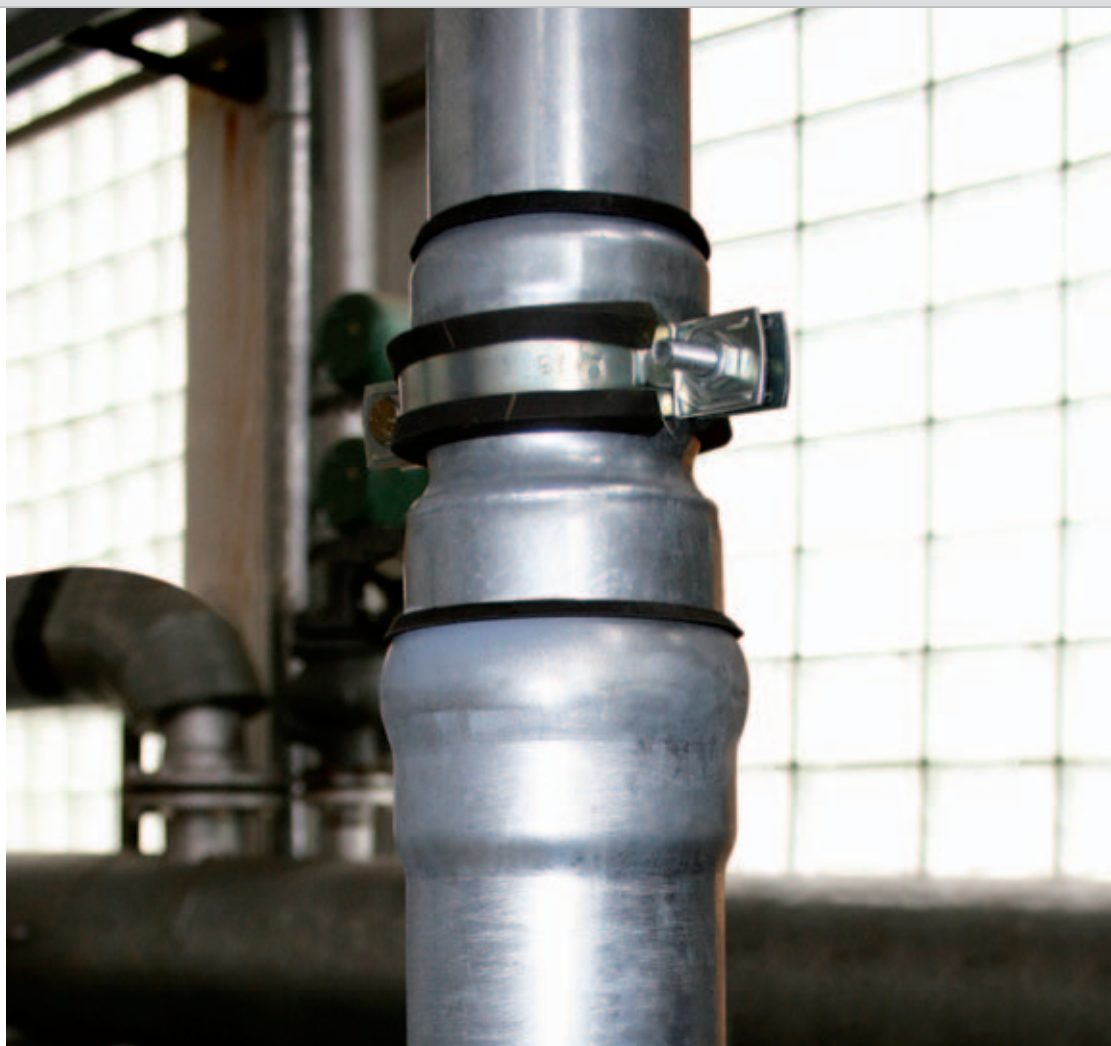




ACO Product catalogue

**ACO GM-X and GM-X-VACplus drain pipes
and steel fittings for building drainage applications**



GM-X Steel drain pipes and fittings

DN 40 - DN 250 and EN 1123

ACO Industries as a member of the international ACO Group of companies with more than 3200 employees worldwide is now presenting new galvanized and coated steel pipe product ranges GM-X and GM-X-VAC for gravity and syphonic drainage. Thanks to on-going development in this field, ACO offers today a wide range of standard pipes and all necessary fittings for building drainage applications. There are specially trained product managers available for you in the product manage-

ment department, who are ready to answer all your questions, which may rise up. The product design and reliability of the system is confirmed by leading international classification authorities.

GM-X steel pipes meet the highest safety requirements (see behaviour in fire resistance). The requirements for cost and weight saving can also be taken into account by the ACO GM-X and ACO GM-X-VAC plug-in socket system. A significantly lower

weight of ACO GM-X and ACO GM-X-VAC pipe systems against welded or threaded systems is achieved by reduced wall thickness.

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We reserve the right of technical changes.

Material

Drain pipes and fittings are manufactured from welded, one-time cold-drawn precision steel pipe in accordance with DIN 2394.

Tensile strength:

Rm 310-410 N/mm²

Elongation at break:

A5 min. 28%

As a material, steel is distinguished by its good technological properties:

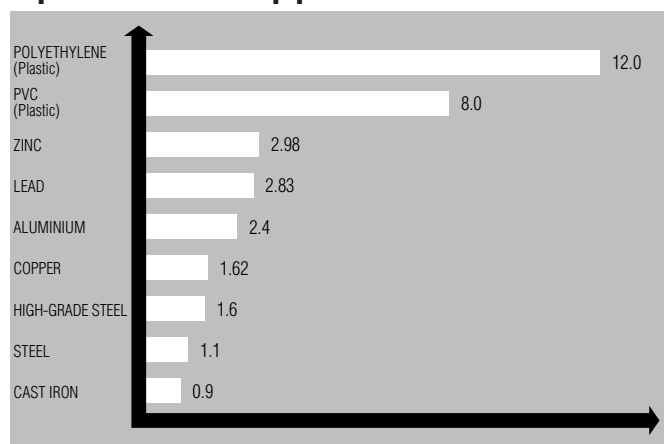
- *unbreakable*
- *dimensionally stable*
- *heat and frost proof*
- *favourable acoustic behaviour*
- *non-combustible*

Thermal expansion

With steel, thermal expansion is exceptionally limited.

When a 1 metre piece of pipe is heated by 100°C, the length increase is 1.1 mm. The thermal expansion produced by the introduction of hot waste water does not therefore need to be considered in the installation. This does not apply to other standard expansion materials.

Expansion of various pipe materials



Increase in length of a body 1 m long when heated by 100°C.

Acoustic behaviour

Sound measurements of discharge noises in built-in drain pipes produced results within the requirements of DIN 4109. The measured noise figure was below the permissible sound level.

To further decrease discharge noise, and as an additional sound proofing measure, plastic insulating supports can be inserted in the socket bed on which the pipe end sits.

Behaviour in fire

The steel drain pipe is fireproof. As per DIN 4102 and DIN 1986 Part 4, steel drain pipe is classified as Incendiary Matter A1 - not flammable.

The GM-X Socket

The GM-X socket is a two-stage design. The seal is retained by the first socket stage. The second stage centres the inserted pipe.

The socket shape construction enables a solid, buckle-proof and rigid connection of pipes and mouldings to be made, and thus

guarantees great tightness between the pipe and the socket, without the risk of the seal being compressed by its own or an outside load.



GM-X Seal

The GM-X seal is in the shape of a lip collar. It is inserted into the upper socket chamber. As a result of the other pipe end being pushed in, the sealing lips are forced



against the inner wall of the seal housing and against the outer wall of the inserted pipe. The seal collar is located on the socket rim and ensures the seating of the seal when the other pipe is pushed in.

The sealing lips press more firmly against the pipe walls as fluid pressure rises, thus positively increasing the tightness of the joint.

The seal is manufactured as standard from an effluent-resistant grade (as per DIN 4060):

NBR (Nitrile Butadiene Rubber)
SBR (Styrene Butadiene Rubber)

For special use areas seals can be supplied in the following grades on request:

EPDM (APTK)
CR (Neoprene)
Si (Silicon)
FKM (Viton)

Seal-tight values

The socket seal-tight connection value requirements in EN 1123 are met. All pipes and fittings, including their joints, are tight at an inside and outside pressure above atmospheric of 0 to 0.5 bar.

For lines in which high pressures can occur, the GM-X securing clip is to be used for extra security against axial thrust. Instead of the securing clip, GM-X securing clamps are supplied for

DN 150 and DN 200 pipes and fittings for axial security.

