



*ACO Marine Product Catalogue*

**ACO pipe stainless steel pipework systems**

**ABS**



Lloyd's  
Register



BUREAU  
VERITAS

**ACO**

# ACO. creating the future of drainage



## The ACO System Chain provides Drainage Solutions for tomorrow's 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 m<sup>3</sup>, 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](http://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 warnishing 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.

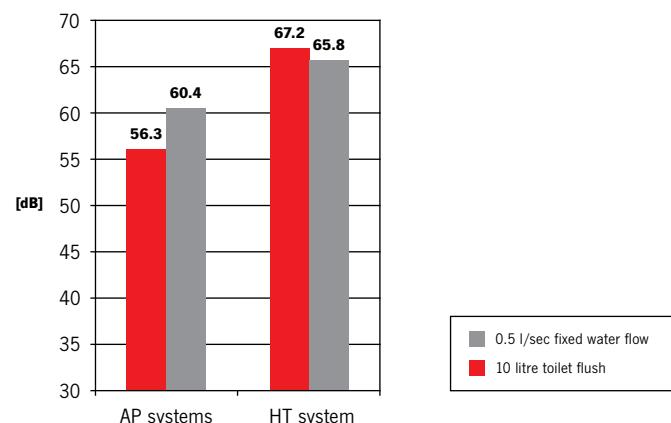
ACO PIPE double lip seal secure for the ultimate system reliability. Unique and sophisticated design of the lips and cavities gives ACO PIPE full tight construction.

**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



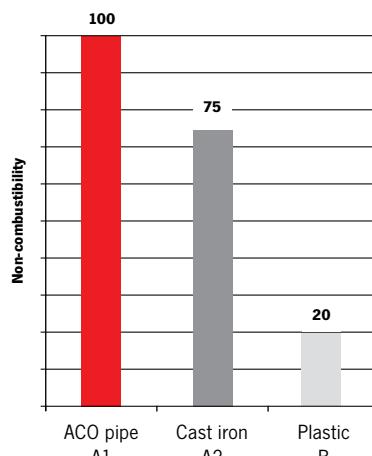
## Fire resistance

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.

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

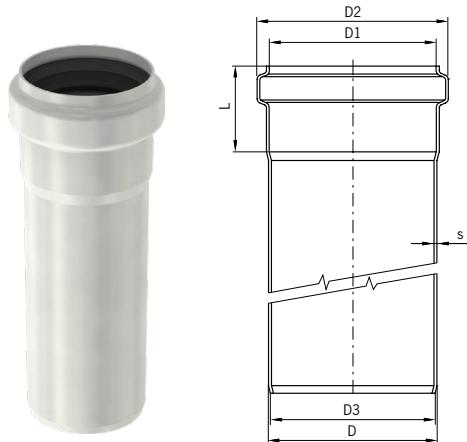
Handle the pipes and fittings with care. Any care less handling (like dumping off the truck...) can cause deformation or damage

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

# ACO Marine Stainless Steel pipe

## System overview

### ACO pipe component overview



### Dimensions of socket and spigot

D [mm]	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	D <sub>3</sub> [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 Marine Stainless Steel pipe**  
**System overview**

**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
					

# ACO Marine Stainless Steel pipe

## System overview

### 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	<b>417304</b>	<b>417320</b>
	40	40	1.0	250	0.42	<b>417306</b>	<b>417322</b>
	40	40	1.0	500	0.62	<b>417308</b>	<b>417324</b>
	40	40	1.0	750	0.80	<b>417310</b>	<b>417326</b>
	40	40	1.0	1000	1.10	<b>417312</b>	<b>417328</b>
	40	40	1.0	1500	1.60	<b>417314</b>	<b>417330</b>
	40	40	1.0	2000	2.60	<b>417316</b>	<b>417332</b>
	40	40	1.0	2500	2.80	<b>417260</b>	<b>417262</b>
	40	40	1.0	3000	3.00	<b>417318</b>	<b>417334</b>

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	<b>98500</b>	<b>98550</b>
	50	42	1.0	250	0.45	<b>98502</b>	<b>98552</b>
	50	42	1.0	500	0.70	<b>98504</b>	<b>98554</b>
	50	42	1.0	750	1.00	<b>98506</b>	<b>98556</b>
	50	42	1.0	1000	1.30	<b>98508</b>	<b>98558</b>
	50	42	1.0	1500	1.90	<b>98510</b>	<b>98560</b>
	50	42	1.0	2000	2.60	<b>98512</b>	<b>98562</b>
	50	42	1.0	2500	3.20	<b>419274</b>	<b>419282</b>
	50	42	1.0	3000	3.80	<b>98514</b>	<b>98564</b>

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

Table 4

\*other dimensions upon request

**AP socketed pipe 110 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	110	57	1.0	150	0.6	<b>98532</b>	<b>98582</b>
	110	57	1.0	250	0.9	<b>98534</b>	<b>98584</b>
	110	57	1.0	500	1.5	<b>98536</b>	<b>98586</b>
	110	57	1.0	750	2.2	<b>98538</b>	<b>98588</b>
	110	57	1.0	1000	2.9	<b>98540</b>	<b>98590</b>
	110	57	1.0	1500	4.3	<b>98542</b>	<b>98592</b>
	110	57	1.0	2000	5.7	<b>98544</b>	<b>98594</b>
	110	57	1.0	2500	7.1	<b>419278</b>	<b>419286</b>
	110	57	1.0	3000	8.4	<b>98546</b>	<b>98596</b>

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	<b>419692</b>	<b>419712</b>
	125	63	1.0	250	1.0	<b>419694</b>	<b>419714</b>
	125	63	1.0	500	1.7	<b>419696</b>	<b>419716</b>
	125	63	1.0	750	2.5	<b>419698</b>	<b>419718</b>
	125	63	1.0	1000	3.3	<b>419700</b>	<b>419720</b>
	125	63	1.0	1500	4.9	<b>419702</b>	<b>419722</b>
	125	63	1.0	2000	6.5	<b>419704</b>	<b>419724</b>
	125	63	1.0	2500	8.1	<b>419708</b>	<b>419728</b>
	125	63	1.0	3000	9.6	<b>419706</b>	<b>419726</b>

Table 6

\*other dimensions upon request

**AP socketed pipe 160 mm**

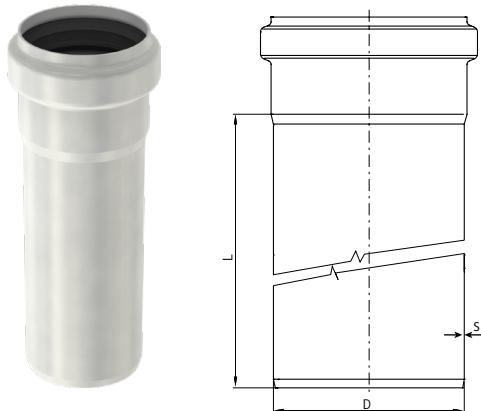
according to EN-1124 form B1

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	<b>98548</b>	<b>98598</b>
	160	70	1.25	250	1.6	<b>98600</b>	<b>98650</b>
	160	70	1.25	500	2.9	<b>98602</b>	<b>98652</b>
	160	70	1.25	750	4.1	<b>98604</b>	<b>98654</b>
	160	70	1.25	1000	5.4	<b>98606</b>	<b>98656</b>
	160	70	1.25	1500	7.9	<b>98608</b>	<b>98658</b>
	160	70	1.25	2000	10.4	<b>98610</b>	<b>98660</b>
	160	70	1.25	2500	12.9	<b>419280</b>	<b>419288</b>
	160	70	1.25	3000	15.4	<b>98612</b>	<b>98662</b>

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	<b>419383</b>	<b>419384</b>
	200	80	1.5	1000	8.3	<b>419387</b>	<b>419388</b>
	200	80	1.5	2000	15.8	<b>419391</b>	<b>419392</b>
	200	80	1.5	3000	23.2	<b>419395</b>	<b>419396</b>

Table 8

\*other dimensions upon request

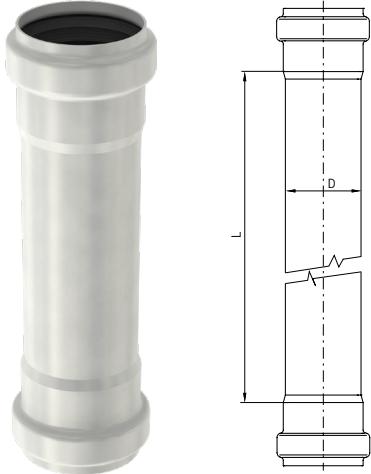
**AP socketed pipe 250 mm**

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	<b>417071</b>	<b>417072</b>
	250	90	1.5	1000	10.2	<b>417075</b>	<b>417076</b>
	250	90	1.5	2000	19.4	<b>417079</b>	<b>417080</b>
	250	90	1.5	3000	28.7	<b>417083</b>	<b>417084</b>

