



ACO Marine Product Catalogue

ACO pipe stainless steel pipework systems



ACO. creating the future of drainage



The ACO System Chain provides Drainage Solutions for tomorrows Environment.

Stricter rules and regulations on board worldwide operating ships require more sophisticated drainage concepts. ACO provides intelligent solutions which perform in two directions. They protect the humans from the water and vice versa. Every ACO product provides within the ACO System Chain the way to economically and ecologically recycle and re-use the water. Within the ACO Group, ACO Marine provides technical solutions for all kinds of ships in the world wide operating maritime industry, from new builds, refits to conversion ship yards.



collect:

Collection and storage

- Scuppers and Channels
- Stainless Steel push fit ACO pipes
- Galvanised GM-X® push fit pipes
- Black water vacuum pump station
- Grey and black water transfer stations
- Stainless steel waste water collection tanks up to 350m³



clean:

Separation and Treatment

- Grease traps and Biological grease traps
- Grease Separators
- Maripur® advanced waste water treatment system
- Clarimar® biological waste water treatment



hold:

Storage and Buffer

- Sludge holding tank
- Aeration systems
- Stainless Steel water tanks
- Disinfection systems for clean water tanks



release:

Discharge

- Clean water lifting and transfer stations
- UV/CI stations



Grease Separation



Push Fit pipe Systems



Sewage Treatment Systems

ACO Marine

ACO Marine is within the ACO Group the world wide contact for advanced onboard drainage and innovative waste water treatment systems. Mega Yachts, Cruise Vessels, Ferries, Military Ships, Offshore Platforms and all kinds of Cargo Vessels are equipped and sailing with system solutions, provided by ACO Marine. This includes the advanced waste water treatment system ACO Maripur® and the biological waste water treatment ACO und Clarimar® as well as stainless steel bioreactors up to 350 m³, fresh water tanks, drainage systems including scuppers, penetrations, and ACO Push-Fit pipes, made of stainless steel or galvanized carbon steel.

With its innovative technology and know-how, ACO helps to keep the ocean clean for the next generations.

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General introduction

Introduction

ACO PIPE is reliable, lightweight and durable push-fit pipe work system, designed, produced and tested for soil, waste, rainwater and industrial wastewater drainage applications as well as for maritime waste water drainage and vacuum toilet systems.

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. Especially with the ACO gully and ACO stainless steel 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 utilizes advanced cold forming techniques, thereby reducing the manufacturing cost and minimizing the amount of welded components, to provide the ultimate in system reliability.

Stainless steel pipe systems are particularly suited to applications subject to thermal shock.



Applications

Typical applications for ACO pipe systems include:

Marine applications in new ships building and repairs focused on

- Cruise ships
- Ferries
- Super yachts
- Offshores
- Cargo ships

Segment of ACO pipe marine applications is covered by company ACO Marine and their materials (www.acomarine.com).

Key features & benefits

ACO pipe stainless steel pipe work systems offer all the key features found in traditional metal waste water systems but with the additional benefits unique to stainless steel material and the push-fit system.



Easy Installation

For connection of pipes within the ACO pipe systems our unique push-fit system is used. It allows very easy pipe connection on site without the use of special tools, or machines or equipment. Installation is therefore very quick and cost effective.



System solution

More than 1,500 different types are available (straight pipes, bends, branches, diameter increasers and reducer's) together with a wide range of accessories this creates a complex and complete system for pipe works construction – the ACO pipe systems.



Certification

ACO pipe stainless steel pipe work systems are designed, manufactured, tested and checked under all required standards. pipe systems are tested for pressure, vacuum, noise, fire and tightness. ACO has for ACO pipe systems all important certificates to declare production quality, product resistance and conformity upon request.



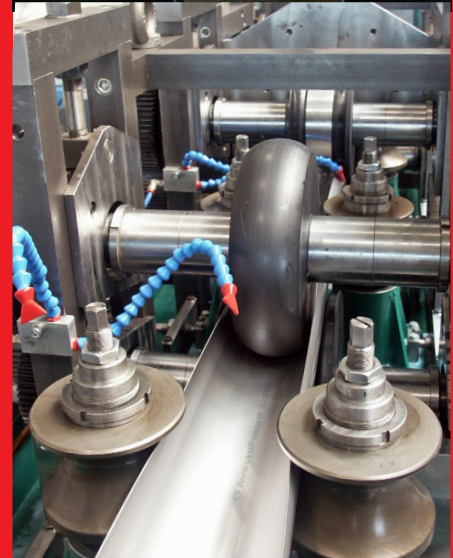
Durability

The use of modern technologies, high quality materials and outstanding surface treatment processes ensure that our products are highly resistant to external environmental influences. The expected service life cycle exceeds 50 years.



Hygiene

Smooth welding, surface quality and full pickle-passivation of all stainless steel products within the ACO pipe systems ensure the prevention of corrosion and allows easy cleaning.



ACO pipe material information

ACO pipe stainless steel pipe work systems are manufactured from austenitic stainless steel in grades 304 and 316L. All products are chemically pickled and passivated for optimum durability and corrosion resistance.

Surface treatment by means of electropolishing or warrishing is available. Recognized for long service and its easily cleaned characteristics, stainless steel's hard, smooth surface provides efficient flow for water and waste products.

ACO pipe sockets are fitted with EPDM seals as standard for regular drainage applications. For particularly aggressive chemical applications, 316L grade stainless steel with Viton® seals can be specific for the ultimate in system security.

Push-fit connection

Very reliable for vacuum and gravity piping system.

ACO PIPE double lip seal secure for the ultimate system reliability. Unique and sophisticated design of the lips and cavities gives ACO PIPE full tight construction.

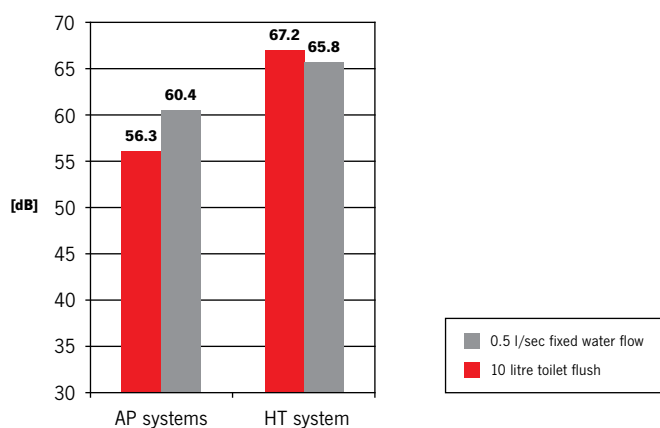
Push-fit advantages

- Easy to assemble
- Time saving
- Cost saving
- Tight connection



Sound

- Comparison of two pipe work systems
 - ACO pipe – DN 110
 - HT system – DN 110
 - Simulation of water fall from 1st floor through ground floor to basement of house
- SS has better results in comparison with cast iron comparable to all other materials



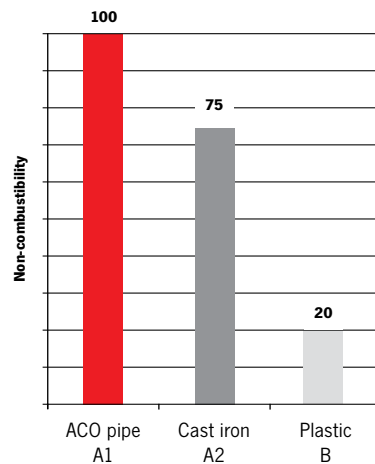
Fire resistance

ACO pipe push-fit system is classified and certified as non-combustible product (as it is manufactured in compliance to EN 1124, part 1 & part 2). That standard classifies the ACO pipe systems as class A1 fire resistant (highest rating).

ACO pipe systems are certified also by SITAC authority as fire resistant (cert. no. 0410-01).

Special certificate of fire resistance for coated pipes (no. CSI PK-08-027) is available

Fire certificates from marine authorities (DNV, ABS) available



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

Standards & certificates

Reference standards

ACO pipe stainless steel pipe work systems are designed, manufactured, tested and checked under the standards EN 1124-1 and EN 1124-2 pipes and fittings of longitudinally welded stainless steel pipes with spigot and socket for waste water systems.

The following standards will assist the designer to select the correct size of pipe system for the particular application.

EN 12056 gravity drainage systems.
EN 752 drain and sewer systems.

Testing

ACO PIPE stainless steel pipe systems are tested for the following points:

- Pressure & vacuum
- Noise
- Fire
- Tightness

Certificates quality & approval:

- ISO 9001
- ABS
- DNV
- Lloyd's Register
- SZÚ
- Bureau Veritas
- ETA
- WaterMark

Resistance:

- Sitac
- CSI



Transport & handling

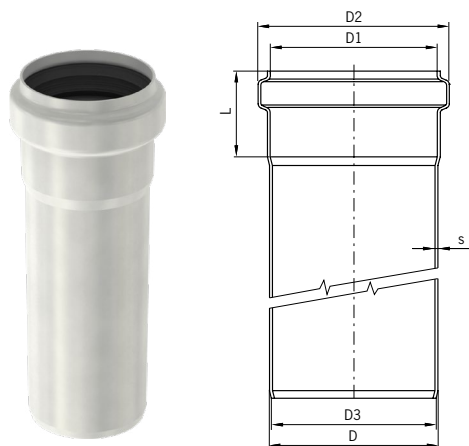
ACO pipe straight pipes are packed on pallets with wood frame and inserts, protected by cardboard and stretch foil. Fittings are packed in cardboard boxes and stacked on pallets. It is strongly recommended to transport and store the pipes and fittings in their original packaging to

avoid their damage. pipes should be stored and supported on a flat surface to avoid deformation.

Handle the pipes and fittings with care. Any care less handling (like dumping off the truck...) can cause deformation or damage

to pipes. Contact with carbon steel can cause corrosion on the stainless steel.

ACO pipe component overview



Dimensions of socket and spigot

D [mm]	D₁ [mm]	D₂ [mm]	D₃ [mm]	Socket length L [mm]	Wall thickness S [mm]
40	41	51.5	38	40	1.0
50	51	62	47	42	1.0
75	76	87.5	72	50	1.0
110	111	125.5	107	57	1.0
125	126	141	122	63	1.0
160	161	178	156	70	1.25
200	201	219	192	80	1.5
250	251	268.6	245	90	1.5

Table 1

ACO pipe component overview

Socketed pipes	Page 13	Bends	Page 21	Single branches	Page 23
					
Double branches		Page 24	Double branch reductions	Page 27	
					
Swept single branches	Page 28	"P" traps		Page 28	
					

System overview

Corner branch and corner branch reduction Page 29 	Couplings Page 31 	Connectors Page 34 
Weld on piece Page 36 	Penetration Page 38 	Flanged Connectors Page 42 
Access units Page 43 	End caps Page 44 	Sealings Page 47 

Part numbers - family range

Features

- pipes and fittings are available in 40 mm, 50 mm, 75 mm, 110 mm, 125 mm, 160 mm, 200 mm and 250 mm external diameters
- Lengths from 0.15 meter up to 6 meter
- Available in 304 (1.4301) and 316 L (1.4404) grades of stainless steel
- Push-fit system for quick assembly
- Fully comply to EN 1124-1 and EN 1124-2
- EPDM and Viton® seals available
- Fully pickle passivated
- Certifications: ISO 9001, ABS, DNV, Lloyd's Register, SZÚ, Bureau Veritas, ETA, Sitac, CSI



AP socketed pipe 40 mm
 according to EN-1124 form B1

Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	40	1.0	150	0.22	417304	417320
	40	40	1.0	250	0.42	417306	417322
	40	40	1.0	500	0.62	417308	417324
	40	40	1.0	750	0.80	417310	417326
	40	40	1.0	1000	1.10	417312	417328
	40	40	1.0	1500	1.60	417314	417330
	40	40	1.0	2000	2.60	417316	417332
	40	40	1.0	2500	2.80	417260	417262
	40	40	1.0	3000	3.00	417318	417334

Table 2

*other dimensions upon request

AP socketed pipe 50 mm
 according to EN-1124 form B1

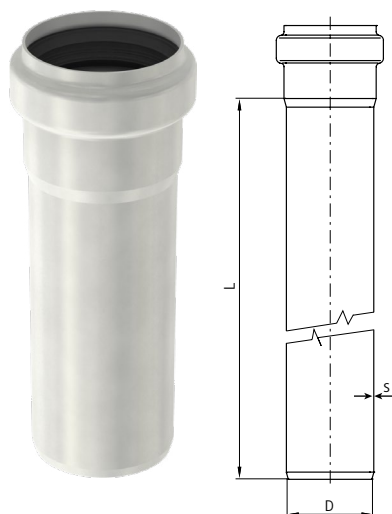
Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	42	1.0	150	0.26	98500	98550
	50	42	1.0	250	0.45	98502	98552
	50	42	1.0	500	0.70	98504	98554
	50	42	1.0	750	1.00	98506	98556
	50	42	1.0	1000	1.30	98508	98558
	50	42	1.0	1500	1.90	98510	98560
	50	42	1.0	2000	2.60	98512	98562
	50	42	1.0	2500	3.20	419274	419282
	50	42	1.0	3000	3.80	98514	98564

