Ostendorf OSMA®

HT System Plus®

ISSUED 07/2019

100% RECYCLABLE

26dB SOUND INTENSITY

90°C TEMPERATURE RESISTANCE

ISO 9001

Leading system features

- **ADVANCED SYSTEM**
- **HIGH UTILITY VALUE**
- **LIFE SPAN OF UP TO 100 YEARS**
- **THERMAL RESISTANCE 100 °C**
- **CHEMICAL STABILITY pH 2 - pH 12**
- **GREATER PROTECTION AGAINST NOISE (26 dB)**
- **5 YEARS WARRANTY**
- **SAFE OPERATION**
- **LOW CLOGGING RISK**
- **100% RECYCLEABLE**
- **UNIVERSAL USE**
- **BRANCH PIPE FOR PRE-FABRICATED HOUSES**
- **TO USE FOR CENTRAL VACUUM**
- **HIGH LABOUR PRODUCTIVITY**
- **INSTALLATION WITH THE MOST COMMON TOOLS**
- **BETTER AND MORE PERMANENT IMPRINT TUBES EAN CODE FOR EASY IDENTIFICATION AS A MEASURE FOR EASIER INSTALLATION**

Meets the highest requirements

The HT-System PLUS® waste Pipes and shaped Pieces are a top-quality product with a high utility value. When designed, the requirements of the most recent architectural and civil engineering knowledge, as well as strict mechanical, sanitary and above all environmental requirements were taken into account. The production conditions as well as dimensions and testing conditions comply with the ČSN EN 1451-1 standard.

Material – PP

The basic material for production of waste Pipes and shaped Pieces is Polypropylene (PP). A material with great durability as well as long-term thermal and chemical stability, providing the Pipelines with an extremely long lifetime.

Smooth and homogeneous wall

The manufacturing method ensures a perfectly smooth inside and outside surface of both Pipes and shaped Pieces. The surface smoothness, along with the carefully designed shape of faucet joints, provides for outstanding hydraulic characteristics of the piping. The faucet joint is sealed with a multiple sealing element providing for both perfect tightness and long-term joint flexibility.

Environment

The product is manufactured using environment-friendly processes. It is fully recyclable and does not produce toxic waste in case of thermal decomposition.

Wide variety

The HT-System PLUS® is a complete system for sewerage inside Buildings, featuring a wide variety of elements and adjusted for domestic construction purposes. It can be easily connected to all types of existing sewage piping.

Easy installation

Easy Connection with Fitting faucets sealed with elastomeric O-rings speeds up the entire installation process, which could be otherwise extremely complicated, especially as far as glued and welded Connections are concerned. It also ensures immediate and perfect tightness of joints, making it possible to carry out pressure tests immediately after the installation.

HT System Plus®

Waste Pipes and shaped Pieces

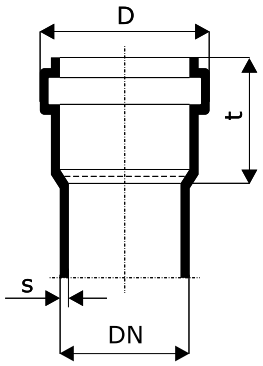
Description

Polypropylene waste Pipes, resistant to high temperatures and made in compliance with the ČSN EN 1451-1 standard.

Field of application

The system is designated for construction of connection, waste, ventilation and collecting Pipelines inside Buildings (application scope B) in cases of higher thermal or chemical exposure without decreased inflammability.

DN(OD)	s [mm]	D [mm]	t [mm]	kg/m
32	1,8	44	40	0,19
40	1,8	53	55	0,24
50	1,8	63	56	0,31
75	1,9	88	61	0,48
90	2,2	105	58	0,61
110	2,7	125	76	0,98
125	3,1	143	82	1,25
160	3,9	181	100	2,05



THE SYMBOLS AND ABBREVIATIONS USED IN THE CATALOG	
D	maximum outer diameter
DN	nominal dimension
s	Pipe wall thickness
t	faucet depth (insertion length of free faucet)

As the materials are mostly supplied by multiple manufacturers, the weight and dimension parameters must be understood as for information purposes only.

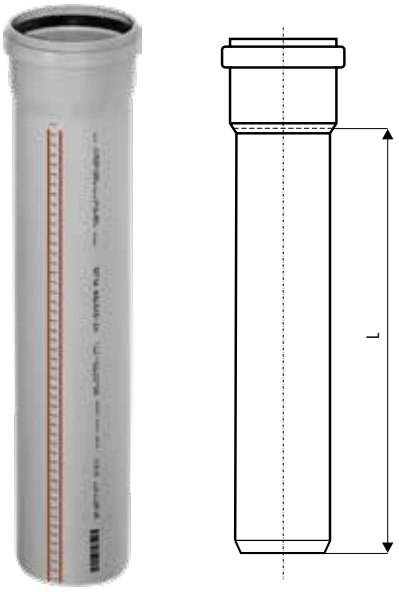
Our technical consultancy services are based on both experience and calculations. Since we do not know and cannot influence the conditions of use of the products we offer, all information must be regarded as recommendations.

In the event of use other than that as recommended by us, potential risks must be taken into consideration.

Typographic errors reserved.

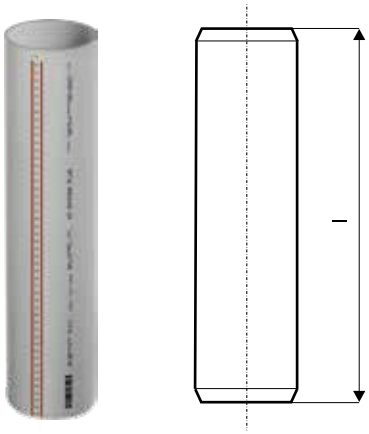
HTEM –Pipe with Socket

EAN CODE	EAN	DN	L (mm)	PACKING	PALLETE
4052836100009	110000	32	150	20	1400
4052836100108	110010	32	250	20	960
4052836100207	110020	32	500	20	320
4052836100405	110040	32	1000	10	300
4052836100603	110060	32	2000	10	300
4052836100702	110070	32	3000	10	300
4052836110008	111000	40	150	20	960
4052836110107	111010	40	250	20	960
4052836110206	111020	40	500	20	320
4052836110404	111040	40	1000	10	260
4052836110503	111050	40	1500	10	260
4052836110602	111060	40	2000	10	260
4025075100703	111070	40	3000	10	260
4052836120007	112000	50	150	20	720
4052836120106	112010	50	250	20	720
4052836120205	112020	50	500	20	320
4052836120403	112040	50	1000	10	200
4052836120502	112050	50	1500	10	200
4052836120601	112060	50	2000	10	200
4025075101700	112070	50	3000	10	200
4052836130006	113000	75	150	20	480
4052836130105	113010	75	250	20	320
4052836130204	113020	75	500	20	160
4052836130402	113040	75	1000	6	120
4052836130501	113050	75	1500	6	120
4052836130600	113060	75	2000	6	120
4025075102707	113070	75	3000	6	120
4052836140005	114000	90	150	20	320
4052836140104	114010	90	250	20	240
4052836140203	114020	90	500	10	120
4052836140401	114040	90	1000	4	96
4052836140500	114050	90	1500	4	96
4052836140609	114060	90	2000	4	96
4052836140708	114070	90	3000	4	96
4052836150004	115000	110	150	20	160
4052836150103	115010	110	250	20	160
4052836150202	115020	110	500	20	80
4052836150400	115040	110	1000	4	60
4052836150509	115050	110	1500	4	60
4052836150608	115060	110	2000	4	60
4025075103629	115070	110	3000	4	60
4052836160003	116000	125	150	10	120
4052836160102	116010	125	250	10	120
4052836160201	116020	125	500	5	60
4052836160409	116040	125	1000	4	54
4052836160508	116050	125	1500	4	54
4052836160607	116060	125	2000	4	54
4025075104701	116070	125	3000	4	54
4052836170002	117000	160	150	20	84
4052836170101	117010	160	250	20	70
4052836170200	117020	160	500	20	35
4052836170408	117040	160	1000	1	35
4052836170507	117050	160	1500	1	35
4052836170606	117060	160	2000	1	35
4025075105708	117070	160	3000	1	35



HTGL – Pipe without Socket

EAN CODE	EAN	DN	L (mm)	PACKING	PALLETE
4052836110800	111080	40	5000	1	260
4052836120809	112080	50	5000	1	200
4052836130808	113080	75	5000	1	120
4052836150806	115080	110	5000	1	60
4052836160805	116080	125	5000	1	54
4052836170804	117080	160	5000	1	35

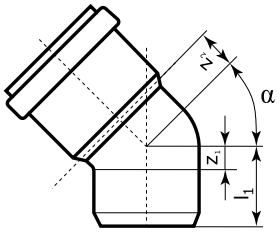


HTB – Bend 15°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	l_1 (mm)	PACKING	PALLETE
4052836101006	110100	32	3	8	45	20	1400
4052836111005	111100	40	4	8	66	20	960
4052836121004	112100	50	5	8	67,5	20	960
4052836131003	113100	75	7	10	73	20	480
4052836141002	114100	90	6	12	54	20	480
4052836151001	115100	110	9	13	85	20	240
4052836161000	116100	125	10	14	92	20	160
4052836171009	117100	160	12	18	113	10	80

HTB – Bend 30°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	l_1 (mm)	PACKING	PALLETE
4052836101105	110110	32	6	10	48	20	1400
4052836111104	111110	40	7	10	69	20	960
4052836121103	112110	50	8	11	70,5	20	960
4052836131102	113110	75	12	15	78	20	480
4052836141101	114110	90	13	18	54	20	480
4052836151100	115110	110	16	20	92	20	240
4052836161109	116110	125	18	22	100	20	160
4052836171108	117110	160	23	29	123	10	80



HTB – Bend 45°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	l_1 (mm)	PACKING	PALLETE
4052836101204	110120	32	9	12	51	20	1400
4052836111203	111120	40	10	13	72	20	960
4052836121202	112120	50	12	15	74,5	20	960
4052836131201	113120	75	17	20	83	20	480
4052836141200	114120	90	20	25	54	20	480
4052836151209	115120	110	25	28	101	20	240
4052836161208	116120	125	28	32	110	20	160
4052836171207	117120	160	36	42	136	10	60