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	<b>417276</b>	<b>417290</b>
	40	500	0.55	<b>417278</b>	<b>417292</b>
	40	750	0.85	<b>417280</b>	<b>417294</b>
	40	1000	1.20	<b>417282</b>	<b>417296</b>
	40	1500	1.80	<b>417284</b>	<b>417298</b>
	40	2000	2.40	<b>417286</b>	<b>417300</b>
	40	3000	3.60	<b>417288</b>	<b>417302</b>

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	<b>419554</b>	<b>419594</b>
	50	500	0.70	<b>419556</b>	<b>419596</b>
	50	750	1.10	<b>419558</b>	<b>419598</b>
	50	1000	1.40	<b>419560</b>	<b>419600</b>
	50	1500	2.00	<b>419562</b>	<b>419602</b>
	50	2000	2.60	<b>419564</b>	<b>419604</b>
	50	3000	3.90	<b>419566</b>	<b>419606</b>

Table 10

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**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	<b>419568</b>	<b>419608</b>
	75	500	1.2	<b>419570</b>	<b>419610</b>
	75	750	1.6	<b>419572</b>	<b>419612</b>
	75	1000	2.1	<b>419574</b>	<b>419614</b>
	75	1500	3.0	<b>419576</b>	<b>419616</b>
	75	2000	4.0	<b>419578</b>	<b>419618</b>
	75	3000	5.8	<b>419580</b>	<b>419620</b>

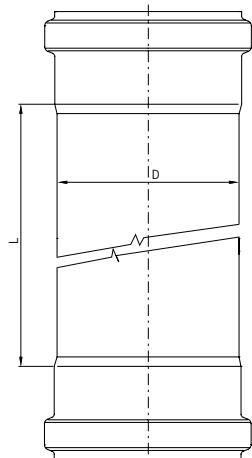
Table 11

**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	<b>419582</b>	<b>419622</b>
	110	750	2.4	<b>419584</b>	<b>419624</b>
	110	1000	3.0	<b>419586</b>	<b>419626</b>
	110	1500	4.4	<b>419588</b>	<b>419628</b>
	110	2000	5.7	<b>419590</b>	<b>419630</b>
	110	3000	8.4	<b>419592</b>	<b>419632</b>

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	<b>419787</b>	<b>419799</b>
	125	750	2.5	<b>419789</b>	<b>419801</b>
	125	1000	3.3	<b>419791</b>	<b>419803</b>
	125	1500	4.9	<b>419793</b>	<b>419805</b>
	125	2000	6.5	<b>419795</b>	<b>419807</b>
	125	3000	9.6	<b>419797</b>	<b>419809</b>

Table 13

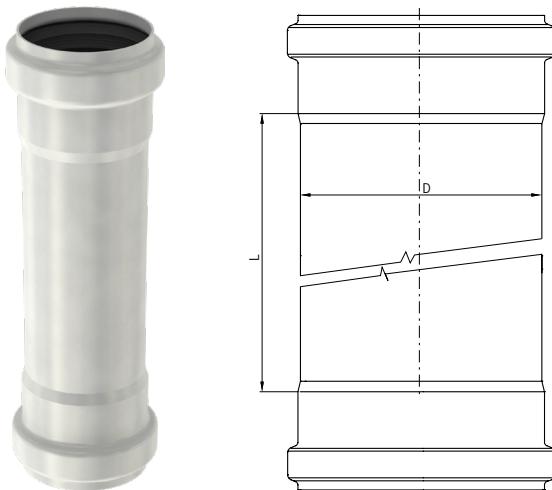
**AP double socketed pipe 160 mm**

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	<b>419634</b>	<b>419646</b>
	160	750	4.5	<b>419636</b>	<b>419648</b>
	160	1000	5.8	<b>419638</b>	<b>419650</b>
	160	1500	8.2	<b>419640</b>	<b>419652</b>
	160	2000	10.7	<b>419642</b>	<b>419654</b>
	160	3000	15.7	<b>419644</b>	<b>419656</b>

Table 14

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



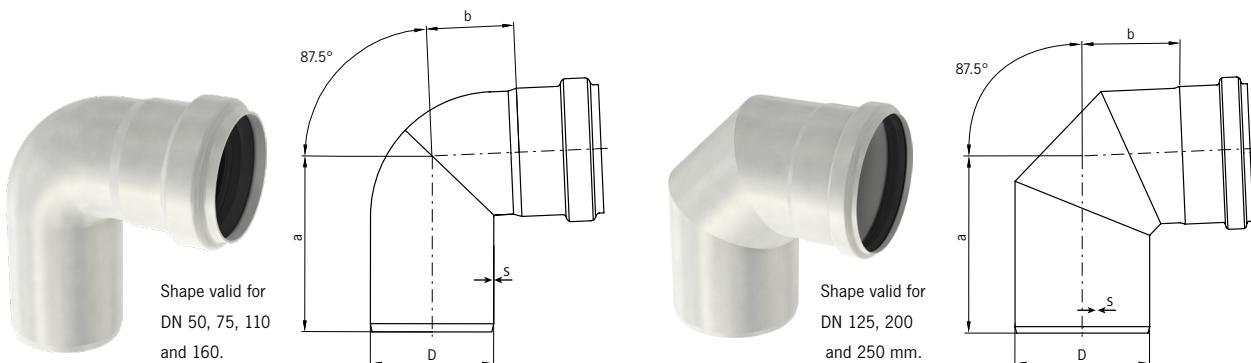
**AP double socketed pipe 200 mm**

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	<b>419658</b>	<b>419659</b>
	200	1000	8.6	<b>419662</b>	<b>419663</b>
	200	2000	15.9	<b>419666</b>	<b>419667</b>
	200	3000	23.1	<b>419670</b>	<b>419671</b>

Table 15

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

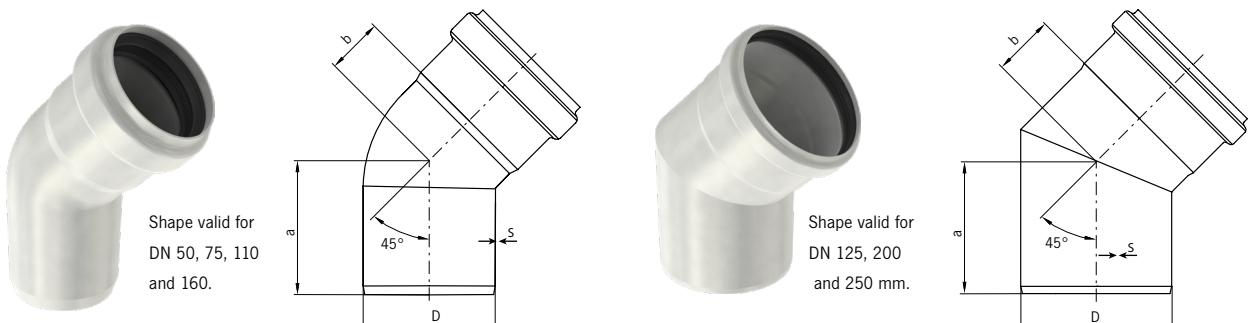


**AP bend 87.5°**

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	<b>417342</b>	<b>417350</b>
	50	86	40	1.0	0.20	<b>98700</b>	<b>98750</b>
	75	107	53	1.0	0.40	<b>98702</b>	<b>98752</b>
	110	134	67	1.0	0.70	<b>98704</b>	<b>98754</b>
	125	161	93	1.0	0.80	<b>419732</b>	<b>419734</b>
	160	181	105	1.25	1.70	<b>98706</b>	<b>98756</b>
	200	215	129	1.5	3.90	<b>419411</b>	<b>419413</b>
	250	297	198	1.5	5.10	-	<b>417088</b>

Table 16



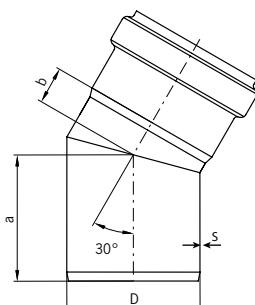
**AP bend 45°**

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	<b>417344</b>	<b>417352</b>
	50	62	24	1.0	0.20	<b>98708</b>	<b>98758</b>
	75	76	32	1.0	0.30	<b>98710</b>	<b>98760</b>
	110	93	42	1.0	0.50	<b>98712</b>	<b>98762</b>
	125	110	50	1.0	0.60	<b>419736</b>	<b>419738</b>
	160	131	55	1.25	1.30	<b>98714</b>	<b>98764</b>
	200	152	60	1.5	2.70	<b>419407</b>	<b>419409</b>
	250	177	76	1.5	4.10	-	<b>417092</b>