Table 3

*other dimensions upon request

ACO Marine Stainless Steel pipe

Part numbers - family range



AP socketed pipe 75 mm

according to EN-1124 form B1

Seal material	D [mm]	Active length L [mm]	Socket length [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	150	50	1.0	0.4	98516	98566
	75	250	50	1.0	0.6	98518	98568
	75	500	50	1.0	1.0	98520	98570
	75	750	50	1.0	1.5	98522	98572
	75	1000	50	1.0	2.0	98524	98574
	75	1500	50	1.0	2.9	98526	98576
	75	2000	50	1.0	3.6	98528	98578
	75	2500	50	1.0	4.8	419276	419284
	75	3000	50	1.0	5.7	98530	98580

Table 4

*other dimensions upon request

AP socketed pipe 110 mm

according to EN-1124 form B1

Seal material	D [mm]	Socket length [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	110	57	1.0	150	0.6	98532	98582
	110	57	1.0	250	0.9	98534	98584
	110	57	1.0	500	1.5	98536	98586
	110	57	1.0	750	2.2	98538	98588
	110	57	1.0	1000	2.9	98540	98590
	110	57	1.0	1500	4.3	98542	98592
	110	57	1.0	2000	5.7	98544	98594
	110	57	1.0	2500	7.1	419278	419286
	110	57	1.0	3000	8.4	98546	98596

Table 5

*other dimensions upon request



AP socketed pipe 125 mm
 according to EN-1124 form B1

Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	125	63	1.0	150	0.7	419692	419712
	125	63	1.0	250	1.0	419694	419714
	125	63	1.0	500	1.7	419696	419716
	125	63	1.0	750	2.5	419698	419718
	125	63	1.0	1000	3.3	419700	419720
	125	63	1.0	1500	4.9	419702	419722
	125	63	1.0	2000	6.5	419704	419724
	125	63	1.0	2500	8.1	419708	419728
	125	63	1.0	3000	9.6	419706	419726

Table 6

*other dimensions upon request

AP socketed pipe 160 mm
 according to EN-1124 form B1

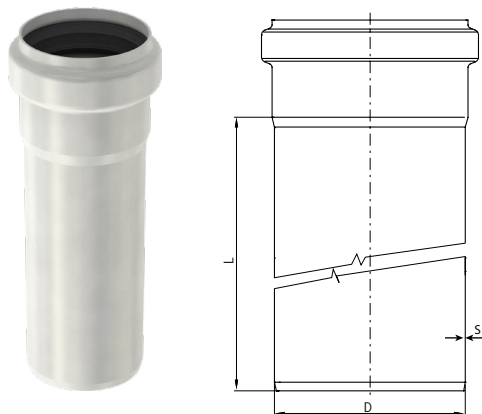
Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	160	70	1.25	150	1.1	98548	98598
	160	70	1.25	250	1.6	98600	98650
	160	70	1.25	500	2.9	98602	98652
	160	70	1.25	750	4.1	98604	98654
	160	70	1.25	1000	5.4	98606	98656
	160	70	1.25	1500	7.9	98608	98658
	160	70	1.25	2000	10.4	98610	98660
	160	70	1.25	2500	12.9	419280	419288
	160	70	1.25	3000	15.4	98612	98662

Table 7

*other dimensions upon request

ACO Marine Stainless Steel pipe

Part numbers - family range



AP socketed pipe 200 mm

according to EN-1124 form B1

Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	200	80	1.5	500	4.5	419383	419384
	200	80	1.5	1000	8.3	419387	419388
	200	80	1.5	2000	15.8	419391	419392
	200	80	1.5	3000	23.2	419395	419396

Table 8

*other dimensions upon request

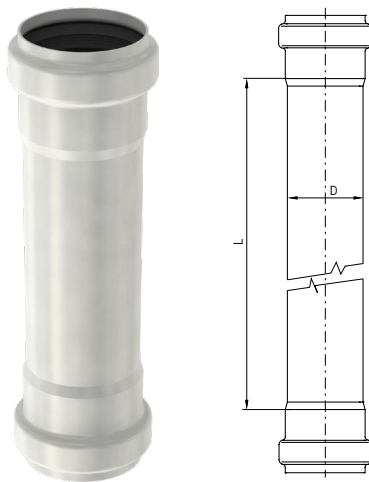
AP socketed pipe 250 mm

according to EN-1124 form B1

Seal material	D [mm]	Socket lenght [mm]	Wall thickness S [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	250	90	1.5	500	5.5	417071	417072
	250	90	1.5	1000	10.2	417075	417076
	250	90	1.5	2000	19.4	417079	417080
	250	90	1.5	3000	28.7	417083	417084

Table 8

*other dimensions upon request



AP double socketed pipe 40 mm

according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	250	0.25	417276	417290
	40	500	0.55	417278	417292
	40	750	0.85	417280	417294
	40	1000	1.20	417282	417296
	40	1500	1.80	417284	417298
	40	2000	2.40	417286	417300
	40	3000	3.60	417288	417302

Table 9

AP double socketed pipe 50 mm

according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	250	0.40	419554	419594
	50	500	0.70	419556	419596
	50	750	1.10	419558	419598
	50	1000	1.40	419560	419600
	50	1500	2.00	419562	419602
	50	2000	2.60	419564	419604
	50	3000	3.90	419566	419606

Table 10



AP double socketed pipe 75 mm
 according to EN-1124 form B2

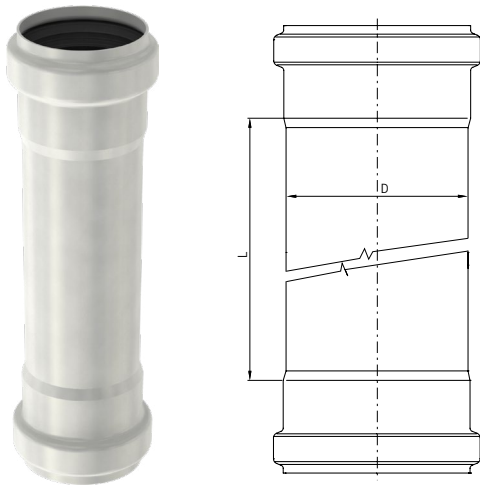
Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	250	0.7	419568	419608
	75	500	1.2	419570	419610
	75	750	1.6	419572	419612
	75	1000	2.1	419574	419614
	75	1500	3.0	419576	419616
	75	2000	4.0	419578	419618
	75	3000	5.8	419580	419620

Table 11

AP double socketed pipe 110 mm
 according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	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

Table 12



AP double socketed pipe 125 mm

according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	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

Table 13

AP double socketed pipe 160 mm

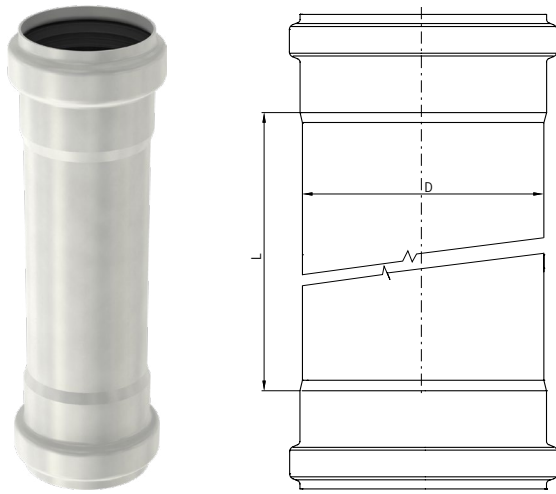
according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	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

Table 14

ACO Marine Stainless Steel pipe

Part numbers - family range

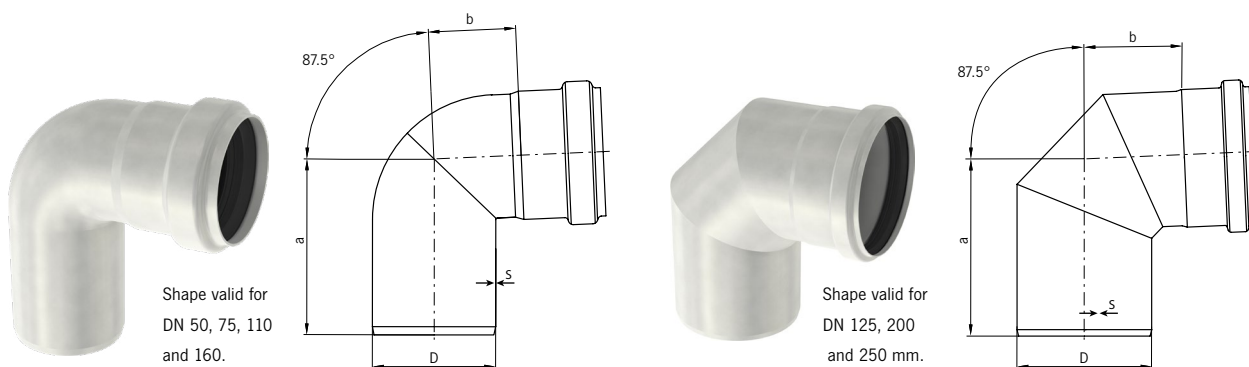


AP double socketed pipe 200 mm

according to EN-1124 form B2

Seal material	D [mm]	Active length L [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	200	500	5.0	419658	419659
	200	1000	8.6	419662	419663
	200	2000	15.9	419666	419667
	200	3000	23.1	419670	419671

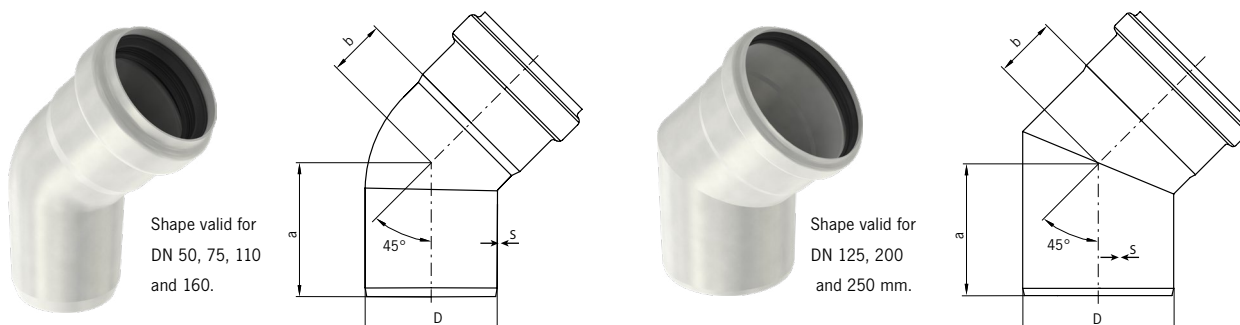
Table 15



AP bend 87.5°
according to EN-1124 form C1, C2

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	79	32	1.0	0.18	417342	417350
	50	86	40	1.0	0.20	98700	98750
	75	107	53	1.0	0.40	98702	98752
	110	134	67	1.0	0.70	98704	98754
	125	161	93	1.0	0.80	419732	419734
	160	181	105	1.25	1.70	98706	98756
	200	215	129	1.5	3.90	419411	419413
	250	297	198	1.5	5.10	-	417088

Table 16



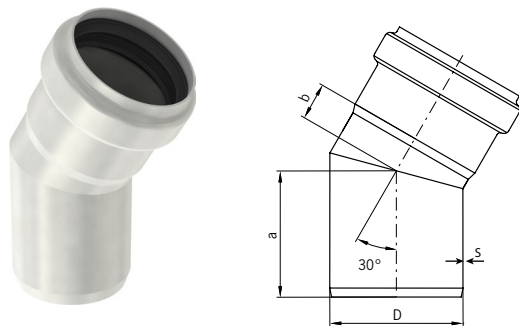
AP bend 45°
according to EN-1124 form C1, C2

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	58	21	1.0	0.15	417344	417352
	50	62	24	1.0	0.20	98708	98758
	75	76	32	1.0	0.30	98710	98760
	110	93	42	1.0	0.50	98712	98762
	125	110	50	1.0	0.60	419736	419738
	160	131	55	1.25	1.30	98714	98764
	200	152	60	1.5	2.70	419407	419409
	250	177	76	1.5	4.10	-	417092

