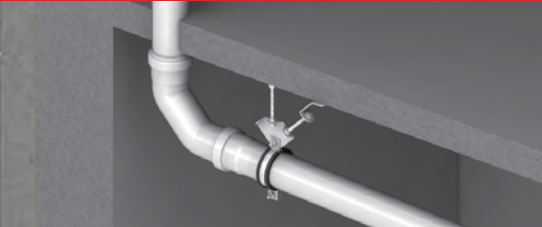


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Cl/SfB (52.9)	

Pipework Systems



Product catalogue

ACO PIPE® Stainless steel pipework systems





ACO Building Drainage

Our built environment is becoming ever more complex. Applications are becoming more sophisticated and the increasing pressure of regulations and standards makes achieving design, performance and financial goals ever tougher.

Our mission: to eliminate design risk, to reduce installed and life cost and to deliver exceptional finish and performance in every product application.

Our global resources and fabrication capacity make it possible for us to deliver best value, both with our standard products and with our bespoke designs. Confidence is further assured with quality systems that are in accordance with ISO 9001-2008.

ACO Building Drainage is a division of ACO Technologies plc and part of the worldwide ACO Group. The Group has sales in excess of £700 million worldwide with production facilities in the UK, Germany, France, Switzerland, Denmark, Spain, Poland, Czech Republic, Australia and the USA. In total more than 4,000 people are employed in over 40 countries throughout the world.

ACO Building Drainage Enquiries Team:

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- A complete pricing service to merchants, contractors and clients.

ACO Building Drainage Customer Services Team:

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- Product availability, delivery lead times, and all other queries including collections, returns and product / service issues.

ACO Building Drainage Design Services Team:

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- Technical and installation advice.
- Detailed design and 'Value Engineering' advice.
- Hydraulic calculations and AutoCAD drawings.
- Advice on suitability of ACO equivalent products.

ACO Building Drainage Marketing and Media Support

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- For all product brochures, imagery or merchandising material requests.



collect:

- Stainless Steel and Galvanised steel Channels
- Stainless Steel Gullies
- Pipe System
- Roof / Balcony Drainage
- Wetroom & Shower Drainage



clean:

- Grease Management Systems



hold:

- Anti-flood Backflow Protection Systems



release:

- Lifting Stations

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For quick access to our website, scan:



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General introduction

Stainless steel pipework

The ACO Building Drainage name is synonymous with the highest standards in product design, range diversity and function for industrial, commercial and architectural drainage products manufactured in stainless steel.

As part of the growing range of engineered drainage solutions, ACO PIPE® presents a wide range of socketed waste pipework systems in thin-wall stainless steel for above and below ground drainage applications.

ACO PIPE® is a reliable, lightweight and durable push-fit pipework system, designed, produced and tested for soil, waste, rainwater and industrial wastewater drainage applications.

ACO PIPE® stainless steel socketed pipe systems provide the modern metal alternative to PVC-u and cast iron soil and waste pipework.

Together with the other products of ACO Group it creates a perfect system and offers a sustainable drainage solution with unique advantages to the customers. ACO stainless steel gully and channel systems provide a unique system for building drainage. The push-fit system ensures quick and easy assembly for a reliable installation for gravity and vacuum drainage.

All ACO PIPE® interconnecting seals and fittings incorporate a unique double sealing system providing a trouble-free, reliable sealing system - every time.

The wide range of fittings available utilises advanced cold forming techniques, thereby reducing the manufacturing cost and minimizing the amount of welded components, to provide the ultimate in system reliability.

Steel has better aesthetics than alternative pipe materials but if the finish and visual appeal of your pipe network is important to you, ACO also give customers the option of specifying specific finishing treatment or coating for their ACO Pipe products. Contact us for more information on the options available.



Typical applications

ACO PIPE® stainless steel pipe is the fast track alternative to cast iron or PVC-u pipe systems and is available in standard and non-standard pipe sizes with easy to assemble push-on fittings. ACO PIPE® is ideal for:

- Food processing plants
- Commercial buildings
- Chemical processing plant
- Industrial buildings
- Hotels
- Kitchens
- Leisure centres
- Hospitals
- Laboratories
- Schools
- Abattoirs

Product benefits

ACO PIPE® socketed stainless steel systems significantly reduces installation time and associated costs along with long term maintenance and care costs.

- Easy installation
- Highly corrosion resistant
- Lightweight and easy to handle
- Double sealed jointed system
- Simple push-fit assembly
- Low thermal expansion coefficient
- No painting required
- Electro-polished option
- Sustainable material
- Hygienic

General introduction

ACO PIPE® material information

ACO PIPE® stainless steel pipework systems are manufactured from austenitic stainless steel in grades 304 and 316. All products are pickled and passivated for optimum durability and corrosion resistance. Surface treatment by means of electropolishing or varnishing is available.

The hard, smooth surface of stainless steel makes it easy to clean and provides efficient flow for water and waste products.

ACO PIPE® sockets are fitted with EPDM seals as standard. For particularly aggressive chemical applications, specify 316 grade stainless steel with Viton® seals for increased resistance

Push-fit connection

Very reliable for vacuum and gravity piping system.

ACO PIPE® double lip seal for ultimate system reliability. The unique design of the lips and cavities gives ACO PIPE® full liquid-tight sealing.

- Push-fit advantages
- Easy to assemble
- Time saving
- Cost saving
- Water tight connection



Sound

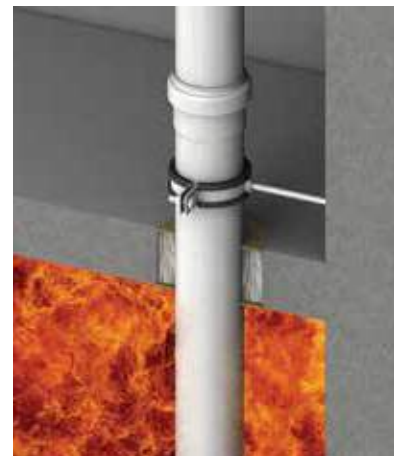
Results of acoustic tests on ACO PIPE® performed to BS EN 13466 are available upon request.

Reaction to fire

ACO PIPE® push-fit system is designed and manufactured to BS EN 1124 Parts 1 & 2 and is non-combustible and classified as class A 'no contribution to fire' as provided for in Commission Decision 96/603/EC as amended.

ACO PIPE® systems are also certified by the Swedish Institute for Technical Approval in Construction (SITAC) as fire resistant, Certificate No 0410-01.

- Non combustible
- No additional fire collars needed at installation
- No toxic fumes emitted in case of fire
- BS EN 1124, SITAC, CSI, DNV and ABS fire certification available

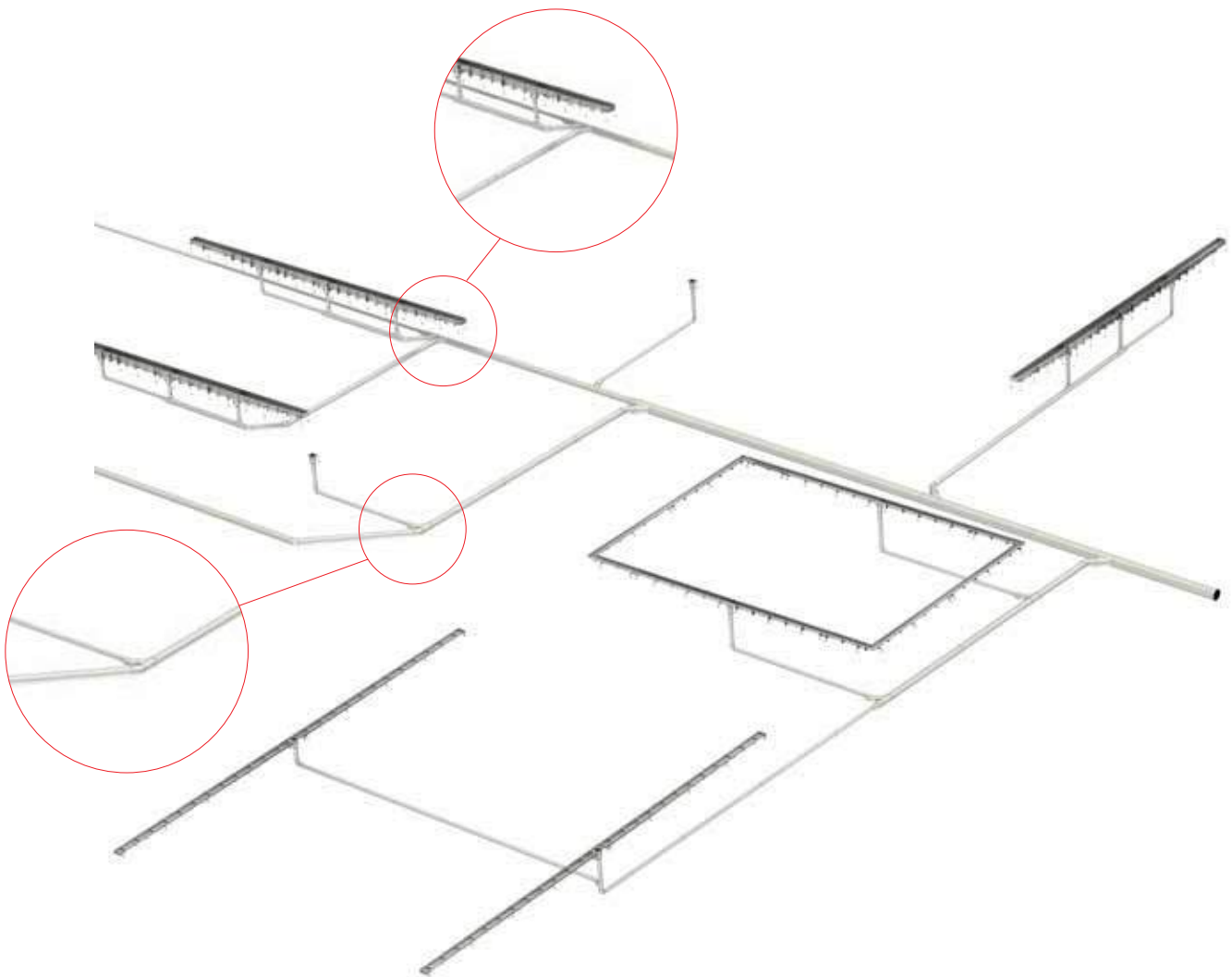


General introduction

Characteristics and system overview

ACO PIPE® is the ideal system for grey and black water, rainwater and industrial waste water drainage application. Use in conjunction with ACO stainless steel gully and channel systems to provide a complete building drainage solution.

ACO PIPE® stainless steel pipes and fittings are available in 40mm, 50mm, 75mm, 110mm, 125mm, 160mm, 200mm, 250mm and 315mm external diameters with the standard lengths from 0.15 metre up to 3 metres for optimum practicality and ease of assembly.

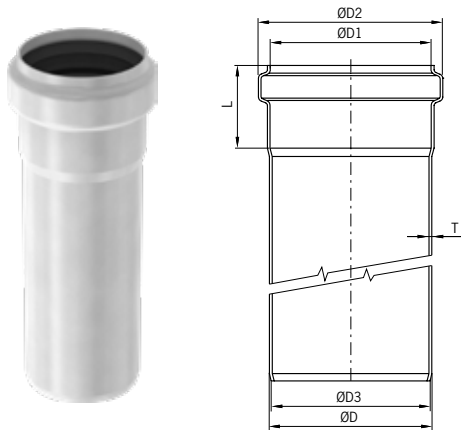


Straight Single socketed pipe

Product information

- Pipes are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm, 250 mm and 315 mm external diameters
- Lengths from 0.15 meter up to 6 meter
- Available in 1.4301 (AISI 304) and 1.4404 (AISI 316L) grades stainless steel
- Push-fit system for quick assembly
- Superior seal security – components comprise a unique double lip sealing system, ideal for extraneous conditions
- Fully comply to EN 1124
- EPDM and Viton® seals available
- Fully pickled and passivated

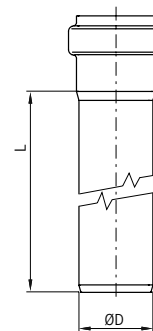
ACO pipe - straight pipe



Dimensions of socket and spigot				Socket length L [mm]	Wall thickness T [mm]
øD [mm]	øD ₁ [mm]	øD ₂ [mm]	øD ₃ [mm]		
40	41	51.5	38	40	1.0
50	51	62.0	47	42	1.0
75	76	87.5	72	50	1.0
110	111	125.5	107	57	1.0
125	126	141.0	122	63	1.0
160	161	178.0	156	70	1.25
200	201	219.0	195	80	1.5
250	251	268.6	245	90	1.5
315	316.2	334.2	309	100	2.0

ACO pipe - straight pipe 40 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
40	150	0.2	417304	417320
40	250	0.3	417306	417322
40	500	0.6	417308	417324
40	750	0.8	417310	417326
40	1000	1.1	417312	417328
40	1500	1.6	417314	417330
40	2000	2.1	417316	417332
40	2500	2.8	417260	417262
40	3000	3.1	417318	417334
40	4000	4.1	417264	417270
40	5000	5.1	417266	417272
40	6000	6.1	417268	417274



* See page 38 for NBr seal. Viton® seal not available for 40mm dia pipe.