Table 17

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

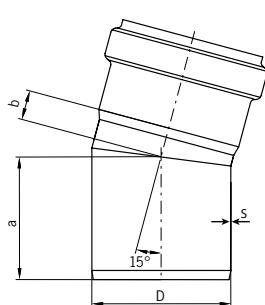


**AP bend 30°**

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	<b>417346</b>	<b>417354</b>
	50	57	16	1.0	0.20	<b>98716</b>	<b>98766</b>
	75	71	21	1.0	0.30	<b>98718</b>	<b>98768</b>
	110	85	27	1.0	0.50	<b>98720</b>	<b>98770</b>
	125	98	28	1.0	0.60	<b>419740</b>	<b>419742</b>
	160	110	40	1.25	1.20	<b>98722</b>	<b>98772</b>
	200	137	45	1.5	2.30	<b>419403</b>	<b>419405</b>
	250	153	58	1.5	2.90	-	<b>417096</b>

Table 18

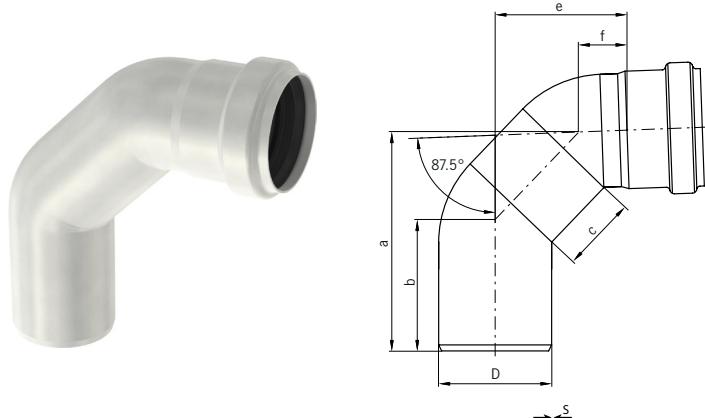


**AP bend 15°**

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	<b>417348</b>	<b>417356</b>
	50	54	12	1.0	0.10	<b>98724</b>	<b>98774</b>
	75	66	16	1.0	0.30	<b>98726</b>	<b>98776</b>
	110	78	15	1.0	0.40	<b>98728</b>	<b>98778</b>
	125	84	19	1.0	0.50	<b>419744</b>	<b>419746</b>
	160	99	29	1.25	1.00	<b>98730</b>	<b>98780</b>
	200	123	31	1.5	1.90	<b>419399</b>	<b>419401</b>
	250	136	40	1.5	2.50	-	<b>417100</b>

Table 19

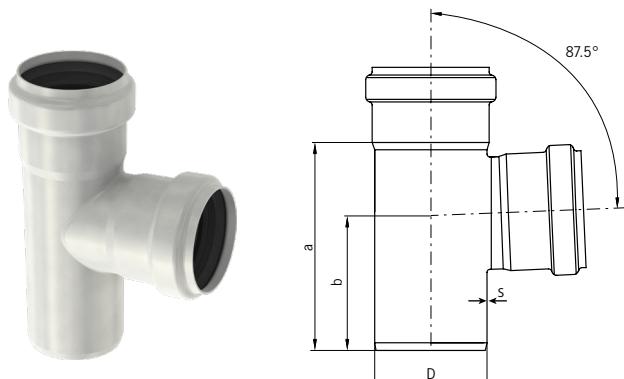


**AP long bend 87.5°**

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	<b>417340</b>	<b>417338</b>
	50	123	71	50	75	25	1.0	0.30	<b>419146</b>	<b>419000</b>
	75	146	87	50	88	32	1.0	0.50	<b>419148</b>	<b>419002</b>
	110	316	103	250	246	39	1.0	1.40	<b>419150</b>	<b>419004</b>
	160	360	126	250	270	92	1.25	2.20	<b>419152</b>	<b>419144</b>

Table 20



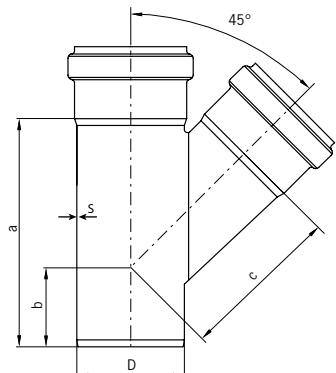
**AP single branch 87.5°**

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	<b>417363</b>	<b>417368</b>
	50	106	71	1.0	0.30	<b>98732</b>	<b>98782</b>
	75	139	90	1.0	0.50	<b>98734</b>	<b>98784</b>
	110	183	117	1.0	0.80	<b>98736</b>	<b>98786</b>
	125	220	135	1.0	0.90	<b>419748</b>	<b>419750</b>
	160	288	184	1.25	2.30	<b>98738</b>	<b>98788</b>
	200	333	206	1.5	4.50	<b>419419</b>	<b>419421</b>
	250	363	215	1.5	5.50	-	<b>417104</b>

Table 21

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

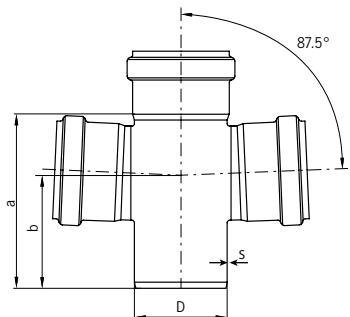


**AP single branch 45°**

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	<b>417366</b>	<b>417372</b>
	50	128	57	76	1.0	0.30	<b>98748</b>	<b>98798</b>
	75	179	74	110	1.0	0.50	<b>98800</b>	<b>98850</b>
	110	233	88	149	1.0	1.00	<b>98802</b>	<b>98852</b>
	125	273	103	170	1.0	1.10	<b>419760</b>	<b>419762</b>
	160	332	119	222	1.25	2.60	<b>98804</b>	<b>98854</b>
	200	415	151	274	1.5	5.70	<b>419427</b>	<b>419429</b>
	250	513	172	336	1.5	9.20	-	<b>417108</b>

Table 22

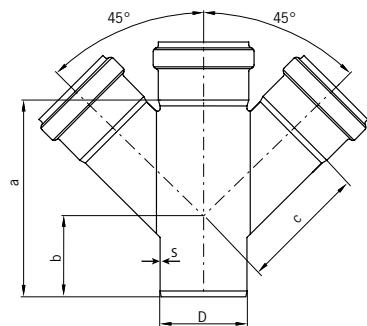


**AP double branch 87.5°**

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	<b>417364</b>	<b>417370</b>
	50	106	71	1.0	0.30	<b>98740</b>	<b>98790</b>
	75	139	90	1.0	0.60	<b>98742</b>	<b>98792</b>
	110	183	117	1.0	0.90	<b>98744</b>	<b>98794</b>
	160	288	184	1.25	2.70	<b>98746</b>	<b>98796</b>

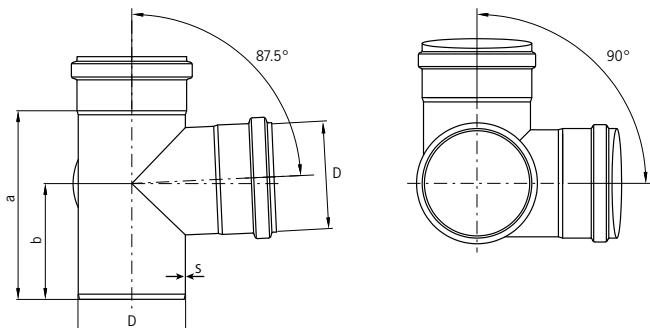
Table 23



**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	<b>417374</b>	<b>417326</b>
	50	128	57	76	1.0	0.40	<b>98806</b>	<b>98856</b>
	75	179	74	110	1.0	0.70	<b>98808</b>	<b>98858</b>
	110	233	88	149	1.0	1.20	<b>98810</b>	<b>98860</b>
	160	332	184	222	1.25	3.50	<b>98812</b>	<b>98862</b>
	250	509	172	336	1.5	11.00	-	<b>417120</b>