Table 17

ACO Marine Stainless Steel pipe

Part numbers - family range

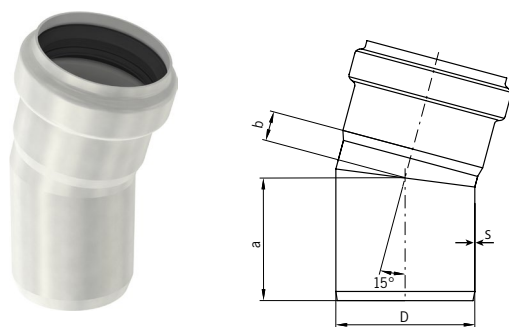


AP bend 30°

according to EN-1124 form C2

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	55	14	1.0	0.12	417346	417354
	50	57	16	1.0	0.20	98716	98766
	75	71	21	1.0	0.30	98718	98768
	110	85	27	1.0	0.50	98720	98770
	125	98	28	1.0	0.60	419740	419742
	160	110	40	1.25	1.20	98722	98772
	200	137	45	1.5	2.30	419403	419405
	250	153	58	1.5	2.90	-	417096

Table 18

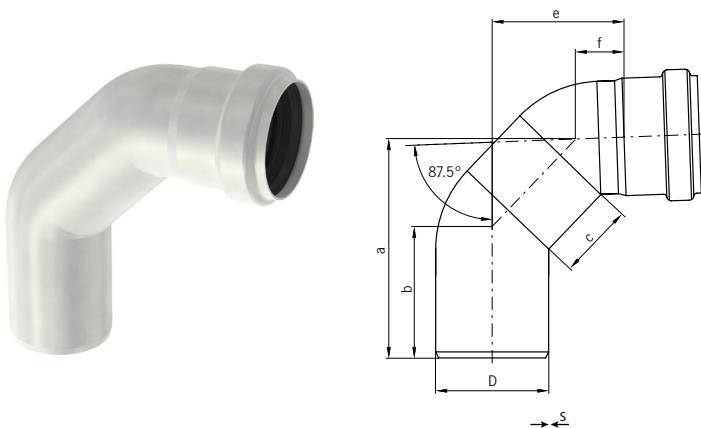


AP bend 15°

according to EN-1124 form C2

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	53	11	1.0	0.08	417348	417356
	50	54	12	1.0	0.10	98724	98774
	75	66	16	1.0	0.30	98726	98776
	110	78	15	1.0	0.40	98728	98778
	125	84	19	1.0	0.50	419744	419746
	160	99	29	1.25	1.00	98730	98780
	200	123	31	1.5	1.90	419399	419401
	250	136	40	1.5	2.50	-	417100

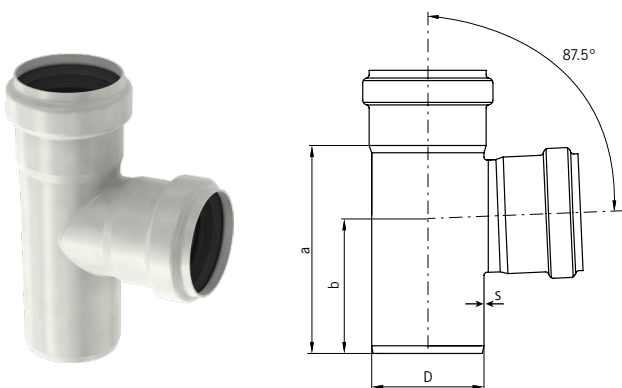
Table 19



AP long bend 87.5°
 according to EN-1124 form C3

Seal material	D [mm]	a [mm]	b [mm]	c [mm]	e [mm]	f [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	105	64	50	66.5	40	1.0	0.20	417340	417338
	50	123	71	50	75	25	1.0	0.30	419146	419000
	75	146	87	50	88	32	1.0	0.50	419148	419002
	110	316	103	250	246	39	1.0	1.40	419150	419004
	160	360	126	250	270	92	1.25	2.20	419152	419144

Table 20



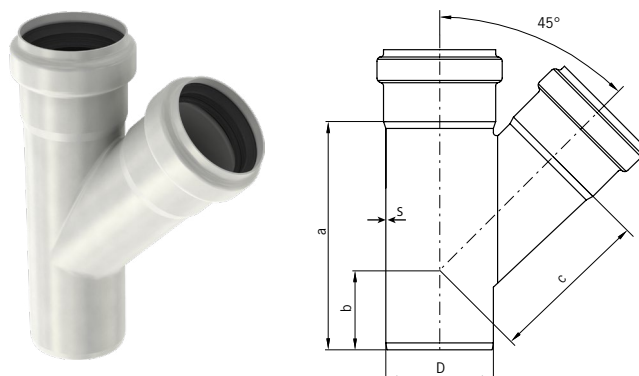
AP single branch 87.5°
 according to EN-1124 form D1

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	101	69	1.0	0.25	417363	417368
	50	106	71	1.0	0.30	98732	98782
	75	139	90	1.0	0.50	98734	98784
	110	183	117	1.0	0.80	98736	98786
	125	220	135	1.0	0.90	419748	419750
	160	288	184	1.25	2.30	98738	98788
	200	333	206	1.5	4.50	419419	419421
	250	363	215	1.5	5.50	-	417104

Table 21

ACO Marine Stainless Steel pipe

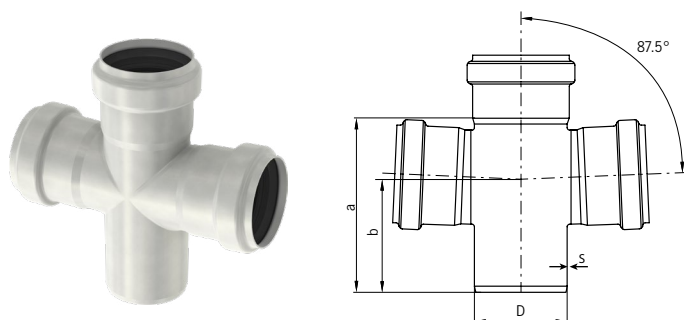
Part numbers - family range



AP single branch 45°
according to EN-1124 form D1

Seal material	D [mm]	a [mm]	b [mm]	c [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	118	58	63	1.0	0.26	417366	417372
	50	128	57	76	1.0	0.30	98748	98798
	75	179	74	110	1.0	0.50	98800	98850
	110	233	88	149	1.0	1.00	98802	98852
	125	273	103	170	1.0	1.10	419760	419762
	160	332	119	222	1.25	2.60	98804	98854
	200	415	151	274	1.5	5.70	419427	419429
	250	513	172	336	1.5	9.20	-	417108

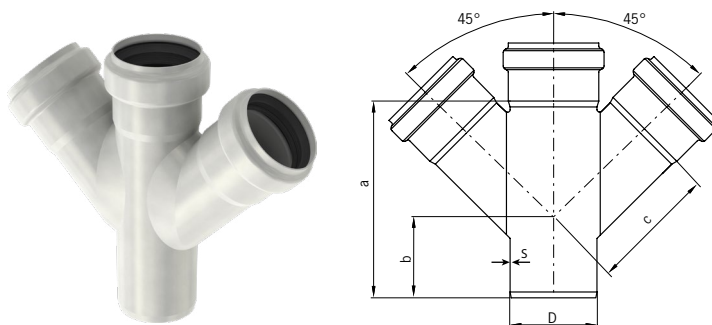
Table 22



AP double branch 87.5°
according to EN-1124 form D2

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	101	69	1.0	0.28	417364	417370
	50	106	71	1.0	0.30	98740	98790
	75	139	90	1.0	0.60	98742	98792
	110	183	117	1.0	0.90	98744	98794
	160	288	184	1.25	2.70	98746	98796

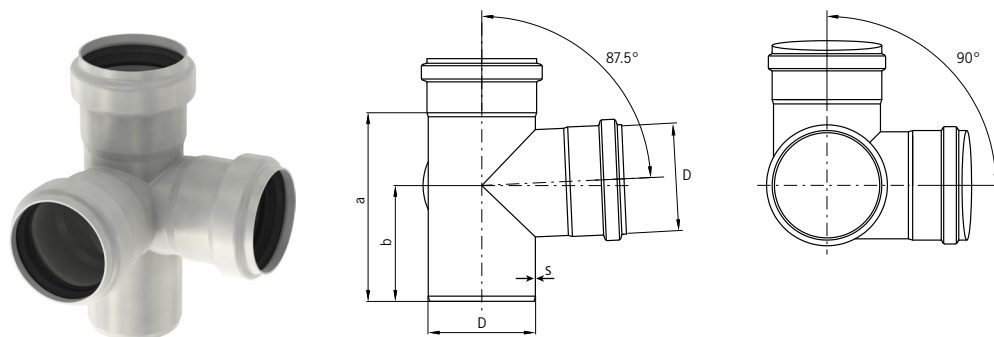
Table 23



AP double branch 45°
 according to EN-1124 form D21

Seal material	D [mm]	a [mm]	b [mm]	c [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	118	58	63	1.0	0.38	417374	417326
	50	128	57	76	1.0	0.40	98806	98856
	75	179	74	110	1.0	0.70	98808	98858
	110	233	88	149	1.0	1.20	98810	98860
	160	332	184	222	1.25	3.50	98812	98862
	250	509	172	336	1.5	11.00	-	417120

Table 24



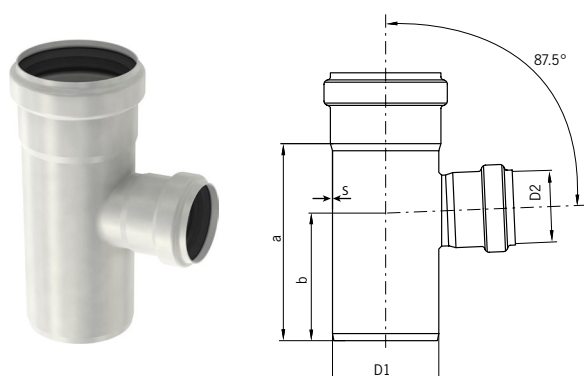
AP corner branch 87.5°
 according to EN-1124 form D3

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	101	69	1.0	0.28	417414	417415
	50	106	71	1.0	0.40	419162	419210
	75	139	90	1.0	0.70	419164	419212
	110	183	117	1.0	1.10	419166	419214
	125	220	135	1.0	1.60	417020	417021
	160	288	184	1.25	2.90	419168	419216

Table 25

ACO Marine Stainless Steel pipe

Part numbers - family range

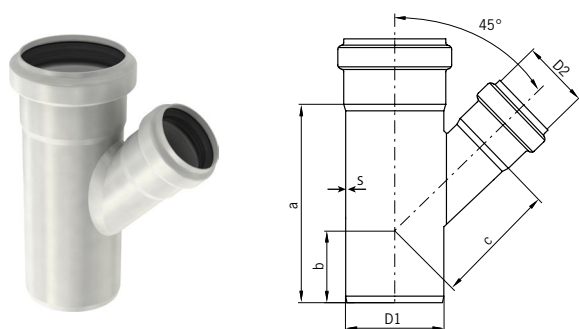


AP single branch reduction 87.5°

according to EN-1124 form D1

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	40	106	98	1.0	0.26	417442	417443
	75	40	139	98	1.0	0.28	417444	417445
	75	50	139	98	1.0	0.30	98928	98930
	110	50	183	117	1.0	0.50	98932	98934
	110	75	183	117	1.0	0.80	98936	98938
	125	75	187	110	1.0	0.90	419752	419754
	125	110	205	127	1.0	0.90	419756	419758
	160	110	288	184	1.25	2.30	400691	400693
	200	160	293	186	1.5	3.70	419415	419417
	250	200	349	226	1.5	5.80	-	417112

Table 26

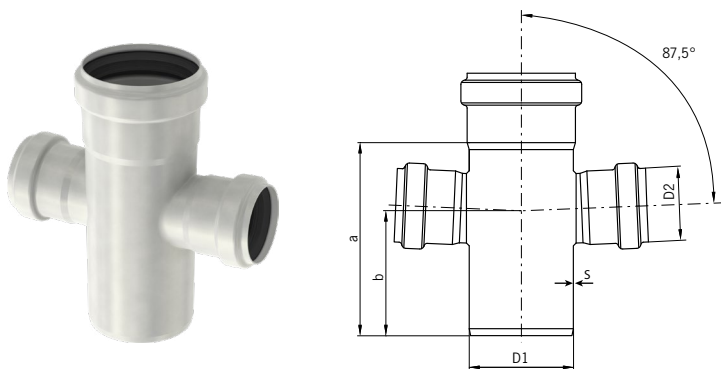


AP single branch reduction 45°

according to EN-1124 form D11

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	40	119	55	71	1.0	0.26	417406	417408
	75	40	144	94	56	1.0	0.28	417446	417447
	75	50	144	56	94	1.0	0.30	400661	400663
	110	50	147	42	119	1.0	0.50	400665	400667
	110	75	182	60	135	1.0	1.00	400669	400671
	125	75	200	65	141	1.0	1.10	419764	419766
	125	110	250	90	160	1.0	1.10	419768	419770
	160	110	332	119	191	1.25	2.60	400699	400701
	200	160	359	123	250	1.5	4.70	419423	419425
	250	200	429	175	307	1.5	7.60	-	417116