HTB – Bend 67°

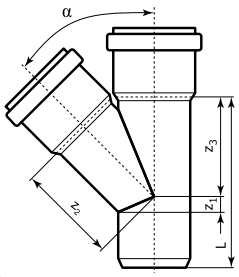
EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	l_1 (mm)	PACKING	PALLETE
4052836101303	110130	32	14	17	58	20	1400
4052836111302	111130	40	16	19	78	20	960
4052836121301	112130	50	19	22	81,5	20	960
4052836131300	113130	75	27	31	93	20	480
4052836141309	114130	90	32	36	54	20	240
4052836151308	115130	110	40	43	116	20	160

HTB – Bend 87°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	l_1 (mm)	PACKING	PALLETE
4052836101402	110140	32	19	23	61	20	1400
4052836111401	111140	40	23	26	85	20	960
4052836121400	112140	50	27	31	89,5	20	960
4052836131409	113140	75	39	43	105	20	480
4052836141408	114140	90	46	49	54	20	240
4052836151407	115140	110	57	61	133	20	160
4052836161406	116140	125	65	69	147	10	120
4052836171405	117140	160	83	89	183	10	60

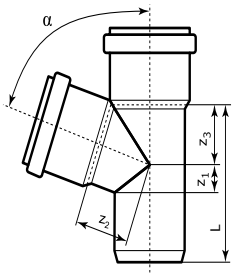
HTEA – Branch Pipe 45°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4052836102003	110200	32/32	10	47	49	107	20	960
4052836112002	111200	40/40	10	49	49	107	20	960
4052836122100	112210	50/40	5	56	54	106	20	480
4052836122001	112200	50/50	12	61	61	125	20	480
4052836132109	113210	75/50	1	79	74	130	20	400
4052836132000	113200	75/75	17	91	91	165	20	240
4052836142207	114220	90/50	9	90	82	127	20	240
4052836142009	114200	90/90	20	110	110	184	20	160
4052836152206	115220	110/50	17	101	90	135	20	240
4052836152107	115210	110/75	0	116	109	173	20	160
4052836152008	115200	110/110	35	127	127	218	10	80
4052836162106	116210	125/110	18	143	141	224	5	60
4052836162007	116200	125/125	28	152	152	249	5	60
4052836172105	117210	160/110	2	166	158	241	5	40
4052836172006	117200	160/160	36	180	185	380	5	30



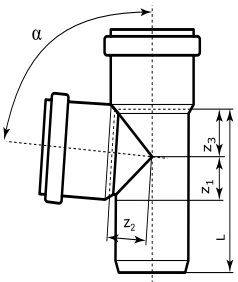
HTEA – Branch Pipe 67°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4052836103000	110300	32/32	14	27	27	85	20	960
4052836113009	111300	40/40	16	32	32	93	20	960
4052836123107	112310	50/40	14	38	35	95	20	480
4052836123008	112300	50/50	19	40	40	113	20	480
4052836133106	113310	75/50	14	53	45	115	20	480
4052836133007	113300	75/75	27	59	59	143	20	240
4052836153203	115320	110/50	8	71	51	125	20	240
4052836153104	115310	110/75	21	77	66	150	20	160
4052836153005	115300	110/110	40	85	85	186	10	120



HTEA – Branch Pipe 87°

EAN CODE	EAN	DN	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4052836104007	110400	32/32	19	21	21	85	20	960
4052836114006	111400	40/40	23	24	24	92	20	960
4052836124104	112410	50/40	22	29	24	94	20	480
4052836124005	112400	50/50	27	29	29	110	20	480
4052836134103	113410	75/50	27	42	30	113	20	400
4052836134004	113400	75/75	39	43	43	142	20	240
4052836134103	113410	90/50	26	50	31	111	20	240
4052836134004	113400	90/90	56	70	51	161	20	240
4052836154200	115420	110/50	40	60	44	120	20	240
4052836154101	115410	110/75	40	60	44	149	20	160
4052836154002	115400	110/110	57	61	61	177	10	120
4052836164100	116410	125/110	57	68	62	191	5	60
4052836164001	116400	125/125	28	120	152	205	5	60
4052836174109	117410	160/110	59	83	63	219	5	60
4052836174000	117400	160/160	36	162	313	245	4	48



HTBO – Bend with digression 87°

EAN CODE	EAN	DN	PACKING	PALLETE
4025075115554	11555	110/50	1	-

HTDB – Bend

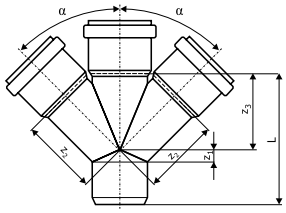
EAN CODE	EAN	DN	PACKING	PALLETE
4025075115509	11550	110/110/ 87°	1	-

HT – Reducer PP - PVC

EAN CODE	EAN	DN1	DN2	PACKING	PALLETE
4025075156502	15650	63	50	1	-
4025075157509	15750	75	63	1	-

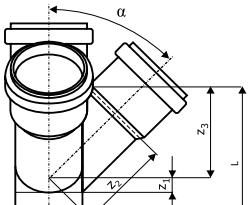
HTDA – double Branch Pipe

EAN CODE	EAN	DN	α	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4052836129000	16100	50/50/50	45°	12	61	61	107	20	320
4052836129000	112900	50/50/50	67°	20	41	41	107	20	320
4025075161209	16120	50/50/50	87°	28	30	30	107	20	320
4052836139009	113900	75/75/75	67°	28	59	59	138	20	240
4025075161254	16125	110/50/50	45°	17	101	90	132	20	160
4052836159106	115910	110/50/50	67°	8	73	54	121	10	120
4025075161353	16135	110/50/50	87°	40	60	44	122	20	160
4025075162305	16230	110/75/75	67°	22	78	67	163	10	80
4025075163005	16300	110/110/110	45°	25	134	134	201	10	80
4052836159007	115900	110/110/110	67°	40	86	86	190	5	60
4025075163401	16340	110/110/110	87°	57	62	62	201	10	80
4025075163357	16335	125/110/110	45°	18	143	141	224	10	40
4025075163500	16350	125/110/110	67°	40	90	90	250	10	40
4025075173554	17355	125/110/110	87°	57	68	62	191	10	40
4025075163555	16355	125/125/125	67°	38	92	94	226	10	40
4025075163654	16365	125/125/125	87°	28	120	152	205	10	40



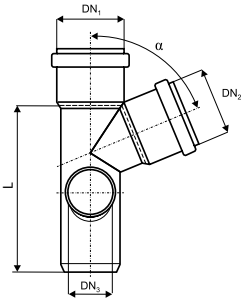
HTED – Corner Branch Pipe

EAN CODE	EAN	DN1	DN2	DN3	α	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4025075171055	17105	50	50	50	45°	12	61	61	125	20	320
4025075171406	17140	50	50	50	67°	20	41	41	124	20	320
4025075172403	17240	75	75	75	67°	28	59	59	153	20	160
4025075173059	17305	110	50	50	45°	17	101	90	135	20	160
4025075173356	17335	110	50	50	67°	8	71	31	125	20	160
4025075173158	17315	110	110	110	45°	35	127	127	218	10	80
4052836159205	115920	110	110	110	67°	40	86	86	156	10	80
4025075173455	17345	110	110	110	87°	57	61	61	177	10	80
4025075173509	17325	125	110	110	45°	18	143	141	224	10	40
4025075173509	17350	125	110	110	67°	40	85	85	250	10	40
4025075174506	17450	125	125	125	87°	40	70	70	250	10	40
4025075174407	17440	160	110	110	67°	50	60	95	240	10	24
4025075174605	17460	160	110	110	87°	55	90	70	230	10	40



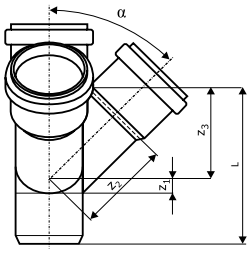
HTEP – Corner Branch for pre-fabricated Buildings

EAN EAN	EAN		DN1	DN2	DN3	α	L (mm)	PACKING	PALLETE
4025075173707	17370	levá	110	75	110	67°	295	10	80
4025075173752	17375	levá	110	75	110	87°	295	10	80
4025075173806	17380	pravá	110	110	75	67°	295	10	80
4025075173851	17385	pravá	110	110	75	87°	295	10	80



HTEPK – Corner Branch for pre-fabricated Buildings short left

EAN CODE	EAN	DN1	DN2	DN3	α	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4025075176005	17600	110	110	50	67°	40	80	80	185	10	80
4025075176203	17620	110	110	50	87°	55	60	60	175	10	80
4025075176401	17640	110	110	75	67°	40	80	80	185	10	80
4025075176609	17660	110	110	75	87°	55	60	60	175	10	80

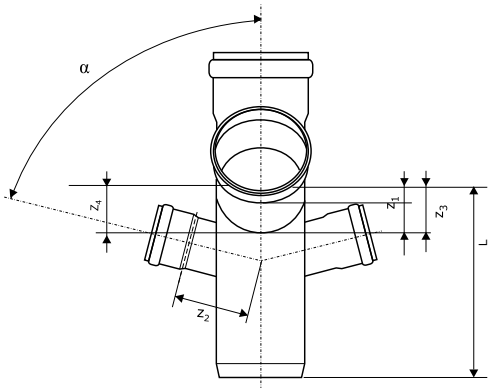


HTEPK – Corner Branch for pre-fabricated Buildings short right

EAN CODE	EAN	DN1	DN2	DN3	α	z_1 (mm)	z_2 (mm)	z_3 (mm)	L (mm)	PACKING	PALLETE
4025075176104	17610	110	110	50	67°	40	80	80	185	10	80
4025075176302	17630	110	110	50	87°	55	60	60	175	10	80
4025075176500	17650	110	110	75	67°	40	80	80	185	10	80
4025075176708	17670	110	110	75	87°	55	60	60	175	10	80

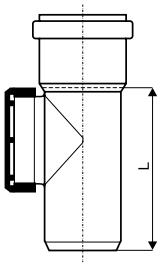
HTEP – Corner Branch for pre-fabricated Buildings triple

EAN CODE	EAN	DN1	DN2	DN3	DN4	α	z_1 (mm)	z_2 (mm)	z_3 (mm)	z_4 (mm)	L (mm)	PACKING	PALLETE
4025075173950	17395	110	110	50	50	67°	45	70	60	60	235	5	40
4025075173905	17390	110	110	75	75	67°	35	80	80	80	235	5	40