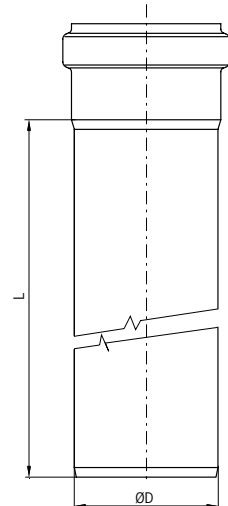
Straight Single socketed pipe

ACO pipe - straight pipe 50 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
50	150	0.2	98500	98550
50	250	0.4	98502	98552
50	500	0.7	98504	98554
50	750	1.0	98506	98556
50	1000	1.3	98508	98558
50	1500	1.9	98510	98560
50	2000	2.6	98512	98562
50	2500	3.2	419274	419282
50	3000	3.8	98514	98564
50	4000	5.0	419458	419482
50	5000	6.3	419466	419490
50	6000	7.5	419474	419498

ACO pipe - straight pipe 75 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
75	150	0.4	98516	98566
75	250	0.6	98518	98568
75	500	1.0	98520	98570
75	750	1.5	98522	98572
75	1000	2.0	98524	98574
75	1500	2.9	98526	98576
75	2000	3.6	98528	98578
75	2500	4.8	419276	419284
75	3000	5.7	98530	98580
75	4000	7.6	419460	419484
75	5000	9.4	419468	419492
75	6000	11.3	419476	419500



ACO pipe - straight pipe 110 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
110	150	0.6	98532	98582
110	250	0.9	98534	98584
110	500	1.5	98536	98586
110	750	2.2	98538	98588
110	1000	2.9	98540	98590
110	1500	4.3	98542	98592
110	2000	5.7	98544	98594
110	2500	7.1	419278	419286
110	3000	8.4	98546	98596
110	4000	11.1	419462	419486
110	5000	13.9	419470	419494
110	6000	16.7	419478	419502

* See page 38 for NBr seal and Viton® seals.

Straight Single socketed pipe

ACO pipe - straight pipe 125 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
125	150	0.7	419692	419712
125	250	1.0	419694	419714
125	500	1.7	419696	419716
125	750	2.5	419698	419718
125	1000	3.3	419700	419720
125	1500	4.9	419702	419722
125	2000	6.5	419704	419724
125	2500	8.1	419708	419728
125	3000	9.6	419706	419726
125	6000	19.0	419710	419730

ACO pipe - straight pipe 160 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
160	150	1.1	98548	98598
160	250	1.6	98600	98650
160	500	2.9	98602	98652
160	750	4.1	98604	98654
160	1000	5.4	98606	98656
160	1500	7.9	98608	98658
160	2000	10.4	98610	98660
160	2500	12.9	419280	419288
160	3000	15.4	98612	98662
160	4000	20.4	419464	419488
160	5000	25.4	419472	419496
160	6000	30.4	419480	419504

ACO pipe - straight pipe 200 mm

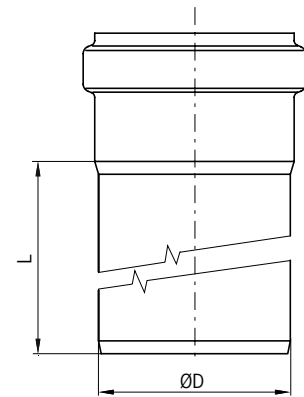
Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
200	500	4.5	419383	419384
200	1000	8.3	419387	419388
200	2000	15.8	419391	419392
200	3000	23.2	419395	419396

ACO pipe - straight pipe 250 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
250	500	5.5	417071	417072
250	1000	10.2	417075	417076
250	2000	19.4	417079	417080
250	3000	28.7	417083	417084

ACO pipe - straight pipe 315 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM**	
			304	316
315	500	9.8	417238	417200
315	1000	17.7	417239	417201
315	2000	33.5	417240	417202
315	3000	49.3	417241	417203



* See page 38 for NBr seal and Viton® seals.

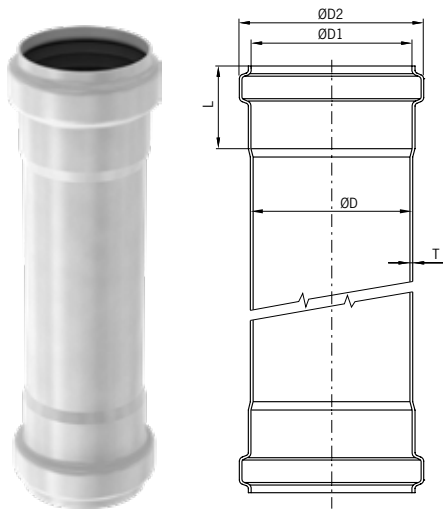
** See page 38 for NBr seal. Viton® seal not available for 315mm dia pipe.

Straight Double socketed pipe

Product information

- Pipes are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm, 250 mm and 315 mm external diameters
- Lengths from 0.15 meter up to 6 meter
- Available in 1.4301 (AISI 304) and 1.4404 (AISI 316L) grades stainless steel
- Push-fit system for quick assembly
- Superior seal security – components comprise a unique double lip sealing system, ideal for extraneous conditions
- Fully comply to EN 1124
- EPDM and Viton® seals available
- Fully pickled and passivated

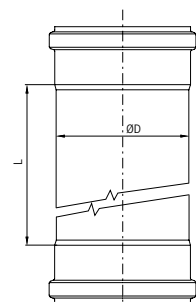
ACO pipe - double socketed pipe



Dimensions of socket and spigot					
øD [mm]	øD ₁ [mm]	øD ₂ [mm]	øD ₃ [mm]	Socket length	Wall thickness
				L [mm]	T [mm]
40	41	51.5	38	40	1.0
50	51	62.0	47	42	1.0
75	76	87.5	72	50	1.0
110	111	125.5	107	57	1.0
125	126	141.0	122	63	1.0
160	161	178.0	156	70	1.25
200	201	219.0	195	80	1.5
250	251	268.6	245	90	1.5
315	316.2	334.2	309	100	2.0

ACO pipe - straight pipe 40 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
40	250	0.2	417276	417290
40	500	0.6	417278	417292
40	750	0.9	417280	417294
40	1000	1.2	417282	417296
40	1500	1.8	417284	417298
40	2000	2.4	417286	417300
40	3000	3.6	417288	417302



* See page 38 for NBr seal. Viton® seal not available for 40mm pipe.

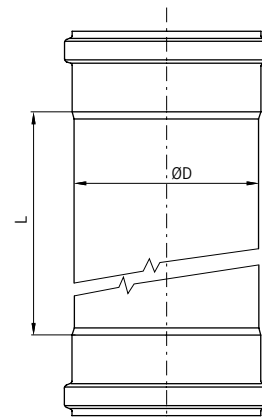
Straight Double socketed pipe

ACO pipe - double socketed pipe 40 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
40	250	0.2	417276	417290
40	500	0.6	417278	417292
40	750	0.9	417280	417294
40	1000	1.2	417282	417296
40	1500	1.8	417284	417298
40	2000	2.4	417286	417300
40	3000	3.6	417288	417302

ACO pipe - double socketed pipe 50 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
50	250	0.4	419554	419594
50	500	0.7	419556	419596
50	750	1.1	419558	419598
50	1000	1.4	419560	419600
50	1500	2.0	419562	419602
50	2000	2.6	419564	419604
50	3000	3.9	419566	419606



ACO pipe - double socketed pipe 75 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
75	250	0.7	419568	419608
75	500	1.2	419570	419610
75	750	1.6	419572	419612
75	1000	2.1	419574	419614
75	1500	3.0	419576	419616
75	2000	4.0	419578	419618
75	3000	5.8	419580	419620

ACO pipe - double socketed pipe 110 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
110	500	1.7	419582	419622
110	750	2.4	419584	419624
110	1000	3.0	419586	419626
110	1500	4.4	419588	419628
110	2000	5.7	419590	419630
110	3000	8.4	419592	419632

* See page 30 for information on NBr and Viton® seals.

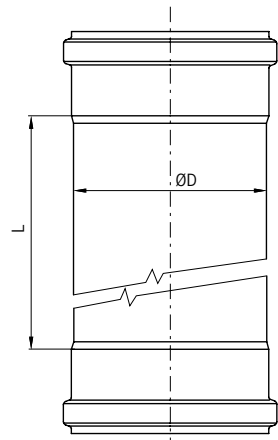
Straight Double socketed pipe

ACO pipe - double socketed pipe 125 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
125	500	1.7	419787	419799
125	750	2.5	419789	419801
125	1000	3.3	419791	419803
125	1500	4.9	419793	419805
125	2000	6.5	419795	419807
125	3000	9.6	419797	419809

ACO pipe - double socketed pipe 160 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
160	500	3.3	419634	419646
160	750	4.5	419636	419648
160	1000	5.8	419638	419650
160	1500	8.2	419640	419652
160	2000	10.7	419642	419654
160	3000	15.7	419644	419656



ACO pipe - double socketed pipe 200 mm

Outlet diameter øD [mm]	Active length L [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
200	500	5.0	419658	419659
200	1000	8.6	419662	419663
200	2000	15.9	419666	419667
200	3000	23.1	419670	419671

* Seals also available in NBR and Viton®, see page 38 for information.
Double socketed pipe are not available for dia. 250mm and 315mm

Bends

Product information

- Bends are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm, 250 mm and 315 mm external diameters
- Available in 1.4301 (AISI 304) and 1.4404 (AISI 316L) grades stainless steel
- Push-fit system for quick assembly
- Superior seal security – components comprise a unique double lip sealing system, ideal for extraneous conditions
- Fully chemically pickled and passivated
- EPDM and Viton® seals available
- Fully comply to EN 1124

ACO pipe - bend 87.5°



ACO pipe - bend 45°



ACO pipe - bend 30°



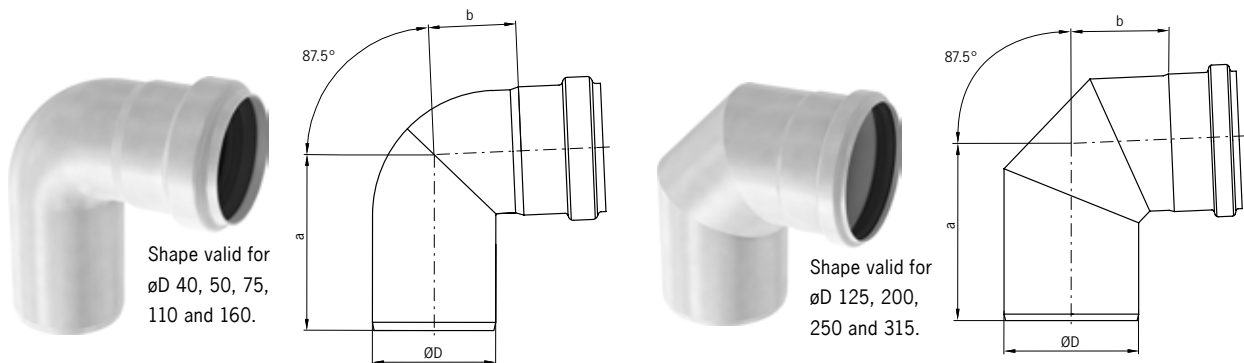
ACO pipe - long bend 87.5°



ACO pipe - bend 15°

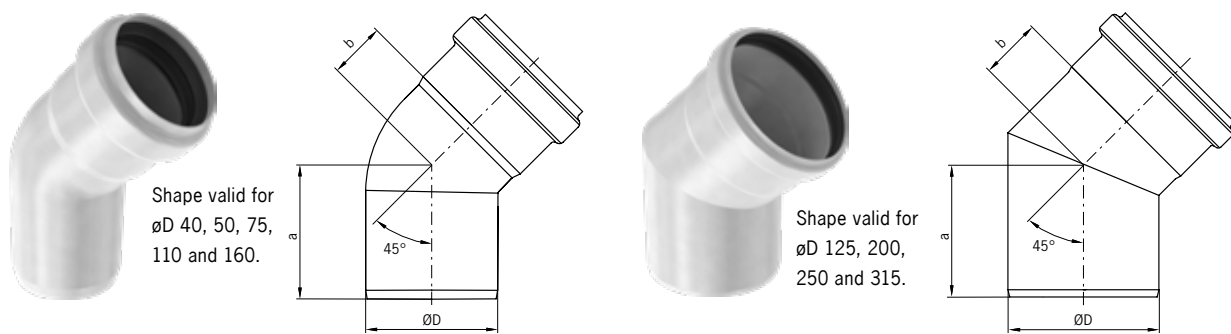


ACO pipe - bend 87.5°



Outlet diameter ØD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	79	32	0.2	417342	417350
50	86	40	0.2	98700	98750
75	107	53	0.4	98702	98752
110	134	67	0.7	98704	98754
125	161	93	0.8	419732	419734
160	181	105	1.7	98706	98756
200	215	129	3.9	419411	419413
250	297	198	5.1	-	417088
315**	393	286	12.8	-	417204