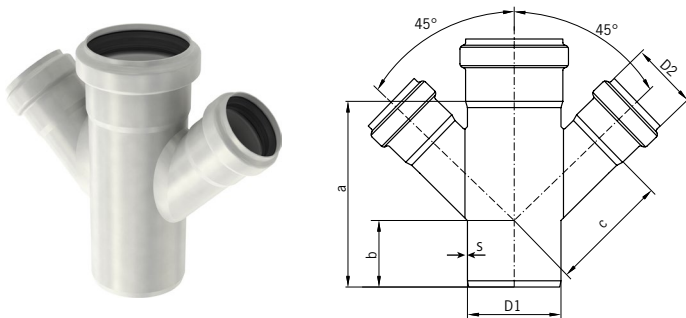
Table 27



AP double branch reduction 87.5°
 according to EN-1124 form D2

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	50	139	90	1.0	0.30	98940	98942
	110	50	183	117	1.0	0.60	98944	98946
	110	75	183	117	1.0	0.90	98900	98902
	160	110	288	184	1.25	2.70	400695	400697

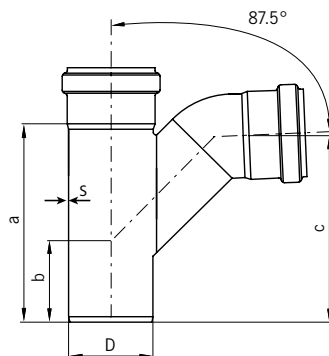
Table 28



AP double branch reduction 45°
 according to EN-1124 form D21

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	50	144	56	94	1.0	0.40	400673	400675
	110	50	147	42	119	1.0	0.70	400677	400679
	110	75	182	60	135	1.0	1.20	400681	400683
	160	110	332	119	190	1.25	3.50	400703	400705
	250	200	429	150	307	1.5	10.1	-	417124

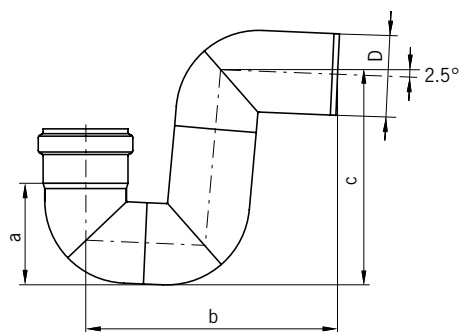
Table 29



AP swept single branch 87.5°

Seal material	D [mm]	a [mm]	b [mm]	c [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	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

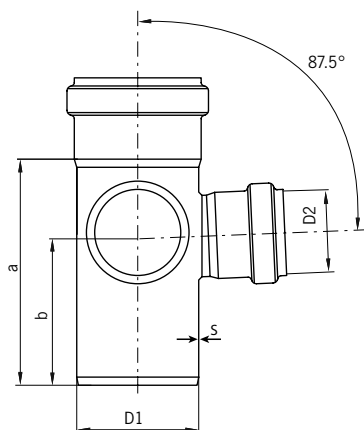
Table 30



AP "P" trap

Seal material	D [mm]	a [mm]	b [mm]	c [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	68	187	149	0.5	98822	98872
	75	94	232	193	0.7	98824	98874
	110	132	300	254	1.3	98826	98876
	160	190	403	347	3.3	98828	98878

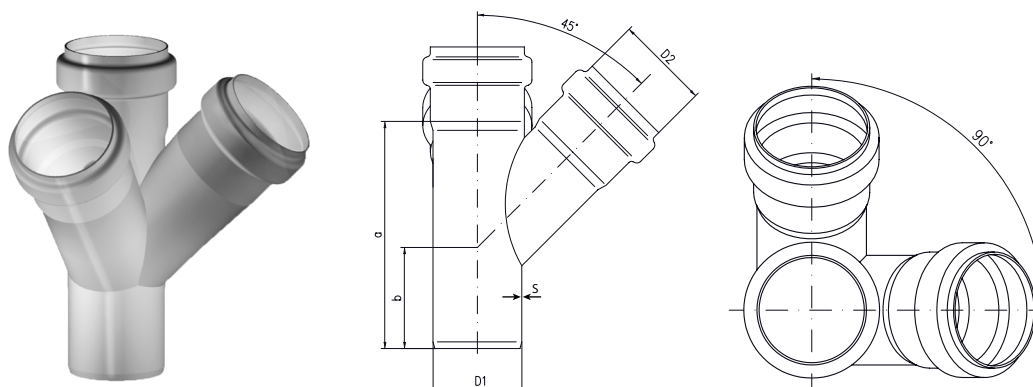
Table 31



Corner branch 87,5° reduced
 according to EN-1124 form D3

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	40	106	71	1.0	0.46	417435	417437
	75	40	139	90	1.0	0.48	417436	417438
	75	50	139	98	1.0	0.52	419170	419218
	110	50	132	93	1.0	0.75	419172	419220
	110	75	152	104	1.0	0.90	419174	419222
	125	75	200	141	1.0	1.23	419985	419987
	125	110	250	155	1.0	1.72	419997	417000
	160	110	236	152	1.25	2.01	419176	419224

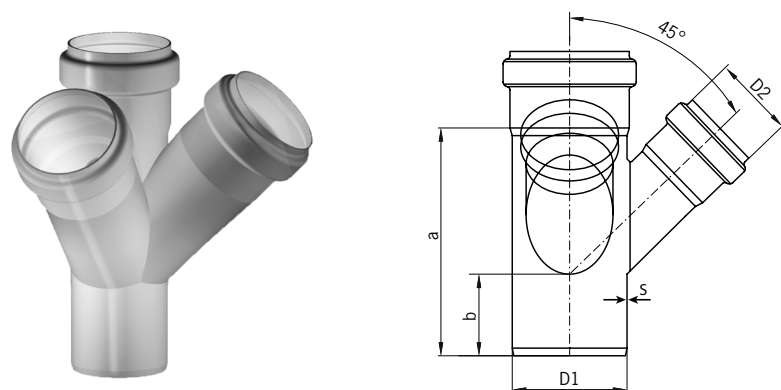
Table 32



Corner branch 45°
 according to EN-1124 form D31

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	50	50	128	57	1.0	0.43	419178	419226
	75	75	167	62	1.0	0.80	419180	419228
	110	110	233	88	1.0	1.53	419182	419230
	125	125	273	103	1.0	2.31	417022	417023
	160	160	330	117	1.25	4.25	419184	419232

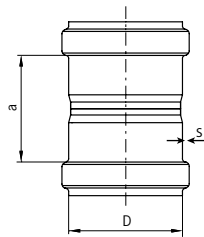
Table 33



Corner branch 45° reduced
 according to EN-1124 form D31

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	50	144	56	1.0	0.59	419186	419234
	110	50	219	74	1.0	1.01	419188	419236
	110	75	182	60	1.0	1.12	419190	419238
	125	75	207	75	1.0	1.42	419979	419981
	125	110	250	93	1.0	2.19	419991	419993
	160	110	258	80	1.25	2.56	419192	419240

Table 34

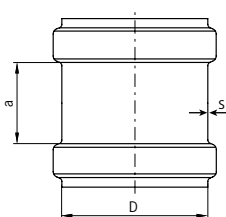


AP straight coupling

according to EN-1124 form F4

Seal material	D [mm]	a [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	51	1.0	0.07	417392	417394
	50	54	1.0	0.10	98920	98970
	75	75	1.0	0.20	98922	98972
	110	84	1.0	0.40	98924	98974
	125	140	1.0	0.40	419813	419815
	160	110	1.25	0.80	98926	98976
	200	136	1.5	1.80	419431	419433
	250	181	1.5	3.10	-	417159

Table 35



AP repair coupling

according to EN-1124 form F41

Seal material	D [mm]	a [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	63	1.0	0.08	417388	417390
	50	44	1.0	0.10	98830	98880
	75	46	1.0	0.20	98832	98882
	110	52	1.0	0.30	98834	98884
	125	70	1.0	0.30	419772	419774
	160	76	1.25	0.70	98836	98886
	200	100	1.5	1.50	419435	419437
	250	182	1.5	2.40	-	417139

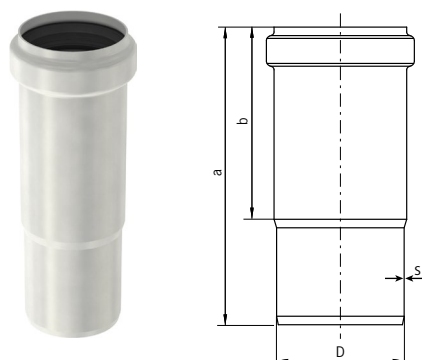
Table 36

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.

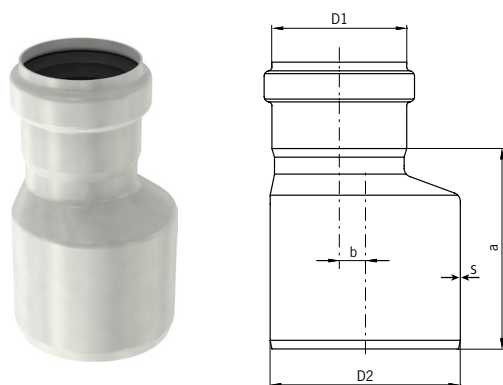


AP expansion socket

according to EN-1124 form D3

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	40	150	90	1.0	0.18	417382	417384
	50	159	102	1.0	0.20	98664	98666
	75	175	113	1.0	0.30	98668	98670
	110	200	121	1.0	0.50	98672	98674
	125	250	165	1.0	0.60	419776	419778
	160	292	170	1.25	1.40	98676	98678
	250	400	190	1.5	3.80	-	417143

Table 37



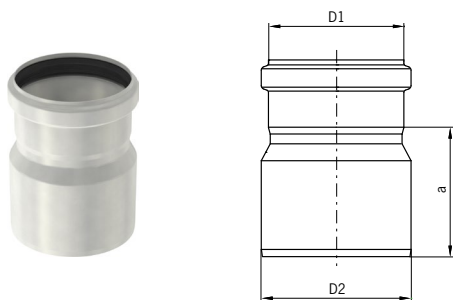
AP eccentric increaser coupling

according to EN-1124 form F1

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 316L
EPDM	40	50	85	5	1.0	0.28	417418
	50	75	75	7	1.0	0.30	98892
	50	110	103	25	1.0	0.40	98978
	75	110	110	15	1.0	0.50	98894
	110	160	160	22	1.0	1.10	98896
	125	160	124	17.5	1.25	0.80	407984 *
	200	250	180	15	1.5	2.40	417135

Table 38

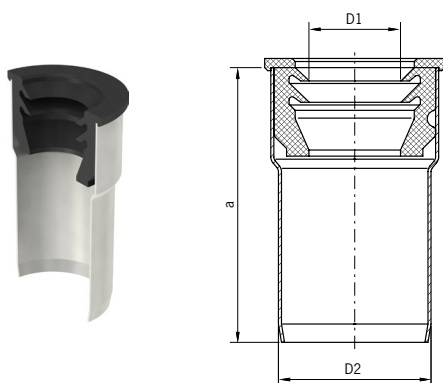
* Material AISI 304 only



AP concentric increaser coupling

Seal material	D1 [mm]	D2 [mm]	a [mm]	Wall Thickness [mm]	Weight [kg]	Order No. AISI 316L
EPDM	40	50	85	1.0	0.25	417416
	40	75	85	1.0	0.26	417417
	50	75	88	1.0	0.28	419826
	50	110	113	1.0	1.41	417018
	75	110	105	1.0	4.42	419828
	110	125	107	1.0	0.60	419780
	110	160	126	1.0	0.87	419830
	125	160	160	1.0	1.20	419811
	160	200	200	1.25	1.80	419441
	200	250	180	1.5	2.40	417133