The seal-tight values thus produced are:

DN 150 – 2 bar
DN 200 – 1 bar

The following seal-tight values were determined for GM-X seal joints with securing clips and glued-on seals:

operation pressure		
DN	40	15 bar
DN	50	15 bar
DN	70	5 bar
DN	80	5 bar
DN	100	5 bar
DN	125	4 bar

The vacuum connection

The vacuum installation with x-socket and GM-X-VACplus sealing element, corresponds to installations of the standard GM-X sealing element. In contrast to the aforementioned installation the GM-X-VACplus sealing element fills both socket stages.

Therefore guaranteeing a trouble-free vacuum operation.

The seal-tight value of the vacuum seal joint complies with DIN 86 281.



GM-X-VACplus seal



The GM-X-VACplus sealing element allows the vacuum installations with „standard socket Type A1“. The seal is manufactured from EPDM and is provided with two flexible lip sealing elements. The outer lip

deforms to follow the contour of the socket and the inner lip deforms to follow the contour of the spigot to ensure a reliable, sealed joint.

Corrosion proofing

All pipes and fittings are hot galvanized inside and out. The zinc coating is on average 400 g/m² or 56 µ. It is impact-resistant and shock-proof. The zinc coating produces a cathodic protection of the cut edges thus preventing bottom rust. In addition, the insides of the pipes and fittings are given an alkyd-melamine resin based plastic coating.

Due to this internal coating of the pipes, frictional resistance on the internal surfaces is reduced and incrustation largely prevented. Together with the zinc coating, optimum corrosion protection is achieved. Both the hot galvanizing and the additional internal coating meet the requirements of EN 1123 Part 1.



Installation

A significant task falls upon the installer, who, in the final analysis, determines the practical value of a drainage installation. The superior quality of our pipe material and the first-class processing of our products help him in this task.

Drainage installations have to be able to be constructed without problems and work without malfunctions. Any connection problem can be quickly and economically resolved by the availability of an extensive range of fittings.

The fully technically developed socket joint enables rapid and simple plug-in assembly, just by turning the pipe and the fitting in the socket.

Steel pipes and fittings are easy to handle, impact-resistant and shock-proof, and unaffected by rough treatment during processing.

The GM-X Drain pipe range can also be supplied with two sockets. When a pipe is cut to size, there is a piece left over with a

socket, which can be used as an extra fitting piece.

Steel drain pipes and fittings - together with the characteristic plug-in socket joint - give the installed drain pipe a practically self-supporting stability. The use of pipe clips and holding devices is only necessary at a few places in the installation.

Cutting to length

Cutting to length can be done with a pipe cutter, a cutting-off wheel or a saw.

Pipes cut to length with a wheel or saw must be de-burred before being inserted in the socket so as not to damage the seal.

Making the socket joint for GM-X sockets

1. The seal is placed obliquely on the lower edge of the socket chamber.
2. Using your forefinger to press the seal to one side, push it into the socket chamber.
3. On releasing, the seal should pop into the socket chamber.
(Adjust where necessary)

Note:

The outside seal edge collar must rest on the socket rim.

4. The seal is coated all-over inside with GM-X lubricant

5. The pipe end is inserted into the socket by turning gently until it is located on the lower socket end.

Note:

The antiseize dries out in time. The socket joint can be loosened again by heating the socket area.

A correct fit of the inserted pipe end into the socket (pipe end is placed upon the lower socket ground) is especially important for the installation of vacuum and pressure burden piping systems. The use of a corresponding marking on the pipe end avoids installation mistakes.



Undoing the socket joint

The insertion pipe is heated around the socket with a heat source until the pipe can be pulled out of the socket. When re-assembling, the seal must be changed.

Connecting to other types of pipes

The GM-X range has a selection of connectors for joining GM-X pipes to other types of pipes.

Pipe fixing

For horizontally laid pipes, the dead weight of the pipe plus the possible water content and the number of fixing points are to be taken into account when choosing fixing materials.

The following GM-X fixing devices can be supplied:

- *Securing clips for axial thrust and for suspending the pipes (perforated belt or steel hoop)*
- *Pipe clips with knock-in pin or rod for welding on without sound-proofing insert*
- *Pipe clips for threaded pin with or without sound-proofing insert*

1 m pipe filled with water weighs:

DN	40	2.9 kg
DN	50	4.0 kg
DN	70	7.0 kg
DN	80	9.4 kg
DN	100	12.8 kg
DN	125	22.0 kg
DN	150	29.0 kg
DN	200	58.0 kg
DN	250	77.4 kg

Test information

In accordance with the amended German Federal States' conformity regulations (PrüfzVO), steel drain pipes and fittings as per DIN EN 1123 are exempt from the construction supervision requirement for official approval. However, the components are still subject to being monitored by an authorized testing body.

Production monitoring

GM-X drain pipes and fittings are subject to production monitoring by the Bavarian Institute for Technical Building Equipment and Domestic Water Supplies, Würzburg branch.

GM-X seals are subject to third-party monitoring by the North Rhine-Westphalia State Materials Testing Office, Dortmund.



Quality management

GM-X drain pipes and fittings are subject to production monitoring in accordance to DIN EN ISO 9001.



Certification

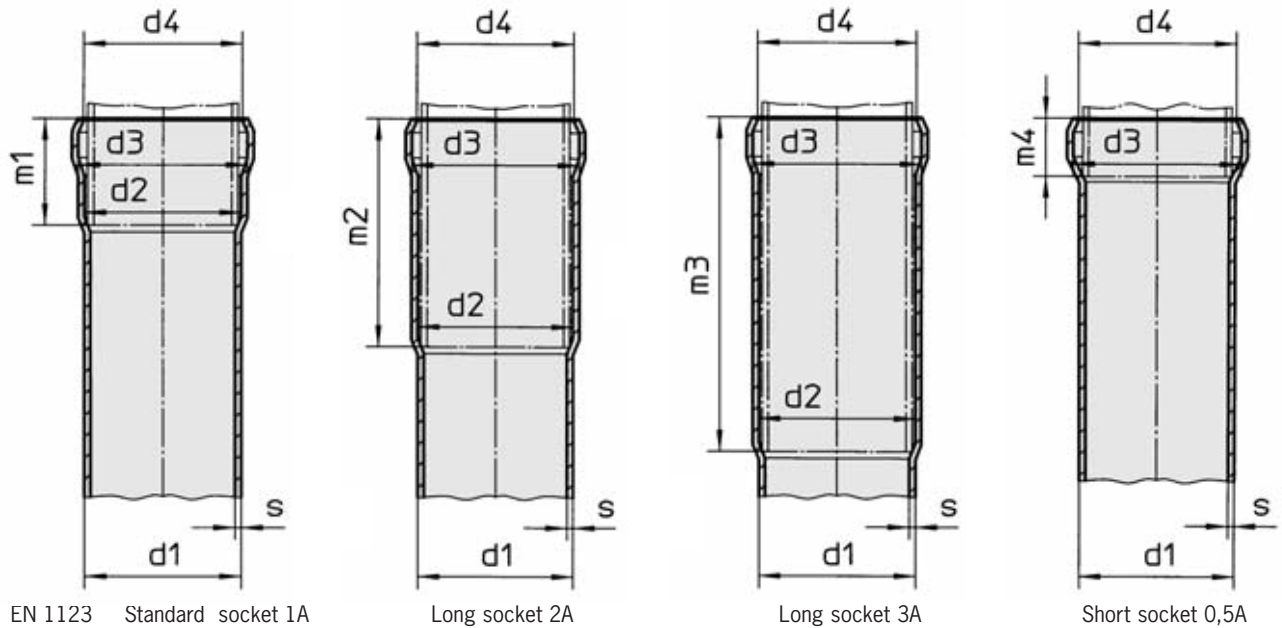
GM-X pipes and special fittings are certified by renowned test registers. This underlines their high operational safety.