ACO pipe - bend 45°



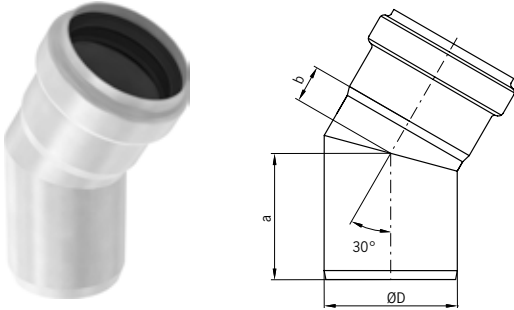
Outlet diameter ØD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	58	21	0.2	417344	417352
50	62	24	0.2	98708	98758
75	76	32	0.3	98710	98760
110	93	42	0.5	98712	98762
125	110	50	0.6	419736	419738
160	131	55	1.3	98714	98764
200	152	60	2.7	419407	419409
250	177	76	4.1	-	417092
315**	199	91	7.2	-	417205

* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

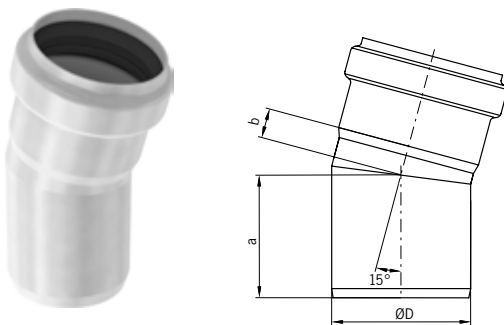
Bends

ACO pipe - bend 30°



Outlet diameter øD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	a [mm]	b [mm]	0.1	417346	417354
50	55	14	0.2	98716	98766
75	57	16	0.3	98718	98768
110	71	21	0.5	98720	98770
125	85	27	0.6	419740	419742
160	98	28	1.2	98722	98772
200	110	40	2.3	419403	419405
250	137	45	2.9	-	417096
315**	153	58	5.8	-	417206

ACO pipe - bend 15°

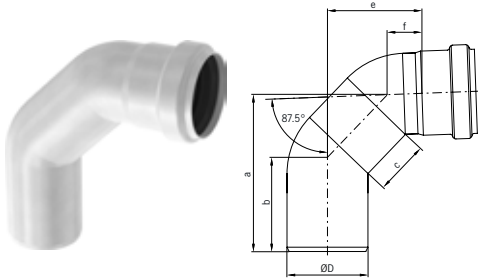


Outlet diameter øD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	a [mm]	b [mm]	0.1	417348	417356
50	53	11	0.1	98724	98774
75	54	12	0.3	98726	98776
110	66	16	0.4	98728	98778
125	78	15	0.5	419744	419746
160	84	19	1.0	98730	98780
200	99	29	1.9	419399	419401
250	123	31	2.5	-	417100
315**	136	40	5.4	-	417207

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

ACO pipe - long bend 87.5°

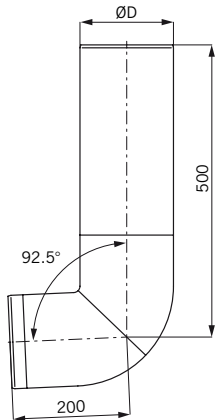


Outlet diameter ØD [mm]	Dimensions					Weight [kg]	Part No	
	a [mm]	b [mm]	c [mm]	e [mm]	f [mm]		EPDM*	
							304	316
40**	105	64	50	67	40	0.2	417340	417338
50	123	71	50	75	25	0.3	419146	419000
75	146	87	50	88	32	0.5	419148	419002
110	316	103	250	246	39	1.4	419150	419004
160	360	126	250	270	92	2.2	419152	419144

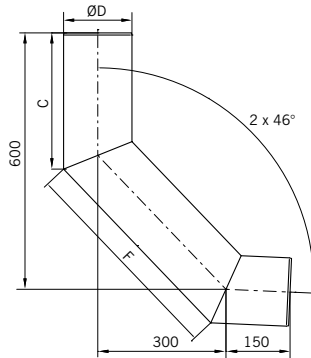
* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40mm pipe diameters.

1 x 92.5" tall bend



D (mm)	Weight (kg)	Part No 304	Part No 316
110	2.0	417056	417057
160	3.7	417058	417059



D (mm)	C (mm)	F (mm)	Weight (kg)	Part No 304	Part No 316
110	309	478	2.4	417060	417061
160	319	498	4.4	417062	417063

Branches

Product information

- Branches are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm, 250 mm and 315 mm external diameters
- Available in 1.4301 (AISI 304) and 1.4404 (AISI 316L) grades stainless steel
- Push-fit system for quick assembly
- Superior seal security – components comprise a unique double lip sealing system, ideal for extraneous conditions
- Fully comply to EN 1124
- EPDM and Viton® seals available
- Fully pickled and passivated

ACO pipe - single branch



ACO pipe - double branch



ACO pipe - single branch reduction



ACO pipe - double branch reduction



ACO pipe - swept single branch

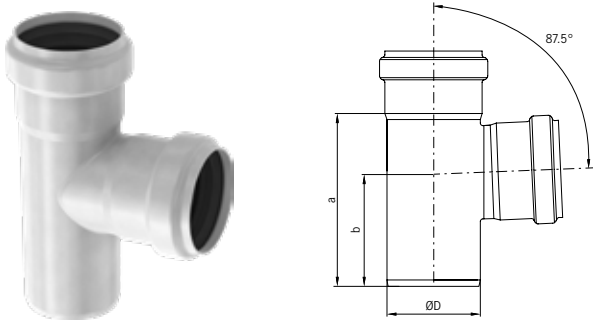


ACO pipe - corner branch



Single branches

ACO pipe - single branch 87.5°

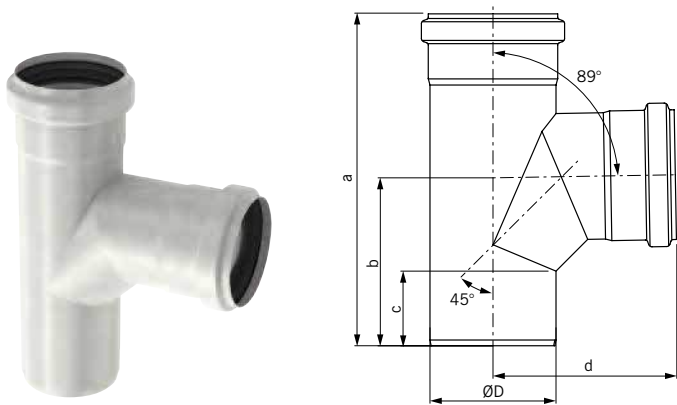


Outlet diameter øD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	101	69	0.3	417362	417368
50	106	71	0.3	98732	98782
75	139	90	0.5	98734	98784
110	183	117	0.8	98736	98786
125	220	135	0.9	419748	419750
160	288	184	2.3	98738	98788
200	333	206	4.5	419419	419421
250	363	215	5.5	-	417104
315**	476	281	14.8	-	417208

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

89° single swept branch special

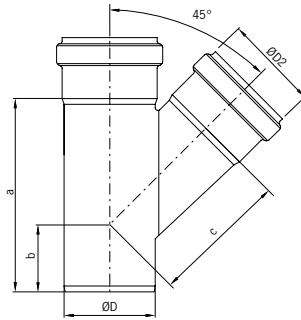


D (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Weight (kg)	Part No
						EPDM*
						304
110	295	148	76	160	1.1	415111
75	229	125	68	134	0.6	415112
50	170	88	48	100	0.3	415113

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

ACO pipe - single branch 45°



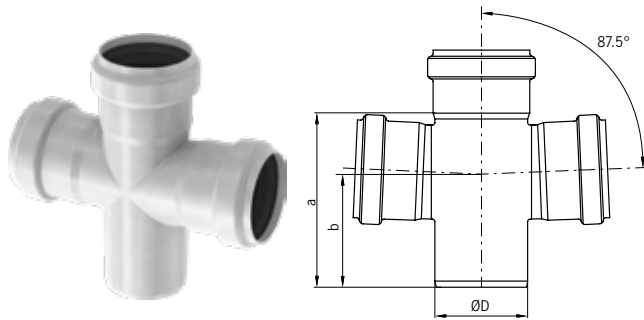
Outlet diameter ØD [mm]	Dimensions			Weight [kg]	Part No	
	a [mm]	b [mm]	c [mm]		EPDM*	
					304	316
40**	118	58	63	0.3	417366	417372
50	128	57	76	0.3	98748	98798
75	179	74	110	0.5	98800	98850
110	233	88	149	1.0	98802	98852
125	273	103	170	1.1	419760	419762
160	332	119	222	2.6	98804	98854
200	415	151	274	5.7	419427	419429
250	513	172	336	9.2	-	417108
315**	616	195	521	20.6	-	417209

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

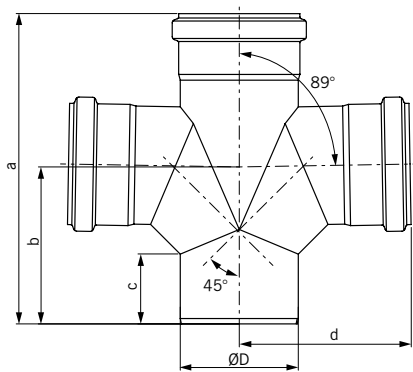
Double branches

ACO pipe - double branch 87.5°



Outlet diameter ØD [mm]	Dimensions		Weight [kg]	Part No	
	a [mm]	b [mm]		EPDM*	
				304	316
40**	101	69	0.3	417364	417370
50	106	71	0.3	98740	98790
75	139	90	0.6	98742	98792
110	183	117	0.9	98744	98794
160	288	184	2.7	98746	98796

89° Double swept branch special

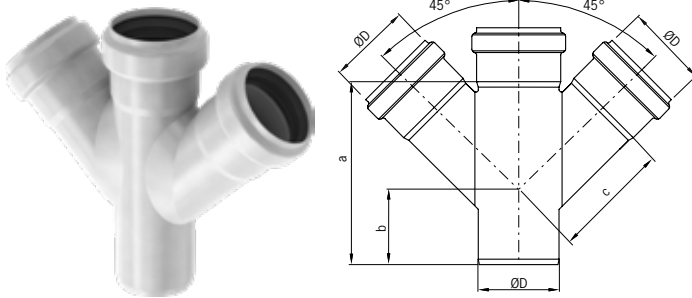


D (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Weight (kg)	Part No
						EPDM*
						304
110	295	148	76	160	1.4	415108
75	229	125	68	134	0.8	415109
50	170	88	48	100	0.4	405110

* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40mm pipe diameters.