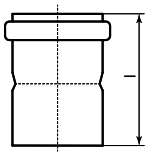
HTRE – Purging Fitting (round cover)

EAN CODE	EAN	DN	L (mm)	PACKING	PALLETE
4052836126009	112600	50	106	20	480
4052836136008	113600	75	135	20	480
4052836156006	115600	110	175	20	160
4052836166005	116600	125	185	5	60
4052836176004	117600	160	215	5	60



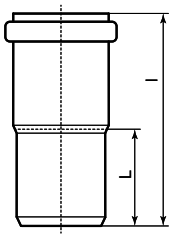
HTAM – individual Socket

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836128102	112810	50	84	20	480
4052836138101	113810	75	95	20	480
4052836158109	115810	110	122	20	240

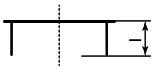
HTL – extended individual Socket (extension Piece)

EAN CODE	EAN	DN	l (mm)	L (mm)	PACKING	PALLETE
4052836118004	111800	40	155	50	20	960
4052836128003	112800	50	211	55	20	480
4052836138002	113800	75	223	59	20	480
4052836158000	115800	110	255	69	20	160

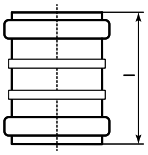
HTM – Socket Stopper

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836106209	110620	32	33	100	7000
4052836116208	111620	40	34	20	2880
4052836126207	112620	50	34	20	2880
4052836136206	113620	75	39	20	2560
4052836146205	114620	90	39	20	960
4052836156204	115620	110	40	20	960
4052836166203	116620	125	45	20	480
4052836176202	117620	160	58	20	480

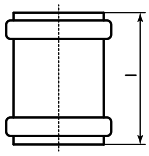
HTMM – double-Socket Sleeve

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836105103	110510	32	93	20	1400
4052836115102	111510	40	103	20	960
4052836125101	112510	50	105	20	960
4052836135100	113510	75	111	20	480
4052836155108	115510	110	128	20	240
4052836165107	116510	125	116	20	160
4052836175106	117510	160	163	15	120

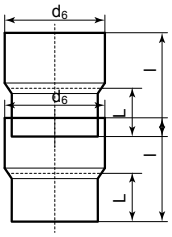
HTU – Sleeve

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836105004	110500	32	93	20	1400
4052836115003	111500	40	103	20	960
4052836125002	112500	50	105	20	960
4052836135001	113500	75	111	20	480
4052836145000	114500	90	98	20	480
4052836155009	115500	110	128	20	240
4052836165008	116500	125	116	20	160
4052836175007	117500	160	163	15	120

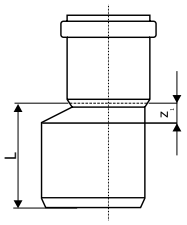
HTUG – Reducer Cast-iron/PP

EAN CODE	EAN	DN	d_e (mm)	l (mm)	L (mm)	PACKING	PALLETE
4052836128201	112820	50	72	116	61	20	960
4052836138200	113820	75	92	118	63	20	480
4052836158208	115820	110	124	129	70	20	480

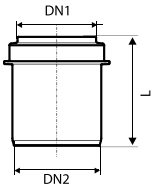
HTR – abaxial Reduction Pipe, long

EAN CODE	EAN	DN	z_1 (mm)	L (mm)	PACKING	PALLETE
4052836117106	111710	40/32	15	45	20	1400
4052836127204	112720	50/32	17	62	20	960
4052836127105	112710	50/40	11	62	20	960
4052836137104	113710	75/50	20	72	20	960
4052836147202	114720	90/50	29	83	20	480
4052836147103	114710	90/75	17	71	20	480
4052836157201	115720	110/50	39	100	20	480
4052836157102	115710	110/75	25	85	20	480
4052836167101	116710	125/110	14	78	20	240
4052836177100	117710	160/110	33	112	20	160
4052836177001	117700	160/125	26	100	20	160



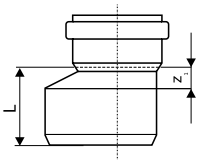
HTR – Reduction short

EAN CODE	EAN	DN1	DN2	l (mm)	PACKING	PALLETE
4052831127159	112715	50	40	62	20	1400



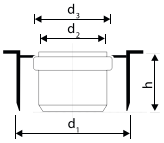
HTR – abaxial Reduction Pipe, short

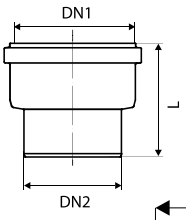
EAN CODE	EAN	DN	z_1 (mm)	L (mm)	PACKING	PALLETE
4052836137159	113715	75/50	13	52	20	480
4052836157270	115725	110/50	18	58	20	480
4052836157157	115715	110/75	20	58	20	480
4052836157058	115705	110/90	17	75	20	480



HTRi – internal Reduction

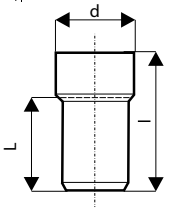
EAN CODE	EAN	DN1	DN2	l (mm)	PACKING	PALLETE
4052836157706	115770	110	50	112	20	480
4052836157607	115760	110	75	112	20	480
4052836157508	115750	110	110	112	20	240





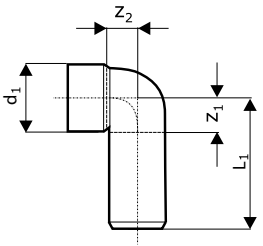
HTS – Connection Piece

EAN CODE	EAN	DN	d (mm)	l (mm)	L (mm)	PACKING	PALLETE
4052836119001	111900	40/40	50	77	48	20	2880
4052836129109	112910	50/40	50	74	48	20	2880
4052836129208	112920	50/50	60	79	50	20	960



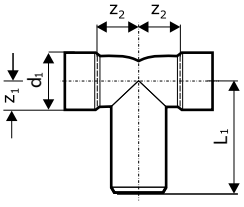
HTSW – Siphon Bend 90°

EAN CODE	EAN	DN	d_1 (mm)	z_1 (mm)	z_2 (mm)	L_1 (mm)	PACKING	PALLETE
4052836119100	111910	40/32	40	27,0	25	75	20	960
4052836119209	111920	40/40	50	25,5	25	75	20	960
4052836129406	112940	50/40	50	30,5	30	81	20	960
4052836129505	112950	50/50	60	30,5	29	81	20	960



HTDSW – double Connection Bend 90°

EAN CODE	EAN	DN	d_1 (mm)	z_1 (mm)	z_2 (mm)	L_1 (mm)	PACKING	PALLETE
4052836129703	112970	40/50/40	50	27	39	90	20	480



HT – spare O-ring

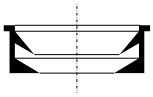
EAN CODE	EAN	DN	PACKING
4052836800008	880000	32	40
4052836800107	880010	40	33
4052836800206	880020	50	34
4052836800305	880030	75	34
4052836800503	880050	110	39
4052836800701	880070	125	25
4052836800800	880080	160	31

HT – GA Cuff

EAN CODE	EAN	DN	PACKING
4052836810052	881005	50	36
4052836810151	881015	75	30
4052836810250	881025	110	16

HTGM – rubber Collar for HTS, HTSW, HTDSW

EAN CODE	EAN	DN	D_1 (mm)	D_2 (mm)	Suitable dimensions	PACKING
4052836812001	881200	40/30 A	40	28-34	DN 40/30	20
4052836812100	881210	40/30 B	50	28-34	DN 40/40	20
4052836812209	881220	40/40 C	50	38-44	DN 40/40	20
4052836812407	881240	50/30 D	60	28-34	DN 50/50	20
4052836812506	881250	50/40 E	60	38-44	DN 50/50	20
4052836812605	881260	50/50 F	60	48-54	DN 50/50	20



HT NBR Gasket (Oil and Fat resistant)

EAN CODE	EAN	DN	PACKING	PALLETE
4025075190254	880210	40	1	-
4025075191251	880220	50	1	-
4025075192258	880230	75	1	-
4052836802408	880240	90	1	-
4025075193255	880250	110	1	-
4025075194252	880270	125	1	-
4025075195259	880280	160	1	-

HT – spare Cap for HTRE

EAN CODE	EAN	DN	PACKING
4025075191008	19100	50	1
4025075192005	19200	75	1
4025075193002	19300	110	1

HT – Pull-out Protection

EAN CODE	EAN	DN	PACKING
4052836815002	881500	50	50
4052836815101	881510	75	30
4052836815309	881530	110	20
4052836815408	881540	125	9
4052836815507	881550	160	10
4052836815606	881560	200	10

COLLECTION PIPING

Collection piping is horizontal piping in the building that can be a main (leads out of the structure and ends 1 m in front of the structure), or lateral (connected to the main collection piping).

CONNECTION PIPING

Connection piping is piping between furnishing objects, inlets or other drainage equipment and the waste pipeline. The bore of the pipe is determined based on the kind and number of furnishing objects connected. It is installed most frequently in grooves in the masonry or suspended under the ceiling structure. Another possibility is to install the pipes inside skin wall systems (e. g. gypsum board) where the pipes are anchored with installation clamps between load-bearing profiles. The connection pipeline should not be longer than 3 m and should be installed in a slope of at least 3%. The inlets in furnishing objects are made of connection knee pieces or connection pieces with reduction sleeves inserted.

WASTE PIPELINE

Waste pipeline is vertical and connects the connection and collection pipelines. It is mostly installed into grooves in masonry or into service ducts. Regardless of calculations, the following minimum pipe bores are required for waste pipeline:

- 75 mm – for draining waste water off urinals, bath tubes and sinks from kitchens in flats
- 110 mm – for drainage of waste from large kitchens.

In case of plastic systems, the transition from the waste into the collection pipelines is made using two knee pieces with 45° angles. In structures comprised of three and more floors, a straight 250 mm long piece, a so called "calming zone", is inserted between the knee pieces. Bore reduction is inserted into the vertical pipeline part before the knee pieces. The inlets from furnishing objects of different types on the same level directly into the waste pipeline is made of corner Branch Pipeieces with inner angles max. 90°.

