</sup>	8	310						
375	418.2-435.2	8	310	410-434 <sup>1</sup>	8	216			
450				488-512	10	216			
450	501.9-518.9	10	310	498-522	10	216			
500				542-566	12	216			
500	555.3-572.3	12	310	552-576	12	216			
600	662.0-679.0	14	310	648-672	14	216			
750									

**NOTES**

1. Not suitable for Series 1 PVC OD.

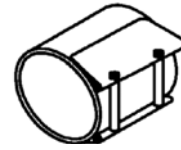
**MULTI-PURPOSE UNRESTRAINED  
FLANGED ADAPTORS**  
(FOR DI/ CI/ AC/ PVC)



Nominal Size
DN
80
100
150
200
225
250

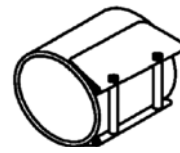


**SINGLE PURPOSE RESTRAINED  
MECHANICAL COUPLINGS  
(FOR DI/CI)**



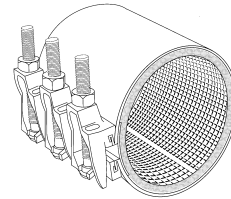
Nominal Size	
DN	
26.9	
30.0	
33.7	
38.0	
42.4	
44.5	
48.3	
54.0	
57.0	
60.3	
73.0	
76.1	
84.0	
88.9	
100.6	
101.6	
104.0	
104.8	
108.0	
114.3	
127.0	
129.0	
130.2	
133.0	
139.7	
141.3	
154.0	
159.0	
168.3	
193.7	
200.0	
204.0	
219.1	
244.5	
250.0	
254.0	
267.0	
273.0	
304.0	
323.9	
355.6	
406.4	
457.2	
508.0	
558.8	
609.6	

**SINGLE PURPOSE UNRESTRAINED  
MECHANICAL COUPLINGS**  
(FOR DI/CI/PE/AC/GRP/CONCRETE)



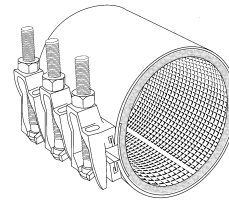
Nominal Size (DN)
48.3
54.0
57.0
60.3
73.0
76.1
84.0
88.9
100.6
101.6
104.0
104.8
108.0
114.3
127.0
129.0
130.2
133.0
139.7
141.3
154.0
159.0
168.3
180.0
200.0
219.1
250.0
267.0
273.0
304.0
323.9
355.6
406.4
457.2
508.0
558.8
609.6
711.2
762.0
812.8
914.4
1016.0
1117.6
1219.2
1320.8
1422.4
1524.0
1625.0