Delivery range overview

GM-X sockets DN 40 to DN 250

GM-X page 11		Pipes with 1 socket	GM-X page 19		Double sockets	GM-X page 29		Seal
GM-X page 11		Pipes with 2 sockets	GM-X page 19		Push-in sockets with long socket	GM-X page 30		Pipe clips
GM-X page 12		Bends	GM-X page 20		Cleaning pipes	GM-X page 31		Drain plugs
GM-X page 13		Angle bends with normal or short socket	GM-X page 21		Pipe bridges	GM-X page 31		Protective socket caps
GM-X page 13		Reduced angle bend with normal or short socket	GM-X page 21		Drain traps	GM-X page 31		Lubricant
GM-X page 14		Tank fittings	GM-X page 22		Wall closet bends 90° for vertical mounting	GM-X page 32		Securing clips
GM-X page 14		Forked T-pieces	GM-X page 22		WC connectors straight			Securing clamps
GM-X page 15		Offsets	GM-X page 23		Connectors threaded			
GM-X page 15		Bends with calming section	GM-X page 23		Angle bends threaded			
GM-X page 16		Single branches Red. single branches	GM-X page 24		Concentric transition pipes			
GM-X page 17		Double branches Red. double branches	GM-X page 24		Transition pipes eccentric			
GM-X page 18		Double branches for corners Red. double branches for corners	GM-X page 25		Connectors for changing from GM-X Sleeves to other pipe types			
GM-X page 18		Transition branches	GM-X page 27		Socket flange Spigot flange			

Socket dimensions



For pipes and fittings with 2 sockets both sockets are the same design

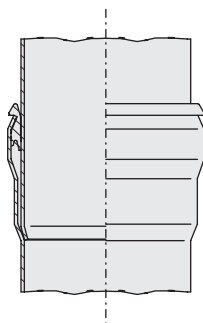
DN	d_1	d_2	d_3	d_4	s	m_1	m_2	m_3	m_4
040	42	45	48	45	1,5	30	70	100	16
050	53	56	60	56	1,5	38	90	130	19
070	73	76	81	76	1,6	55	120	175	27
080	89	92	99	92	1,8	60	130	190	32
100	102	106	114	107	2,0	70	150	220	38
125	133	138	147	140	2,5	75	160	235	41
150	159	164	176	168	2,5	80	170	250	56
200	219	224	241	228	2,9	120	250	370	76
250	273	280	298	284	4,0	130	270	400	90

Special nominal widths for GM-X WC connections and prefabrication

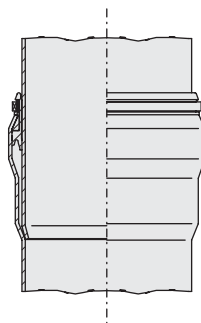
110	102	114	120	115	2,0	70	150	220	32
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GM-X Plug-in connection

Socket DN 40-200 with seal

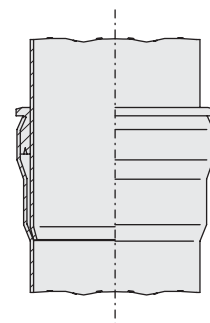


Socket DN 250 with set of seal



GM-X -VACplus Plug-in connection

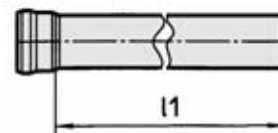
Socket DN 40-70 with seal



Pipes

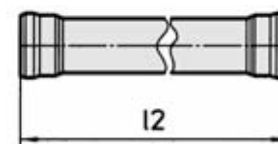
GM-X drain pipes with one socket 1 A in acc. to EN 1123 form B1

Order No.		E01 025	E01 050	E01 075	E01 100	E01 150	E01 200	E01 250	E01 275	E01 300
	l_1	250	500	750	1000	1500	2000	2500	2750	3000
	DN	weight in kg/piece								
040	40	0,45	0,85	1,25	1,64	2,44	3,23	4,03	–	4,82
050	50	0,59	1,10	1,60	2,11	3,12	4,13	5,14	–	6,15
070	70	0,93	1,67	2,41	3,16	4,65	6,14	7,62	8,42	9,11
080	80	1,29	2,31	3,32	4,34	6,37	8,40	10,44	–	12,47
100	100	1,69	2,98	4,27	5,56	8,14	10,71	13,29	14,66	15,87
125	125	2,79	4,88	6,96	9,05	13,22	17,38	21,55	–	25,72
150	150	3,40	5,90	8,40	10,90	15,90	20,90	25,90	–	30,90
200	200	5,90	9,88	13,87	17,85	25,82	33,79	41,76	–	49,73
250	250	10,31	17,10	23,88	30,67	44,24	57,80	71,37	–	84,94



GM-X drain pipes with two sockets 1 A in acc. to EN 1123 form B2

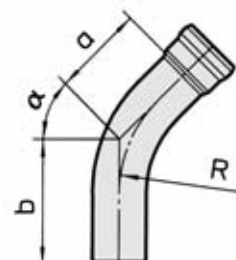
Order No.		E00 025	E00 050	E00 075	E00 100	E00 150	E00 200	E00 300
	l_2	250	500	750	1000	1500	2000	3000
	DN	weight in kg/piece						
040	40	0,41	0,81	1,21	1,60	2,40	3,19	4,78
050	50	0,53	1,03	1,54	2,04	3,05	4,06	6,08
070	70	0,78	1,52	2,27	3,01	4,50	5,99	8,97
100	100	1,37	2,66	3,95	5,24	7,82	10,40	15,55
125	125	2,25	4,34	6,42	8,50	12,67	16,84	25,18
150	150	2,70	5,20	7,70	10,20	15,20	20,20	30,20
200	200	4,30	8,29	12,27	16,26	24,23	32,20	48,14



Bends

Bends in acc. to EN 1123 form C1

Order No.			E10 015			E10 030			E10 045			E10 070			E10 087		
	DN	R	a = 15			a = 30			a = 45			a = 70			a = 87		
			a	b	kg	a	b	kg	a	b	kg	a	b	kg	a	b	kg
040	40	67,5	37	67	0,23	46	76	0,25	56	86	0,28	75	105	0,31	92	122	0,38
050	50	82,5	53	81	0,35	64	92	0,40	76	104	0,45	100	128	0,46	120	148	0,53
070	*70	117,5	50	89	0,60	66	105	0,68	83	122	0,77	118	157	0,89	146	185	1,05
080	*80	114,5	25	85	0,65	56	116	0,70	72	132	1,00	105	165	1,35	134	194	1,40
100	100	<i>in acc. to bends with small radius</i>															
125	125																
150	150																
200	*200	305	45	165	5,35	45	165	5,35	166	270	13,26	254	360	17,30	330	434	20,18
250	*250	381	—	—	—	45	165	6,44	209	339	27,80	318	448	39,50	413	543	48,30

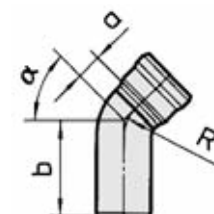


Bends with small radius in acc. to EN 1123 form C2

Order No.			E12 045			E12 070			E12 087		
	DN	R	a = 45			a = 70			a = 87		
			a	b	kg	a	b	kg	a	b	kg
*040	40	27	19	64	0,19	26	72	0,20	33	79	0,29
*050	50	35,5	24	79	0,32	34	89,5	0,35	43	98	0,36
*070	70	50	32	91	0,54	46	105	0,61	59	117,5	0,65
*080	80	82,5	59	119	1,60	83	143	1,40	103	163	1,72

Bends with small radius in acc. to EN 1123 form C2

Order No.			E10 015			E10 030			E10 045			E10 070			E10 087		
	DN	R	a = 15			a = 30			a = 45			a = 70			a = 87		
			a	b	kg	a	b	kg	a	b	kg	a	b	kg	a	b	kg
*100	100	70	34	104	1,17	44	114	1,27	52	124	1,30	74	144	1,48	91	161	1,62
*125	125	90	35	110	1,90	49	124	2,09	62	137	2,15	88	163	2,40	110	185	2,60
*150	150	150	45	125	2,61	65	145	3,61	87	167	4,38	130	210	5,45	165	245	3,95



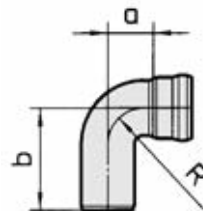
*Attention

We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

Angle bends

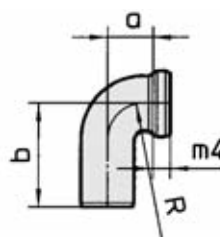
Angle bends in acc. to EN 1123 form E1

Order		E30 010			
No.	DN	a	b	R	kg
*040	40	35	80	28	0,22
*050	50	45	100	35,5	0,35
*070	70	60	120	50	0,75
*080	80	90	152,5	82,5	1,12
*100	100	95	165	70	1,63