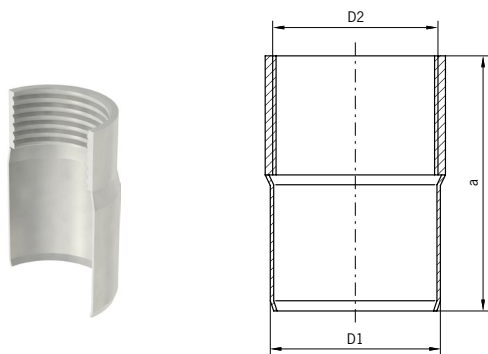
Table 39



AP increaser connector

Seal material	D1 [mm]	D2 [mm]	a [mm]	Weight [kg]	Order No. AISI 316L
NBR	32	50	90	0.20	419373
NBR	40	50	90	0.20	419374

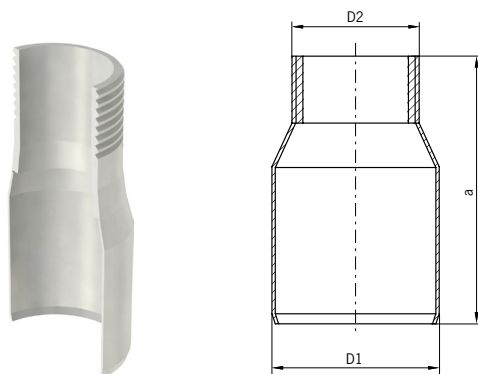
Table 40



AP connector with internal screw thread and spigot

D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
50	G 1"	80	0.2	98993
50	G 1¼"	72	0.2	98956
50	G 1½"	75	0.3	98957
50	G 2"	80	0.3	98958

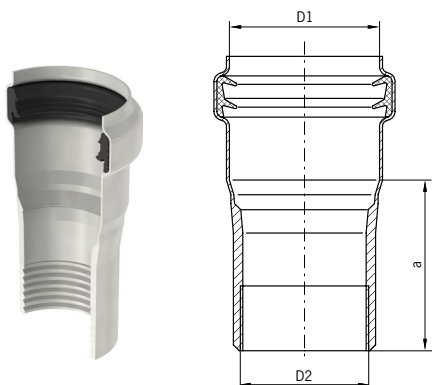
Table 41



AP connector with external screw thread and spigot

D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
50	G 1"	100	0.2	Z203542
50	G 1¼"	100	0.2	419330
50	G 1½"	100	0.3	419331
50	G 2"	100	0.3	419332

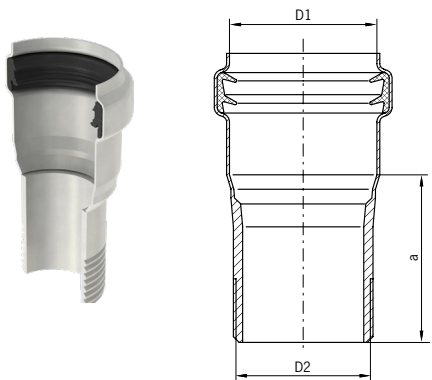
Table 42



AP connector with socket and internal screw thread

Seal material	D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	G 1¼"	58	0.2	419333
	50	G 1½"	58	0.3	419335
	50	G 2"	58	0.3	419337

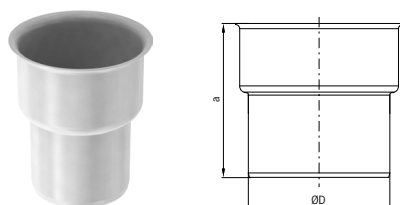
Table 43



AP connector with socket and external screw thread

Seal material	D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	G 1¼"	58	0.2	419250
	50	G 1½"	58	0.3	419252
	50	G 2"	58	0.3	419254

Table 44

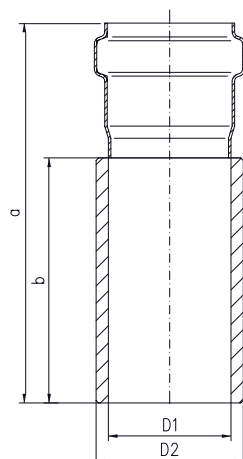


AP connector cast Iron spigot → ACO pipe socket

Seal material	D [mm]	a [mm]	Weight [kg]	Order No. AISI 316L
EPDM	75	121	0.4	98904
	110	137	0.6	98906

Table 45

Note: To be used with reduction sealing item number 400580 for DN75 and 400581 for DN110. More information on page 48

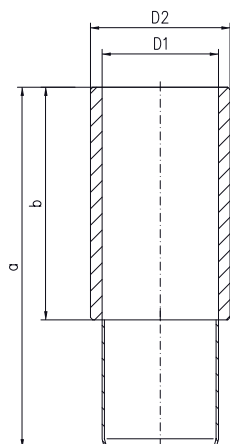


Weld on piece with socket form

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	60.30	155	100	0.77	417006
	75	88.90	160	100	1.53	417010
	110	125	170	100	2.34	417014

Table 46

* Special parts upon request

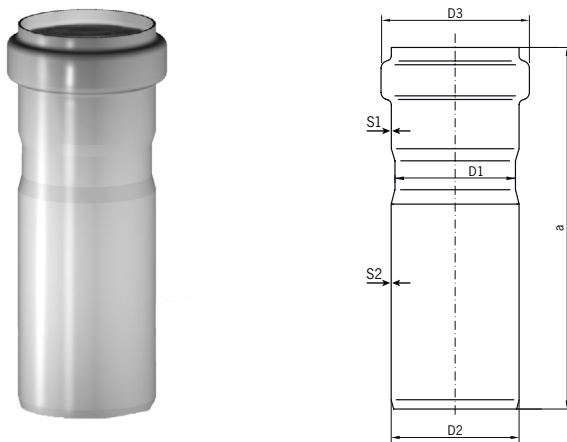


Weld on piece with spigot form E2

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	60.30	155	100	0.90	419963
	75	88.90	160	100	1.60	419965
	110	125	155	100	1.60	419967

Table 47

* Special parts upon request



With ACO pipe discharge pipe on ACO GM-X push-fit sockets

Seal material	ACO-pipe DN	D1 [mm]	D2 [mm]	D3 [mm]	a [mm]	S1 [mm]	S2 [mm]	ACO pipe Art.Nr.	ACO GM-X D5
EPDM	50	50	53	62.0	150	1.00	1.50	419821	53
	75	75	73	87.5	150	1.00	1.00	419822	73
	110	110	102	125.5	170	1.00	1.00	419823	102
	125	125	133	141.0	183	1.00	1.00	419858	133
	160	160	159	178.0	200	1.25	1.25	419824	159
	200	200	219	219.0	250	1.50	1.50	419825	219

Table 48

With ACO pipe discharge pipe on LORO - X - and LORO - XC socket

Seal material	ACO-pipe DN	D1 [mm]	D2 [mm]	D3 [mm]	a [mm]	S1 [mm]	S2 [mm]	ACO pipe Art.Nr.	ACO GM-X D5
EPDM	50	50	53	62.0	150	1.00	1.50	419821	53
	75	75	73	87.5	150	1.00	1.00	419822	73
	110	110	102	125.5	170	1.00	1.00	419823	102
	125	125	133	141.0	183	1.00	1.00	419858	133
	160	160	159	178.0	200	1.25	1.25	419824	159
	200	200	219	219.0	250	1.50	1.50	419825	219

Table 49

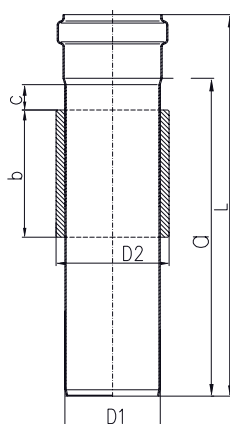
With ACO pipe discharge pipe on stainless steel - drain plug - sockets

Seal material	ACO-pipe DN	D1 [mm]	D2 [mm]	D3 [mm]	a [mm]	S1 [mm]	S2 [mm]	ACO pipe Art.Nr.	ACO GM-X D5
EPDM	50	50	53	62.0	150	1.00	1.50	419821	53
	75	75	73	87.5	150	1.00	1.00	419822	73
	110	110	102	125.5	170	1.00	1.00	419823	102
	125	125	133	141.0	183	1.00	1.00	419858	133
	160	160	159	178.0	200	1.25	1.25	419824	159
	200	200	219	219.0	250	1.50	1.50	419825	219

Table 50

ACO Marine Stainless Steel pipe

Part numbers - family range

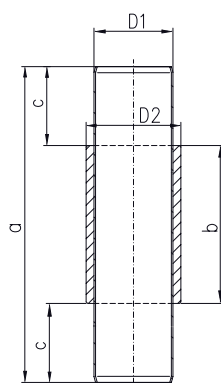


Penetration pipe acc. to EN 1124 form T2

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	L [mm]	pipe Wall Thickness (mm)	Weight (kg)	Order No AISI 304	Order No AISI 316L
EPDM	40	50	150	50	31	190	0.7	0.6	417432	417433
	40	50	250	100	30	290	1.0	1.0	417509	417510
	50	60	150	50	33	192	1.0	0.6	419060	98990
	50	60	250	100	33	292	1.0	1.0	419062	98898
	50	60	500	100	33	542	1.0	1.5	419064	98980
	75	85	150	50	24	200	1.0	0.9	419068	98982
	75	85	250	100	24	300	1.0	1.5	419070	98950
	75	85	500	100	24	550	1.0	2.0	419072	98984
	110	120	150	50	18	207	1.0	1.3	419076	98986
	110	120	250	100	18	307	1.0	2.4	419078	98952
	125	135	250	100	12	313	1.0	3.0	419852	419853
	110	120	500	100	18	557	1.0	3.0	419080	98988
	160	170	250	100	10	320	1.25	3.4	419084	98954
	200	210	250	100	10	330	1.5	3.8	417511	417512

Table 51

* special parts upon request

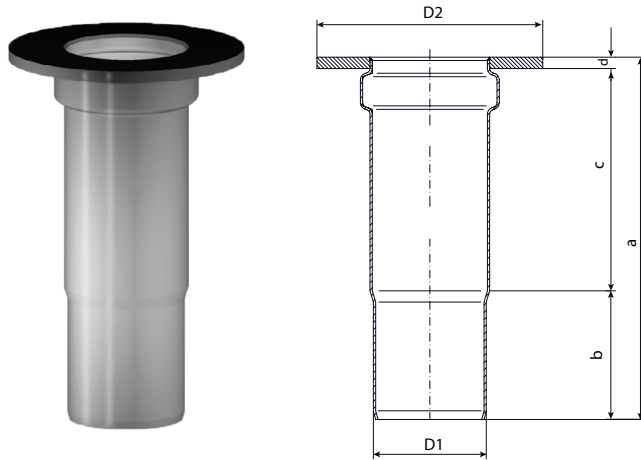


Toilet Penetration

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	pipe Wall Thickness (mm)	Weight (kg)	Order No AISI 304	Order No AISI 316L
EPDM	40	50	200	100	50	1.0	0.8	417513	417514
	50	60	200	100	50	1.0	1.0	419272	419273

Table 52

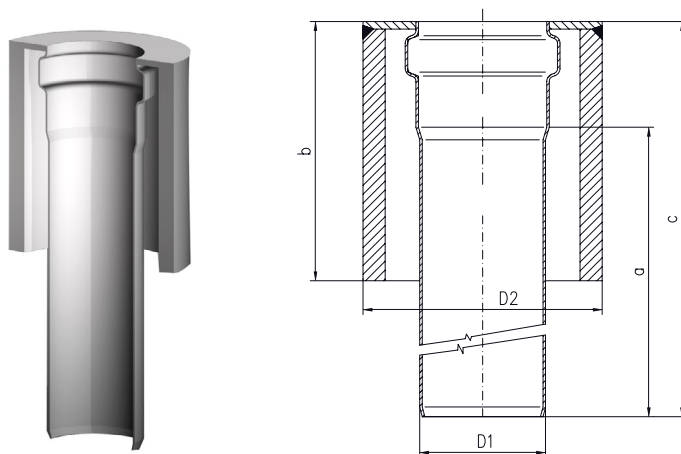
* special parts upon request



Flange Penetration with Expansion Socket

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	d [mm]	Weight (kg)	Order No AISI 304	Order No AISI 316L
EPDM	40	100	150	60	85	5	0.5	417515	417516
	50	100	160	57	98	5	0.6	419088	419006
	75	125	177	62	110	5	1.0	419094	419008
	110	160	202	79	118	5	1.0	419100	419010