ACO pipe - double branch 45°



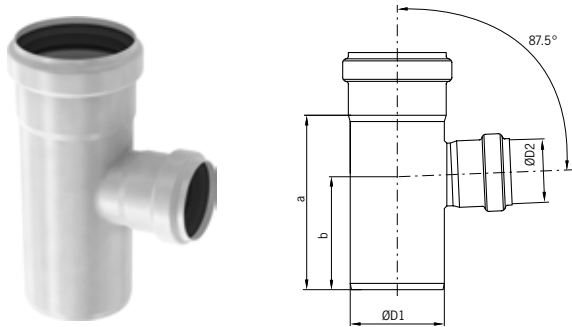
Outlet diameter øD [mm]	Dimensions			Weight [kg]	Part No	
	a [mm]	b [mm]	c [mm]		EPDM*	
					304	316
40**	118	58	63	0.4	417374	417378
50	128	57	76	0.4	98806	98856
75	179	74	110	0.7	98808	98858
110	233	88	149	1.2	98810	98860
160	332	184	222	3.5	98812	98862
250	509	172	336	11	-	417120
315**	616	195	521	29.7	-	417212

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

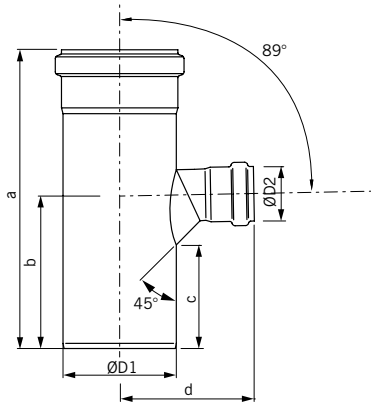
Single branch reductions

ACO pipe - single branch reduction 87.5°



Outlet diameter		Dimensions		Weight [kg]	Part No	
ØD1 [mm]	ØD2 [mm]	a [mm]	b [mm]		EPDM*	
					304	316
50	40**	106	98	0.3	417442	417443
75	40**	139	98	0.3	417444	417445
75	50	139	90	0.3	98928	98930
110	50	183	117	0.5	98932	98934
110	75	183	117	0.8	98936	98938
125	75	187	110	0.9	419752	419754
125	110	205	127	0.9	419756	419758
160	110	288	184	2.3	400691	400693
200	160	293	186	3.7	419415	419417
250	200	349	226	5.8	-	417112
315**	250	411	248	10.5	-	417210

89° single swept branch reduction special

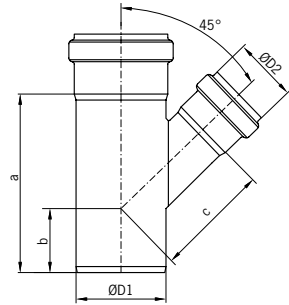


D1 (mm)	D2 (mm)	a (mm)	b (mm)	c (mm)	d w(kg)	Weight (kg)	Part No
							EPDM*
							304
110	50	295	148	104	135	0.9	415106
110	75	295	148	81	143	1.0	415107

* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

ACO pipe - single branch reduction 45°



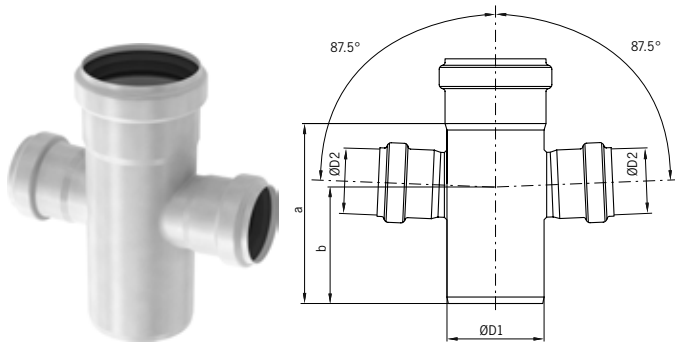
Outlet diameter		Dimensions			Weight [kg]	Part No	
ØD1 [mm]	ØD2 [mm]	a [mm]	b [mm]	c [mm]		EPDM*	
						304	316
50	40**	119	55	71	0.3	417406	417408
75	40**	144	94	56	0.3	417446	417447
75	50	144	56	94	0.3	400661	400663
110	50	147	42	119	0.5	400665	400667
110	75	182	60	135	1.0	400669	400671
125	75	200	65	141	1.1	419764	419766
125	110	250	90	160	1.1	419768	419770
160	110	332	119	191	2.6	400699	400701
200	160	359	123	250	4.7	419423	419425
250	200	429	175	307	7.6	-	417116
315**	250	513	149	382	14.0	-	417211

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

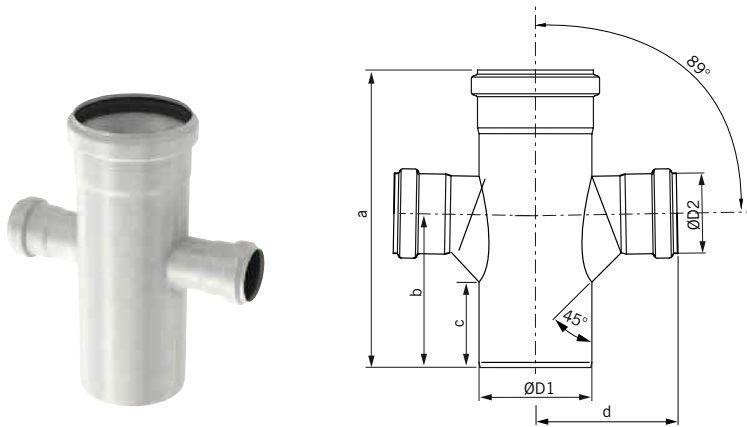
Double branch reductions

ACO pipe - double branch reduction 87.5°



Outlet diameter		Dimensions		Weight [kg]	Part No	
ØD1 [mm]	ØD2 [mm]	a [mm]	b [mm]		EPDM*	
					304	316
50	40**				417398	417399
75	50	139	90	0.3	98940	98942
110	50	183	117	0.6	98944	98946
110	75	183	117	0.9	98900	98902
160	110	288	184	2.7	400695	400697

ACO pipe - 89° double swept branch reduction special

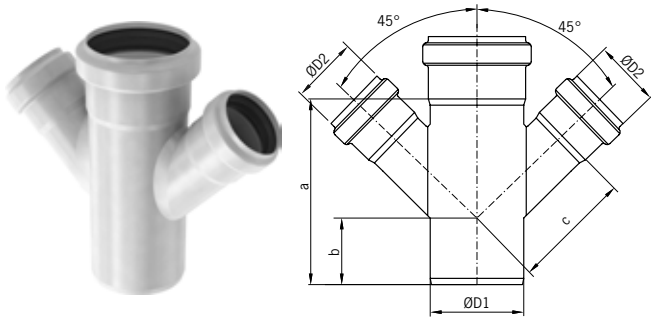


D1 (mm)	D2 (mm)	a (mm)	b (mm)	c (mm)	d w(kg)	Weight (kg)	Part No
							EPDM*
							304
110	50	295	148	81	143	1.1	415104
110	75	295	148	104	135	1.0	415105

* Seals also available in NBR and Viton®, see page 38 for information.

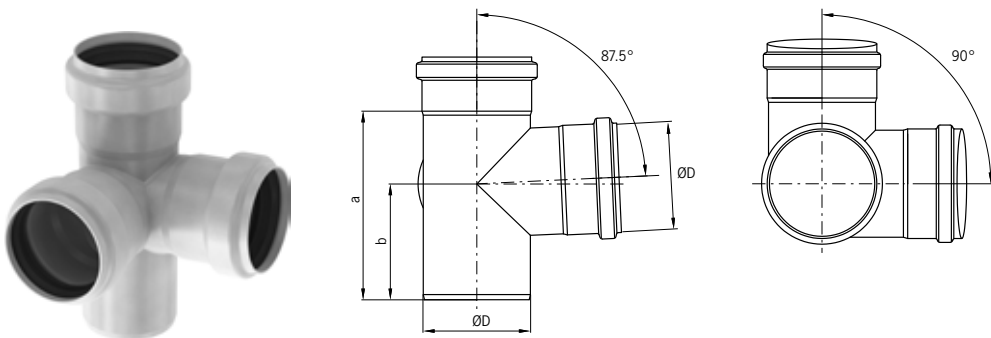
** Viton® seal not available for 40mm pipe diameters.

ACO pipe - double branch reduction 45°



Outlet diameter		Dimensions			Weight [kg]	Part No	
ØD1 [mm]	ØD2 [mm]	a [mm]	b [mm]	c [mm]		EPDM*	
						304	316
50	40**	119	55	71	0.3	417410	417412
75	50	144	56	94	0.4	400673	400675
110	50	147	42	119	0.7	400677	400679
110	75	182	60	135	1.2	400681	400683
160	110	332	119	190	3.5	400703	400705
250	200	429	150	307	10.1	-	417124
315**	250	513	149	382	17.8	-	417213

ACO pipe - corner branch 87.5°



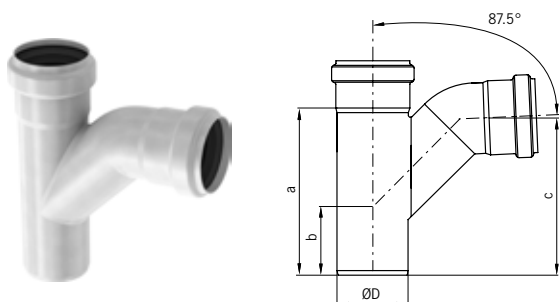
Outlet diameter ØD [mm]	Dimensions		Weight [kg]	Part No	
	a [mm]	b [mm]		EPDM*	
				304	316
40**	101	69	0.3	417414	417415
50	106	71	0.4	419162	419210
75	139	90	0.7	419164	419212
110	183	117	1.1	419166	419214
125	220	135	1.6	417020	417021
160	288	184	2.9	419168	419216

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

Swept single branch

ACO pipe - swept single branch 87.5°



Outlet diameter ØD [mm]	Dimensions			Weight [kg]	Part No	
					EPDM*	
	a [mm]	b [mm]	c [mm]		304	316
40**	115	55	105	0.3	417376	417380
50	128	57	117	0.3	98814	98864
75	179	74	157	0.6	98816	98866
110	233	88	209	1.1	98818	98868
160	332	184	302	2.8	98820	98870

* Seals also available in NBR and Viton®, see page 38 for information.

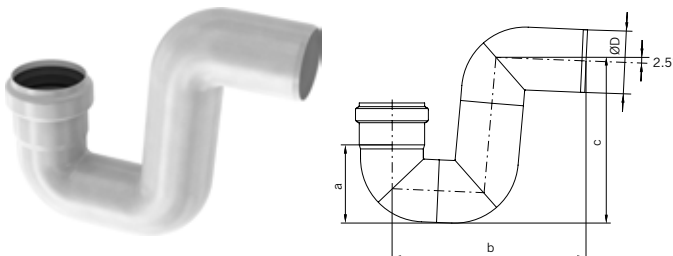
** Viton® seal not available for 40mm pipe diameters.

Accessories

Product information

- Accessories are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm, 250 mm and 315 mm external diameters
- Available in 1.4301 (AISI 304) and 1.4404 (AISI 316L) grades stainless steel
- Push-fit system for quick assembly
- Superior seal security – components comprise a unique double lip sealing system, ideal for extraneous conditions
- Fully comply to EN 1124
- EPDM and Viton® seals available
- Fully pickled and passivated

“P” trap

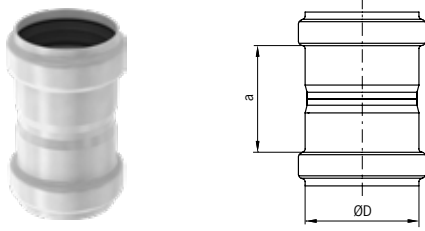


Outlet diameter øD [mm]	Dimensions			Weight [kg]	Part No	
	a [mm]	b [mm]	c [mm]		EPDM	
					304	316
50	68	187	149	98822	98872	
75	94	232	193	98824	98874	
110	132	300	254	98826	98876	
160	190	403	347	98828	98878	

* Seals also available in NBR and Viton®, see page 38 for information.

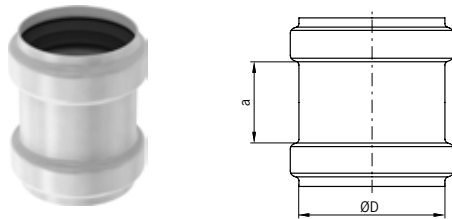
** Viton® seal not available for 40 and 315mm pipe diameters.

Straight coupling



Outlet diameter øD [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
40**	51	0.1	417392	417394
50	54	0.1	98920	98970
75	75	0.2	98922	98972
110	84	0.4	98924	98974
125	140	0.4	419813	419815
160	110	0.8	98926	98976
200	136	1.8	419431	419433
250	181	3.1	-	417160
315**	179	5.2	-	417225

Repair coupling



Outlet diameter øD [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			EPDM*	
			304	316
40**	57	0.1	417388	417390
50	44	0.1	98830	98880
75	46	0.2	98832	98882
110	52	0.3	98834	98884
125	70	0.3	419772	419774
160	76	0.7	98836	98886
200	100	1.5	419435	419437
250	182	2.4	-	417139
315**	179	4.9	-	417220

Note:

Repair couplings are used to aid a convenient repair to a damaged in-situ pipe. Unlike the standard straight coupling, there is no central registration to limit the insertion depth of the pipe. The repair coupling slides completely over a pipe joint and simply re-positioned to bridge the required pipe joint.

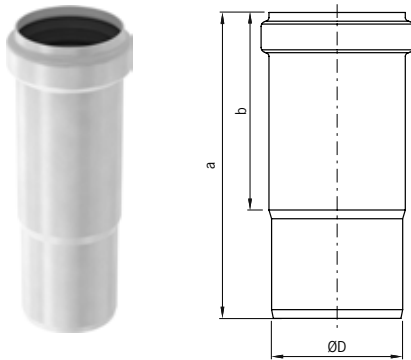
Installation tip:

Mark the final position of the repair coupling on the installed pipe system to ensure the coupling seals are positioned symmetrically about the pipe joint.

* Seals also available in NBr and Viton®, see page 38 for information.

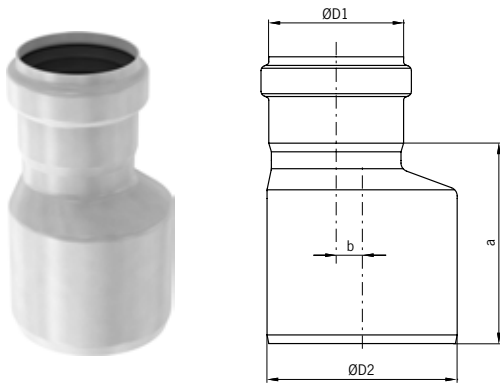
** Viton® seal not available for 40 and 315mm pipe diameters.