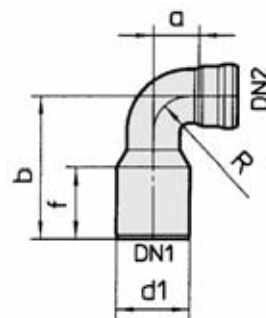
Angle bends with short socket 0,5 A

Order		E30 011				
No.	DN	a	b	m ₄	R	kg
*040	40	35	80	16	28	0,21
*050	50	45	100	19	35,5	0,32



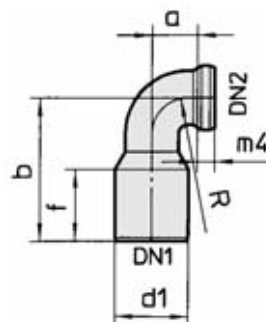
Reduced angle bends in acc. to EN 1123 form E2

Order			E30 012					
No.	DN 1	DN 2	a	b	f	d ₁	R	kg
*050	50	40	35	100	56	53	28	0,30
*070	70	50	45	140	70	73	35,5	0,55



Reduced angle bends with short socket 4A

Order			E30 013						
No.	DN 1	DN 2	a	b	f	m ₄	d ₁	R	kg
*050	50	40	35	100	56	16	53	28	0.26



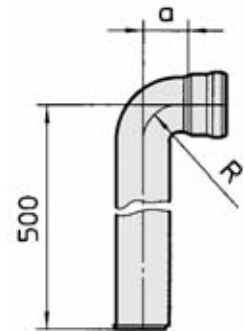
*Attention

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Tank fittings, forked T-pieces

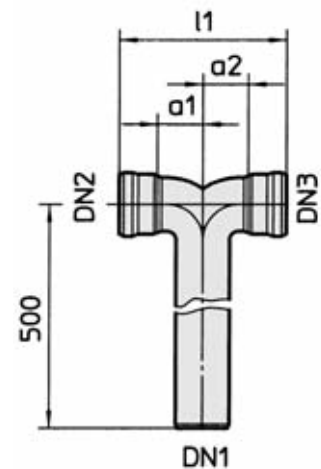
Tank fittings in acc. to EN 1123 form E5

Order		*E90		
No.	DN	a	R	kg
044 040	40	35	28	0,89
055 050	50	45	35,5	1,17



Forked T-pieces in acc. to EN 1123 form E4

Order				E91			
No.	DN 1	DN 2	DN 3	a ₁	a ₂	l ₁	kg
444 040	40	40	40	40	40	140	0,98
544 040	50	40	40	40	40	140	1,18
555 050	50	50	50	42	42	160	1,30



*Attention

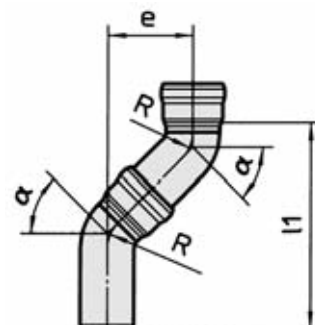
We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

Offsets, bends with calming section

Swan-neck (2 standard range bends)

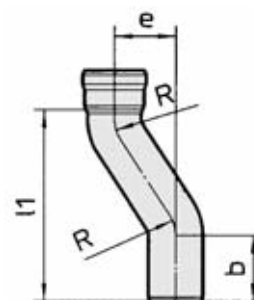
Assembled dimensions when using 2 bends with the same angle »α«

DN	R	α = 15			α = 30			α = 45			α = 70			α = 87		
		e	l ₁	kg	e	l ₁	kg	e	l ₁	kg	e	l ₁	kg	e	l ₁	kg
40	67,5	27	204	0,46	61	228	0,50	100	242	0,56	169	242	0,62	214	225	0,72
50	82,5	35	263	0,70	78	291	0,80	127	307	0,90	214	306	0,92	268	282	1,06
70	117,5	36	273	1,20	86	319	1,36	145	350	1,54	258	369	1,78	331	336	2,10
80	114,5	28	216	1,30	86	321	1,40	145	350	2,00	254	362	2,40	328	345	2,40
DN 100-150 are bends with small radius																
100	117,5	36	271	2,08	79	295	2,54	126	302	1,60	205	293	2,46	252	265	3,24
125	117,5	38	285	3,80	85	315	4,10	135	326	4,30	228	326	4,80	287	304	5,20
150	117,5	44	334	5,22	105	392	7,22	180	434	8,76	319	456	10,90	413	436	12,76
200	305	54	413	12,88	105	392	12,88	308	744	26,92	577	824	35,18	764	805	45,70
250	381	—	—	—	—	—	—	387	935	55,60	720	1028	79,00	957	1006	96,60



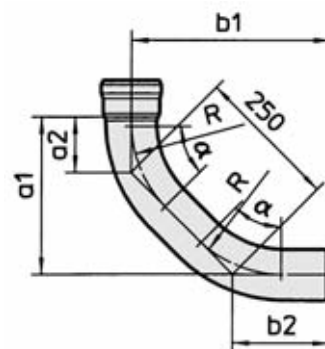
Offsets in acc. to EN 1123 form C4

Order No.			E20 075			E20 130			E20 200		
	DN	R	e = 75			e = 130			e = 200		
			l ₁	b	kg	l ₁	b	kg	l ₁	b	kg
*070	70	117,5	300	73,5	1,15	335	73,5	1,30	359	73,5	1,53
*080	80	114,5	280	85	1,40	335	85	1,75	405	85	2,80
*100	100	70	250	95	1,85	300	95	2,25	370	95	2,75
*125	125	90	270	100	2,90	325	100	3,60	395	100	4,45



Bends with calming section for transition into horizontal pipes in acc. to EN 1123 form C3

Order No.			E11 088					kg
	DN	α	R	a ₁	a ₂	b ₁	b ₂	
*080	80	44	114,5	324	72,5	370	131	1,22
*100	100	44	70	275	53	335	123,5	2,39
*125	125	44	90	292	60	355	134	4,75



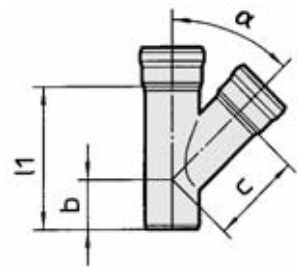
*Attention

We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

Branches

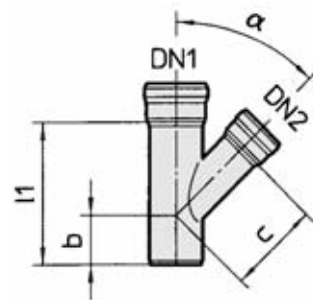
Single branches in acc. to EN 1123 form D1

Order No.	E50 045					E50 070				E50 087			
	DN	$\alpha = 45^\circ$				$\alpha = 70^\circ$				$\alpha = 87^\circ$			
		l_1	b	c	kg	l_1	b	c	kg	l_1	b	c	kg
044	40	125	55	70	0,37	110	60	50	0,34	110	70	40	0,32
055	50	150	65	90	0,56	130	70	60	0,50	130	80	50	0,47
077	70	200	85	115	1,03	175	95	75	1,00	175	110	65	0,97
088	80	235	97	138	1,78	200	110	90	1,30	200	126	75	1,40
100	100	265	110	155	2,50	230	125	110	2,30	230	140	90	2,20
125	125	340	130	210	5,20	285	150	145	4,01	285	170	120	3,79
150	150	380	140	240	6,65	320	160	160	5,68	320	190	135	5,48
200	200	500	190	320	15,34	420	220	210	12,82	420	260	170	12,26
250	250	620	230	370	23,80	–	–	–	–	500	310	190	18,50