Table 53

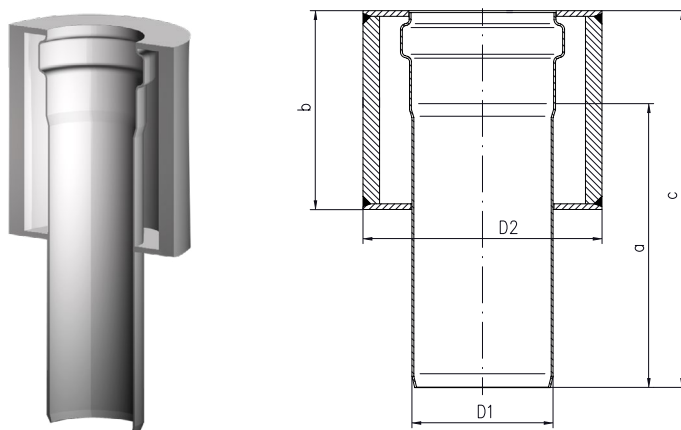


Penetration form R1B with a black pod with opened bottom, for direct welding in the deck | acc. to EN 1124 form T2

Seal material	ACO pipe DN	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	Weight (kg)	Order No AISI 316L
EPDM	040	40	90	115	103	155	1.4	417518
	050	50	95	150	103	192	2.29	419688
	075	75	127	150	103	200	3.15	419689
	110	110	152.4	150	103	207	4.0	419690

Table 54

* Special parts upon request

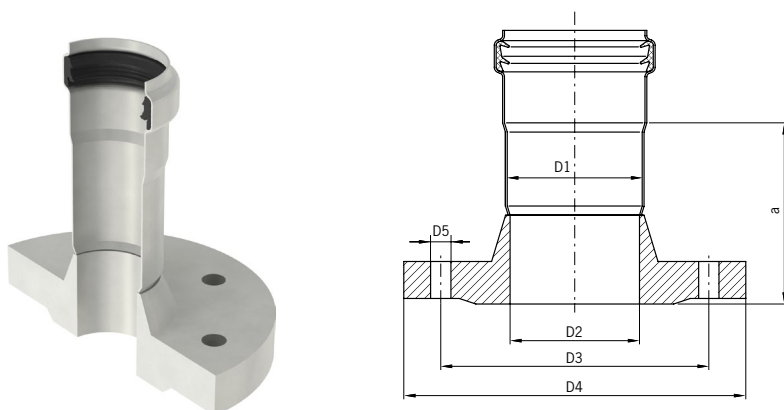


Penetration form R1B with a black pod with closed bottom, for direct welding in the deck | acc. to EN 1124 form T2

Seal material	ACO pipe DN	D1 [mm]	D2 [mm]	a [mm]	b [mm]	c [mm]	Weight (kg)	Order No AISI 316L
EPDM	040	40	90	115	106	156	1.6	417537
	050	50	95	150	106	193	2.49	417534
	075	75	127	150	106	201	3.35	417535
	110	110	152.4	150	106	208	4.2	417536

Table 55

* Special parts upon request



AP connector with socket and flange | acc. to EN 1124 form M1. PN-6 DIN 2631, PN - 10 DIN 2632. PN - 16-DIN 2633

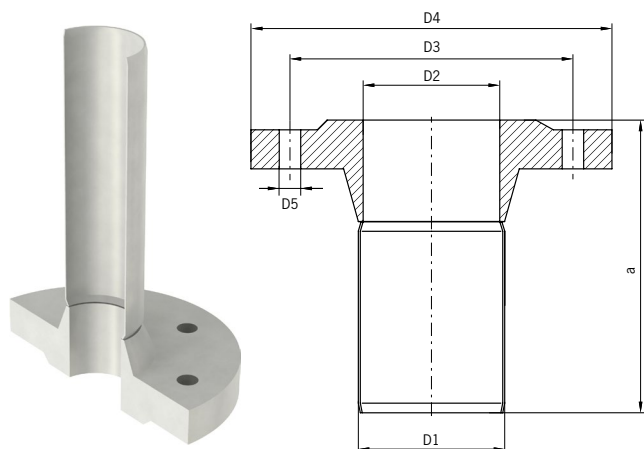
Seal material	D1 [mm]	D2	D3 [mm]	D4 [mm]	n × D5 [mm]	a [mm]	b [mm]	PN	Weight [kg]	Order No. AISI 316L
EPDM	50	DN 40	100	130	4x14	96	138	6	1.30	419528
	50	DN 50	110	140	4x14	93	135	6	1.50	419530
	75	DN 65	130	160	4x14	93	143	6	1.90	419532
	110	DN 110	170	210	4x18	93	150	6	3.60	419534
	125	DN 125	200	240	8x18	100	163	6	5.00	419970
	160	DN 150	225	265	8x18	78	148	6	5.70	419536
	200	DN 200	280	320	8x18	95	175	6	8.80	419538
	50	DN 40	110	150	4x18	100	142	10	2.00	419516
	50	DN 50	125	165	4x18	100	142	10	2.70	419518
	75	DN 65	145	185	4x18	100	150	10	3.30	419520
	110	DN 100	180	220	8x18	100	157	10	4.90	419522
	125	DN 125	210	250	8x18	100	163	10	5.00	419972
	160	DN 150	240	285	8x22	85	155	10	8.30	419524
	200	DN 200	295	340	8x22	102	182	10	12.30	419526
	50	DN 40	110	150	4x18	100	142	16	2.30	419256
	50	DN 50	125	165	4x18	100	142	16	2.70	419258
	75	DN 65	145	185	4x18	100	150	16	3.40	419260
	110	DN 100	180	220	8x18	100	157	16	4.90	419262
	125	DN 125	210	250	8x18	100	163	16	5.00	419974
	160	DN 150	240	285	8x22	85	155	16	8.30	419512
	200	DN 200	295	340	12x22	102	182	16	12.00	419514

Table 56

Note:

n – number of holes for screws in the flange.

ANSI and JIS socket flanges available upon request



AP connector with flange and spigot | acc. to EN 1124 form M1. PN-6 DIN 2631, PN - 10 DIN 2632. PN - 16-DIN 2633

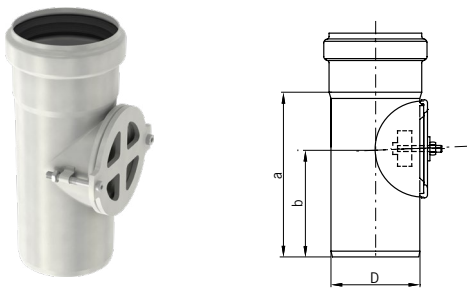
Seal material	D1 [mm]	D2	D3 [mm]	D4 [mm]	n × D5 [mm]	a [mm]	PN	Weight [kg]	Order No. AISI 316L
EPDM	50	DN 40	100	130	4x14	188	6	1.40	419548
	50	DN 50	110	140	4x14	185	6	1.50	419549
	75	DN 65	130	160	4x14	238	6	2.00	419550
	110	DN 110	170	210	4x18	252	6	3.80	419551
	125	DN 125	200	240	8x18	260	6	5.30	419976
	160	DN 150	225	265	8x18	193	6	5.90	419552
	200	DN 200	280	320	8x18	233	6	9.10	419553
	50	DN 40	110	150	4x18	192	10	2.00	419542
	50	DN 50	125	165	4x18	192	10	2.70	419543
	75	DN 65	145	185	4x18	245	10	3.40	419544
	110	DN 100	180	220	8x18	259	10	5.20	419545
	125	DN 125	210	250	8x18	260	10	5.30	419977
	160	DN 150	240	285	8x22	200	10	8.50	419546
	200	DN 200	295	340	8x22	240	10	12.60	419547
	50	DN 40	110	150	4x18	192	16	2.30	419264
	50	DN 50	125	165	4x18	192	16	2.70	419265
	75	DN 65	145	185	4x18	245	16	3.40	419266
	110	DN 100	180	220	8x18	259	16	4.90	419267
	125	DN 125	210	250	8x18	260	16	5.30	419978
	160	DN 150	240	285	8x22	200	16	8.50	419540
	200	DN 200	295	340	12x22	240	16	12.30	419541

Table 57

Note:

n – number of holes for screws in the flange.

ANSI and JIS socket flanges available upon request

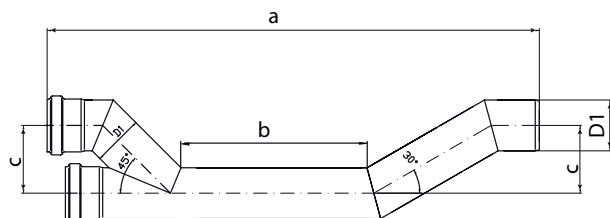
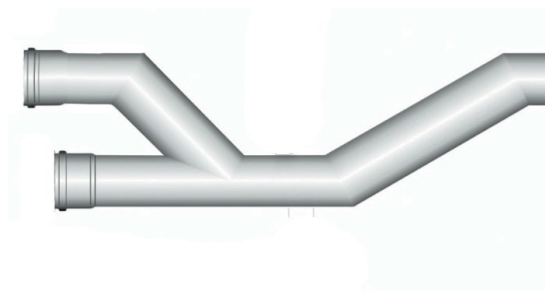


AP access unit

according to EN-1124 form It1

Seal material	D [mm]	a [mm]	b [mm]	Wall thickness S [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
EPDM	75	139	90	1.0	0.5	98913	98963
	110	183	117	1.0	0.8	98915	98965
	125	210	135	1.0	0.9	419783	419785
	160	288	184	1.25	2.3	98917	98967
	200	293	186	1.5	3.7	419676	419678
	250	290	184	1.5	3.8	-	417128

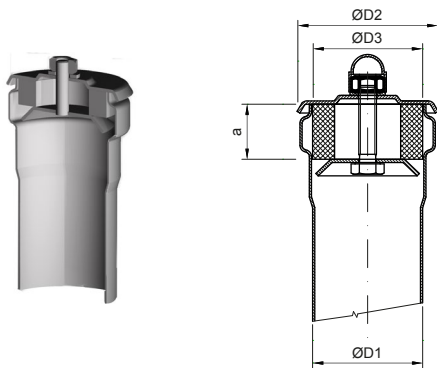
Table 58



Vacuum transport pocket

Seal material	D1 [mm]	a [mm]	b [mm]	c [mm]	Wall Thickness [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	598	183	100	1.0	1.1	417032
	75	726	275	100	1.0	1.8	417036

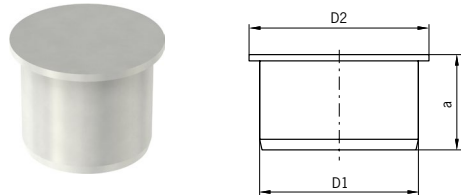
Table 59



Drainplugs with screwed plug

D1 [mm]	D2 [mm]	D3 [mm]	a [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
40	64	40	25	0.15	417403	417404
50	64	50	25	0.08	419942	419948
75	92	75	25	0.50	419943	419949
110	126	105	15	0.50	419944	419950
125	160	124	12	0.90	419945	419951
160	186	166	20	1.20	419946	419952

Table 60

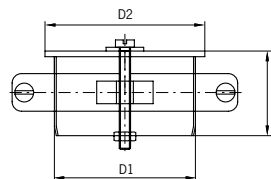
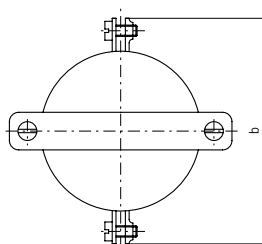


AP socket plug

according to EN-1124 form K10

D1 [mm]	a [mm]	D2 [mm]	Weight [kg]	Order No. AISI 316L
40	35	50	0.07	417405
50	45	58	0.10	98888
75	45	85	0.30	98889
110	45	120	0.50	98890
125	50	135	0.60	419782
160	50	170	0.50	98891
200	50	210	0.70	98994
250	83	260	1.0	417131

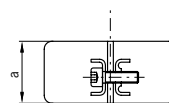
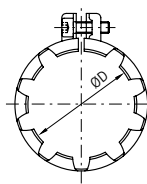
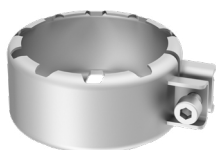
Table 61



AP socket plug with clamp

D1 [mm]	D2 [mm]	a [mm]	b [mm]	Weight [kg]	Order No. AISI 316L
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

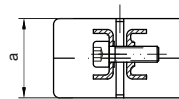
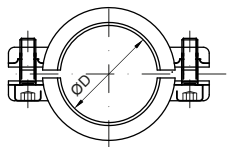
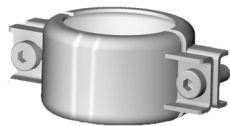
Table 62



AP socket clamp

D [mm]	a [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
50	40	0.11	417066	417067
75	43	0.16	417068	417069
110	43	0.25	417226	417227

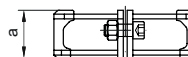
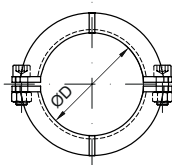
Table 63



AP socket clamp two parts

D [mm]	a [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
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

Table 64



AP peak pressure clamp

D [mm]	D1 [mm]	D2 [mm]	D3 [mm]	a [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
50	49.5	55	84	104	0.45	417167	417168
75	73.5	80	113	150	0.62	417169	417170
110	108	115	110	168	0.84	417171	417172

Table 65



AP reduction sealing cast Iron spigot → ACO pipe socket

Outlet diameter D [mm]	Weight [kg]	Order No. EPDM
DN 70/75	0.06	400580
DN 100/110	0.10	400581

Table 66

Note:

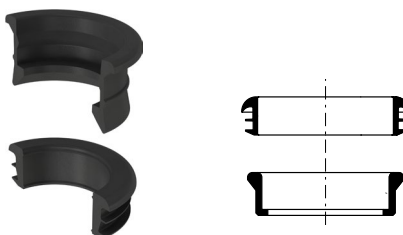
While purchasing AP reduction sealing cast iron spigot → ACO pipe it is necessary order AP cast iron connector.