In case of identical furnishing objects, a double Branch Pipeiece 180° can be used (see Figure 1a). In case double Branch Pipeieces are used for connection of lavatories, a Branch Pipeiece with maximum inner angle of 135° (see Figure 1b) must be used. Purging fittings (HTRE) are always to be placed 1 m above the floor: in the bottom floor at each change of vertical pipeline direction, in the top floor (if no cleaning from roof can be provided), in every third floor, or in every floor in case more furnishing objects are lead collectively into one waste pipeline. Ventilation piping provides for ventilation from the external sewerage system. This is the upper sewerage section, where the main branch always rises above the roof. No more furnishing objects are connected to this section. Individual furnishing objects may be finalised with puff caps or valves.

Figure 1a Connection of furnishing objects of identical type

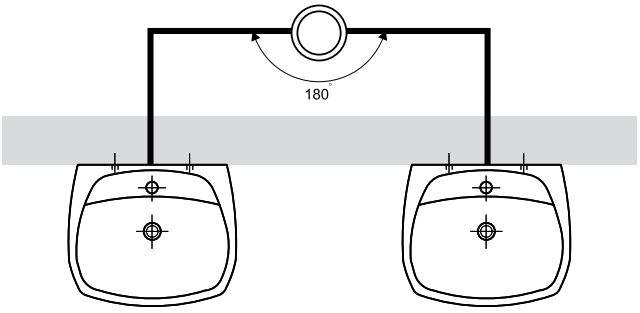
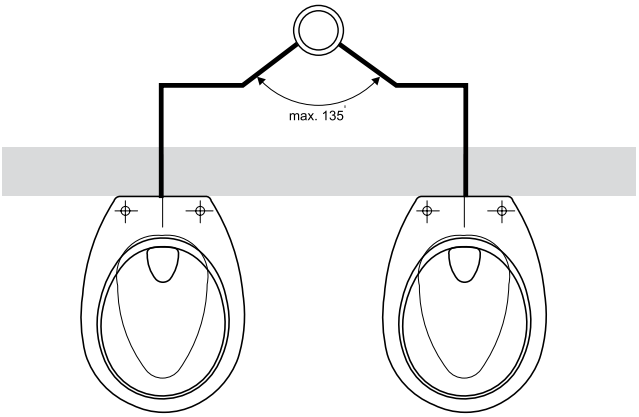


Figure 1b Connection of closets to a double branch



Installation manual HT, ULTRA dB a Skolan SAFE®

1. SCOPE OF VALIDITY

a) This manual describes the handling, storage and installation of pipelines designated for draining media in connection, waste, ventilation and rainwater pipelines made of HT-System PLUS® pipes and shaped pieces which are made in compliance with the ČSN EN 1451-1 standard as well as with the requirements of the Act No. 22/1997 Coll.,„Technical requirements on products". The Declaration of Conformity was issued in compliance with Act No. NV 178/1997 Coll. as amended in Act No. NV 81/97 Coll.
b) This Manual is intended only for installations from genuine pipes and shaped pieces, as well as genuine sealing elements and mounting lubricants.

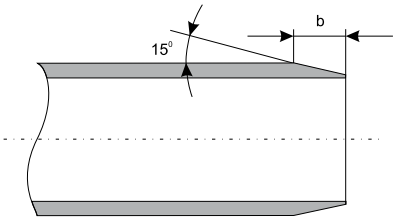
2. TRANSPORT, HANDLING, STORAGE

Free pipes must rest on the cargo bed along all their full length throughout transport. Dragging the pipes along the ground or the cargo bed is not recommended. We recommend proceeding with extreme caution in low ambient temperatures (particularly in temperatures below 0°C). Use textile belts to move the pipes with a crane.
The HT System Plus®, Skolan SAFE® a Ultra dB System pipes and shaped pieces, including sealing elements, may be stored in open areas. Maximum storage time in open areas, however, is limited to two years. For longer periods, it will be necessary to protect the products from UV radiation. The following conditions apply to storage:
a) The pipes must be stored in such a manner as to protect them from any deformation.
b) The pipe faucets must be stored as to protect them from any horizontal and/or vertical deformation.
c) The maximum pile height for pipes not stored in PALLETEs must not exceed 1.5 meters.

3. CONNECTING THE PIPES

The HT System Plus®, Skolan SAFE® a Ultra dB System pipes and shaped pieces are connected by means of socket faucets with a tight connection to even pipe ends provided by means of lipped O-rings. The glueing of pipes or shaped pieces is not recommended. Single pipes and shaped pieces are always fitted with a faucet and an O-ring at one end. Other pipes with no faucets can be connected via sleeves, double faucet sleeves, and individual faucets. The pipes can be cut either with a special pipe cutter, or with a slant-cut hand-saw with fine teeth (see Figure 1). The cut must be lead at a right angle to the pipe axis. The cut must be cleaned and bevelled. The bevel can be created with a special cutter (the bevel will be created during cutting) or with a fine rasp or wood file. The dimensions are given in Figure 2 and in the following table.
Figure 1 Pipe cutting with a hand-saw

Figure 2 Bevel of pipe cut subsequently



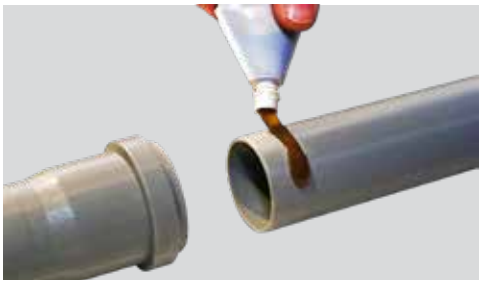
BEVEL DIMENSIONS								
DN	32	40	50	75	110	125	160	200
b[mm]	3,5	3,5	3,5	3,5	4,5	5,0	6,0	6,5

4. CONNECTING PIPES AND SHAPED PIECES

a) Clean the faucet and flat end of the pipe.

b) Check the condition of sealing elements.

c) On the flat end of the bevel evenly spread the original mounting lubricant (usage of petroleum-based greases and oils is not recommended). Prior to fitting the O-ring, the surface must be dry and free from lubricant residue.



d) Insert the flat end of the pipe into the faucet completely. Mark the faucet rim on the flat end with a pencil or marker and move this mark out backwards by ca 10mm. This will allow for pipe expansion. Considering that the pipes with faucets are max. 2,000 mm long, the above mentioned value should be sufficient. In case of longer pipes

(e.g. 5000mm without faucet) it will be necessary to insert an extension bend – extended faucet (HTL, SKL). Flat ends of the fittings are to be inserted in the faucet completely.

5. PIPELINE ANCHORING

Anchoring of the pipeline to the building structure stabilises the pipeline position, transmits forces and loads into the structure and prevents the pipeline from unwanted bending and from transmitting vibrations and noise into the building structure. OSMA recommends anchoring the HT System Plus®, Skolan SAFE® a Ultra dB System pipes with steel holders with rubber lining (decrease transmission of noise on the structure), which are included in the catalogue. The holders must correspond to the outer diameter of the piping. The use of steel hooks or flexible PVC tapes is not recommended.

FIXED HOLDERS (FH)
Holders located along the entire pipeline length are divided into fixed and loose units. Fixed holders (FH) must always be located under the pipe faucet (HTEM, SKEM) or closely under the separate faucet in case of a straight pipe (HTGL) with a faucet socket (HTAM). Fixing at a subsequent connection with sleeve (HTU, SKU) or connection (HTMM) is included in paragraph 11. Fixed holders must always be used with shaped pieces and groups of shaped pieces.

LOOSE HOLDERS (LH)
Loose holders are a supplement to fixed holders in the pipeline anchoring system. Loose holders are fitted with slip rubber sleeves and distance washers and are always a few hundredths of a millimeter greater than the pipe outer diameter (they are not tight, i. e. allowing for pipe expansion).

RECOMMENDED HOLDER SPACING VALUES		
DN	horizontal [m]	vertical [m]
32	0,50	1,2
40	0,50	1,2
50	0,50	1,5
58	0,50	1,5
78	0,80	2,0
75	0,80	2,0
100	1,10	2,0
110	1,10	2,0
125	1,25	2,0
135	1,35	2,0
160	1,60	2,0
200	2,00	2,0

6. INSTALLING PIPELINES IN WALLS

Penetrations and grooves in walls must provide for tension-free pipeline installation and pipeline movement during structure subsidence, as well as for pipeline protection from mechanical damage. No pipeline connections may be placed in penetrations. It is possible to plaster the pipeline immediately after it has been packed in cardboard, felt stripes, mineral wool or plaster carrier, such as e. g. meshwork. At such places where the waste pipeline should be lead along with hot-water pipes, it is necessary to insulate these pipes. At the same time, all directives concerning skin-wall installations as well as standards applicable to construction of waste pipelines inside buildings have to be fully respected. Horizontal pipelines, such as connection pipes leading from multiple furnishing objects, must rest on brickwork along its entire length. Nevertheless, enough space must be provided for pipeline expansion at the same time.

7. PIPING PENETRATION THROUGH CEILINGS

Piping penetration through ceilings must be water and sound-proof. In the event the area needs to be made resistant to the spread of fire, it is possible to use fire-proof sleeves; these sleeves are placed on the ceiling side with greater fire risk. The sleeves are fastened to the structure with steel dowels. The sleeves must never be installed directly into the penetration hole. Fire-proof sleeves are included in the catalogue. In the event an installation certification or regular checks of fire-proof sleeves by an authorised company are needed, please refer to the contact information on the reverse side of the catalogue cover.

8. PIPELINE INSTALLATION IN CONCRETE

The HT System Plus®, Skolan SAFE® a Ultra dB System waste pipes and shaped pieces may be directly encased in concrete, taking the length of thermal expansion into account. The pipeline must be properly fixed and secured against any possible displacement (floating) during concrete placing. At the same time, the connections must be secured with adhesive tape, so that no cement laitance can penetrate into the sealing elements, and any pipeline openings must be closed, if possible with stoppers (HTM, SKM).

9. CONNECTING PIPES MADE OF OTHER MATERIALS

a) The HT-System PLUS® pipeline may be connected to already present PVC-pipeline directly through the faucet or using a sleeve (HTU), double-faucet sleeve (HTMM), or separate faucet (HTAM). Connections between flat ends of Polypropylene pipes and PVC waste pipeline faucets must be equipped with O-rings!! Skolan SAFE® pipes connections with existing glued PVC pipe is not recommended.
b) The HT-System PLUS® pipeline can be directly connected to the horizontal KG System (PP)® sewerage as both systems are fully compatible.
c) Connection to a cast-iron system – see Figures 3 and 4.

d) connections Skolan SAFE® with horizontall KG-System (PVC) ® can be performed at DN 110 and 200 directly to DN 135 is part of the Reducer (SKUKG).