Red. single branches in acc. to EN 1123 form D11

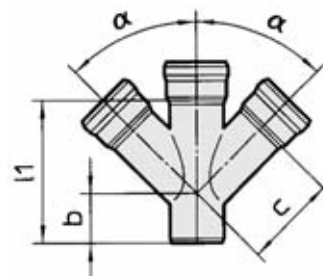
Order No.			E51 045				E51 070				E51 087			
	DN 1	DN 2	$\alpha = 45^\circ$				$\alpha = 70^\circ$				$\alpha = 87^\circ$			
			l_1	b	c	kg	l_1	b	c	kg	l_1	b	c	kg
054	50	40	130	50	79	0,47	120	65	57	0,43	120	75	46	0,42
074	70	40	150	60	95	0,75	140	80	69	0,70	140	95	57	0,70
075	70	50	150	50	106	0,74	150	85	72	0,77	150	100	61	0,75
085	80	50	185,5	72	117	1,35	165	94	80	1,20	165	109	69,5	1,10
140	100	40	180	65	116	1,45	175	100	84	1,41	175	115	72	1,40
150	100	50	200	75	127	1,65	180	95	87	1,50	180	115	76	1,40
170	100	70	230	90	136	1,95	200	110	90	1,69	200	125	80	1,67
180	100	80	265	110	147	2,00	220	120	97	1,90	220	135	81	1,80
125	125	50	225	75	148	2,66	200	105	103	2,60	200	125	91	2,56
127	125	70	255	90	157	3,25	225	120	106	2,90	225	140	95	2,85
225	125	100	290	105	176	4,00	255	135	126	3,57	255	155	105	3,48
220	150	70	255	80	177	3,80	225	115	121	3,40	225	140	109	3,35
250	150	100	290	95	195	4,50	255	130	141	4,10	255	155	119	4,00
275	150	125	340	120	230	5,10	290	150	160	5,10	290	175	135	4,91
300	200	100	325	100	240	8,43	295	160	174	7,78	295	195	150	7,66
325	200	125	380	130	274	10,23	325	175	193	8,90	325	210	165	8,96
350	200	150	420	150	284	10,98	355	190	193	9,77	355	225	167	9,57
360	250	100	370	110	279	12,10	–	–	–	–	330	220	178	10,80
375	250	125	420	140	313	13,75	–	–	–	–	–	–	–	–
400	250	150	450	150	323	14,80	–	–	–	–	–	–	–	–
450	250	200	540	190	359	23,90	–	–	–	–	–	–	–	–



Branches

Double branches

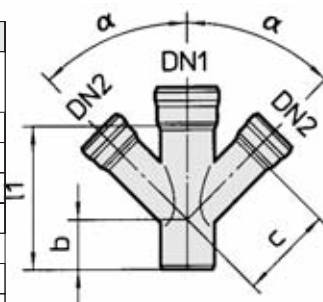
Order No.	DN	E52 045				E52 070				E52 087			
		$\alpha = 45$				$\alpha = 70$				$\alpha = 87$			
		l_1	b	c	kg	l_1	b	c	kg	l_1	b	c	kg
555	50	150	65	90	0,75	130	70	60	0,50	130	80	50	0,59
777	70	200	85	115	1,44	175	95	75	1,47	175	110	65	1,19
111	100	265	110	155	3,18	230	125	110	2,79	230	140	90	2,66
125	125	340	130	210	6,28	285	150	145	5,35	285	170	120	5,99
150	150	380	140	240	7,67	320	160	160	6,32	320	190	135	5,95
600	200	500	190	320	20,16	420	220	210	17,45	420	260	170	15,36



Red. double branches in acc. to EN 1123 form D21

Order Nr.	DN 1	DN 2	E52 045				E52 070				E52 087			
			$\alpha = 45$				$\alpha = 70^*$				$\alpha = 87$			
			l_1	b	c	kg	l_1	b	c	kg	l_1	b	c	kg
755	70	50	175	75	106	1,18	150	85	72	1,00	150	100	61	1,00
177	100	70	230	90	136	2,47	200	110	90	2,00	200	125	80	1,90
188	100	80	265	110	147	2,94	220	120	97	2,65	220	135	81	2,39
325	125	100	290	105	176	4,38	255	135	126	3,85	255	155	105	3,67
350	150	100	290	95	195	5,12	255	130	141	4,52	255	155	119	4,34
400	150	125	340	120	230	5,87	290	150	160	5,91	290	175	134	5,65
800	200	100	325	100	240	8,82	295	160	174	8,08	295	195	150	7,91
850	200	125	380	130	274	10,87	325	175	193	9,79	325	210	165	9,43
900	200	150	420	150	284	12,92	355	190	193	10,81	355	225	166	10,42

* Parts only on request

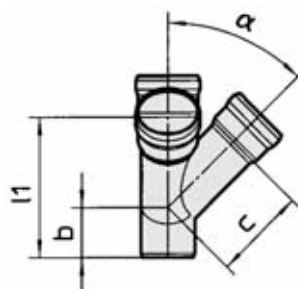


Branches

Double branches for corners

Order No.	E53 045					E53 070					E53 087				
	DN	$\alpha = 45$				$\alpha = 70^*$					$\alpha = 87$				
		l_1	b	c	kg	l_1	b	c	kg		l_1	b	c	kg	
555	50	150	65	90	0,75	130	70	60	0,60		130	80	50	0,60	
777	70	200	85	115	1,44	175	95	75	1,50		175	110	65	1,19	
111	100	265	110	155	3,20	230	125	110	2,80		230	140	90	2,66	

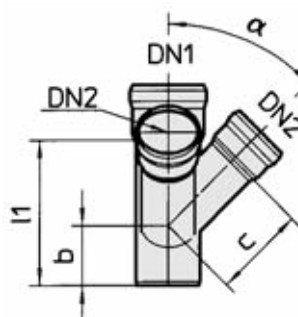
* Parts only on request



Red. double branches for corners in acc. to EN 1123 form D31

Order No.			E53 045					E53 070					E53 087				
	DN 1	DN 2	$\alpha = 45$					$\alpha = 70^*$					$\alpha = 87$				
			l_1	b	c	kg		l_1	b	c	kg		l_1	b	c	kg	
755	70	50	175	75	106	1,20		150	85	72	1,00		150	100	61	0,75	
177	100	70	230	90	136	1,95		200	110	90	2,00		200	125	80	1,90	
325	125	100	290	105	176	4,40		255	135	126	3,85		255	155	105	3,70	
350	150	100	290	95	196	5,10		255	130	141	4,50		255	155	119	4,30	

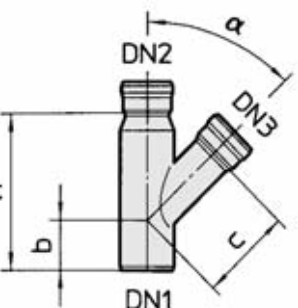
* Parts only on request



Transition branches in acc. to EN 1123 form D12

Order No.				E54 045					E54 070					E54 087				
	DN 1	DN 2	DN 3	$\alpha = 45$					$\alpha = 70^*$					$\alpha = 87$				
				l_1	b	c	kg		l_1	b	c	kg		l_1	b	c	kg	
544	50	40	40	150	50	79	0,48		140	65	57	0,43		140	75	46	0,42	
545	50	40	50	170	65	90	0,60		150	70	60	0,50		150	80	50	0,50	
744	70	40	40	200	60	95	0,86		185	80	69	0,86		185	95	57	0,80	
745	70	40	50	210	75	106	0,85		195	85	72	0,90		195	100	61	0,70	
754	70	50	40	200	60	95	0,80		180	80	69	0,70		180	95	57	0,70	
755	70	50	50	200	75	106	0,85		180	85	72	0,70		180	100	61	0,75	

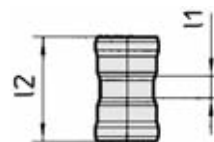
* Parts only on request



Connecting pieces

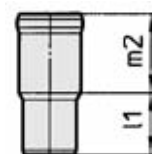
Double sockets in acc. to EN 1123 Form F4

Order		E70 020		
No.	DN	l_1	l_2	kg
040	40	16	76	0,14
050	50	18	94	0,22
070	70	25	135	0,45
080	80	25	145	0,60
100	100	40	180	0,97
125	125	40	190	1,61
150	150	40	200	2,12
200	200	50	290	5,70
250	250	60	320	7,10



Push-in sockets with long socket in acc. to EN 1123 form F5

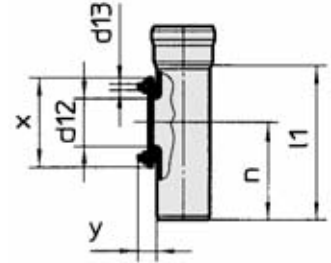
Order		E70 040		
No.	DN	l_1	m_2	kg
040	40	50	70	0,20
050	50	60	90	0,32
070	70	70	120	0,58
080	80	80	130	0,80
100	100	90	150	1,21
125	125	100	160	2,17
150	150	115	170	2,86
200	200	150	250	6,85



