OSMA®

Ultra dB
UdB System

100% RECYCLABLE

24dB SOUND INTENSITY

90°C TEMPERATURE RESISTANCE

ISO 9001

- **MINERAL-FILLED POLYPROPYLENE**

- **APPLICABLE IN ALL AREAS OF STRUCTURAL ENGINEERING**

- **EXCELLENT MECHANICAL AND ACOUSTIC FEATURES**

- **VIBRATION REDUCTION OF WALLS**

- **LIMITATIONS OF AIR RESONANCE COLUMNS**

- **ABILITY TO EFFECTIVELY MUFFLE THE NOISE**

- **ABILITY TO PREVENT THE SPREAD OF NOISE**

- **THICK WALLS = QUIET**

- **THE 24 dB (A) ACCORDING TO DIN 4109**

- **HIGH DENSITY MATERIAL**

- **STURDY AND ROBUST DESIGN**

- **THERMAL RESISTANCE SHORT 95 ° C, LONG 90 ° C**

- **HIGH QUALITY AND LASTING**

- **MEETS ECONOMIC AND ECOLOGICAL CRITERIA**

- **EVALUATES PROPERTY**

- **INCREASE OF LIVING STANDARDS**

Trust your ears

Unique System silent sewage pipes and fittings dB Ultra System is a quality product of Polypropylene containing a large amount of mineral filler. This material lends waste pipes and fittings dB System Ultra excellent mechanical and acoustic properties, which significantly reduce the intensity of noise penetrating through the pipe wall to the surroundings. Ultra dB System is thus predestined for in all areas of civil engineering (family and apartment houses, industrial, cultural and sports facilities, hospitals, hotels, etc.).

Ultra dB System can prevent noise

Unique System silent sewage pipes and fittings dB Ultra System is able to effectively dampen noise already in place its very beginning - inside the pipe and in addition to prevent the lead pipe wall. The tubes are made of two layers - the inner and outer white blue. On the transition from one phase to another leads to noise reduction. Pipes and fittings comprise a mineral filler, which reduces the transmission of noise.

Do not let the noise chance - learn water whisper

Given the silence – thick walls sewage pipes and fittings dB Ultra System can achieve noise levels approaching the threshold of human hearing perception. When testing was achieved significantly lower values than those required by DIN 4109 - Standard, specifying the noise conditions in areas protected from noise. The measured value of 24 db (A) at standardized assembly lines and speed of the water 4l / s was even lower than the requirement of just 25 dB (A) stricter German VDI 4100.

Strength and durability

Pipes and fittings dB Ultra System are available in dimensions DN 50 - 160. High-quality material processing, surface treatment and packaging quality guarantee that will hold up under extreme conditions with the most demanding customer.

Guarantee of Quality

Laboratory testing of plant and stable in-process control during the manufacturing process guarantee a constant and high quality.

LivingCulture

In connection with the increasing demands on hygiene in the built environment, to which noise protection is undoubtedly one, they are designed and manufactured products that comply with strict ecological and economic criteria. Ultra dB System due to its properties fully meets these criteria and use in the construction or reconstruction leads clearly to raise the standard of living, and thus to evaluate the property.

UdB System

Ultra dB System
## Waste Pipes and shaped Pieces

Description

Drains of Polypropylene, high temperature resistant, manufactured by AT ITB AT-15-9406 / 2014 with the properties according to EN 1451-1, if necessary. EN14758-1.

Field of application

System is designed to build the connection, waste, and vent the drain pipes inside buildings (application scope B) in the case of higher thermal or chemical load, but without flame retardant.

DN(OD)	s [mm]	D [mm]	t [mm]
50	2,0	64	56
75	2,3	89	61
110	3,4	128	72
160	4,9	187	95
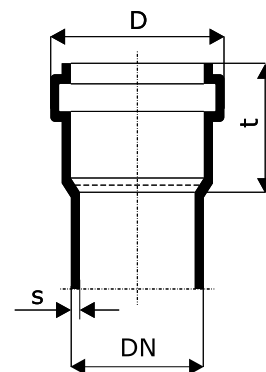
THE SYMBOLS AND ABBREVIATIONS USED IN THE CATALOG	
DN	nominal dimension
D	maximum outer diameter
t	faucet depth (insertion length of free faucet)
s	Pipe wall thickness

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.