Table 24

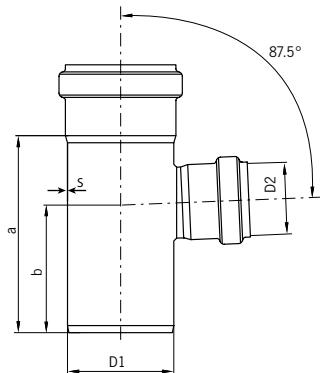


**AP corner branch 87.5°**  
according to EN-1124 form D3

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	<b>417414</b>	<b>417415</b>
	50	106	71	1.0	0.40	<b>419162</b>	<b>419210</b>
	75	139	90	1.0	0.70	<b>419164</b>	<b>419212</b>
	110	183	117	1.0	1.10	<b>419166</b>	<b>419214</b>
	125	220	135	1.0	1.60	<b>417020</b>	<b>417021</b>
	160	288	184	1.25	2.90	<b>419168</b>	<b>419216</b>

Table 25

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

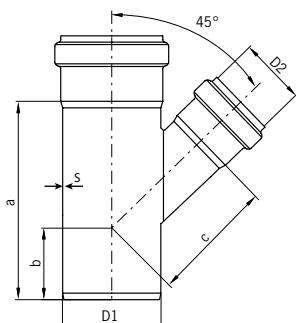


**AP single branch reduction 87.5°**

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	<b>417442</b>	<b>417443</b>
	75	40	139	98	1.0	0.28	<b>417444</b>	<b>417445</b>
	75	50	139	98	1.0	0.30	<b>98928</b>	<b>98930</b>
	110	50	183	117	1.0	0.50	<b>98932</b>	<b>98934</b>
	110	75	183	117	1.0	0.80	<b>98936</b>	<b>98938</b>
	125	75	187	110	1.0	0.90	<b>419752</b>	<b>419754</b>
	125	110	205	127	1.0	0.90	<b>419756</b>	<b>419758</b>
	160	110	288	184	1.25	2.30	<b>400691</b>	<b>400693</b>
	200	160	293	186	1.5	3.70	<b>419415</b>	<b>419417</b>
	250	200	349	226	1.5	5.80	-	<b>417112</b>

Table 26

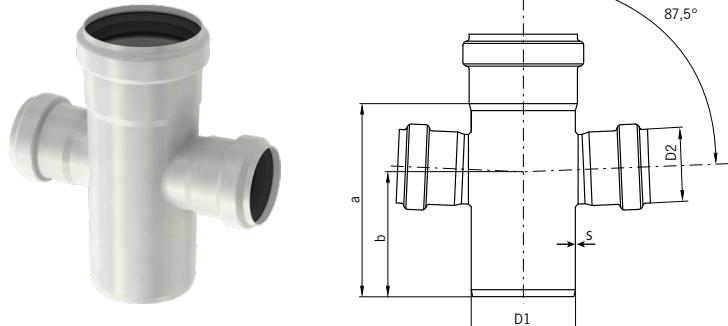


**AP single branch reduction 45°**

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	<b>417406</b>	<b>417408</b>
	75	40	144	94	56	1.0	0.28	<b>417446</b>	<b>417447</b>
	75	50	144	56	94	1.0	0.30	<b>400661</b>	<b>400663</b>
	110	50	147	42	119	1.0	0.50	<b>400665</b>	<b>400667</b>
	110	75	182	60	135	1.0	1.00	<b>400669</b>	<b>400671</b>
	125	75	200	65	141	1.0	1.10	<b>419764</b>	<b>419766</b>
	125	110	250	90	160	1.0	1.10	<b>419768</b>	<b>419770</b>
	160	110	332	119	191	1.25	2.60	<b>400699</b>	<b>400701</b>
	200	160	359	123	250	1.5	4.70	<b>419423</b>	<b>419425</b>
	250	200	429	175	307	1.5	7.60	-	<b>417116</b>

Table 27

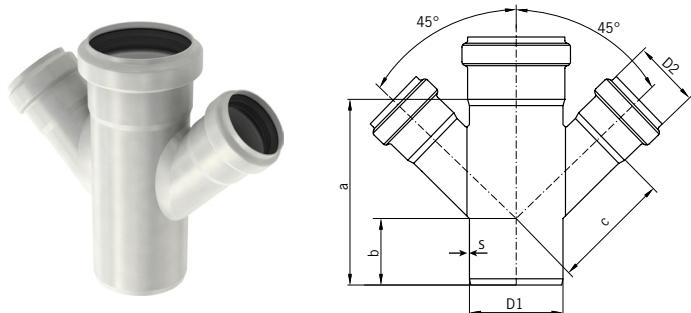


**AP double branch reduction 87.5°**

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	<b>98940</b>	<b>98942</b>
	110	50	183	117	1.0	0.60	<b>98944</b>	<b>98946</b>
	110	75	183	117	1.0	0.90	<b>98900</b>	<b>98902</b>
	160	110	288	184	1.25	2.70	<b>400695</b>	<b>400697</b>

Table 28



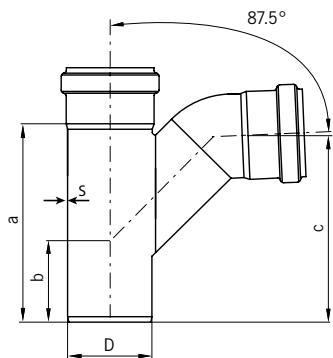
**AP double branch reduction 45°**

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	<b>400673</b>	<b>400675</b>
	110	50	147	42	119	1.0	0.70	<b>400677</b>	<b>400679</b>
	110	75	182	60	135	1.0	1.20	<b>400681</b>	<b>400683</b>
	160	110	332	119	190	1.25	3.50	<b>400703</b>	<b>400705</b>
	250	200	429	150	307	1.5	10.1	-	<b>417124</b>

Table 29

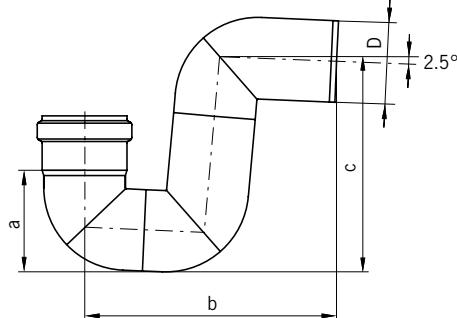
**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**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	<b>98814</b>	<b>98864</b>
	75	179	74	157	0.6	<b>98816</b>	<b>98866</b>
	110	233	88	209	1.1	<b>98818</b>	<b>98868</b>
	160	332	184	302	2.8	<b>98820</b>	<b>98870</b>

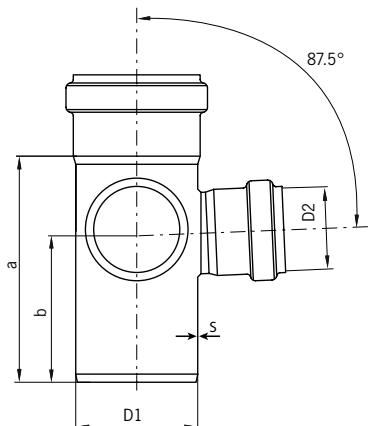
Table 30



**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	<b>98822</b>	<b>98872</b>
	75	94	232	193	0.7	<b>98824</b>	<b>98874</b>
	110	132	300	254	1.3	<b>98826</b>	<b>98876</b>
	160	190	403	347	3.3	<b>98828</b>	<b>98878</b>

Table 31

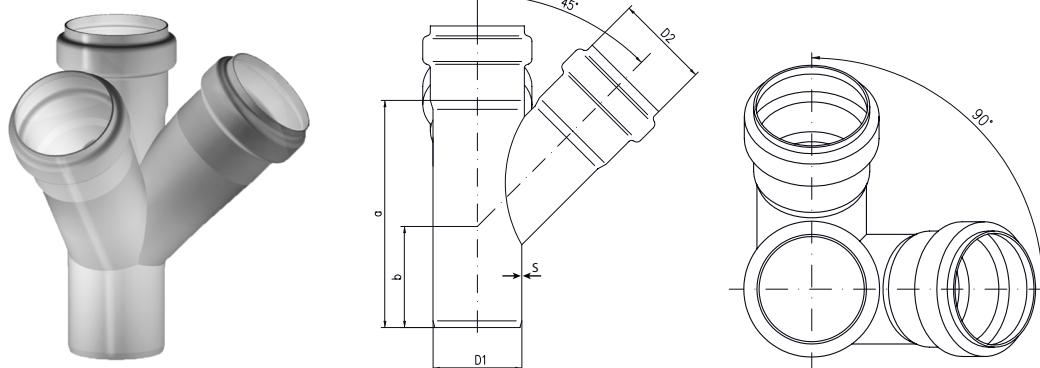


**Corner branch 87,5° reduced**  
according to EN-1124 form D3

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	<b>417435</b>	<b>417437</b>
	75	40	139	90	1.0	0.48	<b>417436</b>	<b>417438</b>
	75	50	139	98	1.0	0.52	<b>419170</b>	<b>419218</b>
	110	50	132	93	1.0	0.75	<b>419172</b>	<b>419220</b>
	110	75	152	104	1.0	0.90	<b>419174</b>	<b>419222</b>
	125	75	200	141	1.0	1.23	<b>419985</b>	<b>419987</b>
	125	110	250	155	1.0	1.72	<b>419997</b>	<b>417000</b>
	160	110	236	152	1.25	2.01	<b>419176</b>	<b>419224</b>