Cleaning pipes

Cleaning pipes with round cleaning aperture in acc.to EN 1123 form H1

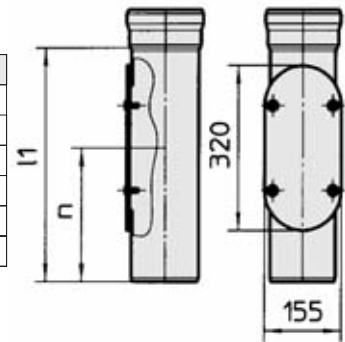
Order		E70 010						
No.	DN	l_1	n	d_{12}	d_{13}	x	y	kg
040	40	125	80	36	M6	78	15	0,47
050	50	150	95	45	M6	86	15	0,60
070	70	200	125	60	M6	100	15	0,92
080	80	210	135	76	M8	124	23	1,00
100	100	265	165	96	M8	164	23	2,18
125	125	290	180	125	M8	191	27	3,20
150	150	320	190	125	M8	191	27	4,30
200	200	420	260	125	M8	191	27	10,50



Cleaning pipes with oblong cleaning aperture in acc. to EN 1123 form H3

Order		E70 015		
No.	DN	l_1	n	kg
100	100	450	255	5,30
125	125	455	260	7,20
150	150	460	265	7,90
200	200	500	285	14,00
250	250	580	340	21,30

clear width of cleaning aperture $\hat{=}$ 265 x 100 mm

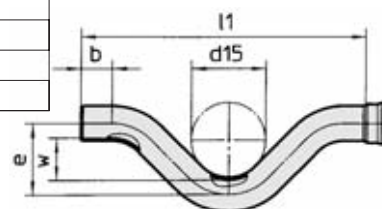


Pipe bridges, drain traps

Pipe bridges* in acc. to EN 1123 form G3

Order		E20 410					
No.	DN	b	l ₁	w	d ₁₅	e	kg
*050	50	70	430	60	115	110	1,11
*070	70	73,5	576	100	170	170	3,64
*100	100	95	690	100	190	198	4,70

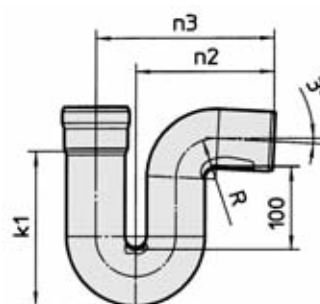
* only supplied with threaded mud plug on request; in future only without threaded mud plug in accordance with Euro standard.



P-drain traps* in acc. to EN 1123 form G1

Order		E20 441				
No.	DN	n ₂	k ₁	R	n ₃	kg
*070	70	172	190	50	220	1,80
*080	80	247	215	82,5	330	3,64
*100	100	234	240	70	303	3,75

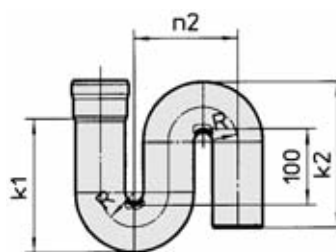
* only supplied with threaded mud plug on request; in future only without threaded mud plug in accordance with Euro standard.



S-drain traps* in acc. to EN 1123 form G2

Order		E20 426				
No.	DN	n ₂	k ₁	k ₂	R	kg
*070	70	150	190	154	50	1,9
*100	100	200	240	216	70	4,2

* only supplied with threaded mud plug on request; in future only without threaded mud plug in accordance with Euro standard.



*Attention

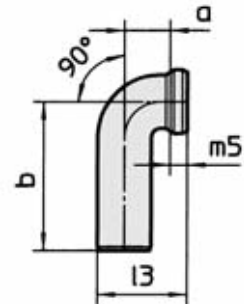
We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

WC-connectors

with short socket to fit plastic pipe DN 80 (Ø 90 mm), with special socket to fit plastic socket pipe DN 100 (Ø 110 mm)

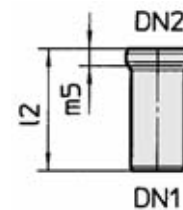
Wall closet bend 90 for vertical mounting, with inserted seal
in acc. to EN 1123 form E6

Order		530 195					
No.	DN	a	b	m _s	l ₃	R	kg
*080	80	55	130	31	130	130,5	0,95
*100	100	57	161	34	142	143	1,54



WC-connectors, straight with inserted seal
in acc. to EN 1123 form E9

Order		530 170			
No.	DN 1	DN 2	l ₂	m _s	kg
100	100	110	165	32	0,95



Special WC connector

WC Connector with seal

Order		E95 014		
No.	DN1	DN2	L1	kg
100	80	110	250	1,3



*Attention

We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

Threaded connectors

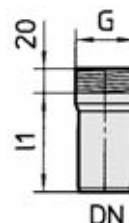
Connectors with external thread* in acc. to DIN 86287/86288 form L3

Order	560			
No.	DN	G	l_1	kg
011 040	40	R 1 1/4"	120	0,22
010 040	40	R 1 1/2"	120	0,25
011 050	50	R 1 1/4"	120	0,30
012 050	50	R 1 1/2"	120	0,35
010 050	50	R 2"	120	0,40

* Use with sanitary installations not allowed (DIN 1986)

Connectors with internal thread* in acc. to DIN 86287/86288 form L1

Order	560			
No.	DN	G	l_1	kg
111 040	40	R 1 1/4"	120	0,22
110 040	40	R 1 1/2"	120	0,25
111 050	50	R 1 1/4"	120	0,30
112 050	50	R 1 1/2"	120	0,35
110 050	50	R 2"	120	0,40



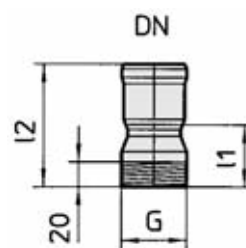
Connectors with external thread* in acc. to DIN 86287/86288 form L5

Order	E60				
No.	DN	G	l_1	l_2	kg
204 040	40	R 1 1/4"	45	90	0,20
210 040	40	R 1 1/2"	45	90	0,34
205 040	40	R 2"	55	100	0,35
204 050	50	R 1 1/4"	58	115	0,25
205 050	50	R 1 1/2"	48	105	0,30
210 050	50	R 2"	35	105	0,45
210 070	70	R 2 1/2"	50	120	0,60

* Use with sanitary installations not allowed (DIN 1986)

Connectors with internal thread* in acc. to DIN 86288 form ·/.

Order	E60				
No.	DN	G	l_1	l_2	kg
214 040	40	R 1 1/4"	45	90	0,20
211 040	40	R 1 1/2"	47	92	0,25
212 040	40	R 2"	60	105	0,35
215 050	50	R 1 1/4"	48	105	0,32
214 050	50	R 1 1/2"	43	100	0,30
211 050	50	R 2"	48	105	0,40



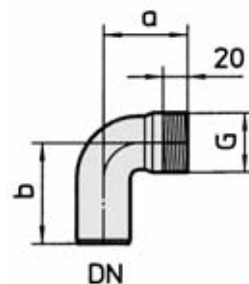
Angle bend with external thread* in acc. to DIN 86287/86288 form L4

Order	*530				
No.	DN	G	a	b	kg
140 040	40	R 1 1/2"	63	80	0,28
140 050	50	R 2"	70	100	0,33

* Use with sanitary installations not allowed (DIN 1986)

Angle bend with internal thread* in acc. to DIN 86287/86288 form L2

Order	*530				
No.	DN	G	a	b	kg
120 040	40	R 1 1/4"	67	80	0,30
100 040	40	R 1 1/2"	67	80	0,40
120 050	50	R 1 1/4"	74	100	0,35
110 050	50	R 1 1/2"	74	100	0,40
100 050	50	R 2"	74	100	0,50



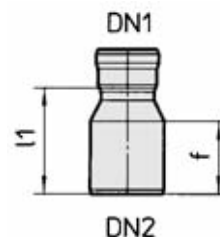
*Attention

We would like to bring your attention to the fact, that all shaped components with the bend share varies due to production-engineering reasons. The design data are available at any time, if needed.