Expansion socket



Outlet diameter øD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
40**	150	90	0.2	417382	417384
50	159	102	0.2	98664	98666
75	175	113	0.3	98668	98670
110	200	121	0.5	98672	98674
125	250	165	0.6	419776	419778
160	292	170	1.4	98676	98678
250	400	190	3.8	-	417143
315	450	200	7.2	-	417221

Eccentric increaser coupling

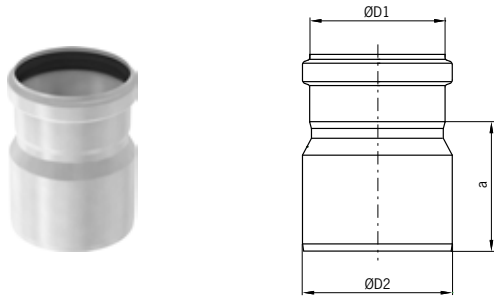


Outlet diameter		Dimensions		Weight [kg]	Part No
øD1 [mm]	øD2 [mm]	a [mm]	b [mm]		EPDM*
					316
40**	50	85	5	0.3	417418
40**	75	85	17	0.3	417419
50	75	75	7	0.3	98892
50	110	110	25	0.4	98978
75	110	110	15	0.5	98894
110	160	160	22	1.1	98896
200	250	180	15	2.4	417135
250	315 **	190	15	4.4	417218

* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

Concentric increaser coupling

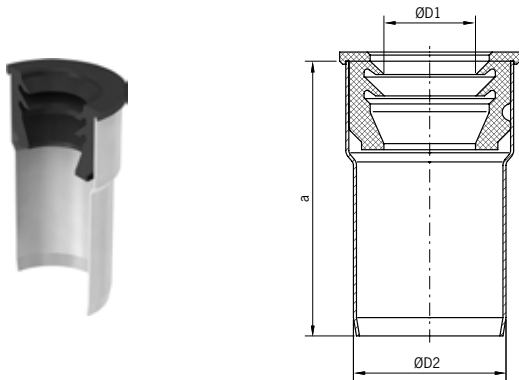


Outlet diameter		Dimension a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]			EPDM*
40**	50	85	0.25	316
40**	75	85	0.3	417416
50	75	88	0.3	417417
50	110	113	1.4	419826
75	125	105	0.6	417018
110	125	107	0.6	419828
110	160	126	0.9	419780
125	160	160	1.2	419830
160	200	200	1.8	419811
200	250	180	2.4	419441
315*	250	190	4.4	417133
				417217

* Seals also available in NBR and Viton®, see page 38 for information.

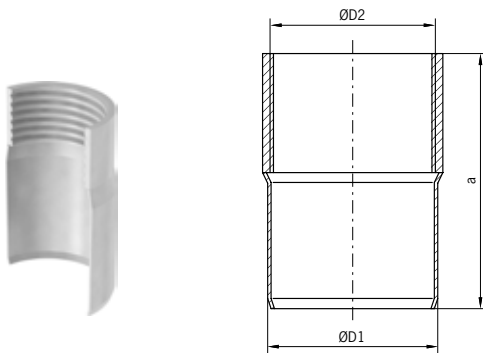
** Viton® seal not available for 40 and 315mm pipe diameters.

Increaser connector



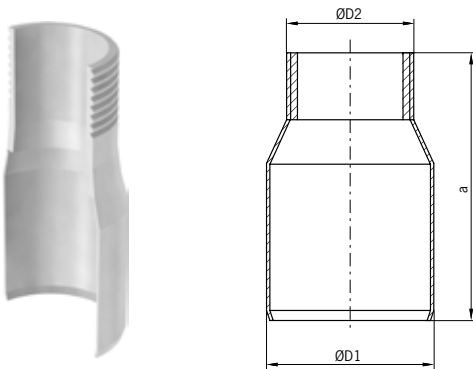
Outlet diameter		Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]			NBR
32	50	90	0.2	316
40	50	90	0.2	419373
				419374

Connector with internal screw thread and spigot



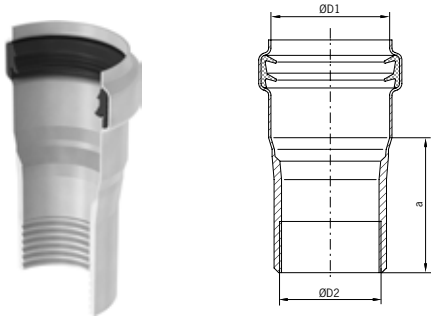
Outlet diameter		Dimensions	Weight	Part No
ØD1 [mm]	ØD2 [mm]	a [mm]	[kg]	316
40	G 1¼"	70	0.2	417337
50	G 1¼"	72	0.2	98956
50	G 1½"	75	0.3	98957
50	G 2"	80	0.3	98958

Connector with external screw thread and spigot



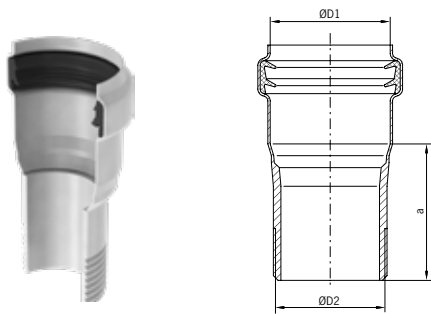
Outlet diameter		Dimensions	Weight	Part No
ØD1 [mm]	ØD2 [mm]	a [mm]	[kg]	316
50	G 1¼"	100	0.2	419330
50	G 1½"	100	0.3	419331
50	G 2"	100	0.3	419332

Connector with socket and internal screw thread



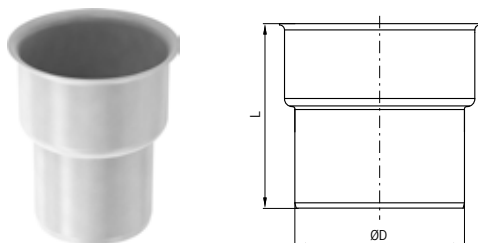
Outlet diameter		Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]			EPDM*
				316
40**	G 1¼"	35	0.2	417336
50	G 1¼"	58	0.2	419333
50	G 1½"	58	0.3	419335
50	G 2"	58	0.3	419337

Connector with socket and external screw thread



Outlet diameter		Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]			EPDM*
				316
50	G 1¼"	58	0.2	419250
50	G 1½"	58	0.3	419252
50	G 2"	58	0.3	419254

Connector cast iron spigot → ACO pipe socket



Outlet diameter ØD [mm]	Dimensions L [mm]	Weight [kg]	Part No
			316
75	121	0.4	98904
110	137	0.6	98906
160	174	1.0	98905

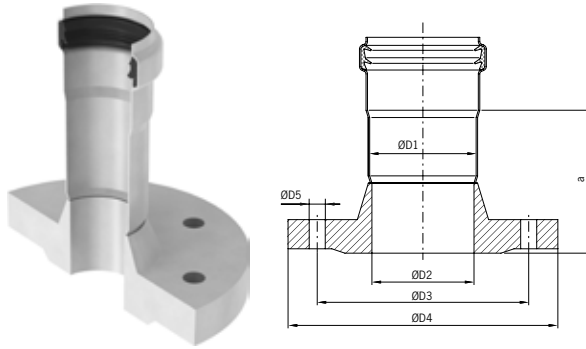
Note:

To be used with reduction sealing item number 400580 for DN 75 and 400581 for DN 110

* Seals also available in NBR and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

Connector with socket and flange



Outlet diameter				n x ØD5 [mm]	Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]	ØD3 [mm]	ØD4 [mm]				EPDM* 316
40	DN 40	110	150	4 × 18	100	2.0	417420
40	DN 40	110	150	4 × 18	100	2.0	417421
50	DN 40	110	150	4 × 18	100	2.3	419256
50	DN 50	125	165	4 × 18	100	2.7	419258
75	DN 65	145	185	4 × 18	100	3.4	419260
110	DN 100	180	220	8 × 18	100	4.9	419262
200	DN 200	295	340	12 × 22	102	12.0	419514

* Seals also available in NBr and Viton®, see page 38 for information.

** Viton® seal not available for 40 and 315mm pipe diameters.

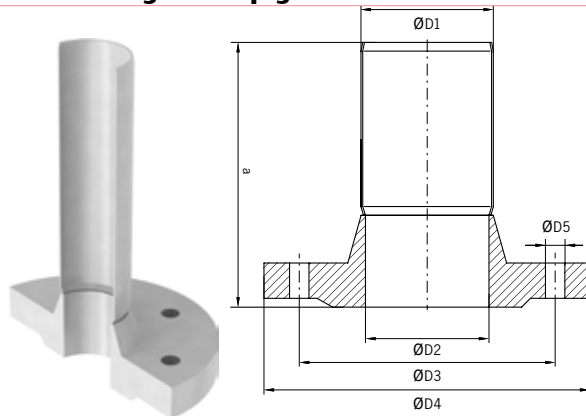
Note:

n – number of holes for screws in the flange.

Flange PN 16 DIN 2633.

Flange PN 6 and PN 10 available on request.

Connector with flange and spigot



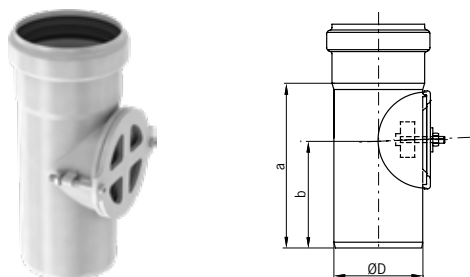
Outlet diameter				n x ØD5 [mm]	Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]	ØD3 [mm]	ØD4 [mm]				316
40	DN 40	100	130	4 × 18	161	1.6	417430
40	DN 50	100	130	4 × 18	161	1.6	417431
40	DN 40	110	150	4 × 18	165	2.0	417422
40	DN 50	110	150	4 × 18	165	2.0	417423
50	DN 40	110	150	4 × 18	192	2.3	419264
50	DN 50	125	165	4 × 18	192	2.7	419265
75	DN 65	145	185	4 × 18	245	3.4	419266
110	DN 100	180	220	8 × 18	259	4.9	419267
160	DN 150	240	285	8 × 22	200	8.5	419540
200	DN 200	295	240	12 × 22	240	12.3	419541

Note:

n – number of holes for screws in the flange.

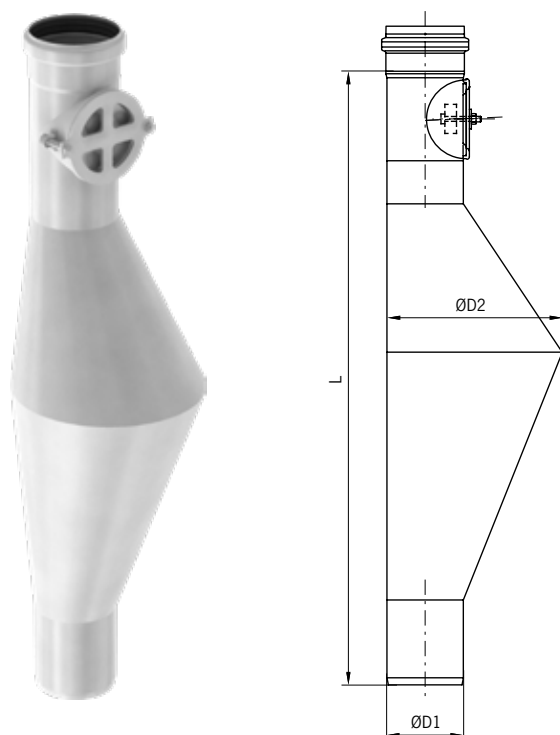
Flange PN 16 DIN 2633. | Flange PN 6 and PN 10 available on request.

Access unit



Outlet diameter øD [mm]	Dimensions		Weight [kg]	Part No	
				EPDM*	
				304	316
75	139	90	0.5	98913	98963
110	183	117	0.8	98915	98965
125	210	135	0.9	419783	419785
160	288	184	2.3	98917	98967
200	293	186	3.7	419676	419678
250	290	184	3.8	-	417128
315**	340	228	8.9	-	417214

Rat-stop

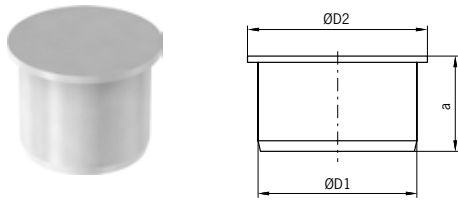


Seal material	Outlet diameter		Dimensions L [mm]	Weight [kg]	Part No	
	øD1 [mm]	øD2 [mm]			304	316
EPDM*	110	250	864	3.8	419268	419270

* Seals also available in NBR and Viton®, see page 38 for information.