AP reduction sealing ACO pipe spigot → cast iron socket

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

Table 67

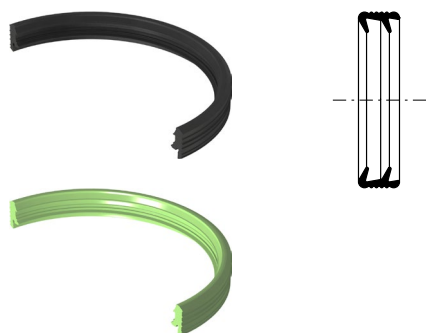


AP reduction sealing set for cast iron

Outlet diameter D [mm]	Weight [kg]	Order No. EPDM
DN 70/75	0.11	419370
DN 100/110	0.18	419371
DN 150/160	0.26	419372

Table 68

Note: Set of reduction sealings cast iron spigot → ACO pipe socket and ACO pipe spigot → cast iron socket.



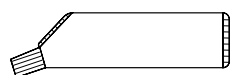
AP pipe seal

Outlet diameter D [mm]	Weight [kg]	Order No. EDPM
40	0.01	417400
50	0.01	98400
75	0.02	98401
110	0.05	98402
125	0.06	419453
160	0.08	98403
200	0.10	98433
250	0.12	417146

Table 69

Note:

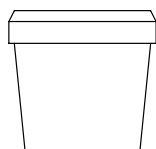
ACO pipe seals in indifferent grades (Viton® and NBR) grades are available on request.



ACO Universal Lubricant

Weight [kg]	Order No.
0.15	E80350000

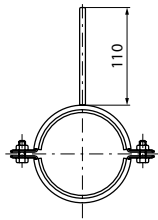
Table 70



ACO Universal Lubricant in bucket 1kg

Weight [kg]	Order No.
1.00	E80350001

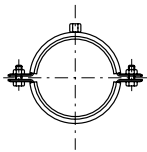
Table 71



Support bracket with weld-on-rod

Outlet diameter D [mm]	Weight [kg]	Order No. AISI 316L
40	0.21	417358
50	0.25	419680
75	0.33	419681
110	0.44	419682
125	0.47	419856
160	0.50	419683
200	0.55	419684

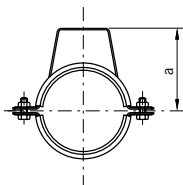
Table 72



AP support bracket with rubber infill

Outlet diameter D [mm]	Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
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

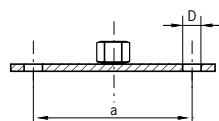
Table 73



AP support bracket with rubber infill and stirrup

Outlet diameter D [mm]	Dimension a [mm]	Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
50	56	0.18	400541	400537
75	80	0.28	400542	400538
110	116	0.41	400543	400539
160	166	0.48	400544	400540

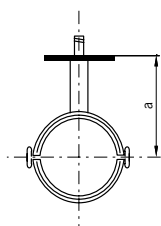
Table 74



AP socket plug

Outlet diameter D [mm]	Dimension a [mm]	Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
8.4	70	0.05	400525	400521

Table 75



AP support bracket with rubber infill and key

Outlet diameter D [mm]	Dimension a [mm]	Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
50	120	0.24	400549	400545
75	133	0.33	400550	400546
110	150	0.43	400551	400547
160	175	0.49	400552	400548

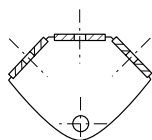
Table 76



AP threaded support pole M8

D [mm]	Length l [mm]	Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
M8	1000	0.39	400557	400553
M8	90	0.03	400558	400554
M8	40	0.016	400559	400555

Table 77



AP set for axial fixing

Weight [kg]	Order No. Galvanised steel	Order No. AISI 316L
0.11	400565	400561

Table 78

Note: Six M8 nuts included



AP ACO pipe cutter manual 50–110 mm

Note	Weight [kg]	Order No.
in plastic case	3.50	419363

Table 79

AP replacement discs for ACO pipe cutters manual

Note	Weight [kg]	Order No.
for cutter manual 419363	0.005	419365

Table 80

Note: Minimum order quantity 10pcs.



AP pipe manual cutter

D [mm]	Weight [kg]	Order No.
50–110	1.0	419364
110–160	2.0	400738

Table 81

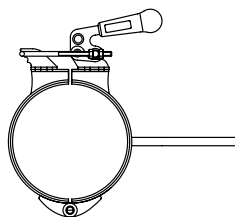
Note: While purchasing AP manual cutter it is necessary order AP holder for manual cutting.

AP replacement discs for manual cutter disc

Note	Weight [kg]	Order No.
for cutter 400738 and 419364	0.005	400578

Table 82

Note: Minimum order quality - 10pcs



AP holder for manual cutting

D [mm]	Weight [kg]	Order No.
125	3.5	419857
160	4.0	400742
200	4.5	400743

Table 83

Note:

While order AP holder for manual cutting it is necessary order AP manual cutter.



Electric cutter 50 – 110 mm

Note	Weight [kg]	Order No.
in plastic case	20	400745

Table 84

AP replacement discs for ACO pipe cutters electric

Note	Weight [kg]	Order No.
for cutter electric 400745	0.05	417193

Table 85

Installation guide

Generally

The following standards will assist designers 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 but also EN 12056-2, EN 12056-3 and EN 752.

pipe cutting

If it is necessary to adapt or shorten pipe lengths then whatever tools are used, the cut must be square, clean and ready chamfered. Suitable cutters and whole cutter sets are available from ACO (see page 53).

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 mating 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 home into the socket recess so as to allow for thermal expansion within the system.



Always wear protective gear



Vertical pipe stacks

When designing a rainwater or soil and waste system, pipe work must be supported at not more than 2 meter centres and vertical pipes should be fixed to the wall not less than 30 mm to facilitate maintenance and painting. Allow at least one bracket per fitting preferably at the downstream end of the fitting with additional brackets at changes of direction or junction points.

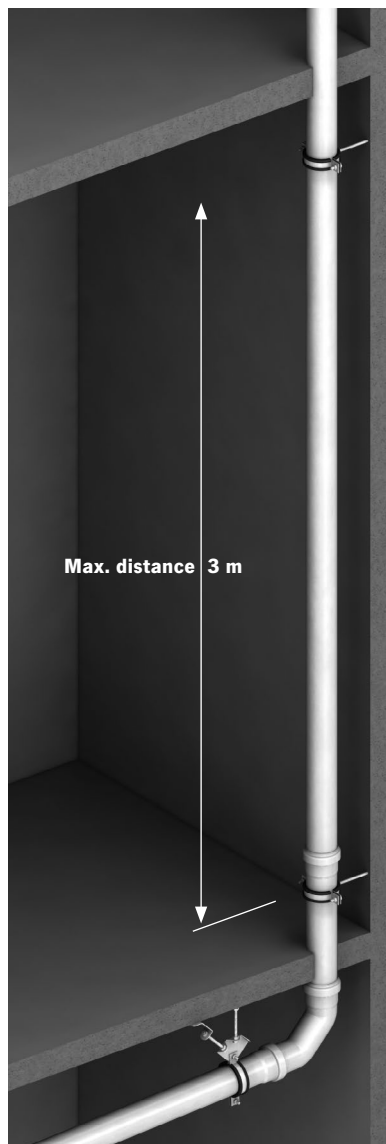
pipe weights

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 of the pipe between brackets should not exceed 1.5 mm. The discretion of the installer should be applied in each instance to ensure that the pipe is adequately supported.

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

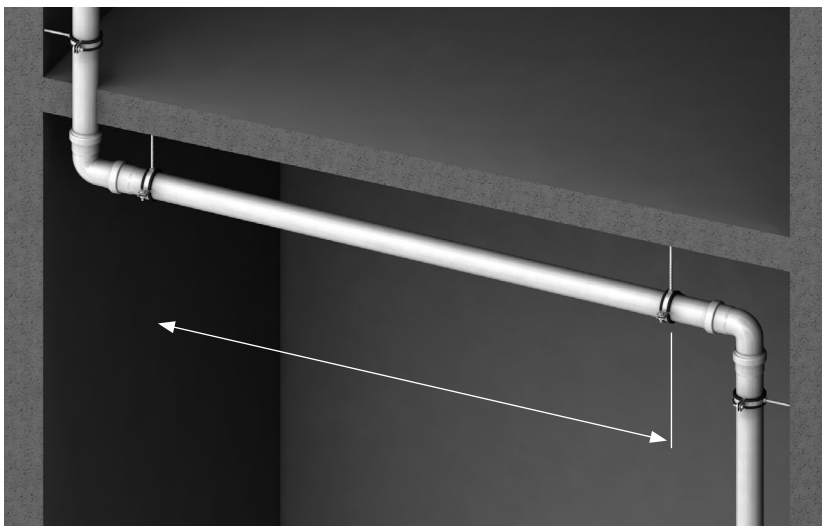
pipe diameter bracket spacing*

Pipe diameter [mm]	Length [m]
50	2.0
75	2.3
110	2.5
125	3.0
200	3.0



Horizontal pipe runs

Horizontal pipe work should be supported with at least two brackets per 3 meter pipe length. 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 2 metres from the next bracket. 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.



Socket clamps

The ACO pipe socketed systems have push-fit socket joints and consequently they will not be able to resist internal pressure unless precautions are made to ensure that the joints will not slide apart.

Appropriate fixing to the structure can prevent the joints from sliding apart in most cases, but if it is difficult or impossible to fix the pipes to the structure, the socket clamps (page 46) and pressure peak clamps can prevent the push-fit sockets and spigot ends from sliding apart if the system is overloaded or internal pressure is generated.

Working pressure

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.

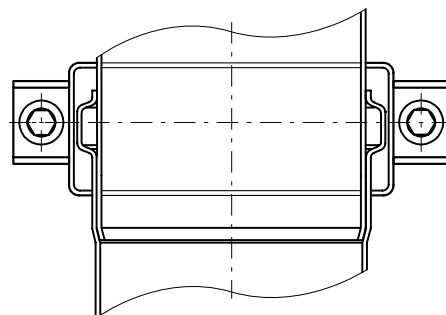
Vacuum applications

Pipe diameter [mm]	Max. 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

AP Socket clamp

Pipe diameter [mm]	Max. pressure [bar]	Max. pressure [bar]
	Without socket clamp	With socket clamp
40	0.5	2.0
50	0.5	2.0
75	0.5	2.0
110	0.5	2.0
160	0.5	1.0

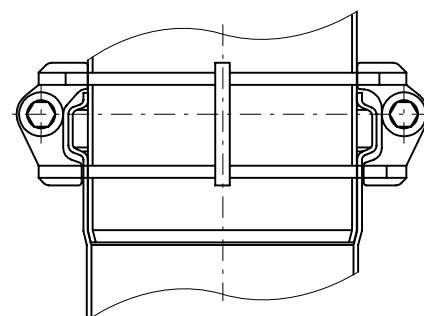
Table 86



AP Pressure peak clamp

Pipe diameter [mm]	Max. pressure [bar]
50	8.0
75	8.0
110	8.0

Table 87



ACO pipe material information

Thermal movement

ACO pipe stainless steel pipe work systems have a low coefficient of thermal expansion, of approximately 1 in 1000 mm 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	1.44 mm
■ Copper	0.98 mm
■ Grey cast iron	0.75 mm
■ HDPE	9.0 mm
■ PVCu	3.0 mm
■ Stainless steel	0.99 mm

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

Table 88

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.