Transition pipes

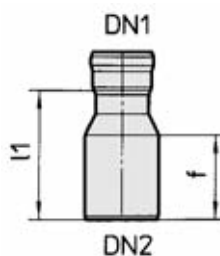
Transition pipes, concentric in acc. to EN 1123 form F2

Order No.			E40		
	DN 1	DN 2	l_1	f	kg
100 054	40	50	85	60	0,21
100 074	40	70	120	87	0,45
110 075	50	70	110	65	0,40
100 150	50	100	160	104,5	0,83
110 087	70	80	110	87	0,65
120 170	70	100	140	109	0,95
130 132	70	125	160	96	1,35
120 180	80	100	140	100	0,95
140 225	100	125	160	100	1,65
150 250	100	150	170	110	1,95
155 300	100	200	250	140	2,05
150 275	125	150	150	107	2,20
155 325	125	200	255	158	4,40
155 350	150	200	235	158	4,50
156 450	200	250	280	220	8,20



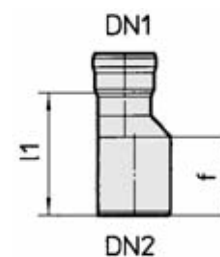
Transition pipes, concentric with extended spigot end, fits securing clips in acc. to EN 1123 form F3

Order No.			E41		
	DN 1	DN 2	l_1	f	kg
100 054	40	50	100	75	0,35
110 075	50	70	130	105	0,50
110 087	70	80	135	105	1,00
120 170	70	100	155	115	1,05
120 180	80	100	155	120	1,05
140 225	100	125	190	130	2,35
150 275	125	150	170	132	2,50
155 350	150	200	255	170	4,25



Transition pipes, eccentric in acc. to EN 1123 form F1

Order No.			E40 160		
	DN 1	DN 2	l_1	f	kg
054	40	50	110	60	0,27
074	40	70	115	70	0,42
075	50	70	140	80	0,40
150	50	100	157	100	0,89
087	70	80	135	84	0,70
170	70	100	160	104	1,08
132	70	125	167	100	1,25
180	80	100	165	100	1,60
225	100	125	182	100	1,87
250	100	150	194	103	2,55
275	125	150	210	105	2,66
350	150	200	272	150	4,92



Connectors

Connectors for changing from GM-X pipe to plastic pipe socket as per
in acc. to EN 1123 form E16, in acc. to DIN 19530 form G16

DIN 19531 (PVC, hart)

DIN 19534 (PVC, hart)

DIN 19535 (PE, hart) $\geq$ DN 70

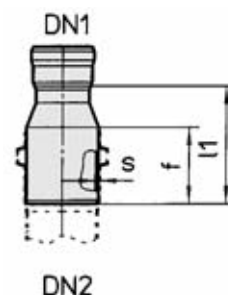
DIN 19537 (HDPE)

DIN 19560 (PP)

DIN 19561 (ABS/ASA)

Order			E40				
No.	DN 1	DN 2	l_1	f	d_{10}	s	kg
300 040	40	50	60	45	50	1,5	0,16
300 050	50	50	60	45	50	1,5	0,20
310 050	50	70	100	60	75	1,5	0,36
310 070	70	70	95	60	75	1,6	0,47
311 070	70	100	120	80	110	2,0	1,10
313 080	80	80	—	—	—	—	—
311 080	80	100	115	80	110	2,0	0,89
311 100	100	100	110	80	110	2,0	0,93
312 100	100	125	140	85	125	2,0	1,20
312 125	125	125	130	85	125	2,5	1,80
315 100	100	150	160	100	160	2,5	1,98
315 125	125	150	150	100	160	2,5	2,17
	150	150	fits without connectors				
316 150	150	200	180	110	200	2,0	2,73
316 200	200	200	150	110	200	2,0	4,15

d_{10} plastic pipe diameter



Connectors for changing from GM-X pipe to plastic pipe socket as per
in acc. to EN 1123 form E17, in acc. to DIN 19530 form G17

DIN 19535 (PE, hart) $\leq$ DN 70

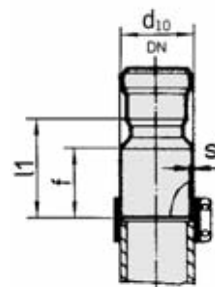
Order			E40				
No.	DN 1	DN 2	l_1	f	d_{10}	s	kg
610 040	40	50	90	50	56	1,5	0,23
610 050	50	50	62	50	56	1,5	0,22

d_{10} plastic pipe diameter

Connectors

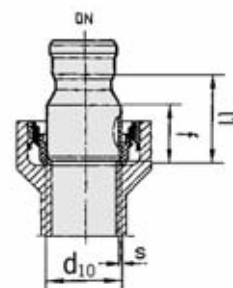
Connector for changing from GM-X pipe to cast iron as per in acc. to EN 1123 form E14, in acc. to DIN 19522 (SML)

Order No.	DN1 DN2		E 40				
			l_i	f	d_{i0}	s	kg
200 040	40	50	100	70	58	1,5	0,25
200 050	50	50	95	70	58	1,5	0,3
210 040	40	70	135	75	78	1,5	0,58
210 050	50	70	130	75	78	1,5	0,46
210 070	70	70	105	75	78	1,6	0,52
220 050	50	100	150	75	110	2	0,83
220 070	70	100	120	80	110	2	0,88
220 100	100	100	110	80	110	2	0,97
230 100	100	125	150	100	135	2,5	1,58
	125	125	fits directly to the SML pipe				
240 100	100	150	170	90	150	2,5	2,02
240 125	125	150	150	100	160	2,5	2,17
	150	150	fits directly to the SML pipe				
250 100	100	200	240	120	210	3,2	3,54
250 125	125	200	225	120	210	3,2	4,1
250 150	150	200	210	120	210	3,2	3,1
250 200	200	200	170	140	210	3,2	5,18



Connector for changing from GM-X pipe to clay pipe as per in acc. to EN 1123 form E15, in acc. to EN 295

Order No.	DN1 DN2		E 40				
			l_i	f	d_{i0}	s	kg
220 070	70	100	120	80	110	2	0,88
220 100	100	100	110	80	110	2	0,97
230 100	100	125	160	100	135	2,5	1,58
	125	125	fits without connectors				
240 100	100	150	170	90	160	2,5	2,02
240 125	125	150	150	100	160	2,5	2,17
	150	150	fits without connectors				
250 100	100	200	240	120	210	3,2	3,54
250 125	125	200	225	120	210	3,2	4,1
250 150	150	200	210	140	210	3,2	3,1
250 200	200	200	170	140	210	3,2	5,18



* under use of connector rings EN 295 of the clay pipe producer

¹⁾ welding area free of galvanized coating

* Parts only on request

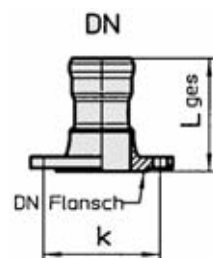
Vacuum installation in DN 40, DN 50, DN 70 with special GM-X-VACplus sealing element and standard x-socket piping system

Connectors with flange

GM-X socket flange without mating flange in accordance to DIN 86288

PN 6 DIN 2631 PN 10 DIN 2632 PN 16 DIN 2633 VG-flange on request

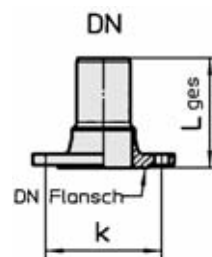
Order No.	E 97					
	DN	Form	PN in bar	L _{ges} in mm	k in mm	weight in kg
091 002	40	M1	16	104	110	2,0
091 001	40	M1	6	100	100	1,3
092 002	50	M1	16	122	125	2,7
092 001	50	M1	6	115	110	1,5
093 002	70	M1	16	135	145	3,4
093 001	70	M1	6	128	130	2,0
094 002	80	M1	16	135	160	4,2
094 001	80	M1	6	127	150	3,2
095 002	100	M1	16	147	180	5,3
095 001	100	M1	6	140	170	3,9
096 002	125	M1	16	155	210	7,5
096 001	125	M1	6	148	200	6,1
097 002	150	M1	16	155	240	9,1
097 001	150	M1	6	153	225	6,4
098 002	200	M1	10	207	295	14,5
098 001	200	M1	6	200	280	10,7
099 002	250	M1	10	249	350	18,8
099 001	250	M1	6	241	335	14,9



GM-X spigot flange without mating flange in accordance to DIN 86288

PN 6 DIN 2631 PN 10 DIN 2632 PN 16 DIN 2633 VG-flange on request

Order No.	E 97					
	DN	Form	PN in bar	L _{ges} in mm	k in mm	weight in kg
101 002	40	M2	16	107	110	2,0
101 001	40	M2	6	103	100	1,3
102 002	50	M2	16	111	125	2,7
102 001	50	M2	6	104	110	1,5
103 002	70	M2	16	140	145	3,4
103 001	70	M2	6	133	130	2,1
104 002	80	M2	16	155	160	4,1
104 001	80	M2	6	147	150	3,1
105 002	100	M2	16	173	180	5,4
105 001	100	M2	6	166	170	3,9
106 002	125	M2	16	205	210	7,8
106 001	125	M2	6	198	200	5,8
107 002	150	M2	16	235	240	9,5
107 001	150	M2	6	228	225	7,0
108 002	200	M2	10	264	295	13,7
108 001	200	M2	6	257	280	11,5
109 002	250	M2	10	249	350	18,64
109 001	250	M2	6	241	335	14,70