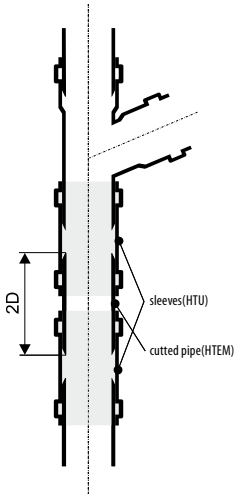
Figure 3 Connection to the cast-iron pipe flat end

Figure 4 Connection to the cast-iron pipe faucet

10. SUBSEQUENT INSERTION OF BRANCH

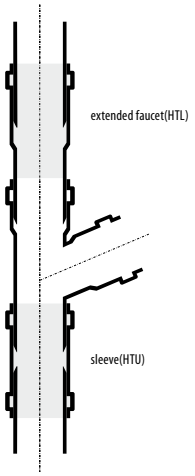
a) Procedure using two sleeves and a piece of cut pipe (see Figure 5): First, cut the existing pipeline in twice the length of the Branch Pipe to be inserted. Fit the Branch Pipe on one end and the sleeve on the other. Then close the remaining gap with the cut pipe and the sleeve. Finally, use the sleeves to close the connections.

Figure 5 Subsequent insertion of branch (using two HTU, SKU sleeves)



b) Procedure using a sleeve and an extended faucet (see Figure 6): Cut the existing pipeline in the length corresponding to the shaped piece length + the extended faucet (HTL, SKL) length. Fit the extended faucet completely on one end and the sleeve (HTU) on the other. Insert the flat end of the extended faucet to the inserted Branch Pipe and tighten the Branch Pipe flat end with the sleeve to fix the inserted Branch Pipe.

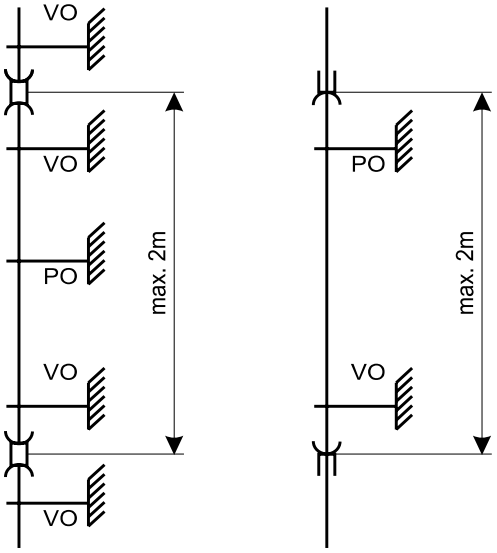
Figure 6 Subsequent insertion of branch (using an HTU, SKU sleeve and an extended HTL, SKL faucet)



11. PRINCIPLES FOR WORK WITH PIPES WITHOUT FAUCETS (HTGL) AND PIPE CUT-OFFS

Pipes with no faucets can be connected using sleeves (HTU), double faucet sleeves (HTMM, SKGL), and individual faucets (HTAM, SKAM). Nevertheless, it is always necessary to respect thermal linear expansion of the materials; this means that extended faucets (HTL, SKL) must be used with pipes of lengths exceeding 2 m. The anchoring of vertical pipelines is shown in Figure 7. The anchoring of horizontal pipelines is described in paragraph 5.

Figure 7 Anchoring of pipeline connected subsequently



a) Sleeve (HTU, SKU) b) individual Socket (HTAM, SKAM)

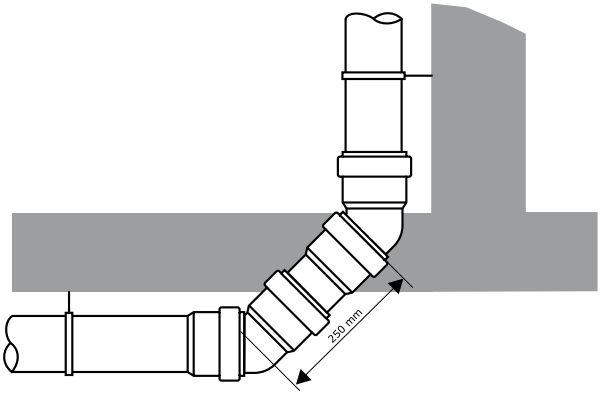
12. MEASURES AGAINST NOISE LEADING AND TRANSMISSION

According to DIN 4109 the noise emissions from pipelines installed in noise-protected areas should not exceed 35 dB(A). Therefore, the piping must not be installed uncovered in such areas. The piping can be installed in wall channels or on the other side of the wall only if its surface density is equal to 220 kg/m2. Further noise emission reduction can be reached by using holders with rubber bushings and by anchoring the piping in plastic dowels in walls. For further information, please refer to DIN 1986, Part 1, and DIN 4109, Annex 2 – silencing zone (see Figure 8). Should these solutions not be enough, we recommend using the Skolan SAFE® „silent waste system".

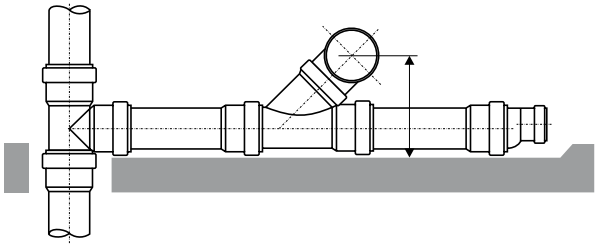
13. MEASURES TO REDUCE THE MANAGEMENT AND TRANSFER OF NOISE

According to DIN 4109 should not noise emissions from the built pipeline in areas protected from noise exceed 35 dB (A).
In these areas it is not permissible to install pipes uncovered. A channel in the wall or on the other side of the pipe walls can be placed only takes place if a basis weight of 220 kg / m2. Further reduction of noise emissions can be achieved by use of clamps with rubber lining and anchored to the anchors in the wall. For more information, refer to DIN 1986, Part 1 and DIN 4109, Annex 2 - silencing zone (see Figure 8).

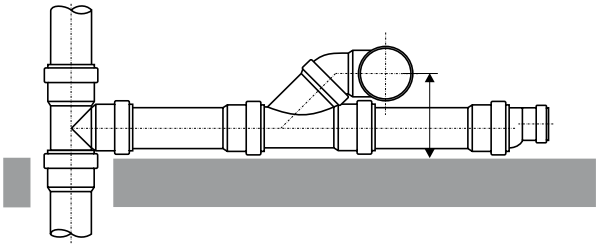
Figure 8 Silencing zone – transition from vertical to horizontal piping



Skolan SAFE® - use standard fittings, installation height 260 mm



Skolan SAFE® - USE parallel branch (SKPA), installation height 195 mm



14. FIRE PRECAUTIONS

Fire protection of buildings, especially high-rise buildings, is based on division of these buildings into fire sectors. In the event of fire, these sectors must be perfectly separated from each other, so no fire or combustion gases can penetrate other areas. The HT System Plus®, Skolan SAFE® a Ultra dB System is classified as B2 according to DIN 4102 - materials with normal inflammability. The following measures are necessary to prevent any fire or smoke from penetrating other fire sectors:

a) In case the collection piping penetrates a ceiling separating two different fire sectors, the piping must be fitted with a fire-proof sleeve (HTBM, SKBM) containing a filling that will seal the piping penetration hole at 130 °C completely, so no air or fire can pass through this hole. Thus, the sleeve will prevent any fire or smoke from penetrating the hole.

b) In case the collection piping is lead through an installation shaft being a separate fire sector, all branches must be fitted with fire-proof sleeves (HTBM, SKBM).

Installation of fire block SKBM:

1. Open the cuff so that it can be put on the pipe.
2. Place the cuff on the tube so that the metal sleeve to be outside.
3. Insert the clip into the notches and bend - the cuff tightly.

4th cuff into the hole in the wall, mineral wool and wrap or fix it to the wall with the supplied mounting hardware.

In addition to these general rules, national fire regulations, standards and directives must be observed. .

15. INTERNAL SEWERAGE SYSTEM TESTS

Internal sewerage system tests are carried out in compliance with the ČSN 75 6760 standard and consist of three parts:

a) technical inspection;

b) collection piping water-tightness test;

c) collection, connection and ventilation piping gas tightness test.

If the sewerage system has not been tested, the piping to be tested must be left accessible and clean (visible connections). All openings in the piping must be sealed during the collection piping water tightness test, which is carried out with water free of mechanical impurities at overpressures of minimum 3 kPa and maximum 50 kPa.

The water tightness test lasts one hour and is passed if water leaks related to 10 m2 of the internal piping surface does not exceed the volume of 0.5 l/hour.

The water tightness test is carried out after furnishing objects have been fitted and brazes have been filled with water. At the same time, the waste piping is temporarily sealed in cleaning shaped pieces installed at the lowest places. The ventilation piping remains temporarily open until testing gas starts leaking. The testing gas must be sanitary and non-combusting, though foul-smelling or coloured. The cleaning shaped piece located in the lowest position is fitted with a testing cap and micropressure gauge. With the ventilation piping sealed, the piping is then filled with the testing gas under the overpressure of 0.4 kPA through the inlet valve. The test is passed if no gas can be smelled or seen in the entire building after 0.5 hour. A written record is made of the test results.

16. STANDARDS AND REGULATIONS

The following ČSN EN and DIN standards also apply to the installation of the HT System Plus®, Skolan SAFE® a Ultra dB System piping:

ČSN ENV 13801
Plastic piping system for sewerage (for low and high temperatures) inside buildings – Thermoplastic materials – Installation recommendations.
ČSN EN 12056-1
Sewerage system inside buildings – Gravity systems Part 1: General and functional requirements.
ČSN EN 12056-2
Sewerage system inside buildings – Gravity systems Part 2: Draining of sewerage water – Designing and calculation.
ČSN EN 12056-3
Sewerage systems inside buildings – Gravity systems Part 3: Draining of rainwater from roofs – Designing and calculation.
ČSN EN 12056-4
Sewerage systems inside buildings – Gravity systems Part 4: Sewerage water pumping plants – Designing and calculation.
ČSN EN 12056-5
Sewerage systems inside buildings – Gravity systems Part 5: Installation and testing, instructions for operation, maintenance and use.
ČSN EN 1451-1
Plastic piping waste systems (for low and high temperatures) inside buildings – Polypropylene (PP) Part 1: Requirements on pipes, shaped pieces and system.
ČSN EN 681
Elastomeric sealants – Requirements on materials for sealing of connections of pipes designated for water supply and waste systems – Part 1: Vulcanised rubber
ČSN EN 743
Plastic distribution and protective piping systems – Pipes made of thermoplastic materials – Determination of linear shrinkage
DIN 4102
Fire resistance of construction materials and parts.
DIN 4109
Noise protection in structural engineering.