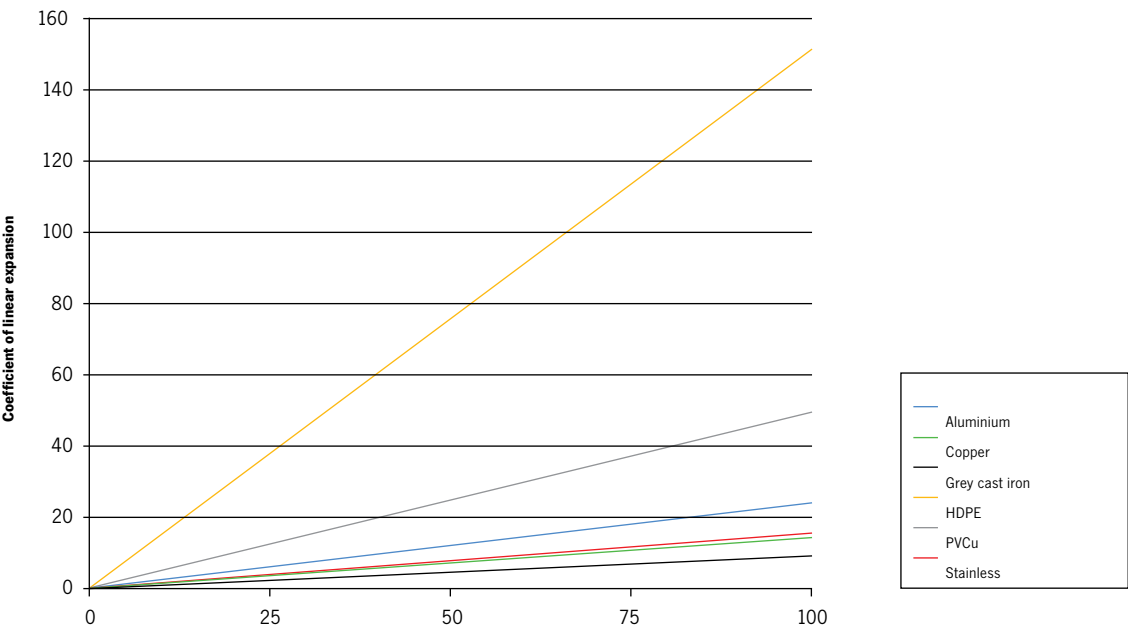
Engineers will need to know weights and loading when designing vertical stack and horizontal pipe run systems. The table below gives weights for all pipe sizes empty and full of water.

pipe diameter [mm]	pipe weight Empty [kg/m]	pipe weight full (water) [kg/m]
50	1.2	3.0
75	1.8	6.9
110	2.7	11.9
125	3.3	15.8
160	5.0	24.6
200	7.5	38.0

Table 89

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

Thermal expansion



Sealing materials

Seal material information

The ACO pipe socketed stainless steel pipe systems are fitted with a unique, double lip seal manufactured from either EPDM, NBR or Viton®. The double lip seal arrangement provides added security for the ultimate in long term reliability.

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 (nitril butan rubber)

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

FPM (fluorelastomer) – Viton®

Green sealing rubber ring 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.

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



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

* Table 90

Viton® is a registered trademark for fluoroelastomer by DuPont Performance Elastomers L.L.C.

Please contact ACO in case of any doubts regarding this topic.

Care and maintenance

Cleaning methods

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

Precautions

If all the suggestions and actions in the table below have been attempted, stainless steel has the facility to be mechanically cleaned by specialists on site. Please contact ACO Industries for further assistance.

Problem	Cleaning agent	Comment
Routine cleaning, all finishes.	Soap or mild detergent and water (such as washing up liquid).	Sponge, rinse with clean water, wipe dry if necessary.
Fingerprints, all finishes.	Soap or warm water or organic solvent (e.g. acetone, alcohol).	Rinse with clean water, wipe dry if necessary.
Stubborn stains and discolouration.	Mild cleaning solutions (e.g. Jif, Goddard stainless steel care).	Rinse well with clean water and wipe dry.
Oil and grease marks, all finishes.	Organic solvents (e.g. acetone, alcohol, trichlorethylene).	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 water. May continue using Jif to give final clean.	Rinse well with clean water (precautions for acid cleaners should be observed).
Scratches on brush (satin) finish.	Household synthetic fibre scouring pads (e.g. Scotch Brite fibre pad). For deeper scratches; apply in direction of polishing. The clean with soap or detergent as per routine cleaning.	Do not use ordinary steel wool (iron particles can become embedded in stainless steel and cause further surface problems).

Table 91

Resistance of materials

1 = Very good service to operating limit of material 2 = Moderate service 3 = Limited or variable service 4 = Unsatisfactory	AISI 316L L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
Acetone	1	1	1	4	4	2	1	4	4
Acetic acid (diluted) 30%	1	1	1	3	3	1	1	2	2
Acetic acid 100%	1	1	1	4	4	3	1	3	3
Acetic acid anhydride	1	1	1	2	4	3	2	3	4
Aluminium chloride	4	4	2	1	1	1	1	1	1
Aluminium sulfate	1	4	2	1	1	1	1	1	1
Ammonium carbonate	1	1	2	1	1	1	1	4	-
Ammonium chloride	2	3	2	1	1	1	1	1	-
Ammonium hydroxide	1	1	2	1	1	1	1	4	2
Amyl chloride	1	1	2	4	4	4	-	-	-
Anilin	1	1	2	4	4	2	2	4	3

1 = Very good service to operating limit of material 2 = Moderate service 3 = Limited or variable service 4 = Unsatisfactory	AISI 316L L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
Anilin hydrochloride	4	4	2	2	4	4	2	2	2
Barium chloride	2	2	2	1	1	1	1	1	1
Barium hydroxide	1	1	2	1	1	1	1	1	1
Benzaldehyde	1	1	2	4	4	3	1	4	4
Benzene	1	1	1	4	4	4	4	4	1
Benzoic acid	1	1	2	1	1	2	-	-	1
Borax	1	1	2	1	1	1	1	2	1
Boric acid	1	1	2	1	1	1	1	1	1
Bromine	4	4	4	4	4	4	-	-	1
Bromine chloride acid	4	4	4	1	4	3	1	2	1
Bromine hydrogen acid	4	4	4	1	1	3	1	4	1

1 = Very good service to operating limit of material 2 = Moderate service 3 = Limited or variable service 4 = Unsatisfactory	AISI 316L L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
Bromoethylene	1	1	2	4	4	4	-	-	-
Butanol	1	1	1	4	4	4	4	1	1
Butyl acetat	1	1	2	4	4	4	2	-	4
Butyric acid	1	1	1	4	4	1	-	-	-
Calcium bisulfate el sulfite	1	1	4	1	1	1	4	1	1
Calcium chloride	2	2	2	1	1	1	1	1	1
Calcium hydroxide	1	1	3	1	1	1	1	1	1
Calcium hypoklorite	2	3	2	1	3	2	1	3	1
Carbon disulfide	1	1	1	4	4	4	-	-	-
Carbon tetrachloride	1	1	1	4	4	4	4	3	1
Chloracetic acid (mono)	4	4	2	4	4	4	2	-	-
Chloride	4	4	2	3	1	4	-	-	-
Chloril acid	4	4	2	3	1	4	-	-	-
Chlorine (dry)	1	1	2	4	4	4	-	-	1
Chlorobenzene	1	1	2	4	4	4	4	4	1
Chloroform	2	2	2	4	4	4	4	4	1
Chlorosulfonic acid	2	3	1	4	4	4	4	4	3
Copper chloride	2	2	2	1	1	2	1	1	1
Copper nitrate	1	1	1	1	1	2	-	-	-
Copper sulfate	1	1	1	1	1	2	1	1	1
Ether	1	1	1	4	4	4	-	-	-
Ethyl chloride	1	1	1	4	4	4	1	1	1
Fatty acid	1	1	1	4	1	2	4	2	1
Flouiner (dry)	1	1	4	4	2	4	-	-	-
Flourine hydrogen acid	4	4	4	2	3	3	2	4	1
Formaldehyde	1	1	1	1	1	2	1	2	1
Formic acid	1	1	1	3	4	2	1	2	3
Furfural	1	1	2	4	4	4	2	4	4
Gallic acid	1	1	1	1	1	1	2	2	1
Hydrochloric acid	4	4	4	1	1	1	1	4	1
Hydrogen peroxide	1	1	2	3	4	3	3	4	2
Iodine (wet)	4	4	4	4	4	3	-	-	-
Lead acetate	1	1	2	1	1	1	1	2	-
Magnesium chloride	2	2	2	1	1	1	1	1	1
Magnesium sulfate	1	1	1	1	1	1	1	1	1
Mercury	1	1	1	1	1	1	1	1	1
Methanol	1	1	1	1	1	2	1	1	3
Methyl chloride	1	1	1	4	4	4	3	4	1
Methylene chloride	2	2	1	4	4	4	4	4	2
Natphalene	1	1	2	4	1	3	4	4	1
Nickel chloride	2	2	2	1	1	1	1	1	1
Nickel sulfate	1	1	2	1	1	1	1	1	1
Nitric acid	3	3	1	4	4	4	3	4	1
Oxalic acid	3	3	2	1	1	3	1	2	1
Perchloric acid	4	4	1	1	4	3	2	-	1
Phorsphor acid	1	1	2	1	1	2	2	4	1
Picric acid	1	1	2	3	4	4	2	2	1
Potassium bromide	1	1	2	1	1	1	-	-	-

1 = Very good service to operating limit of material 2 = Moderate service 3 = Limited or variable service 4 = Unsatisfactory	AISI 316L L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
Potassium carbonate	1	1	2	1	1	1	-	-	-
Potassium chlorate	1	1	2	1	1	1	-	-	-
Potassium cyanide	1	1	2	1	1	1	1	1	1
Potassium hydroxide	1	1	4	1	1	1	1	2	2
Potassium nitrate	1	1	1	1	1	1	1	1	1
Potassium permanganate	1	1	2	2	2	3	-	-	-
Potassium sulfate	1	1	1	1	1	1	1	1	1
Potassium sulfide	1	1	1	1	1	1	-	-	-
Potassiumchloride	2	2	1	1	1	1	1	1	1
Prophylyene dichloride	1	1	1	4	4	4	-	-	-
Sal ammoniac	2	3	2	1	1	1	1	1	-
Silver nitrate	1	1	1	1	1	1	1	2	1
Soda (ash)	1	1	2	1	1	1	-	-	-
Sodium acetate	1	1	2	1	1	1	1	2	4
Sodium bicarbonate	1	1	1	1	1	1	1	1	1
Sodium bisulfate	1	3	1	1	1	1	-	-	-
Sodium bisulfite	1	1	4	1	1	1	1	1	1
Sodium bromide	2	2	2	1	1	1	-	-	-
Sodium chlorate	1	1	1	1	3	1	-	-	-
Sodium chloride	4	4	2	3	1	4	-	-	-
Sodium cyanide	1	1	1	1	1	1	1	1	1
Sodium fluoride	1	1	4	1	1	1	-	-	-
Sodium hydroxide	1	1	4	1	1	1	1	2	2
Sodium hypoklorite	4	4	2	3	1	2	2	2	1
Sodium nitrate	1	1	1	1	1	1	1	2	-
Sodium sulfate	1	1	1	1	1	1	1	1	1
Sodium sulfide	1	1	2	1	1	1	-	-	-
Sodium sulfite	1	1	4	1	1	1	-	-	-
Stannic chloride	2	3	2	1	1	1	2	1	1
Sulfur	1	1	1	3	1	2	1	4	1
Sulfur chloride	1	1	4	4	4	4	4	3	1
Sulfur dioxide	1	2	4	3	4	3	1	4	1
Sulfuric acid	4	4	1	4	4	3	2	4	1
Sulfurous acid	1	3	4	1	1	2	2	2	1
Tionyl chloride	1	1	2	4	4	3	4	-	1
Toluene (toluol)	1	1	1	4	4	4	4	4	1
Trichloroethylene	1	1	1	4	4	4	4	3	1
Turpentine	1	1	2	4	4	4	4	1	1
Xylene (xylol)	1	1	2	4	4	4	-	-	-
Zinc sulfate	1	1	1	1	1	1	-	-	-

Table 92

Note:

Concentration levels and length of exposure have a direct influence on the resistance of stainless steel to certain chemicals. Each application should therefore be carefully reviewed to determine the suitability of stainless steel.

Assumptions:

Data represented is to be used as a guide only, for detailed information please contact our technical department.

Headquarters

ACO Marine s.r.o.

Strakonicka 3367
CZ - 150 00 Praha 5
Czech Republic

e-mail: acomarine@acomarine.com
www.acomarine.com

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