Material properties

100% RECYCLABLE

24dB SOUND INTENSITY

90°C TEMPERATURE RESISTANCE

UdBEM –Pipe with Socket

EAN CODE	EAN	DN	s1(mm)	D(mm)	t(mm)	L (mm)	PACKING	PALLETE
4052836460103	146010	50	2,0	64	56	250	20	148
4052836460202	146020	50	2,0	64	56	500	20	320
4052836460400	146040	50	2,0	64	56	1000	10	200
4052836460608	146060	50	2,0	64	56	2000	10	200
4052836461100	146110	75	2,3	89	61	250	20	320
4052836461209	146120	75	2,3	89	61	500	20	160
4052836461407	146140	75	2,3	89	61	1000	6	120
4052836461605	146160	75	2,3	89	61	2000	6	120
4052836462107	146210	110	3,4	128	72	250	15	120
4052836462206	146220	110	3,4	128	72	500	10	80
4052836462404	146240	110	3,4	128	72	1000	1	80
4052836462602	146260	110	3,4	128	72	2000	1	80
4052836462701	146270	160	4,9	187	95	500	1	35
4052836462800	146280	160	4,9	187	95	1000	1	35
4052836462909	146290	160	4,9	187	95	2000	1	35
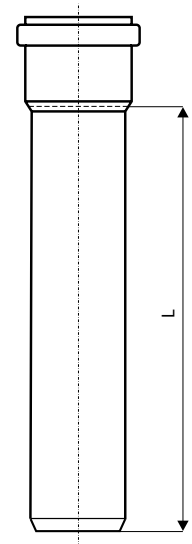
UdBB – Bend

EAN CODE	EAN	degrees	DN	z_1 (mm)	z_2 (mm)	PACKING	PALLETE
4052836463005	146300	15°	50	10	70	20	960
4052836463104	146310	30°	50	9	68	20	960
4052836463203	146320	45°	50	17	87	20	960
4052836463302	146330	87°	50	28	84	20	960
4052836463401	146340	15°	75	23	91	20	480
4052836463500	146350	30°	75	11	80	20	480
4052836463609	146360	45°	75	18	92	20	480
4052836463708	146370	87°	75	42	94	20	480
4052836464200	146420	15°	110	9	77	20	240
4052836464309	146430	30°	110	17	85	20	240
4052836464408	146440	45°	110	26	94	20	240
4052836464507	146450	87°	110	59	127	20	160
4052836464538	146453	45°	160	37	126	1	60
4052836464576	146457	87°	160	84	173	1	60
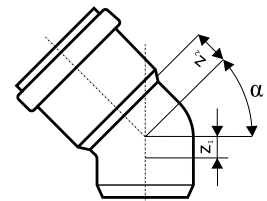
UdBEA – Branch Pipe

EAN CODE	EAN	degrees	DN	z_1 (mm)	z_2 (mm)	z_3 (mm)	PACKING	PALLETE
4052836465603	146560	45°	50/50	133	116	12	20	480
4052836465405	146570	87°	50/50	117	91	28	20	480
4052836465207	146540	45°	75/50	147	145	1	20	400
4052836465009	146550	87°	75/50	119	99	27	20	400
4052836464804	146520	45°	75/75	183	159	18	20	240
4052836464606	146530	87°	75/75	158	115	40	20	240
4052836465702	146500	45°	110/50	150	158	17	20	160
4052836465504	146510	87°	110/50	150	125	23	20	160
4052836465306	146480	45°	110/75	186	186	50	20	160
4052836465108	146490	87°	110/75	186	126	36	20	160
4052836464903	146460	45°	110/110	134	134	26	8	96
4052836464705	146470	87°	110/110	64	62	59	10	120
4052836464859	146485	45°	160/110	162	168	2	1	46
4052836464651	146465	45°	160/160	194	194	37	1	28
4052836464750	146475	87°	160/160	91	91	81	1	32

UdB System Ultra dB
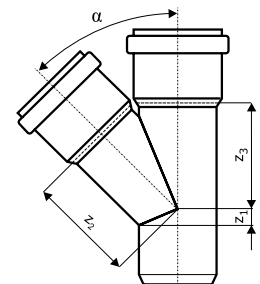
UdBMM – double-Socket Sleeve

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836466808	146680	50	112	20	960
4052836466907	146690	75	118	20	480
4052836467003	146700	110	136	20	240
4052836467058	146705	160	136	1	120
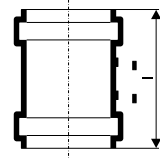
UdBU – Sleeve

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836466501	146650	50	103	20	960
4052836466600	146660	75	109	20	480
4052836466709	146670	110	136	20	240
4052836466754	146675	160	185	1	96
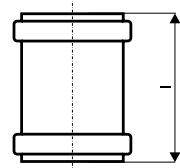
UdBR – abaxial Reduction Pipe, short

EAN CODE	EAN	DN	z_1 (mm)	L (mm)	PACKING	PALLETE
4052836466006	146600	75/50	19	73	20	480
4052836466105	146610	110/50	37	93	20	480
4052836466204	146620	110/75	22	87	20	480
4052836466259	146625	160/110	34	135	1	192
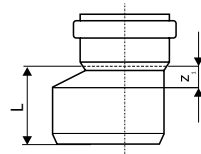
UdBRE – Purging Fitting

EAN CODE	EAN	DN	L (mm)	PACKING	PALLETE
4052836467508	146750	110	308	8	96
4052836467553	146755	160	380	1	40
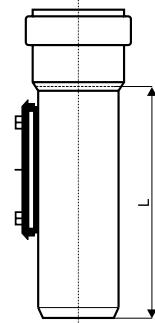
UdBM – Socket Stopper