Polypropylene chemical stability

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
acetone	100	+	SDgr	
gaseous ammonia	100	+	+	
ammonium, hydrous sol.	concd. soln.	+	+	
ammonium, hydrous sol.	10	+	+	
amyl alcohol, pure		+	+	
acetanhydride	100	+		
benzenamine	100	+		+*
benzaldehyde	100	+		
benzaldehyde, sol. aq.	sat.	+		
benzine	(see "Technical liquids")			
benzole	100	-*	-	
liquid bromide	100	-		
bromide fumes	high	-	-	
bromide fumes	dil.	SDgr	-	
bromide water	sat.	-	-	
liquid butane	100	+		
butane gas	100	+	+	
butyl acetane	100	+	SDgr	
cyclohexane	100	+		
cyclohexanol	100	+	+	
cyclohexanone	100	+	-	
dibutylphthalate	(see "Technical liquids")			
diethyl ether	100	SDgr		
potassium dichromate, sol. aq.	sat.	+	+	+
dimethylformamide	100	+		
1.4-dioxan	100	+	SDgr	-
ammonium nitrate, hydrous	all	+	+	+
potassium nitrate, sol. aq.	sat.	+	+	
sodium nitrate, sol. aq.	sat.	+	+	
calcium nitrate, sol. aq.	sat.	+	+	+
ethyl acetate	100	SDgr	SDgr	
ethyl alcohol	100	+		
ethyl alcohol, sol. aq.	96	+	+	
ethyl alcohol, sol. aq.	50	+	+	
ethyl alcohol, sol. aq.	10	+	+	
ethyl-benzene	100	SDgr	-	
ethylene chloride	100	SDgr	-*	
2-ethoxyethanol	100	+		
ethyl chloride	100	-		
ethyl ether see "diethyl ether"				
phenol	sat.	+	+	
formaldehyde, sol. aq.	40	+	+	
formaldehyde, sol. aq.	30	+	+	
formaldehyde, sol. aq.	10	+	+	
triammonium phosphate, hydrous	all	+	+	+
sodium phosphate, sol. aq.	sat.	+	+	+
glycerine	100	+	+	
glycerine, sol. aq.	high	+	-	-
glycerine, sol. aq.	dil.	+	-	-
glycol	100	+	+	
glycol, sol. aq.	high	+	+	
glycol, sol. aq.	dil.	+	+	+
heptane	100	+	SDgr	
hexane	100	+	SDgr	
aluminium salts	all	+	+	+
hydrogen sulphite sodium, sol. aq.	sat.	+	+	
sodium bicarbonate, sol. aq.	sat.	+	+	+
potassium hydroxide	50	+	+	
potassium hydroxide	25	+	+	
potassium hydroxide	10	+	+	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
sodium hydroxide	100	+	+	
liquid chlorine	100	-		
chlorine gas, anhydrous	100	-	-	-
chlorine gas, humid	10	SDgr	-	-
chlorbenzene	100			
sodium chlorate, sol. aq.	5	+		
ammonium chloride, sol. aq.	all	+	+	+
tin dichloride	sat.	+	+	
potassium chloride, aq.	sat.	+	+	+
sodium chloride, sol. aq.	sat.	+	+	+
calcium chloride, hydrous	sat.	+	+	+
sodium perchlorate, sol. aq.	5	+	+	
potassium hypochlorite, sol. aq.	sat.	+	+	
sodium hypochlorite, sol. aq.	25	+	+	
chloroform	100	-*	-	
chlorine water	sat.	SDgr	-	
muriatic acid gas	high	+	+	
iso-octane	100	+	SDgr	
isopropyl alcohol	100	+	+	
potassium iodide, hydrous	sat.	+	+	
hydroxytoluene	100	+	SDgr	
hydroxytoluene, sol. aq.	sat.	+	SDgr	
benzenecarboxylic acid	100	+	+	
benzenecarboxylic acid, sol. aq.	sat.	+	+	+
boracic acid	100	+	+	
boracic acid, hydrous	sat.	+	+	
citric acid, sol. aq.	sat.	+	+	+
nitric acid	50	SDgr	-	
nitric acid	25	+	+	
nitric acid	10	+	+	
fluorohydric acid	40	+	+	
orthophosphoric acid	sat.	+	SDgr	
orthophosphoric acid	50	+	+	
orthophosphoric acid	10	+	+	+
hydrochloric acid	sat.	+	+	
chlorosulphonic acid	100	-	-	
chromic acid	sat.	+	-	
chromic acid	20	+	SDgr	
butanedioic acid, sol. aq.	sat.	+	+	
lactacid, sol. aq.	90	+	+	
lactacid, sol. aq.	50	+	+	
lactacid, sol. aq.	10	+	+	+
methanoic acid	98	+	SDgr	
methanoic acid	90	+		
methanoic acid	50	+	+	
methanoic acid	10	+	+	+
glacial acetic acid	100	+	SDgr	-
acetic acid, sol. aq.	50	+	+	
acetic acid, sol. aq.	10	+	+	+
oleic acid	100	+		
sulphuric acid	96	+	SDgr	
sulphuric acid	50	+	+	
sulphuric acid	25	+	+	
sulphuric acid	10	+	+	+
stearic acid	100	+		
ethanedioic acid, sol. aq.	sat.	+	+	+
2,3-dihydroxybutandioic acid, sol. aq.	sat.	+	+	
permanganate of potassium, sol. aq.	sat.	+	+*	
methanol	100	+	+	
methanol, sol. aq.	50	+	+	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
methane ethyl ketone	100	+	SDgr	
methyl chloride	100	SDgr		
mineral oils	(see "Technical liquids")			
urea, sol. aq.	sat.	+	+	
naphthalene	100	+		
naphthalene	100	-*	-	-
soda lime	50	+	+	
soda lime	25	+	+	
soda lime	10	+	+	+
n-butanol	100	+	+	
nitrobenzene	100	+*	SDgr	
ammonium acetate, sol. aq.	all	+	+	+
octane see "iso-octane"				
diphosphorus pentaoxide	100	+		
sulphur dioxide	dil.	+	+	
ozone < 0,5 ppm		+*	-*	
hydrogen dioxide, sol. aq.	90			
hydrogen dioxide, sol. aq.	30	+	SDgr	
hydrogen dioxide, sol. aq.	10	+	+	
hydrogen dioxide, sol. aq.	3	+	+	+
potassium persulphate, sol. aq.	sat.	+		
propane, liquid	100	+		
propane gas	100	+	+	
pyridine	100	+	SDgr	
mercury	100	+	+	
sulphur	100	+	+	+
ammonium sulphate, sol. aq.	all	+	+	+
potassium sulphate, sol. aq.	sat.	+	+	+
sulphate of strontium, sol. aq.	sat.	+	+	+
carbon sulphide	100	SDgr		
hydrogen sulphide	dil.	+	+	
sodium sulphite, sol. aq.	sat.	+	+	
barium salts	all	+	+	+
magnesium salts, sol. aq.	sat.	+	+	+
chromium salts 2+, 3+	sat.	+	+	
copper salts	sat.	+	+	+
nickel salts	sat.	+	+	
mercury salts, sol. aq.	sat.	+	+	
argent salts	sat.	+	+	
zinc salts, sol. aq.	sat.	+	+	
ferrum salts, sol. aq.	sat.	+	+	+
sodium sulphide, sol. aq.	sat.	+	+	
trisodium tetraborate, sol. aq.	sat.	+	+	+
tetrahydrofuran	100	SDgr	-	
tetrahydro-naphthalene	100	SDgr	-	
tetrachloroethane	100	SDgr	-	
tetrachloromethane	100	SDgr	-	
thiophene	100	SDgr	-	
sodium thiosulphate, sol. aq.	sat.	+	+	
toluene	100	SDgr	-	
chloral	100	SDgr	-*	
ammonium carbonate, sol. aq.	all	+	+	+
potassium carbonate (potash)	sat.	+	+	
carbonate of soda (soda)	sat.	+	+	
carbonate of soda (soda)	10	+	+	+
water	100	+	+	+
xylene	100	SDgr	-	
Technical liquids				
accumulator acid		+	+	
asphalt		+	SDgr	
petrol, pure		+	SDgr	
unleaded petrol		+	SDgr	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
leaded petrol		+	SDgr	
super petrol		+*	SDgr	
bleaching liquor (12,5 % Cl)		SDgr	SDgr	
sodium tetraborate, sol. aq.	sat.	+	+	
pine oil		+	+*	
brake fluid		+	+	
tar		+	SDgr	
Formalin®		+	+	
photographic developer	usual	+	+	
Fridex®		+	+	
calcium hypochlorite		+	+	
chromium tanning bath		+	+	
chromium-sulphur mixture		-	-	
alumen, sat.		+	+	
shoe polish		+	SDgr	
Kresolum saponatum®		+		
anti-moth marbles		+		
Lanolin®		+	SDgr	
LITEX®		+	+	
flax-seed oil		+	+	
Lysol®		+	SDgr	
mineral oils (w/o aromates)		+	SDgr	-
engine oils		+	SDgr	-
diesel fuel		+	SDgr	
synthetic degreasers	c. u.	+	+	+
two-cycle engine oil		SDgr	SDgr	
typewriter oil		+	+*	
transformer oil		+	SDgr	
fuming sulphuric acid	all	-	-	
paraffin	100	+	+	-
paraffin oil	100	+	SDgr	-
pectose, sat.		+	+	
pectrol-ether	100	+	SDgr	
furniture polish		+	SDgr	-
laundry agents high		+	+	
Sagrotan®		+	SDgr	
kitchenware detergent		+	+	+
silicone oil		+	+*	
spruce oil		+	+*	
soda	(see "carbonate of soda")			
Solvina		+	+	
turpentine		SDgr	-	
fuel oil		+	SDgr	
graphite		+	+	
fixative bath	10	+	+	
salt water		+	+	+
aqueous glass		+	+	
floor polish		+	SDgr	
softening agent – dibutylphthalate		+	SDgr	
softening agent – dibutyl sebacate		+		
softening agent – dihexylphtalate		+		
softening agent – dinonyl-adipate		+		
softening agent – dioctyl-adipate		+		
softening agent – dioctyl-phtalate		+		
softening agent – tricresyl phosphate		+		
softening agent – trioctyl phosphate		+		
Pharmaceuticals and cosmetics				
Aspirin®		+		
Quinine		+		