Table 32

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

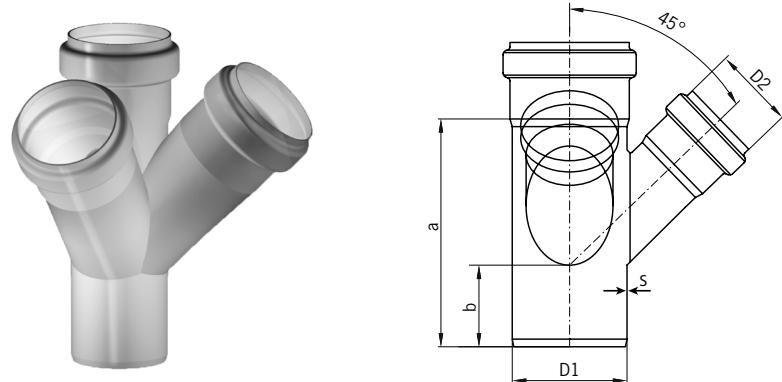


**Corner branch 45°**

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	<b>419178</b>	<b>419226</b>
	75	75	167	62	1.0	0.80	<b>419180</b>	<b>419228</b>
	110	110	233	88	1.0	1.53	<b>419182</b>	<b>419230</b>
	125	125	273	103	1.0	2.31	<b>417022</b>	<b>417023</b>
	160	160	330	117	1.25	4.25	<b>419184</b>	<b>419232</b>

Table 33

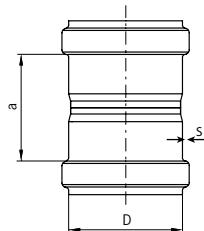


**Corner branch 45° reduced**

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	<b>419186</b>	<b>419234</b>
	110	50	219	74	1.0	1.01	<b>419188</b>	<b>419236</b>
	110	75	182	60	1.0	1.12	<b>419190</b>	<b>419238</b>
	125	75	207	75	1.0	1.42	<b>419979</b>	<b>419981</b>
	125	110	250	93	1.0	2.19	<b>419991</b>	<b>419993</b>
	160	110	258	80	1.25	2.56	<b>419192</b>	<b>419240</b>

Table 34

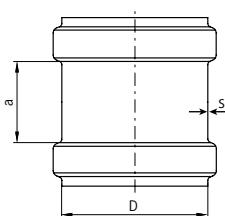


#### **AP straight coupling**

according to EN-1124 form F4

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

Table 35



#### **AP repair coupling**

according to EN-1124 form F41

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

Table 36

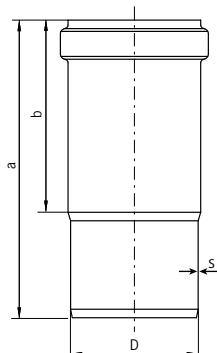
Note:

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.

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

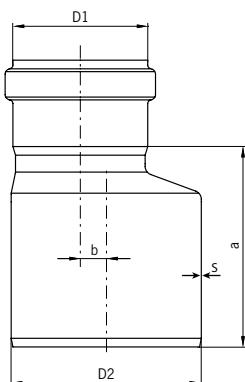


**AP expansion socket**

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	<b>417382</b>	<b>417384</b>
	50	159	102	1.0	0.20	<b>98664</b>	<b>98666</b>
	75	175	113	1.0	0.30	<b>98668</b>	<b>98670</b>
	110	200	121	1.0	0.50	<b>98672</b>	<b>98674</b>
	125	250	165	1.0	0.60	<b>419776</b>	<b>419778</b>
	160	292	170	1.25	1.40	<b>98676</b>	<b>98678</b>
	250	400	190	1.5	3.80	-	<b>417143</b>

Table 37



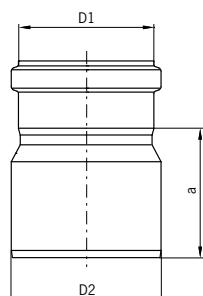
**AP eccentric increaser coupling**

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	<b>417418</b>
	50	75	75	7	1.0	0.30	<b>98892</b>
	50	110	110	25	1.0	0.40	<b>98978</b>
	75	110	110	15	1.0	0.50	<b>98894</b>
	110	160	160	22	1.0	1.10	<b>98896</b>
	125	160	124	17.5	1.25	0.80	<b>407984 *</b>
	200	250	180	15	1.5	2.40	<b>417135</b>

Table 38

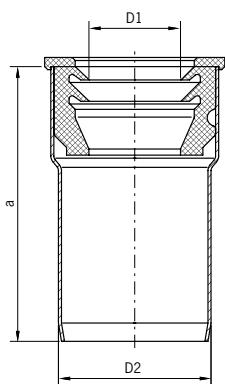
\* Material AISI 304 only



**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	<b>417416</b>
	40	75	85	1.0	0.26	<b>417417</b>
	50	75	88	1.0	0.28	<b>419826</b>
	50	110	113	1.0	1.41	<b>417018</b>
	75	110	105	1.0	4.42	<b>419828</b>
	110	125	107	1.0	0.60	<b>419780</b>
	110	160	126	1.0	0.87	<b>419830</b>
	125	160	160	1.0	1.20	<b>419811</b>
	160	200	200	1.25	1.80	<b>419441</b>
	200	250	180	1.5	2.40	<b>417133</b>

Table 39

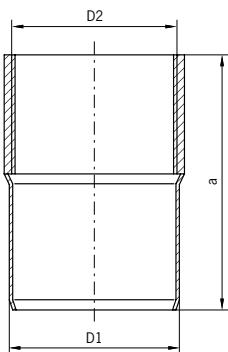


**AP increaser connector**

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

Table 40

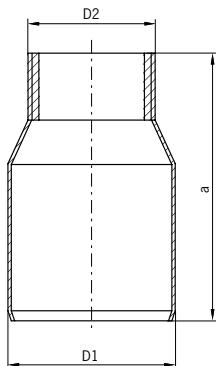
**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**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	<b>98993</b>
50	G 1¼"	72	0.2	<b>98956</b>
50	G 1½"	75	0.3	<b>98957</b>
50	G 2"	80	0.3	<b>98958</b>

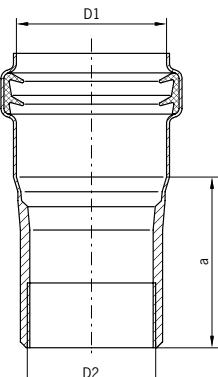
Table 41



**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	<b>Z203542</b>
50	G 1¼"	100	0.2	<b>419330</b>
50	G 1½"	100	0.3	<b>419331</b>
50	G 2"	100	0.3	<b>419332</b>

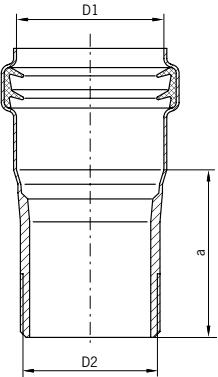
Table 42



**AP connector with socket and internal screw thread**

Seal material	D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	G 1 1/4"	58	0.2	<b>419333</b>
	50	G 1 1/2"	58	0.3	<b>419335</b>
	50	G 2"	58	0.3	<b>419337</b>

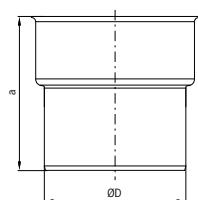
Table 43



**AP connector with socket and external screw thread**

Seal material	D1 [mm]	D2	a [mm]	Weight [kg]	Order No. AISI 316L
EPDM	50	G 1 1/4"	58	0.2	<b>419250</b>
	50	G 1 1/2"	58	0.3	<b>419252</b>
	50	G 2"	58	0.3	<b>419254</b>

Table 44



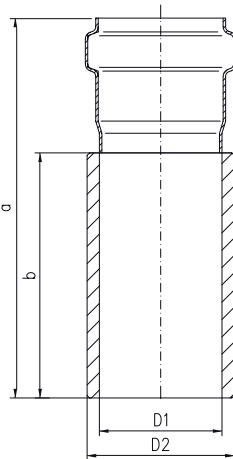
**AP connector cast Iron spigot → ACO pipe socket**