**SINGLE PART  
STAINLESS STEEL REPAIR CLAMPS**



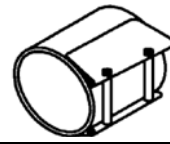
Nominal Size Pipe DN x Clamp length	Clamp Range ID (mm)	Crevet Compatible Pipeline Systems	Clamp Range ID (mm)	Wang Compatible Pipeline Systems
40 x 150			47 - 52	UPVC/GST
50 x 150			47 - 52	Cu
50 x 150	59 - 64	UPVC/ GST	59 - 64	UPVC/ GST
50 x 200	59 - 64	UPVC/ GST		
50 x 300	59 - 64	UPVC/ GST		
50 x 400	59 - 64	UPVC/ GST		
50 x 150			69 - 74	AC
65 x 150			63 - 69	Cu
65 x 200				
65 x 300				
65 x 400				
65 x 150	69 - 74	UPVC/ GST	75 - 80	UPVC/GST
65 x 200	69 - 74	UPVC/ GST		
65 x 300	69 - 74	UPVC/ GST		
65 x 400	69 - 74	UPVC/ GST		
80 x 150	75 - 80	Cu	75 - 80	Cu
80 x 200	75 - 80	Cu		
80 x 300	75 - 80	Cu		
80 x 400	75 - 80	Cu		
80 x 150	88 - 95	UPVC/ GST	85 - 95	UPVC/ GST
80 x 200	88 - 95	UPVC/ GST	85 - 95	UPVC/ GST
80 x 300	88 - 95	UPVC/ GST	85 - 95	UPVC/ GST
80 x 400	88 - 95	UPVC/ GST		
80 x 150	95 - 105	DI/ CI/ AC/ GRP	95 - 105	DI/ CI/ AC/ GRP
80 x 200	95 - 105	DI/ CI/ AC/ GRP	95 - 105	DI/ CI/ AC/ GRP
80 x 300	95 - 105	DI/ CI/ AC/ GRP	95 - 105	DI/ CI/ AC/ GRP
80 x 400	95 - 105	DI/ CI/ AC/ GRP		
100 x 200			95 - 105	Cu
100 x 300			95 - 105	Cu
100 x 400				
100 x 200	110 - 120	UPVC/ GST		
100 x 300	110 - 120	UPVC/ GST		
100 x 400	110 - 120	UPVC/ GST		
100 x 200			114 - 124	UPVC/ GST
100 x 300			114 - 124	UPVC/ GST
100 x 400				
100 x 200	120 - 130	DI/ CI/ AC/ GRP	120 - 130	DI/ CI/ AC/ GRP
100 x 300	120 - 130	DI/ CI/ AC/ GRP	120 - 130	DI/ CI/ AC/ GRP
100 x 400	120 - 130	DI/ CI/ AC/ GRP	120 - 130	DI/ CI/ AC/ GRP
125 x 200				
125 x 300				
125 x 400				
125 x 200			140 - 150	UPVC/ GST/ CI
125 x 300			140 - 150	UPVC/ GST/ CI
125 x 400			140 - 150	UPVC/ GST/ CI
150 x 200	150 - 160	UPVC		
150 x 300	150 - 160	UPVC		

**SINGLE PART  
STAINLESS STEEL REPAIR CLAMPS**



Nominal Size Pipe DN x Clamp length	Crevet		Wang	
	Clamp Range ID (mm)	Compatible Pipeline Systems	Clamp Range ID (mm)	Compatible Pipeline Systems
150 x 400	150 – 160	UPVC		
150 x 200	160 – 170	UPVC/ GST	160 – 170	UPVC/ GST
150 x 300	160 – 170	UPVC/ GST	160 – 170	UPVC/ GST
150 x 400	160 – 170	UPVC/ GST	160 – 170	UPVC/ GST
150 x 200				
150 x 300				
150 x 400				
150 x 200	175 – 185	DI/ CI/ AC/ GRP	175 – 185	DI/ CI/ AC/ GRP
150 x 300	175 – 185	DI/ CI/ AC/ GRP	175 – 185	DI/ CI/ AC/ GRP
150 x 400	175 – 185	DI/ CI/ AC/ GRP	175 – 185	DI/ CI/ AC/ GRP
150 x 200			190 – 200	RC
150 x 300			190 - 200	RC
200 x 200				
200 x 300				
200 x 400				
200 x 200	215 – 225		215 – 225	UPVC
200 x 300	215 – 225		215 – 225	UPVC
200 x 400	215 – 225		215 – 225	UPVC
200 x 200	225 – 240	DI/ CI/ AC/ GRP	230 – 240	DI/ CI/ AC/ GRP
200 x 300	225 – 240	DI/ CI/ AC/ GRP	230 – 240	DI/ CI/ AC/ GRP
200 x 400	225 – 240	DI/ CI/ AC/ GRP	230 – 240	DI/ CI/ AC/ GRP
225 x 300	245 – 255	UPVC/ DI/ CI/ AC/ GRP	250 – 260	UPVC/ DI/ CI/ AC/ GRP
225 x 400	245 – 255	UPVC/ DI/ CI/ AC/ GRP	250 – 260	UPVC/ DI/ CI/ AC/ GRP
225 x 300	255 – 265			
225 x 400	255 – 265			
250 x 300	270 – 285	UPVC	275 – 285	UPVC
250 x 400	270 – 285	UPVC	275 – 285	UPVC
250 x 300	285 – 295	DI/ CI/ AC/ GRP	285 – 295	DI/ CI/ AC/ GRP
250 x 400	285 – 295	DI/ CI/ AC/ GRP	285 – 295	DI/ CI/ AC/ GRP
300 x 300			310 – 325	UPVC
300 x 400			310 – 325	UPVC
300 x 300			340 - 350	DI/ CI/ AC/ GRP
300 x 400			340 - 350	DI/ CI/ AC/ GRP