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
iodine tincture		+		
bornyl chloride		+		
fingernail polish		+		
menthol		+		
soap and soapflakes		+		
soap solution	sat.	+	+	+
soap solution	10	+	+	+
fingernail polish remover		+	SDgr	
perfumes		+		
hair shampoo		+	+	
paraffin jelly		+	SDgr	
toothpaste		+	+	
Food and eatables				
potato salad		+		
Coca-Cola®		+		
dry sugar		+	+	+
sugar solution		+	+	+*
tea tree leaves		+	+	
tea – drink		+	+	+*
lemon pulp and peel		+		
apple pulp		+	+	+*
orange pulp and peel		+		
essential oils		+	SDgr	
gin	40	+		
mustard		+		
cocoa – drink		+	+	+
cocoa – powder		+		
coffee (beans and ground coffee)		+		
coffee – drink		+	+	+
ketchup		+	+	
cognac		+		
spices		+		
fish in vinegar		+	+	+*
pickled cabbage		+	+	+*
liqueur	all	+		
lemonade		+		
beef tallow		+	+	
mayonnaise		+		
margarine		+	+	
jam		+	+	+*
butter		+	+	
honey		+	+	
milk products		+	+	+*
milk		+	+	+*
flour		+		
vinegar	c. u.	+	+	
lemon oil		+		
coconut oil		+	+*	
peppermint oil		+		
olive oil		+	+	
palm oil		+	SDgr	
orange oil		+		
vegetable oil		+	SDgr	
soya bean oil		+	SDgr	
corn-germ oil		+	SDgr	
peanut oil		+	+*	-*
animal oil		+	SDgr	
fruit salad		+		
baked goods		+	+	+*
beer		+		
butter milk		+		
pudding		+	+	+*

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
rum	40	+	+	
fish oil		+		
lard		+	SDgr	
salami		+	+	
beet syrup	all	+	+	+*
herrings		+		
carbonated water		+		
salt brine		+	+	+
common salt	(see "sodium chloride")			
cheese		+		
fecula – sol. aq.	all	+	+	
whipped cream		+		
pineapple juice		+	+	
lemon juice		+	+	
grapefruit juice		+	+	
apple juice		+	+	
fruit juice		+	+	
orange juice		+	+	
tomato sauce		+	+	
roast-food sauce		+	+	+*
lemon essence		+		
bitter almond essence		+		
vinegar essence	c. u.	+	+	
rum essence		+		
vanilla essence		+	+	
cottage cheese		+		
eggs (raw and cooked)		+	+	+*
wine		+	+	
whisky	40	+		
vegetables		+	+	+*
gelatine		+	+	+*

Legend :	
+	resistance
+*	partial resistance
SDgr	conditional resistance
-*	low resistance
-	instability
no classification	not tested
all	all concentrations
concd. soln.	concentrated solution
low conc.	low concentration
c. u.	commonly used concentration
usual	usual, commercial concentration
dil.	diluted solution
sol. aq.	aqueous solution
sat.	cold-saturated solution
hot sat.	hot-saturated solution
m. a.	minute amounts

Chemical stability of unplasticized polyvinyl chloride

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
acetaldehyde	100			
acetaldehyde	40	°	°	
acetaldehyde+ acetic acid	90/40	°		
acetanhydride	100	-		
acetone	m. a.	-		
acetone	100	-		
allyl alcohol	96	°		
liquid ammonia	100	°	°	
gaseous ammonia	100	+	+	+
pure phenylamine	100	-		
phenylamine hydrochloride, hydrous	sat.	°		
anon	100	-		
inorganic fertilizers	up to 10	+	+	°
inorganic fertilizers	sat.	+	+	+
antiformin hydrous	2	+		
Asfluid I, liquid		-		
benzaldehyde, sol. aq.	0.1	-	-	-
benzine	100	+	+	+
benzine-benzole mixture	80/20	-	-	-
sodium benzoate, sol. aq.	up to 10	+	+	
sodium benzoate, sol. aq.	up to 36			°
benzole	100	-	-	-
bleach liquid (12.5 % active clorine)	c. u.	+	+	°
sodium tetraborate, sol. aq.	dil.	+	+	°
sodium tetraborate, sol. aq.	sat.			°
potassium borate, sol. aq.	1	+	+	°
liquid bromide	100	-		
gaseous bromide	low conc.	°		
potassium bromate, sol. aq.	dil.	+	+	°
potassium bromate, sol. aq.	dil.	+	+	°
potassium bromate, sol. aq.	sat.	+	+	+
bromide water	sat.	°	°	
butadiene	100	+	+	+
butane gas	50	+		
succinaldehyde	up to 10	+	°	-
butanol	up to 100	+	+	°
butine-diol	100		°	
butyl acetane	100	-		
butylphenol	100	°		
cellulose, sol. aq.	sat.	+	°	
cycannone	c. u.	+	+	+
cyclohexanol	100	-	-	-
cyklohexanone	100	-	-	-
tanning cellulose extracts	usual			
tanning herbal extracts	usual	+		
ammonia liquor	sat.	+	+	°
densodrine	c. u.	+	+	+
dextrine, sol. aq.	sat.	+		
dextrine, sol. aq.	18			°
potassium dichromate, sol. aq.	40	+		
ammonium nitrate, hydrous	dil.	+	+	°
ammonium nitrate, hydrous	sat.	+	+	+
potassium nitrate, sol. aq.	sat.	+	+	+
potassium nitrate, sol. aq.	dil.	+	+	°
silver nitrate, sol. aq.	up to 8	+	+	°
calcium nitrate, sol. aq.	50	+	+	+
paraffine emulsions	c. u.	+	+	
acetic ester	100	-		
ethyl-acrylate	100	-		
ethyl alcohol (inoculum)	c. u.	+	+	°
ethyl alcohol and acetic acid (fermentation mixture)	c. u.	+	°	
denaturated ethyl alcohol (2 % of toluene)	96	+	°	°
ethyl alcohol, sol. aq.	96	+	+	°
ethylene chloride	100	-		
ethylene oxide, liquid	100	-		
ethyl ether	100	-		
phenol water	up to 90	°	°	-
phenol water	1	+		

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
phenylhydrazine	100	-		
phenylhydrazine-hydrochloride, sol. aq.	sat.	°		
ferri-cyanide and ferro-cyanide				
potassium sol. aq.	dil.	+	+	°
potassium sol. aq.	sat.	+	+	+
ammonium fluoride, hydrous	up to 20	+		°
copper difluoride, hydrous	2	+	+	+
nitrogen fluoride, sol. aq.	up to 20	+		°
formaldehyde, sol. aq.	dil.	+	+	°
formaldehyde, sol. aq.	40	+	+	+
phosphane	100	+		
gaseous carbonyl dichloride	100	+		°
liquid carbonyl dichloride	100	-		
photoemulsion	all	+	+	
fixative	c. u.	+	+	
developing agent	c. u.	+	+	
FRIGEN®	100	+		
fructose (grape suger), sol. aq.	sat.	+	+	°
glycerine, sol. aq.	all	+	+	+
glycocoll, sol. aq.	10	+	+	+
glycol, sol. aq.	c. u.	+	+	+
hexane-triol	c. u.	+	+	+
beef tallow, sulphonate emulsion	c. u.	+		
hydrogen sulphite sodium, sol. aq.	dil.	+	+	°
hydrogen sulphite sodium, sol. aq.	sat.	+	+	+
hydroxylamine sulphate, sol. aq.	up to 12	+	+	
chlophene	c. u.	°		-
chlorine gas, anhydrous	100	°	°	-
chlorine gas, hydrous	0.5	+		
chlorine gas, hydrous	1	°		
chlorine gas, hydrous	5	°		
chlorine gas, hydrous	97	°		
liquified chlorine		-		
chloramine, sol. aq.	dil.	+	-	-
sodium chlorate, sol. aq.	up to 10	+	+	°
sodium chlorate, sol. aq.	sat.	+	+	+
ammonium chloride, hydrous	dil.	+		°
ammonium chloride, hydrous	sat.	+	+	+
antimonous chloride, hydrous	90	+	+	+
tin bichloride, hydrous	sat.	+	+	°
tin bichloride, hydrous	dil.	+	+	°
potassium chloride, sol. aq.	sat.	+	+	+
potassium chloride, sol. aq.	dil.	+	+	°
trichloride phosphorous	100	-		
aluminium trichloride, hydrous	dil.	+	+	°
aluminium trichloride, hydrous	sat.	+	+	+
magnesium chloride, hydrous	dil.	+	+	°
magnesium chloride, hydrous	sat.	+	+	+
copper chloride, hydrous	sat.	+	+	
sodium chloride	(see Common salt)			
calcium chloride, hydrous	dil.	+	+	°
calcium chloride, hydrous	sat.	+	+	+
chloride zinc, hydrous	sat.	+	+	+
chloride zinc, hydrous	dil.	+	+	°
ferric chloride	up to 10	+	+	°
ferric chloride	sat.	+	+	+
potassium perchlorate, sol. aq	1	+	+	°
sodium hypochlorite, sol. aq.	dil.	+		
chlorine water	sat.	°	°	
chlorine hydride, hydrous		+	+	
hydrogen chloride, anhydrous		+	+	+
potassium chromate, sol. aq.	40	+	+	+
chrome alume, sol. aq.	dil.	+	+	°
chrome alume, sol. aq.	sat.	+	+	+
chromium-sulphur cleaning mixture	50/15/35	+	+	°
metallic iodine and in alcaline solution		-		
hydrous alumen	dil.	+	+	°