EAN CODE	EAN	DN	l (mm)	PACKING	PALLETE
4052836467102	146710	50	39	20	2400
4082836467201	146720	75	39	20	2560
4082836467300	146730	110	46	20	960

Overview of Ultra dB System

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.
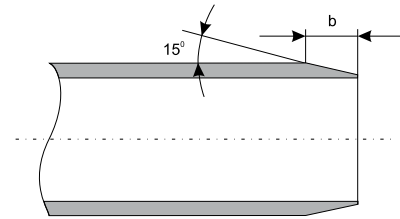
3. CONNECTING THE PIPES

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)
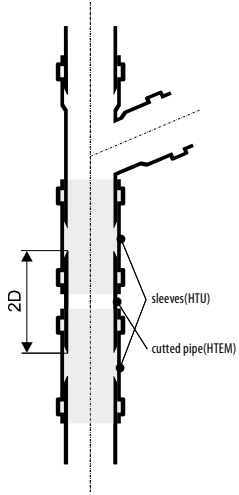
b) Procedure using a sleeve and an extended faucet (see Figure 6): Cut the existing pipeline in the length corresponding to the shaped piece length + the extended faucet (HTL, SKL) length. Fit the extended faucet completely on one end and the sleeve (HTU) on the other. Insert the flat end of the extended 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)
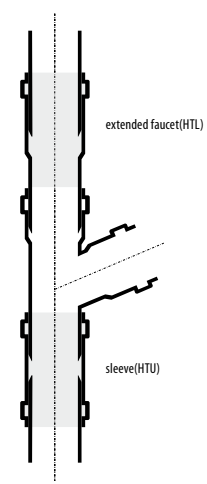
11. PRINCIPLES FOR WORK WITH PIPES WITHOUT FAUCETS (HTGL) AND PIPE CUT-OFFS

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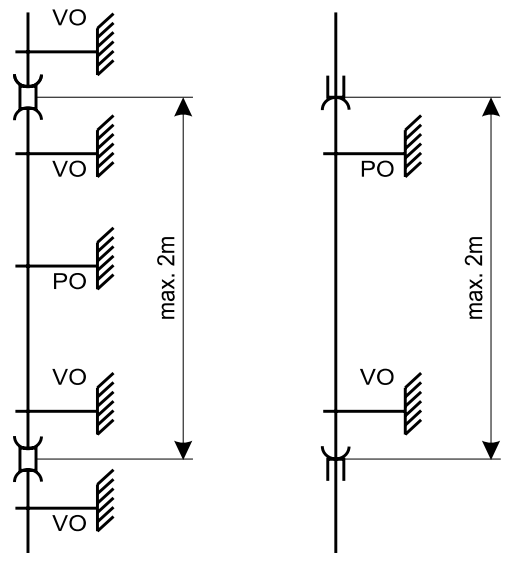
a) Sleeve (HTU, SKU)   b) individual Socket (HTAM, SKAM)

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
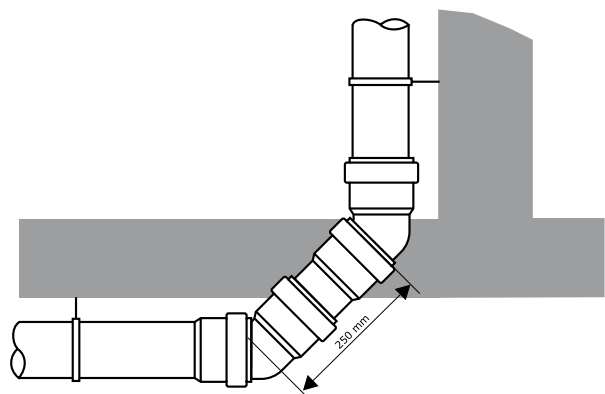
Skolan SAFE® - use standard fittings, installation height 260 mm
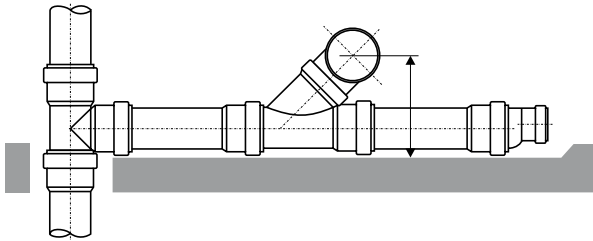
Skolan SAFE® - USE parallel branch (SKPA), installation height 195 mm
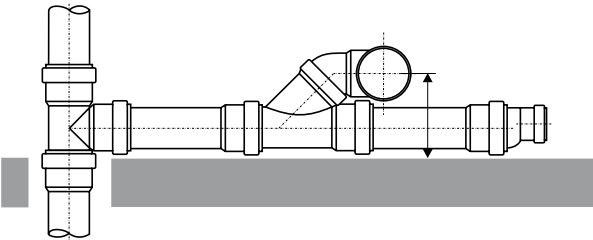
14. FIRE PRECAUTIONS

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 [%]	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 [%]	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 [%]	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 [%]	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 chlorine)	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.	+	°	
denatured 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 [%]	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 [%]	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 [%]	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 [%]	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

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