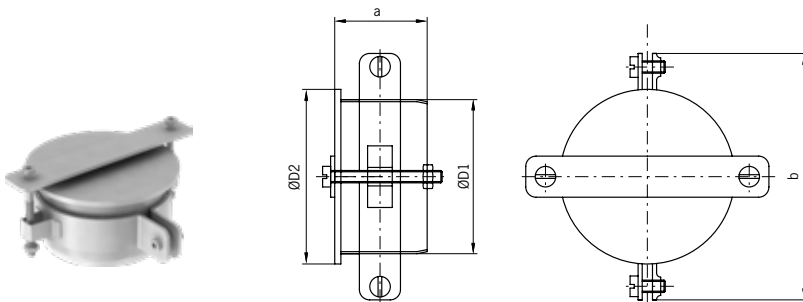
** Viton® seal not available for 40 and 315mm pipe diameters.

Socket plug



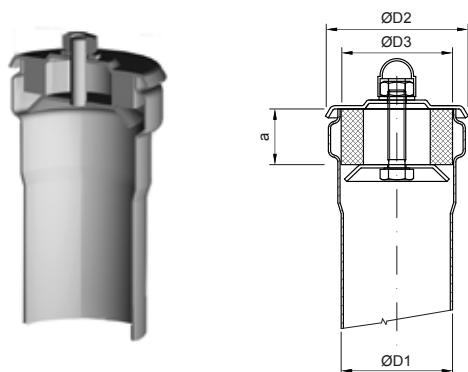
Outlet diameter		Dimensions a [mm]	Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]			316
40	35	50	0.1	417405
50	58	45	0.1	98888
75	85	45	0.3	98889
110	120	45	0.5	98890
125	135	50	0.6	419782
160	170	50	0.5	98891
200	210	50	0.7	98994
250	260	83	1.0	417131
315	325	73	2.2	417215

Socket plug with clamp



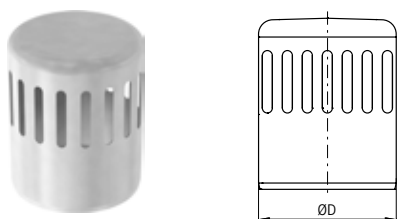
Outlet diameter		Dimensions		Weight [kg]	Part No
ØD1 [mm]	ØD2 [mm]	a [mm]	b [mm]		316
40					417402
50	58	45	88	0.4	419138
75	85	45	120	0.6	419139
110	120	45	167	0.8	419140
160	170	50	214	1.1	419141
250	260	83	302	1.3	417132
315	325	130	371	3.7	417216

Drainplugs with screwed plug



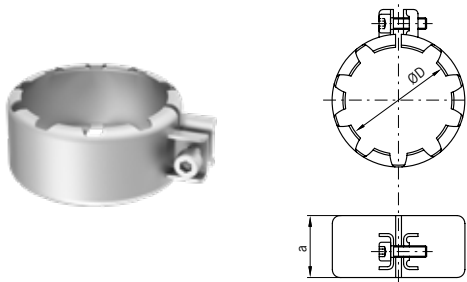
ØD1 [mm]	Outlet diameter		Dimensions a [mm]	Weight [kg]	Part No	
	ØD2 [mm]	ØD3 [mm]			304	316
50	64	50	25	0.1	419942	419948
75	92	75	25	0.5	419943	419949
110	126	105	15	0.5	419944	419950
125	160	124	12	0.9	419945	419951
160	186	166	20	1.2	419946	419952

Vent cowl



Outlet diameter ØD [mm]	Weight [kg]	Part No
		316
110	0.4	98962

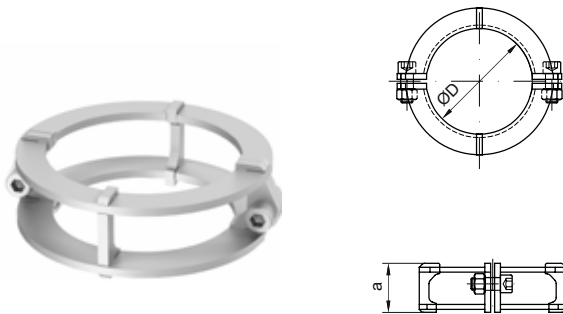
Socket clamp



Outlet diameter øD [mm]	Dimensions a [mm]	Weight [kg]	Part No
			316
50	40	0.11	417067
75	43	0.16	417069
110	43	0.25	417227

Note: See page ? for maximum operating pressures

Socket clamp - two parts



Outlet diameter øD [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			304	316
40	36	0.10	417396	417397
50	40	0.14	417024	417025
75	40	0.25	417026	417027
110	43	0.34	417028	417029
125	45	0.38	417016	417017
160	45	0.48	417030	417031
200	45	0.51	-	419983
250	45	0.71	-	417137
315	48	0.9	-	417219

Note: See page 45 for maximum operating pressures

ACO PIPE® Stainless Steel Pipework Systems

Seal



Outlet diameter øD [mm]	Weight [kg]	Part No EPDM	Part No	
			NBR	Viton®
40	0.01	417400	417401	–
50	0.01	98400	417037	98404
75	0.02	98401	417038	98405
110	0.05	98402	417039	98406
125	0.06	419453	417041	419454
160	0.08	98403	417040	98407
200	0.10	98433	417042	98437
250	0.12	417146	417148	417147
315	0.30	417222	417223	–

Note:

Detailed technical data sheet on page ?

Reduction sealing cast iron spigot → ACO pipe socket



Outlet diameter øD [mm]	Weight [kg]	Part No
		EPDM
DN 70/75	0.06	400580
DN 100/110	0.10	400581
DN 150/160	0.14	400582

Note:

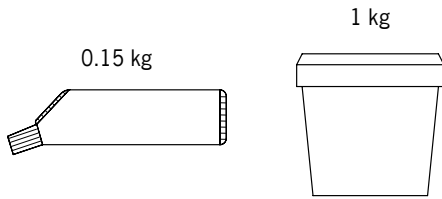
While purchasing AP reduction sealing cast iron spigot → ACO pipe, it is necessary to order AP cast iron connector. See page

Reduction sealing ACO pipe spigot → cast iron socket



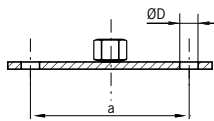
Outlet diameter øD [mm]	Weight [kg]	Part No
		EPDM
DN 70/75	0.05	400586
DN 100/110	0.08	400587
DN 150/160	0.12	400588

ACO Universal lubricant



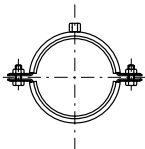
Weight [kg]	Part No
0.15	E80350000
1.00	E80350001

Fixing plate



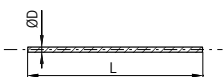
Outlet diameter øD [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			304	316
8.4	70	0.05	400525	400521

Support bracket with rubber infill



Outlet diameter øD [mm]	Weight [kg]	Part No	
		304	316
40	0.12	417434	417359
50	0.14	400533	400529
75	0.23	400534	400530
110	0.33	400535	400531
125	0.36	419854	419855
160	0.39	400536	400532
200	0.44	419451	419675
250	0.60	-	417149
315	1.0	-	417224

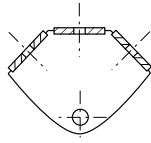
Threaded support pole M8



øD [mm]	L [mm]	Weight [kg]	Part No	
			304	316
M8	1000	0.39	400557	400553
M8	90	0.03	400558	400554
M8	40	0.016	400559	400555

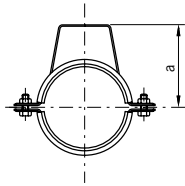
ACO PIPE® Stainless Steel Pipework Systems

Set for axial fixing



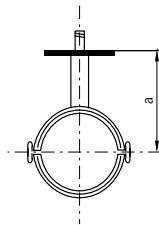
Weight [kg]	Part No Galvanised steel	Part No
		316
0.11	400565	400561

Support bracket with rubber infill and stirrup



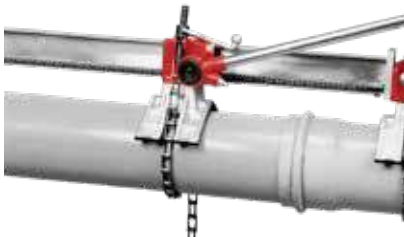
Outlet diameter $\varnothing D$ [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			304	316
40			417358	417360
50	56	0.18	400541	400537
75	80	0.28	400542	400538
110	116	0.41	400543	400539
160	166	0.48	400544	400540

Support bracket with rubber infill and key



Outlet diameter $\varnothing D$ [mm]	Dimensions a [mm]	Weight [kg]	Part No	
			304	316
40			-	417361
50	120	0.16	400549	400545
75	133	0.26	400550	400546
110	150	0.38	400551	400547
160	175	0.44	400552	400548

Joiner/disjoiner



$\varnothing D$ [mm]	Weight [kg]	Part No
100 - 400	25	417070

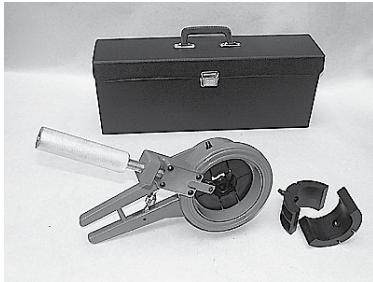
Electric cutter 50 – 110 mm



Note	Weight [kg]	Part No
in plastic case	20	400745

Note: Convenient tool for pipe cutting, suitable for larger projects

Manual cutter set 50-110 mm



Note	Weight [kg]	Part No
in plastic case	3.50	419363

Manual cutter



øD [mm]	Weight [kg]	Part No
50-110	1.0	419364
110-160	2.0	400738
160-250	2.0	417228

Note:
ACO pipe manual cutter should be ordered together with a holder for manual cutting.

Replacement discs for manual cutters

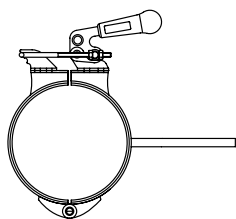


Note	Weight [kg]	Part No
for cutter 419363	0.005	419365
for cutters 400738 and 419364	0.005	400578

Note:

Minimum order quantity – 10 pcs.

Holder for manual cutting



øD [mm]	Weight [kg]	Part No
125	3.5	419857
160	4.0	400742
200	4.5	400743

Note: ACO pipe holder for manual cutting should be ordered together with ACO pipe manual cutter.

Full bore flow rate tables for varying gradients

For rainwater/storm drainage applications

Flow rates based on Colebrook-White formula.
Roughness coefficient $k_s = 0.6 \text{ mm}$

Gradient [%]	Pipe ø 40 mm		Pipe ø 50 mm		Pipe ø 75 mm		Pipe ø 110 mm		Pipe ø 125 mm	
	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]
10.0			2.74	1.52	8.40	2.01	23.81	2.60	33.61	2.83
7.5			2.38	1.31	7.28	1.74	20.62	2.25	29.11	2.45
5.0			1.94	1.07	5.94	1.42	16.83	1.84	23.77	2.00
4.5			1.84	1.02	5.64	1.35	15.97	1.74	22.55	1.90
4.0			1.73	0.96	5.31	1.27	15.06	1.64	21.26	1.79
3.5			1.62	0.90	4.97	1.19	14.08	1.54	19.88	1.67
3.0			1.50	0.83	4.60	1.10	13.04	1.42	18.41	1.55
2.5			1.37	0.76	4.20	1.00	11.90	1.30	16.80	1.41
2.0			1.23	0.68	3.76	0.90	10.64	1.16	15.03	1.26
1.5			1.06	0.59	3.25	0.78	9.22	1.01	13.01	1.10
1.0			0.87	0.48	2.66	0.63	7.53	0.82	10.63	0.89

Gradient [%]	Pipe ø 160 mm		Pipe ø 200 mm		Pipe ø 250 mm		Pipe ø 315 mm	
	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]
10.0	64.15	3.31	116.89	3.83	218.31	4.45	401.51	5.15
7.5	55.56	2.87	101.22	3.32	188.95	3.85	347.54	4.46
5.0	45.36	2.34	82.65	2.71	154.13	3.14	283.52	3.64
4.5	43.03	2.22	78.40	2.57	146.17	2.98	268.90	3.45
4.0	40.57	2.10	73.92	2.43	137.77	2.81	253.45	3.25
3.5	37.95	1.96	69.14	2.27	128.82	2.63	236.99	3.04
3.0	35.13	1.81	64.01	2.10	119.20	2.43	219.31	2.82
2.5	32.07	1.66	58.43	1.92	108.74	2.22	200.09	2.57
2.0	28.68	1.48	52.26	1.71	97.18	1.98	178.83	2.30
1.5	24.84	1.28	45.26	1.48	84.05	1.71	154.70	1.99
1.0	20.28	1.05	36.95	1.21	68.48	1.40	126.07	1.62

Note:

The flow rates shown above assume an unrestricted discharge from the pipe. For installations without an unrestricted discharge, the flow rate will be affected by the downstream throttle.

For shallow gradients, the Colebrook-White formula underestimates flow rates (because when gradient tends towards zero %, velocity also tends to zero).