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

Table 45

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

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

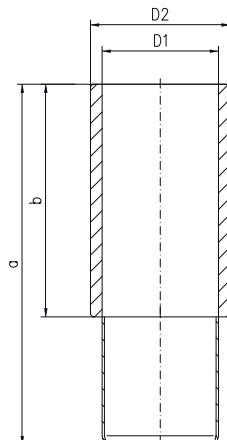


**Weld on piece with socket form**

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Weight [kg]	Order No. AISI 316L
EPDM	40	50	150	100	0.45	<b>417432</b>
	50	60.30	155	100	0.77	<b>417006</b>
	75	88.90	160	100	1.53	<b>417010</b>
	110	125	170	100	2.34	<b>417014</b>

Table 46

\* Special parts upon request



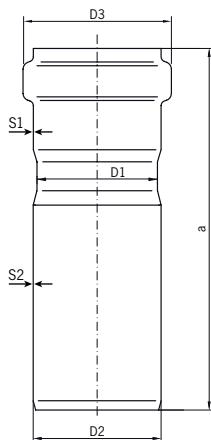
**Weld on piece with spigot form E2**

Seal material	D1 [mm]	D2 [mm]	a [mm]	b [mm]	Weight [kg]	Order No. AISI 316L
EPDM	40	50	150	100	0.80	<b>417433</b>
	50	60.30	155	100	0.90	<b>419963</b>
	75	88.90	160	100	1.60	<b>419965</b>
	110	125	155	100	1.60	<b>419967</b>

Table 47

\* Special parts upon request

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**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	<b>419821</b>	53
	75	75	73	87.5	150	1.00	1.00	<b>419822</b>	73
	110	110	102	125.5	170	1.00	1.00	<b>419823</b>	102
	125	125	133	141.0	183	1.00	1.00	<b>419858</b>	133
	160	160	159	178.0	200	1.25	1.25	<b>419824</b>	159
	200	200	219	219.0	250	1.50	1.50	<b>419825</b>	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	<b>419821</b>	53
	75	75	73	87.5	150	1,00	1,00	<b>419822</b>	73
	110	110	102	125.5	170	1,00	1,00	<b>419823</b>	102
	125	125	133	141.0	183	1,00	1,00	<b>419858</b>	133
	160	160	159	178.0	200	1,25	1,25	<b>419824</b>	159
	200	200	219	219.0	250	1,50	1,50	<b>419825</b>	219

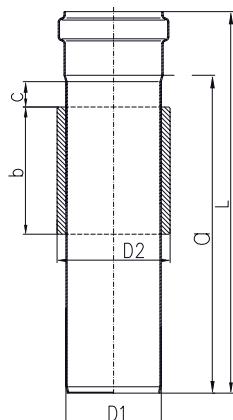
Table 49

**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	<b>419821</b>	53
	75	75	73	87.5	150	1.00	1.00	<b>419822</b>	73
	110	110	102	125.5	170	1.00	1.00	<b>419823</b>	102
	125	125	133	141.0	183	1.00	1.00	<b>419858</b>	133
	160	160	159	178.0	200	1.25	1.25	<b>419824</b>	159
	200	200	219	219.0	250	1.50	1.50	<b>419825</b>	219

Table 50

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

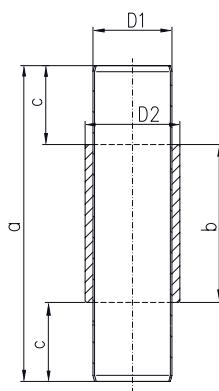


Penetration pipe acc. to EN 1124 form T2

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

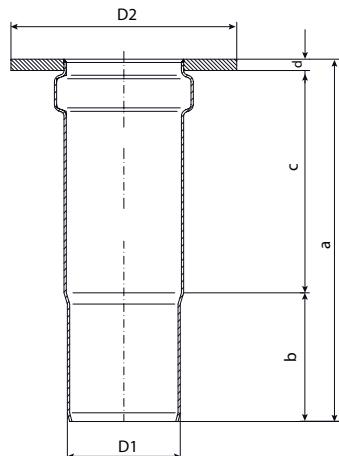


Toilet Penetration

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

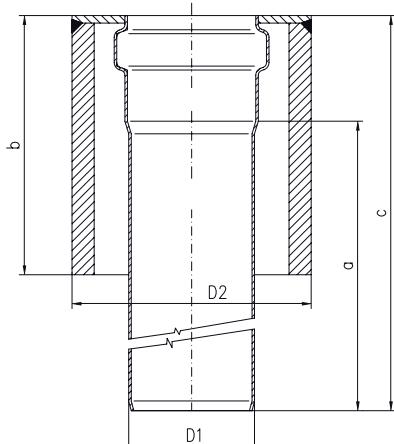


**Flange Penetration with Expansion Socket**

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	<b>417515</b>	<b>417516</b>
	50	100	160	57	98	5	0.6	<b>419088</b>	<b>419006</b>
	75	125	177	62	110	5	1.0	<b>419094</b>	<b>419008</b>
	110	160	202	79	118	5	1.0	<b>419100</b>	<b>419010</b>

Table 53

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**

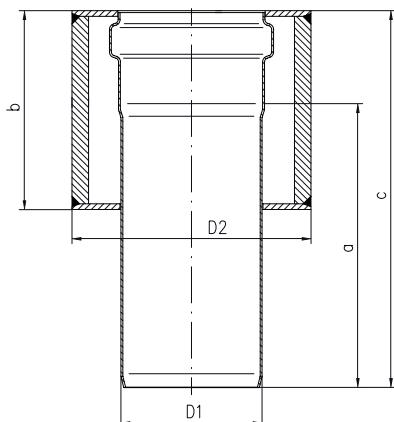


**Penetration form R1B with a black pod with opened bottom, for direct welding in the deck | acc. to EN 1124 form T2**

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	<b>417518</b>
	050	50	95	150	103	192	2.29	<b>419688</b>
	075	75	127	150	103	200	3.15	<b>419689</b>
	110	110	152.4	150	103	207	4.0	<b>419690</b>

Table 54

\* Special parts upon request

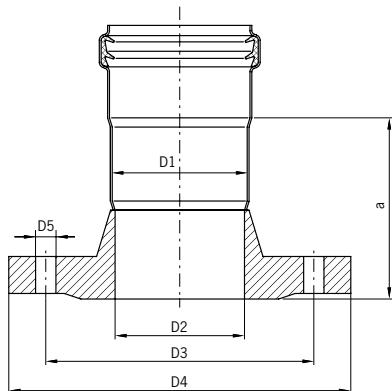


**Penetration form R1B with a black pod with closed bottom, for direct welding in the deck | acc. to EN 1124 form T2**

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	<b>417537</b>
	050	50	95	150	106	193	2.49	<b>417534</b>
	075	75	127	150	106	201	3.35	<b>417535</b>
	110	110	152.4	150	106	208	4.2	<b>417536</b>

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 x 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	<b>419528</b>
	50	DN 50	110	140	4x14	93	135	6	1.50	<b>419530</b>
	75	DN 65	130	160	4x14	93	143	6	1.90	<b>419532</b>
	110	DN 110	170	210	4x18	93	150	6	3.60	<b>419534</b>
	125	DN 125	200	240	8x18	100	163	6	5.00	<b>419970</b>
	160	DN 150	225	265	8x18	78	148	6	5.70	<b>419536</b>
	200	DN 200	280	320	8x18	95	175	6	8.80	<b>419538</b>
	50	DN 40	110	150	4x18	100	142	10	2.00	<b>419516</b>
	50	DN 50	125	165	4x18	100	142	10	2.70	<b>419518</b>
	75	DN 65	145	185	4x18	100	150	10	3.30	<b>419520</b>
	110	DN 100	180	220	8x18	100	157	10	4.90	<b>419522</b>
	125	DN 125	210	250	8x18	100	163	10	5.00	<b>419972</b>
	160	DN 150	240	285	8x22	85	155	10	8.30	<b>419524</b>
	200	DN 200	295	340	8x22	102	182	10	12.30	<b>419526</b>
	50	DN 40	110	150	4x18	100	142	16	2.30	<b>419256</b>
	50	DN 50	125	165	4x18	100	142	16	2.70	<b>419258</b>
	75	DN 65	145	185	4x18	100	150	16	3.40	<b>419260</b>
	110	DN 100	180	220	8x18	100	157	16	4.90	<b>419262</b>
	125	DN 125	210	250	8x18	100	163	16	5.00	<b>419974</b>
	160	DN 150	240	285	8x22	85	155	16	8.30	<b>419512</b>
	200	DN 200	295	340	12x22	102	182	16	12.00	<b>419514</b>

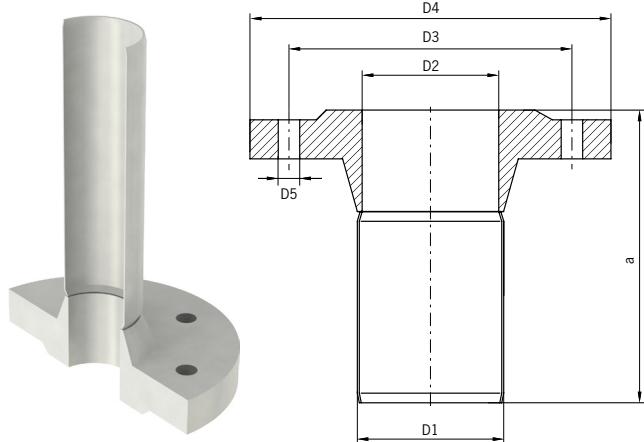
Table 56

Note:

n – number of holes for screws in the flange.