* Parts only on request

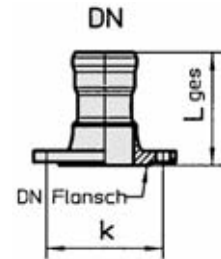
Vacuum installation in DN 40, DN 50, DN 70 with special GM-X-VACplus sealing element and standard x-socket piping system

Connectors with flange

GM-X socket flange without mating flange ANSI flange B 16.5 150 lb/sq.in

PN 6 DIN 2631 PN 10 DIN 2632 PN 16 DIN 2633

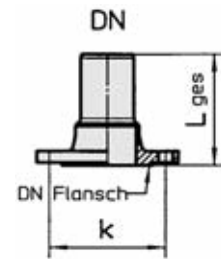
Order No.	DN	E 97				
		Form	PN in bar	L _{ges} in mm	k in mm	weight in kg
161 001	40	M1	6	99	98,4	1,5
162 001	50	M1	6	111	120,6	2,4
163 001	70	M1	6	140	152,4	3,9
164 001	80	M1	6	155	177,8	5,4
165 001	100	M1	6	171	190,5	6,5
166 001	125	M1	6	194	215,9	7,8
167 001	150	M1	6	193	241,3	9,8
168 001	200	M1	6	262	398,4	16,8
169 001	250	M1	6	*	*	*



GM-X spigot flange without mating flange ANSI flange B 16.5 150 lb/sq.in

PN 6 DIN 2631 PN 10 DIN 2632 PN 16 DIN 2633

Order No.	DN	E 97				
		Form	PN in bar	L _{ges} in mm	k in mm	weight in kg
171 001	40	M2	6	110	98,4	1,5
172 001	50	M2	6	130	120,6	2,4
173 001	70	M2	6	160	152,4	3,7
174 001	80	M2	6	155	177,8	5,7
175 001	100	M2	6	197	190,5	6,1
176 001	125	M2	6	194	215,9	8,1
177 001	150	M2	6	194	241,3	9,8
178 001	200	M2	6	247	298,4	16,4
179 001	250	M2	6	*	*	*



* Parts only on request

Vacuum installation in DN 40, DN 50, DN 70 with special GM-X-VACplus sealing element and standard x-socket piping system

Seals

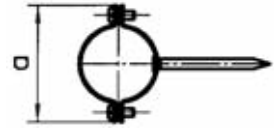
	Order No.	040	050	070	080	100	125	150	200	250
		40	50	70	80	100	125	150	200	250
for GM-X pipes	E80 010	•	•	•	•	•	•	•	•	.....
for transition to MS-socket 32 mm	E80 100	•	•	.....	.....	.....	.....	.....	.....	.....
for transition to MS-socket 38 mm and plastic siphon 40 mm	E80 110	•	•	.....	.....	.....	.....	.....	.....	.....
for transition to MS-socket 48 mm and plastic siphon 50 mm	E80 130	.....	•	.....	.....	.....	.....	.....	.....	.....
for transition from KA socket DN 100 to GM-X pipe DN 100	E80 040	.....	.....	.....	.....	•	.....	.....	.....	.....
for GM-X pipes (seal set)	E80 015	.....	.....	.....	.....	.....	.....	.....	.....	•
for transition to GM-X sockets DN 80 to KA pipe DN 80	E80 060	.....	.....	.....	•	.....	.....	.....	.....	.....
for transition from GM-X special sockets DN 110 to KA pipe 110 mm	E80 010 110	.....	.....	.....	.....	•	.....	.....	.....	.....
for transition from GM-X sockets DN 125 to KA pipe 125 mm	E80 055	.....	.....	.....	.....	.....	•	.....	.....	.....
GM-X-VACplus for X-socket	E80 200	•	•	•	.....	.....	.....	.....	.....	.....



Pipe clips

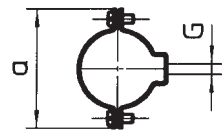
Pipe clips with knock-in pin without sound-proofing insert

Order		580
No.	DN	a
300 040	40	82
300 050	50	95
300 070	70	115
300 080	80	130
300 100	100	150



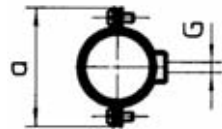
Pipe clips for threaded pin without sound-proofing insert

Order		580	
No.	DN	a	G
400 040	40	82	M8
400 050	50	95	M8
400 070	70	115	M8
400 080	80	130	M10
400 100	100	150	M12
400 125	125	185	M12
400 150	150	208	M12
400 200	200	272	M12



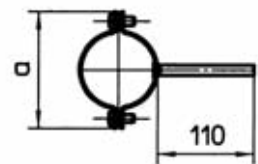
Pipe clips for threaded pin with sound-proofing insert

Order		580	
No.	DN	a	G
500 040	40	95	M8
500 050	50	108	M8



Pipe clips with weld-on-rod

Order		580
No.	DN	a
405 040	40	82
405 050	50	97
405 070	70	120
405 080	80	140
405 100	100	160
405 125	125	190
405 150	150	215

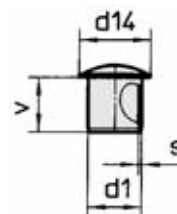


Special configurations on request

Drain plugs

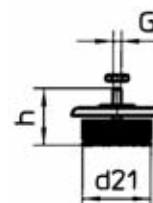
Steel drain plugs in acc. to EN 1123 form K10

Order		570 030				
No.	DN	d_1	d_{14}	v	s	kg
040	40	42	53	30	1,5	0,11
050	50	53	68	38	1,5	0,16
070	70	73	90	55	1,6	0,30
080	80	89	102	60	1,8	0,45
100	100	102	117	65	2,0	0,54
125	125	133	157	75	2,5	1,05
150	150	159	190	75	2,5	1,43
200	200	219	250	120	2,9	3,45
250	250	273	292	130	4,0	5,21



Drain plugs with screwed plug in acc. to EN 1123 form K12

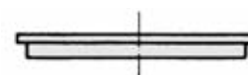
Order		570 031			
No.	DN	d_{21}	G	h	kg
040	40	44	M6	26	0,07
050	50	52	M6	28	0,10
070	70	71,5	M8	28	0,20
100	100	105,5	M12	32	0,50
125	125	138	M12	39	0,70
150	150	160	M12	39	1,00



Accessories

Plastic protective socket caps

Order No.		580 201					
DN		040	050	070	100	125	150
		40	50	70	100	125	150



Lubricant in tubes 150 g

Order No.	E 80 350 000
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Lubricant in bucket 1 kg

Order No.	E 80 350 001
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Bonding agent for seals 125 g

Order No.	E 80 365 000
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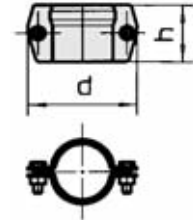


Accessories

Securing clips against axial thrust and for suspending the pipes

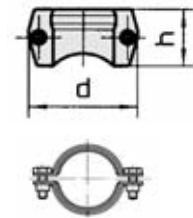
Order No.	DN	EN 1123	570 <i>d</i>	<i>h</i>	weight in kg
033 040	40	K1	85	49	0,2
033 050	50	K1	98	60	0,3
033 070	70	K1	135	69	0,5
033 080	80	K1	150	70	0,8
033 100	100	K2	185	81	1,0
033 125	125	K2	220	90	1,3

DN 40 - DN 80 with 2 screws DN 100 and DN 125 with 4 screws



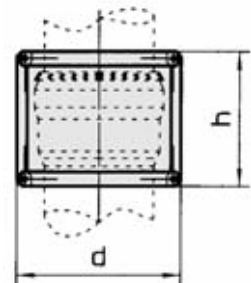
Securing clips with notched recess for pipe/branch connection

Order No.	DN	EN 1123	570 <i>d</i>	<i>h</i>	weight in kg
034 040	40	K3	85	49	0,2
034 050	50	K3	108	60	0,3
034 070	70	K3	135	64	0,4
034 080	80	K3	150	70	0,6
034 100	100	K3	185	81	1,0
034 125	125	K3	220	90	1,25



Securing clamp

Order No.	DN	EN 1123	570 <i>d</i>	<i>h</i>	weight in kg
035 150	150	K4	250	154	0,95
035 200	200	K4	300	200	1,20



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