For level or nearly level installations (slope < 1 %), spatially varied flow tables should be used.

For soil/foul water drainage applications

Flow rates based on Colebrook-White formula.
Roughness coefficient $k_s = 0.6 \text{ mm}$

Gradient [%]	Pipe ø 40 mm		Pipe ø 50 mm		Pipe ø 75 mm		Pipe ø 110 mm		Pipe ø 125 mm	
	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]
10.0			2.30	1.27	7.14	1.71	20.45	2.23	28.97	2.44
7.5			1.99	1.10	6.19	1.48	17.71	1.93	25.09	2.11
5.0			1.63	0.90	5.05	1.21	14.46	1.58	20.49	1.72
4.5			1.54	0.85	4.79	1.14	13.72	1.50	19.43	1.64
4.0			1.46	0.80	4.52	1.08	12.94	1.41	18.32	1.54
3.5			1.36	0.75	4.23	1.01	12.10	1.32	17.14	1.44
3.0			1.26	0.70	3.91	0.93	11.20	1.22	15.87	1.34
2.5			1.15	0.64	3.57	0.85	10.23	1.12	14.49	1.22
2.0			1.03	0.57	3.19	0.76	9.15	1.00	12.96	1.09
1.5			0.89	0.49	2.77	0.66	7.92	0.86	11.22	0.94
1.0			0.73	0.40	2.26	0.54	6.47	0.71	9.16	0.77

Gradient [%]	Pipe ø 160 mm		Pipe ø 200 mm		Pipe ø 250 mm		Pipe ø 315 mm	
	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]	Flow rate Q [l/s]	Velocity v [m/s]
10.0	55.61	2.87	101.81	3.34	206.87	4.22	382.95	4.92
7.5	48.16	2.49	88.17	2.89	177.84	3.62	329.47	4.23
5.0	39.32	2.03	71.99	2.36	143.52	2.93	266.21	3.42
4.5	37.30	1.93	68.30	2.24	135.71	2.77	251.81	3.23
4.0	35.17	1.82	64.39	2.11	127.46	2.60	236.59	3.04
3.5	32.90	1.70	60.23	1.98	118.69	2.42	220.42	2.83
3.0	30.46	1.57	55.76	1.83	109.29	2.23	203.07	2.61
2.5	27.80	1.44	50.90	1.67	99.10	2.02	184.25	2.37
2.0	24.87	1.28	45.53	1.49	87.86	1.79	163.50	2.10
1.5	21.53	1.11	39.43	1.29	75.18	1.53	140.05	1.80
1.0	17.58	0.91	32.19	1.06	60.25	1.23	112.42	1.44

Note:

The flow rates shown above assume an unrestricted discharge from the pipe. For installations without an unrestricted discharge, the flow rate will be affected by the downstream throttle.

For shallow gradients, the Colebrook-White formula underestimates flow rates (because when gradient tends towards zero %, velocity also tends to zero).

For level or nearly level installations (slope < 1 %), spatially varied flow tables should be used.

Operating pressures

The ACO pipe socketed stainless steel pipe systems are fitted with a unique, double lip seal manufactured from either EPDM or Viton®. The double lip seal arrangement provides added security for the ultimate long term reliability. The ACO pipe; socketed stainless steel pipe systems are tested and approved for operating pressures in gravity, siphonic and vacuum systems.

ACO pipe stainless steel pipe systems are designed for maximum working pressure 0.5 bar according to EN 1124. In case where higher pressure may apply, it is necessary to combine the system with socket clamps.

Pipe diameter [mm]	Operating pressure [bar]	
	Without socket clamp	With socket clamp
40	0.5	2.5
50	0.5	2.5
75	0.5	2.5
110	0.5	2.5
125	0.5	2.5
160	0.5	1.5
200	0.5	1.5
250	0.5	1.0
315	0.5	0.7

Vacuum applications	
Pipe diameter [mm]	Operating pressure [bar]
40	-0.8
50	-0.8
75	-0.8
110	-0.8
125	-0.8
160	-0.8
200	-0.8
250	-0.8
315	-0.8

ACO pipe

Generally

The following standards will help designers to select the correct size of pipe system for a particular application: EN 12056: gravity drainage systems inside buildings. EN 752: drain and sewer systems outside buildings. Installation should be in accordance with the manufacturer's recommendations as well as with EN 12056-2, EN 12056-3 and EN 752.

Pipe cutting

If it is necessary to adapt or shorten pipe lengths where tools are used, the cut must be square, clean and chamfered.

Suitable cutters are available from ACO.

These tools are designed to form the edge bevel on the male spigoted end of the pipe. Carbon steel cutting wheels are not suitable.

Pipe jointing

The assembly of pipe joints is quick and straightforward requiring only a light application of lubricant available from ACO to the chamfered pipe end. Ensure that the matching ends of the pipes and fittings are clean and free from contamination. Push-fit the pipe end into the socket, but do not push fully into the socket recess so as to allow for thermal expansion within the system.



Seal Assembly

Seal assembly

The double lip seal is easily removed and replaced from the female end of all pipes and fittings. This allows the on-site upgrade of seal material from EPDM or Viton without the need for special tools.

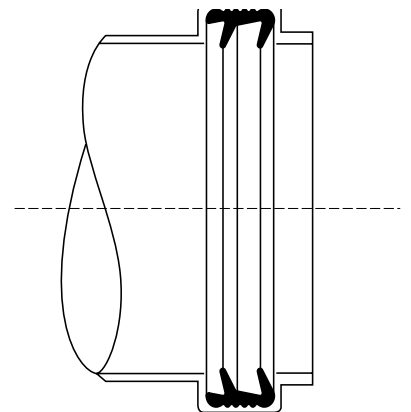
Seal installation notes

1. If changing the seal, ensure the correct size and grade of seal is selected for the application. For reference, EPDM seals are BLACK and Viton seals are GREEN. If in doubt, contact the ACO Building Drainage Helpline on 01462 816666 for assistance.

Seal integrity

Providing the installation guidelines are followed and that all reasonable precautions are taken during the installation and that the system is not exposed to chemicals or conditions outside the specification for the component materials, a life expectancy of

2. Ensure the seal itself and the zone around the pipe and/or fitting receiving the seal is clean, dry and free from dirt, dust or particulates.
3. Insert the dry seal into the pipe/fitting recess as shown in the diagram below. NOTE: the seal MUST be inserted so the double sealing lips face away from the opening of the pipe/fitting.
4. Do not use tools to aid the assembly process otherwise damage to the pipes, fittings and seals may occur.



around 25 years can be reasonably expected. No guarantee on seal integrity can be offered as the ACO PIPE® components are subjected to a variety of installation and in-service operational variables beyond the control of ACO building Drainage.

Pipe weights

ACO PIPE® thin-wall stainless steel pipe systems are light in weight and high on performance with clear advantages in ease of handling and savings in labour costs over traditional metal pipe systems.

Engineers will need to know weights and loading when designing vertical stack and horizontal pipe run systems. The table gives weights for all pipe sizes empty and full of water.

Pipe diameter (mm)	Pipe weight Empty (kg/m)	Pipe weight Full (kg/m)
40	1.0	2.1
50	1.3	3.1
75	1.9	6.0
110	2.8	12.4
125	3.2	15.1
160	5.1	24.6
200	7.7	38.2
250	9.6	57.5
315	16.4	92.4

Socket clamps

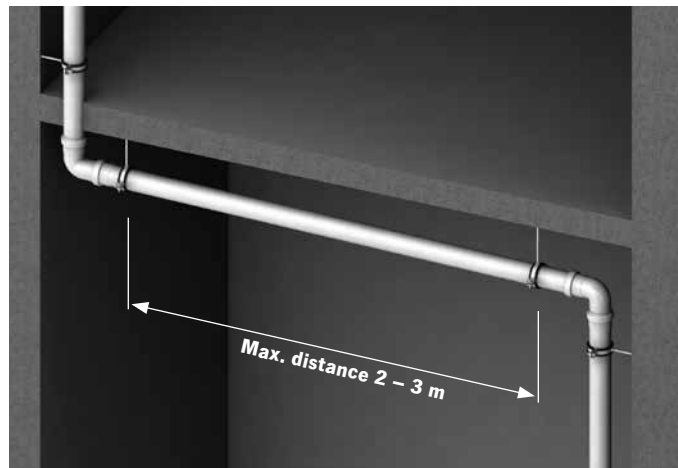
Drainage systems for soil, waste water and rainwater in above-ground installations are gravity systems with free drainage and should not be overloaded/clogged. the ACO PIPE® socketed systems have push-fit socket joints and consequently will not be able to resist internal pressure unless precautions are taken to ensure that the joints will not slide apart.

appropriate fixing to the building can prevent the joints from sliding apart in most cases, but if it is difficult or impossible to fix the pipes to the building, the socket clamps (Part No. 419134-7 - see page 37) can prevent the push-fit sockets and spigot ends from sliding apart if the system is overloaded or internal pressure is generated.

Horizontal pipe runs

Horizontal pipework should be supported by pipe brackets in 3 meter intervals maximum. One bracket should be within 300 mm of the pipe joint and the other approximately at the midpoint of the pipe length, but not more than 3 metres from the next bracket (depending on the pipe diameter- refer to the table below).

Additional brackets should be used at changes of direction and at junction points immediately downstream of the fitting. Horizontal pipe runs may be installed at a fall of 1 in 50 and feeder connections should be achieved using 45° branches. Where long pipe runs occur i.e. greater than 15 meters, a fixing arm should be attached to the bracket to prevent pendulum movement within the system.



As a guide, use the table below for bracket spacing on horizontal pipes.

Pipe diameter bracket spacing

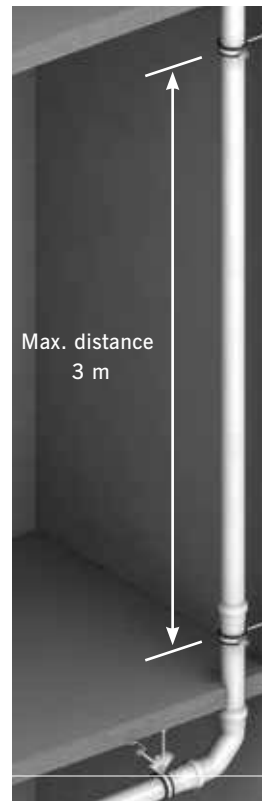
Pipe ø [mm]	Length [m]
40	2.0
50	2.0
75	2.3
110	2.5
125	3.0
200	3.0
250	3.0

Vertical pipe stacks

The load applied with a fluid in the pipe is vertically down. Position the highest bracket adjacent to the top inlet of the pipe, then mount brackets at 3 meter spacings. At the bottom of the vertical pipe, use a bracket within 200mm of the bottom. Fit brackets at each change of pipework in direction of junction points. Pipework should be at least 30mm from the wall to facilitate maintenance and painting.

Pipe weights

Engineers should be aware of minimum and maximum weights when designing vertical stack and horizontal pipe run systems. Generally, when the pipe is completely full of water, then the vertical deflection should not exceed 1.5mm. The discretion of the installer should be applied in each instance to ensure that the pipe is adequately supported.



Below ground installation

Back-filling

Back-filling around the pipe can only start when the position of the pipe has been checked and approved.

Compression

Care should be taken to avoid distortion of both the pipe run and the pipe itself during back-filling and compaction. Avoid tipping backfill material directly onto the pipe system. If mechanical compaction is used, the weight and resultant compressive force must be taken into account to avoid distortion. Back-fill materials should be compacted to a minimum of 93%.

Filling in the excavation

Soil from the excavation can be used for filling, but larger stones and blocks should not be used. Compression of the filling material outside reinforced areas is not necessary if the settling will not cause problems or damage.

Local standards

It is recommended to install pipes according to local standards.



ACO PIPE® material information

Pipe material information

Thermal movement

ACO PIPE® stainless steel pipework systems have a low coefficient of thermal expansion, of approximately 1 in 1000mm per 60°C of temperature change.

The requirement for thermal tolerance on pipe systems is otherwise confined to hot water conditions. A comparison of approximate thermal movement between different pipe materials in mm per metre with a temperature change of 60°C is given below.

- Aluminium alloy 1.44mm
- Copper 0.98mm
- Grey cast iron 0.75mm
- HDPE 9.0mm
- PVCu 3.0mm
- Stainless steel 0.99mm

Coefficients of linear expansion (α) for various materials are as follows:

Material	Coefficient of linear expansion (10 ⁻⁶ K ⁻¹)
HDPE	150.0
PVCu	50.0
Aluminium	24.0
Stainless steel	16.5
Copper	16.4
Grey cast iron	12.5

Sealing material information

EPDM

(ethylene propylene diene monomer)

Black sealing rubber ring, which is suitable for most applications where there are no oil or petrol residues in the waste water.

NBR

(acryl nitrile-butadiene rubber)

Black sealing rubber ring which is suitable for waste water applications where there are petrol or oil residues. NBR is not resistant to solvents and high temperatures.