ANSI and JIS socket flanges available upon request

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



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

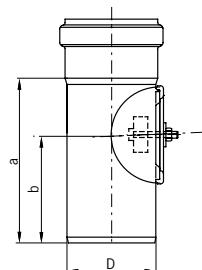
Seal material	D1 [mm]	D2	D3 [mm]	D4 [mm]	n × D5 [mm]	a [mm]	PN	Weight [kg]	Order No. AISI 316L
EPDM	50	DN 40	100	130	4x14	188	6	1.40	<b>419548</b>
	50	DN 50	110	140	4x14	185	6	1.50	<b>419549</b>
	75	DN 65	130	160	4x14	238	6	2.00	<b>419550</b>
	110	DN 110	170	210	4x18	252	6	3.80	<b>419551</b>
	125	DN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

Table 57

Note:

n – number of holes for screws in the flange.

ANSI and JIS socket flanges available upon request

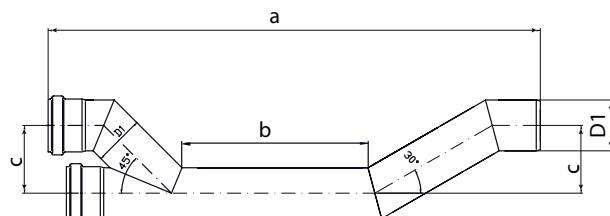
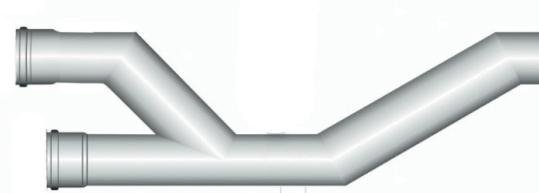


#### AP access unit

according to EN-1124 form lt1

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	<b>98913</b>	<b>98963</b>
	110	183	117	1.0	0.8	<b>98915</b>	<b>98965</b>
	125	210	135	1.0	0.9	<b>419783</b>	<b>419785</b>
	160	288	184	1.25	2.3	<b>98917</b>	<b>98967</b>
	200	293	186	1.5	3.7	<b>419676</b>	<b>419678</b>
	250	290	184	1.5	3.8	-	<b>417128</b>

Table 58

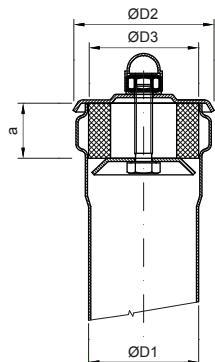


#### Vacuum transport pocket

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	<b>417032</b>
	75	726	275	100	1.0	1.8	<b>417036</b>

Table 59

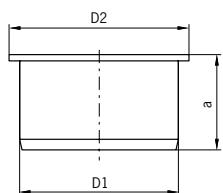
**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**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	<b>417403</b>	<b>417404</b>
50	64	50	25	0.08	<b>419942</b>	<b>419948</b>
75	92	75	25	0.50	<b>419943</b>	<b>419949</b>
110	126	105	15	0.50	<b>419944</b>	<b>419950</b>
125	160	124	12	0.90	<b>419945</b>	<b>419951</b>
160	186	166	20	1.20	<b>419946</b>	<b>419952</b>

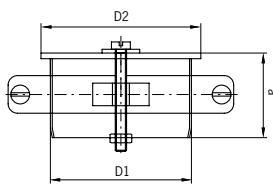
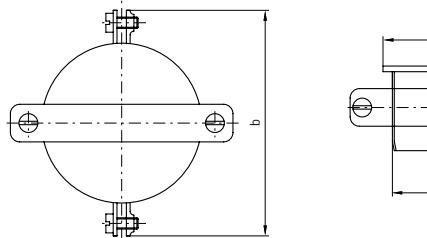
Table 60



**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	<b>417405</b>
50	45	58	0.10	<b>98888</b>
75	45	85	0.30	<b>98889</b>
110	45	120	0.50	<b>98890</b>
125	50	135	0.60	<b>419782</b>
160	50	170	0.50	<b>98891</b>
200	50	210	0.70	<b>98994</b>
250	83	260	1.0	<b>417131</b>

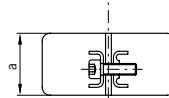
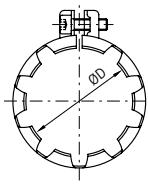
Table 61



**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	<b>419138</b>
75	85	45	120	0.6	<b>419139</b>
110	120	45	167	0.8	<b>419140</b>
160	170	50	214	1.1	<b>419141</b>
250	260	83	302	1.3	<b>417132</b>

Table 62

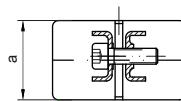
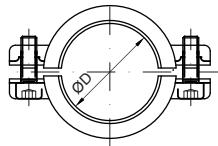


**AP socket clamp**

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

Table 63

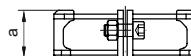
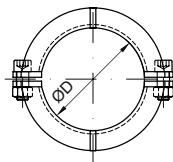
**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



**AP socket clamp two parts**

D [mm]	a [mm]	Weight [kg]	Order No. AISI 304	Order No. AISI 316L
40	36	0.10	<b>417396</b>	<b>417397</b>
50	40	0.14	<b>417024</b>	<b>417025</b>
75	40	0.25	<b>417026</b>	<b>417027</b>
110	43	0.34	<b>417028</b>	<b>417029</b>
125	45	0.38	<b>417016</b>	<b>417017</b>
160	45	0.48	<b>417030</b>	<b>417031</b>
200	45	0.51	-	<b>419983</b>
250	45	0.71	-	<b>417137</b>

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	<b>417167</b>	<b>417168</b>
75	73.5	80	113	150	0.62	<b>417169</b>	<b>417170</b>
110	108	115	110	168	0.84	<b>417171</b>	<b>417172</b>

Table 65

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



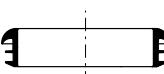
**AP reduction sealing cast Iron spigot → ACO pipe socket**

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

Table 66

Note:

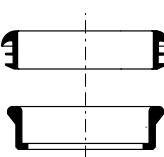
While purchasing AP reduction sealing cast iron spigot → ACO pipe it is necessary order AP cast iron connector.



**AP reduction sealing ACO pipe spigot → cast iron socket**

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

Table 67



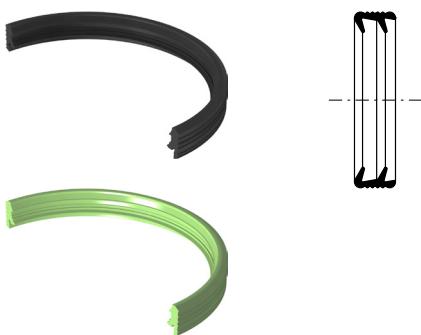
**AP reduction sealing set for cast iron**

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

Table 68

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

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range**



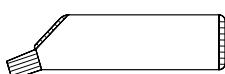
**AP pipe seal**

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

Table 69

Note:

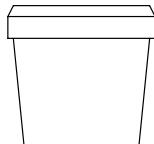
ACO pipe seals in indifferent grades (Viton® and NBR) grades are available on request.