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
hydrous alumen	sat.	+	+	+
carbolineum, fruit origin	c. u.	+		
acacia	c. u.	+		
hydroxytoluene, sol. aq.	up to 90	°	°	
crotonaldehyde	100	-		
colour agents	c. u.	+	+	+
potassium cyanide, sol. aq.	up to 10	+	+	°
adipinic acid	sat.	+	+	°
antraquinone-sulphone acid				
aqueous suspension		+		
arsenic acid, sol. aq.	dil.	+	+	°
arsenic acid, sol. aq.	80	+	+	°
benzenecarboxylic acid	all	+	+	°
boracic acid, sol. aq.	sat.	+	+	°
bromhydric acid, sol. aq.	48	+	+	+
bromhydric acid, sol. aq.	up to 10	+	+	°
oxychlorine acid, sol. aq.	up to 10	+	+	°
oxychlorine acid, sol. aq.	sat.	+	+	+
hypochlorous acid, sol. aq.	10	+	+	°
hypochlorous acid, sol. aq.	20	+	+	°
hypochlorous acid, sol. aq	1	+	+	°
chlorosulphonic acid	100	°		
chromic acid, sol. aq.	up to 50	+	+	°
citric acid, sol. aq.	sat.	+	+	+
citric acid, sol. aq.	up to 10	+	+	°
diethylene-glycol acid	30	+	+	°
diethylene-glycol acid	sat.	+		
nitric acid, sol. aq.	up to 50	+	+	°
nitric acid, sol. aq.	98	-		
fluorosilicic acid, sol. aq.	up to 32	+	+	+
orthophosphoric acid, sol. aq.	up to 30	+	+	°
orthophosphoric acid, sol. aq.	above 30	+	+	+
glycollic acid, sol. aq.	37	+		
2-hydroxybutanedioic acid, sol. aq.	1	+	+	
silicilic acid, sol. aq.	all	+	+	+
(Z)-butenedioic acid, sol. aq.	sat.	+	+	°
(Z)-butenedioic acid, sol. aq.	35	+	+	
butanoic acid, concd. sol.		-		
butanoic acid, sol. aq.	20	+	-	-
methanesulfone acid	100	+	+	°
methanesulfone acid, sol. aq.	up to 50	+	°	
lactacid acid, sol. aq.	90	+	°	-
lactacid acid, sol. aq.	up to 10	+	+	°
monochloroacetic acid, sol. aq.	85	+		
monochloroacetic acid, sol. aq.	100	+	+	°
methanoic acid, hydrous	100	+	°	-
methanoic acid, hydrous	up to 50	+	+	°
methanoic acid, hydrous	50	+		°
acetic acid, sol. aq.	do 25	+	+	°
glacial acetic acid	100	°	-	
acetic acid, sol. aq.	25-60	+	+	+
acetic acid, sol. aq	80	+	°	
cruce acetic acid	95		°	
(Z)-9-octadecenoic acid	c. u.	+	+	+
picrite acite	1	+		
sulphurous acid (at 8 bar)	sat.	+		
sulphuric acid, sol. aq.	do 40	+	+	°
sulphuric acid, sol. aq.	40-80	+	+	+
sulphuric acid, sol. aq.	96	+	°	
sulphuric acid, sol. aq.	80-90			
chlorhydric acid, sol. aq.	do 30	+	+	°
chlorhydric acid, sol. aq.	concd.	+	+	+
stearic acid	100	+	+	+
ethanedioic acid, sol. aq.	sat.	+	+	+
ethanedioic acid, sol. aq.	dil.	+	+	+
carbonic acid, sol. aq. (up to 8 bar)	sat.	+		
2,3-dihydroxybutandioic acid, sol. aq.	up to 10	+	+	°
2,3-dihydroxybutandioic acid, sol. aq.	sat.	+	+	+
oxygen	all.	+	+	+
spirits		+		
liqueurs		+		

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
caustic potash lye, sol. aq.	up to 40	+	+	°
caustic potash lye, sol. aq.	50-60	+	+	+
sodium lye, sol. aq.	up to 40	+	+	°
sodium lye, sol. aq.	50-60	+	+	+
aqua regia		°		
tallow	100	+	+	+
permanganate of potassium, sol. aq.	6	+	+	+
permanganate of potassium, sol. aq.	up to 18	+	+	
fatty acids	100	+	+	+
palm oil fatty acids	100	+	+	+
molasses	c. u.	+	+	°
molasses mixture	c. u.	+	+	+
Mersol D	c. u.	+	+	°
methanol, sol. aq.	32	°		
methanol	100	+	+	°
chloromethane	100	-		
methylene-chloride	100	+	+	°
mineral oils		+	+	+
beer wort	c. u.	+	+	
milk		+	+	+
urine		+	+	°
urea, sol. aq.	up to 10	+	+	°
urea, sol. aq.	33	+	+	+
Mowilith D	c. u.	+		
NEKAL BX ® aq.	dil.	+	+	°
nicotine, sol. aq.	c. u.	+		
nicotinic preparates, sol. aq.	c. u.	+		
nitroglycerine	dil.	°		
nitroglycol	dil.	-		
oxides of nitrogen	concd. soln.	°		
wine vinegar	c. u.	+	+	+
acetate lead, sol. aq.	sat.	+	+	+
acetate lead, sol. aq.	dil.	+	+	°
acetate lead, sol. aq.	hot sat.	+	+	
mists containing sulphuric acid (hydrous)	all	+	+	+
mists containing sulphur trioxide	all	°		
mists containing carbon dioxide	all	+	+	+
mists containing hydrogen fluoride	all	+	+	+
mists containing sulphur dioxide	low concd.	+	+	+
mists containing carbon monoxide	all	+	+	+
mists containing nitrogene oxides	all	+	+	
mists containing fuming sulphuric acid	low conc.	+	+	+
mists containing chlorine hydride	all	+	+	+
mists containing oxides of nitrogen	all	+	+	+
flax-seed oil	100	+	+	
oils and fats		+	+	+
fuming sulphuric acid	10	-		
fruit juice	c. u.	+	+	+
fruit drinks	c. u.	+	+	+
diphosphorous pentaoxide	100	+		
sulphur dioxide, anhydrous	all	+	+	+
sulphur dioxide, hydrous	50	+	+	
sulphur dioxide, liquid	100	°		
sulphur dioxide, hydrous	all	+	+	°
carbon monoxide	100	+	+	+
carbon dioxide, anhydrous	100	+	+	+
carbon dioxide, hydrous	all	+	+	°
nitrogen oxides, hydrous and anhydrous	dil.			°
nitrogen oxides, hydrous	concd soln.	-		
ozone	100	+	+	+
ozone	10	+		
paraffin alcohols	100	+	+	+
sulphuric acid fumes	higher	°		
sulphuric acid fumes	níz.	+		
hydrogen dioxide, sol. aq.	up to 30	+		
hydrogen dioxide, sol. aq	up to 20	+	+	
potassium peroxydisulphate	sat.	+	+	°
potassium peroxydisulphate	dil.	+	+	°
beer		+	+	+

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
potash, sol. aq.	sat.	+	+	
propane gas		+		
propane, liquid	100	+		
propargyl alcohol, sol. aq.	7	+	+	+
plant protective agents	(see carbolineum and nicotinic preparates)			
pyridine	all	-		
mercury		+	+	+
carbon sulphide	100	°		
hydrogen sulphide, anhydrous	100	+	+	+
ethyl alcohol, sol. aq.	sat.	+	+	°
ammonium sulphate, hydrous	sat.	+	+	+
ammonium sulphate, hydrous	dil.	+	+	°
magnesium sulphate, sol. aq.	sat.	+	+	+
magnesium sulphate, sol. aq.	dil.	+	+	°
cupric sulphate, sol. aq.	sat.	+	+	+
cupric sulphate, sol. aq.	dil.	+	+	°
nickel sulphate, sol. aq.	dil.	+	+	°
nickel sulphate, sol. aq.	sat.	+	+	+
sodium sulphate, sol. aq.	dil.	+	+	°
sodium sulphate, sol. aq.	sat.	+	+	+
zinc sulphate, sol. aq.	sat.	+	+	+
zinc sulphate, sol. aq.	dil.	+	+	°
mixed acids (nitric/sulphuric/water)	50/50/0	°	-	
mixed acids (nitric/sulphuric/water)	10/20/70	+	+	
mixed acids (nitric/sulphuric/water)	10/87/3	°		
mixed acids (nitric/sulphuric/water)	50/31/19	+		
mixed acids (nitric/sulphuric/water)	48/49/3	+	°	
soda solution	sat.	+	+	+
soda solution	dil.	+	+	°
sodium bisulphide, sol. aq. with carbon dioxide	sat.	+	+	+
spinner acids with CS2	200 mg/l		°	
spinner acids with CS2	100 mg/l	+	+	
spinner acids with CS2	700 mg/l		-	
spinning viscose bath liquors		+	+	+
common salt, sol. aq.	dil.	+	+	°
common salt, sol. aq.	sat.	+	+	+
lighting gas w/o benzene		+		
fecula, sol. aq.	c. u.	+	+	+
tetrachlormethane	100	°	-	
tetraethyl lead	100	+		
thionyl chloride	concd.	-		
toluene	100	-		
trichlorethylene	100	-		
trietanolamine	100	-		
trimethylpropane, sol. aq.	c. u.		°	
trimethylpropane, sol. aq.	up to 10	+	+	°
potassium carbonate (sol. aq.)	(see potash)			
sodium carbonate	(see soda)			
wine spirits of all kinds		+		
wine spirit		+	+	
vinyl acetate	100	-		
white and red wine		+	+	+
salt water		+	+	°
water in general		+	+	°
carbonated water		+	°	°
distilled water		+	+	
soap water	concd.	+		°
drinking water		+	+	
spring water		+	+	
condensed water		+	+	
waste water (also acetic w/o organic solvents)		+	+	
waste water with minute amounts of phenols and butanol				
hydrogen	100	+	+	+
higher fatty alcohols	100	+	+	+
xylol	100	-		
gelatine, sol. aq.	all	+	+	

Legend :	
+	resistant
+*	partially resistant
°	conditionally resistant
-*	low resistance
-	instability
no classification	not tested
all	all concentrations
concd.	concentrated colution
low	low concentration
c. u.	commonly used concentration
usual	usual, commercial concentration
dil.	diluted solution
sol. aq.	aqueous solution
sat.	cold-saturated solution
hot sat.	hot-saturated solution
m. a.	minute amounts


OSMA
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HT System
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dB
Skolan SAFE
OSMA
Ultra dB
UdB System
ISO 9001
OSMA
PVC
KG System
ISO 9001
OSMA
Polypropylene
KG 2000
ISO 9001
OSMA
Dualcore
Magnacor
ISO 9001
OSMA
OSMA
RV System
ISO 9001