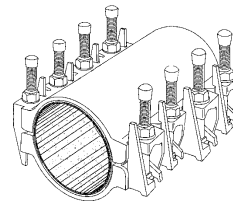
**SINGLE PART  
STAINLESS STEEL REPAIR CLAMPS  
(FOR DI/CI/PVC/VC/PE/AC/GRP/CONCRETE)**



Nominal Size (DN)
48.3
54.0
57.0
60.3
73.0
76.1
84.0
88.9
100.6
101.6
104.0
104.8
108.0
114.3
127.0
129.0
130.2
133.0
139.7
141.3
154.0
159.0
168.3
180.0
200.0
219.1
250.0
267.0
273.0
304.0
323.9
355.6
406.4
457.2
508.0
558.8
609.6
711.2
762.0
812.8
914.4
1016.0
1117.6
1219.2

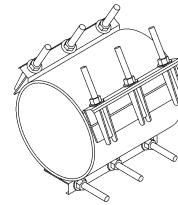
•

**DOUBLE PART  
STAINLESS STEEL REPAIR CLAMPS**



Nominal Size		Wang		Crevet	
Pipe DN x Clamp length	Clamp Range ID (mm)	Compatible Pipeline Systems	Clamp Range ID (mm)	Compatible Pipeline Systems	
200 x 300	215-235	UPVC/ DI/ CI/ AC			
200 x 400	215-235	UPVC/ DI/ CI/ AC			
200 x 500					
200 x 600					
225 x 300	250-270	UPVC/ DI/ CI/ AC			
225 x 400	250-270	UPVC/ DI/ CI/ AC			
225 x 500					
225 x 600					
225 x 300	270-290	RC			
250 x 300	275-290	UPVC/ DI/ CI/ AC			
250 x 400					
250 x 500					
250 x 600					
300 x 300	310-330	UPVC			
300 x 400	310-330	UPVC	310-340	UPVC	
300 x 500					
300 x 600	310-330	UPVC			
300 x 300	330-350	DI/ CI/ AC			
300 x 400	330-350	DI/ CI/ AC	330-345	DI/ CI/ AC	
300 x 500					
300 x 600	330-350	DI/ CI/ AC			
300 x 600	350-370	RC			
350 x 400					
350 x 500					
350 x 600					
375 x 400	400-420	UPVC			
375 x 500					
375 x 600	400-420	UPVC			
375 x 400	410-430	DI/ CI/ AC			
375 x 500					
375 x 600	410-430	DI/ CI/ AC			
375 x 400	440-460	RC			
375 x 600	440-460	RC			
400 x 400	440-465	UPVC			
400 x 500					
400 x 600	440-465	UPVC			
450 x 400	490-510	DI/ CI/ AC			
450 x 500					
450 x 600	490-510	DI/ CI/ AC			
500 x 400					
500 x 500					
500 x 600					
600 x 400					
600 x 500					
600 x 600					

**MULTI PART  
STAINLESS STEEL REPAIR CLAMPS**



Nominal Size	Wang	
Pipe DN x Clamp length	Clamp Range ID (mm)	Compatible Pipeline Systems
375 x 400	400-430	UPVC/ DI/ CI/ AC/ GRP
375 x 500		
375 x 600	400-430	UPVC/ DI/ CI/ AC/ GRP
375 x 400	430-460	RC
375 x 500		
375 x 600	430-460	RC
400 x 400	430-460	GRP
400 x 500		
400 x 600	430-460	GRP
450 x 400	490-520	DI/ CI/ AC/ GRP
450 x 500		
450 x 600	490-520	DI/ CI/ AC/ GRP
450 x 400	560-590	RC
450 x 500		
450 x 600	560-590	RC
500 x 400	560-590	DI/ CI/ GRP
500 x 500		
500 x 600	560-590	DI/ CI/ GRP
500 x 800		
525 x 400	570-600	AC/ GRP
525 x 500		
525 x 600	570-610	AC/ GRP
525 x 800		
600 x 400	620-650	AC
600 x 500		
600 x 600	620-650	AC
600 x 800		
600 x 400	650-680	DI/ CI/ AC/ GRP
600 x 500		
600 x 600	650-680	DI/ CI/ AC/ GRP
600 x 800		
600 x 400	690-720	RC
600 x 500		
600 x 600	690-720	RC