**ACO Universal Lubricant**

Weight [kg]	Order No.
0.15	<b>E80350000</b>

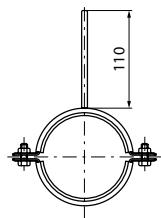
Table 70



**ACO Universal Lubricant in bucket 1kg**

Weight [kg]	Order No.
1.00	<b>E80350001</b>

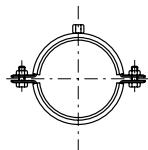
Table 71



**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

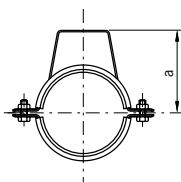
Table 72



**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



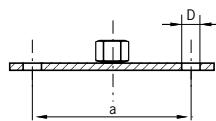
**AP support bracket with rubber infill and stirrup**

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

## ACO Marine Stainless Steel pipe

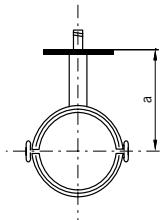
### Part numbers - family range



**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

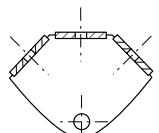
Table 76



**AP threaded support pole M8**

D [mm]	Length I [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	<b>419363</b>

Table 79

**AP replacement discs for ACO pipe cutters manual**

Note	Weight [kg]	Order No.
for cutter manual 419363	0.005	<b>419365</b>

Table 80

Note: Minimum order quantity 10pcs.



**AP pipe manual cutter**

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

Table 81

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

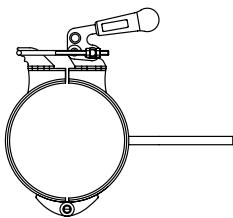
**AP replacement discs for manual cutter disc**

Note	Weight [kg]	Order No.
for cutter 400738 and 419364	0.005	<b>400578</b>

Table 82

Note: Minimum order quality - 10pcs

**ACO Marine Stainless Steel pipe**  
**Part numbers - family range & Flow rates**



**AP holder for manual cutting**

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

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	<b>400745</b>

Table 84

**AP replacement discs for ACO pipe cutters electric**

Note	Weight [kg]	Order No.
for cutter electric 400745	0.05	<b>417193</b>

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.

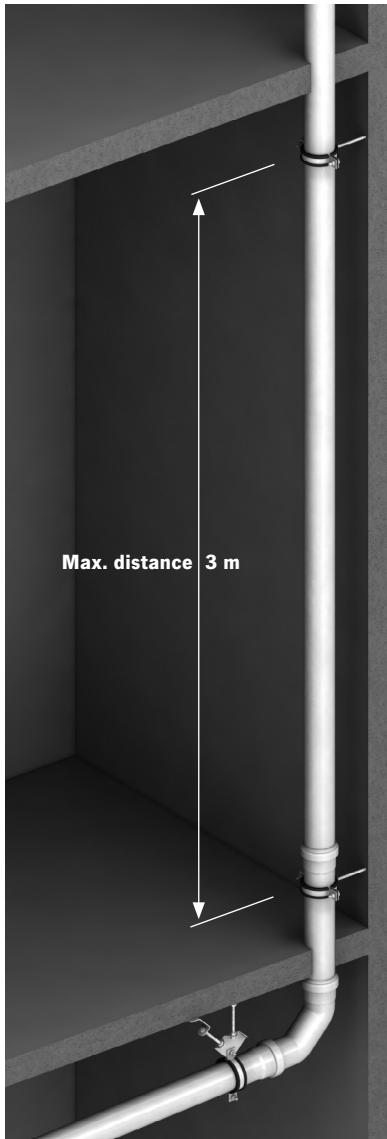
### pipe cutting

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.



### 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.

# ACO Marine Stainless Steel pipe

## Installation guide

### 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 an 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.

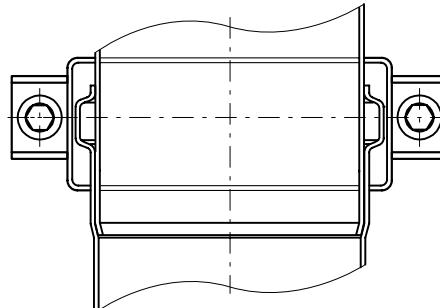
### Vacuum applications

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

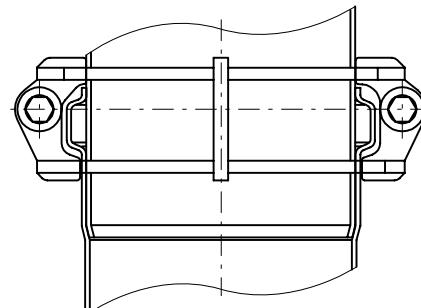
Table 86



### 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.

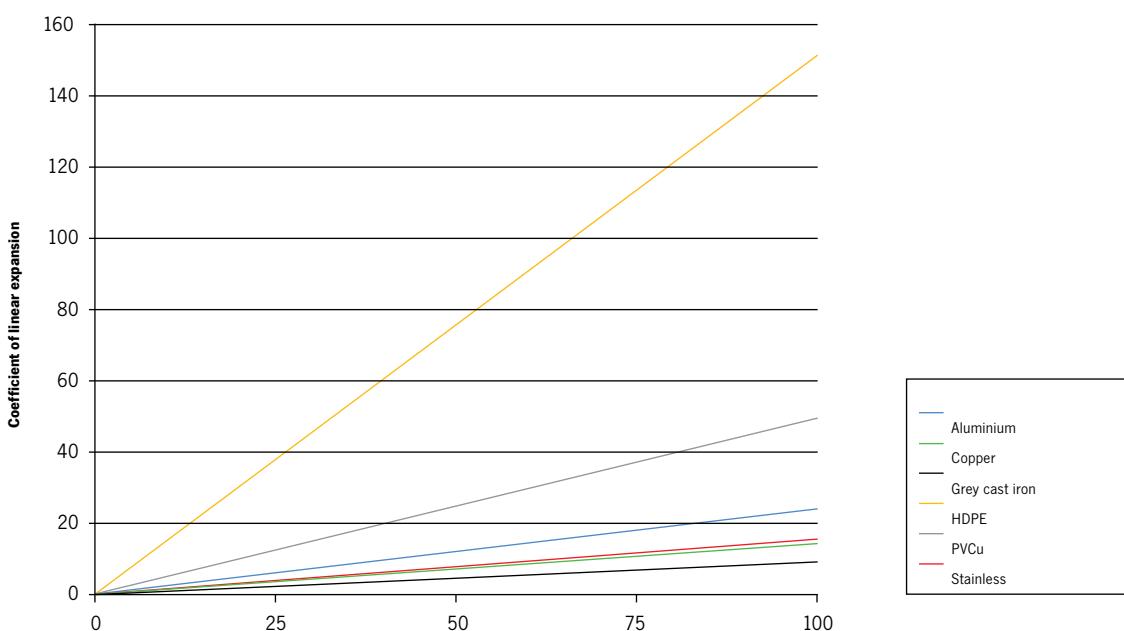
Engineers will need to know weights and loading when designing vertical stack and horizontal pipe run systems. The table below gives weights for all pipe sizes empty and full of water.

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 ( $\alpha$ ) for various materials are as follows:

### Thermal expansion



# **ACO Marine Stainless Steel pipe**

## **ACO pipe material information**

### **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
<b>Resistance</b>			
<b>Water</b>	excellent	good	good
<b>Chemicals</b>			
Acids	good	fair	excellent
Bases	good	fair	excellent
Benzene/Petrol	unsatisfied	excellent	excellent
<b>Oils</b>			
ASTM Oil No. 1	unsatisfied	excellent	excellent
ASTM Oil No. 3	unsatisfied	excellent	excellent
<b>Ozone &amp; weather stresses</b>	good	limited	good

\* Table 90

Viton® is a registered trademark for fluorelastomer 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

	AISI 316L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
1 = Very good service to operating limit of material									
2 = Moderate service									
3 = Limited or variable service									
4 = Unsatisfactory									
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

	AISI 316L Stainless	AISI 304 Stainless	Cast iron	Polyethylene	PVC	Polypropylene	EPDM	NBR	FPM
1 = Very good service to operating limit of material									
2 = Moderate service									
3 = Limited or variable service									
4 = Unsatisfactory									
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

# ACO Marine Stainless Steel pipe

## Care and maintenance

	<b>AISI 316 L Stainless</b>	<b>AISI 304 Stainless</b>	<b>Cast iron</b>	<b>Polyethylene</b>	<b>PVC</b>	<b>Polypropylene</b>	<b>EPDM</b>	<b>NBR</b>	<b>FPM</b>
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	-	-	-
Chlorilic 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
Naphthalene	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
Phosphoric 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	-	-	-

	<b>AISI 316 L Stainless</b>	<b>AISI 304 Stainless</b>	<b>Cast iron</b>	<b>Polyethylene</b>	<b>PVC</b>	<b>Polypropylene</b>	<b>EPDM</b>	<b>NBR</b>	<b>FPM</b>
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
Prophylene 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	-	-	-
Stannicous 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.

**Notes**

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A large grid of empty squares, likely intended for handwritten notes or calculations.

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