FPM

(fluoroelastomer) – Viton®

Green sealing rubber ring which is suitable for special applications where oil, solvents and strong acids are present in waste water; and for applications with higher temperatures. Viton® seal has limited resistance to chemicals like acetone, methyl alcohol.

TPEV

(thermoplastic elastomer vulkanized)

Sealing rubber with excellent heat resistance, physical and mechanical properties. Suitable for pharmaceutical, medical, food and beverage applications. TPEV has limited resistance in oil or petrol residues in waste water.

Rubber type	Sealing materials			
	EPDM	NBR	FPM (Viton®)	TPEV
Colour	black	black	green	red
Temperature range	-50 / +130 / +150 °C	-30 / +80 / +100 °C	-20 / +200 / +300 °C	-35 / +120 / +140 °C
Resistance				
Water	excellent	good	good	excellent
Chemicals				
Acids	good	fair	excellent	good
Bases	good	fair	excellent	excellent
Benzene/Petrol	unsatisfied	excellent	excellent	limited
Oils				
ASTM Oil No. 1	unsatisfied	excellent	excellent	limited
ASTM Oil No. 3	unsatisfied	excellent	excellent	limited
Ozone & weather stresses	good	limited	good	good

To be sure of suitability for special applications please consult exact seal material features within ACO installation guide.

Care and maintenance

Maintenance programme

With care taken during the fabrication and installation, cleaning before handing over to the client should present no special problems, although more attention than normal may be required if the installation period has been prolonged.

Where surface contamination is suspected, immediate attention to cleaning after site fixing will encourage a trouble-free product.

Food and beverage handling, pharmaceutical and chemical industry applications require extremely high levels of cleanliness applicable to each industry.

Advice is often sought concerning the frequency of cleaning stainless steel and the answer is quite simple - clean the metal whenever it becomes dirty in order to restore its original appearance. This may vary from one to four times per year for external applications or it may be once per day for products installed in hygienic or chemically aggressive applications.

Frequency and cost of cleaning is lower with stainless steel than with many other materials and will often outweigh the initial higher cost of this superior product.

Stainless steel is easy to clean. Washing with soap or mild detergent in warm water followed by a clear water rinse is usually quite adequate for many industrial applications. An enhanced aesthetic appearance will be achieved if the cleaned surface is finally wiped dry.

Precautions

Acids should ONLY be used for on-site cleaning when all other methods have been proved unsatisfactory and in accordance with manufacturers' instructions. Appropriate personal protection equipment should be used at all times.

Care should be taken to ensure that acid cleaners do not spill over adjacent areas. Solvents should not be used in confined areas without adequate ventilation and only in accordance with manufacturers' instructions.

Conclusion

If all the cleaning suggestions and actions in the table below have been attempted and the surface is still not satisfactory, stainless steel can be mechanically cleaned or electropolished by specialists on site. For further information, contact the ACO Building Drainage Helpline on 01462 816666 for help and assistance.

Problem	Cleaning Agent	Comments
Routine cleaning.	Soap or mild detergent (e.g. washing up liquid) and water.	Sponge, rinse with clean water. Wipe dry if necessary.
Fingerprints.	Soap and warm water or organic solvent (e.g. alcohol, acetone).	Rinse with clean water, wipe dry if necessary.
Stubborn stains and discolouration.	Mild cleaning solutions (e.g. Cif, GODDARD'S STAINLESS STEEL CARE).	Rinse well with clean water and wipe dry.
Oil and grease marks.	Organic solvent (e.g. alcohol, acetone).	Clean after with soap and water, rinse with clean water and dry.
Rust and other corrosion products.	Oxalic acid. The cleaning solution should be applied with a swab and allowed to stand for 15-20 minutes before being washed away with clean water. May continue using Cif to give final clean.	Rinse well with clean water. Precautions for acid cleaners must be observed.

Note: Always read instructions on propriety cleaning agents

Care and maintenance

The resistance information contained within this table is indicative only.

All data is based on reactions noted at an ambient temperature of 20 °C. Higher temperatures will generally reduce the corrosion resistance of the materials.

Please contact ACO if guarantees are required
Legend of specific material suitability.

We shall arrange for tests to be undertaken with the reagent to establish the chemical resistance of the materials.

Legend

- ✓ Recommend.
- ? Suitable.
However, contact ACO for further advice,
- ✗ Not recommended.
- ~ No data available

Reagent	Stainless Steel 304	Stainless Steel 316	EPDM	Viton
Acetic Acid 20%	✓	✓	✓	✓
Acetic Acid 80%	✓	✓	✓	✓
Acetone	✓	✓	✓	✗
Alcohol (Methy or Ethyl)	✓	✓	✓	?
Aluminium Chloride	?	?	✓	✓
Aluminium Sulphate	✓	✓	✓	✓
Ammonia Gas (Dry)	✓	✓	~	~
Ammonium wChloride	?	?	✓	✓
Ammonium Hydroxide	✓	✓	✓	✓
Ammonium Nitrate	✓	✓	✓	✓
Ammonium Phosphate	✓	✓	✓	✓
Ammonium Sulphate	?	✓	✓	✓
Ammonium Sulphide	✓	✓	~	~
Amyl Chloride	✓	✓	✗	?
Aniline	✓	✓	?	✓
Barium Chloride	✓	✓	✓	✓
Barium Hydroxide 10%	~	~	✓	✓
Barium Sulphate	✓	✓	✓	✓
Barium Sulphide	~	~	✓	✓
Beer	✓	✓	✓	✓
Beet Sugar Liquors	✓	✓	✓	✓
Benzene	✓	✓	✗	✓
Benzoic Acid	✓	✓	✗	✓
Bleach - 12.5% Active C1	~	~	✓	✗
Boric Acid	✓	✓	✓	✓
Bromic Acid	?	?	~	~
Bromine Water	✗	✗	~	~
Butane	✓	✓	✗	✓
Calcium Carbonate	✓	✓	✓	✓
Calcium Chloride	✗	?	✓	✓
Calcium Hydroxide	?	✓	✓	✓
Calcium Hypochlorite	✗	?	?	✓
Calcium Sulphate	✓	✓	✓	✓
Cane Sugar Liquors	~	~	✓	✓
Carbonic Acid	~	~	✓	✓
Carbon Bisulphide	✓	✓	✗	✓
Carbon Dioxide	✓	✓	✓	✓
Carbon Monoxide	✓	✓	✓	✓
Carbon Tetrachloride	?	?	✗	✓

Reagent	Stainless Steel 304	Stainless Steel 316	EPDM	Viton
Caustic Potash	✓	✓	✓	✓
Caustic Soda 20%	✓	✓	✓	✓
Caustic Soda 50%	✓	✓	✓	✓
Caustic Soda 80%	✓	✓	✓	✓
Chlorine (Dry)	?	?	✓	✓
Chlorine (Wet)	✗	✗	✗	✓
Chloroacetic Acid	?	✓	?	✗
Chlorobenzene	✓	✓	✗	✓
Chloroform	?	?	✗	✓
Chromic Acid 50%	✗	✗	?	✓
Chromic Acid 10%	✓	✓	✗	?
Citric Acid	?	✓	✓	✓
Copper Chloride	✗	✗	✓	✓
Copper Cyanide	✓	✓	✓	✓
Copper Nitrate	✓	✓	~	✓
Copper Sulphate	✓	✓	✓	✓
Cottonseed Oil	~	~	✗	✓
Cresol	~	~	✗	✗
Cyclohexanone	?	✓	✗	✗
Cyclohexane	✓	✓	✗	✓
Diethylamine	?	?	?	✗
Disodium Phosphate	~	~	✓	✓
Distilled Water	✓	✓	✓	✓
Ethyl Acetate	✓	✓	?	✗
Ethylene Chloride	✓	✓	✗	?
Ethylene Glycol	✓	✓	✓	✓
Fatty acids (Cb)	✓	✓	✗	✓
Ferric Sulphate	✓	✓	✓	✓
Fluorene Gas (Wet)	✗	✗	✓	?
Formaldehyde 37%	✓	✓	✓	✓
Formic Acid 90%	✗	✓	✓	?
Freon 12	✓	✓	✓	✓
Fruit Juices & Pulp	?	✓	~	✓
Furfural	✓	✓	✗	✗
Gasoline (Refined)	✓	✓	✗	✓
Glucose	✓	✓	✓	✓
Glycerine	✓	✓	✓	✓

Care and maintenance

Reagent	Stainless Steel 304	Stainless Steel 316	EPDM	Viton
Hydrobromic Acid 20%	✗	✗	✓	✓
Hydrochloric Acid 40%	✗	✗	✗	✓
Hydrocyanic Acid	✓	✓	?	✓
Hydrogen Peroxide 90%	✓	✓	✗	✓
Hydroquinone	~	~	✗	✓
Hypochlorous Acid (Chlorine Water)	~	~	✓	✓
Iodine	✗	?	?	✓
Kerosene	✓	✓	✗	✓
Lactic Acid 25%	✓	✓	✓	✓
Linseed Oil	✓	✓	✗	✓
Magnesium Chloride	?	?	✓	✓
Magnesium Sulphate	✓	✓	✓	✓
Maleic Acid	?	?	✗	✓
Methyl Chloride	?	?	✗	✗
Methyl Ethyl Ketone	~	~	✓	✗
Milk	✓	✓	✓	✓
Minerals Oils	~	~	✗	✓
Nickel Chloride	?	?	✓	✓
Nickel Sulphate	✓	✓	✓	✓
Oils and Fats	✓	✓	✗	✓
Oleic Acid	✓	✓	✓	✓
Oleum	~	~	✗	✓
Oxalic Acid	?	?	✓	✓
Palmitic Acid 10%	~	~	✓	✓
Perchloric Acid 10%	✗	✗	?	✓
Perchloric Acid 70%	✗	✗	?	✓
Petroleum Oils	✓	✓	✗	✓
Phenol 5%	✓	✓	?	✓
Phosphorous Trichloride	✓	✓	✓	✓
Photographic Solutions	?	?	✓	✓
Picric Acid	✓	✓	✓	✓
Plating Solutions	~	~	~	✓
Potassium Carbonate	✓	✓	✓	✓
Potassium Chloride	✓	✓	✓	✓
Potassium Cyanide	✓	✓	✓	✓
Potassium Dichromate	✓	✓	✓	✓
Potassium Hydroxide	✓	✓	✓	✓
Potassium Permanganate	✓	✓	✓	✓
Potassium Sulphate	✓	✓	✓	✓
Propane Gas	~	~	~	✓
Propyl Alcohol	~	~	✓	✓
Sea Water (Natural)	✗	?	✓	✓
Silver Nitrate	✓	✓	✓	✓

Reagent	Stainless Steel 304	Stainless Steel 316	EPDM	Viton
Silver Sulphate	✓	✓	✓	✗
Sodium Bicarbonate	✓	✓	✓	✓
Sodium Bisulphite	✓	✓	✓	✗
Sodium Carbonate	✓	✓	✓	✓
Sodium Cyanide	✓	✓	✓	✓
Sodium Ferrocyanide	~	~	?	✓
Sodium Hydroxide	✓	✓	✓	✓
Sodium Hypochlorite	?	✓	?	✓
Sodium Sulphate	✓	✓	✓	✓
Sodium Sulphide	?	✓	✓	✓
Sodium Sulphite	?	✓	✓	✓
Sodium Thiosulphate	✓	✓	✓	✓
Stannous Chloride	?	?	✗	✓
Stearic Acid	✓	✓	?	✓
Sulphurous Acid	?	✓	?	✓
Sulphur	?	✓	~	✓
Sulphur Dioxide (Dry)	?	✓	✓	✓
Sulphur Dioxide (Wet)	?	✓	✓	✓
Sulphuric Acid 50%	✗	✗	?	✓
Sulphuric Acid 70%	✗	✗	?	✓
Sulphuric Acid 93%	✗	✗	?	✓
Tannic Acid	✓	✓	✓	✓
Tanning Liquors	✓	✓	✓	✓
Tartaric Acid	~	~	?	✓
Toluene	~	~	✗	✗
Trichloroethylene	✓	✓	✗	✗
Triethylamine	✓	✓	✓	✗
Trisodium Phosphate	~	~	✓	✓
Turpentine	✓	✓	✗	✓
Urea	✓	✓	✓	✓
Urine	✓	✓	✓	✓
Vinegar	✓	✓	✓	✓
Water (Fresh)	✓	✓	✓	✓
Water (Mine-acid)	✓	✓	✓	✓
Water (Salt)	~	~	✓	✓
Whisky	✓	✓	✓	✓
Wines	✓	✓	✓	✓
Xylene	~	~	✓	✓
Zinc Chloride	✗	✗	✓	✓
Zinc Sulphate	?	✓	✓	✓

ACO Technologies plc

- ACO Building Drainage
- ACO Water Management
Civils + Infrastructure
Urban + Building Landscape
- ACO Sport
- ACO Wildlife



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