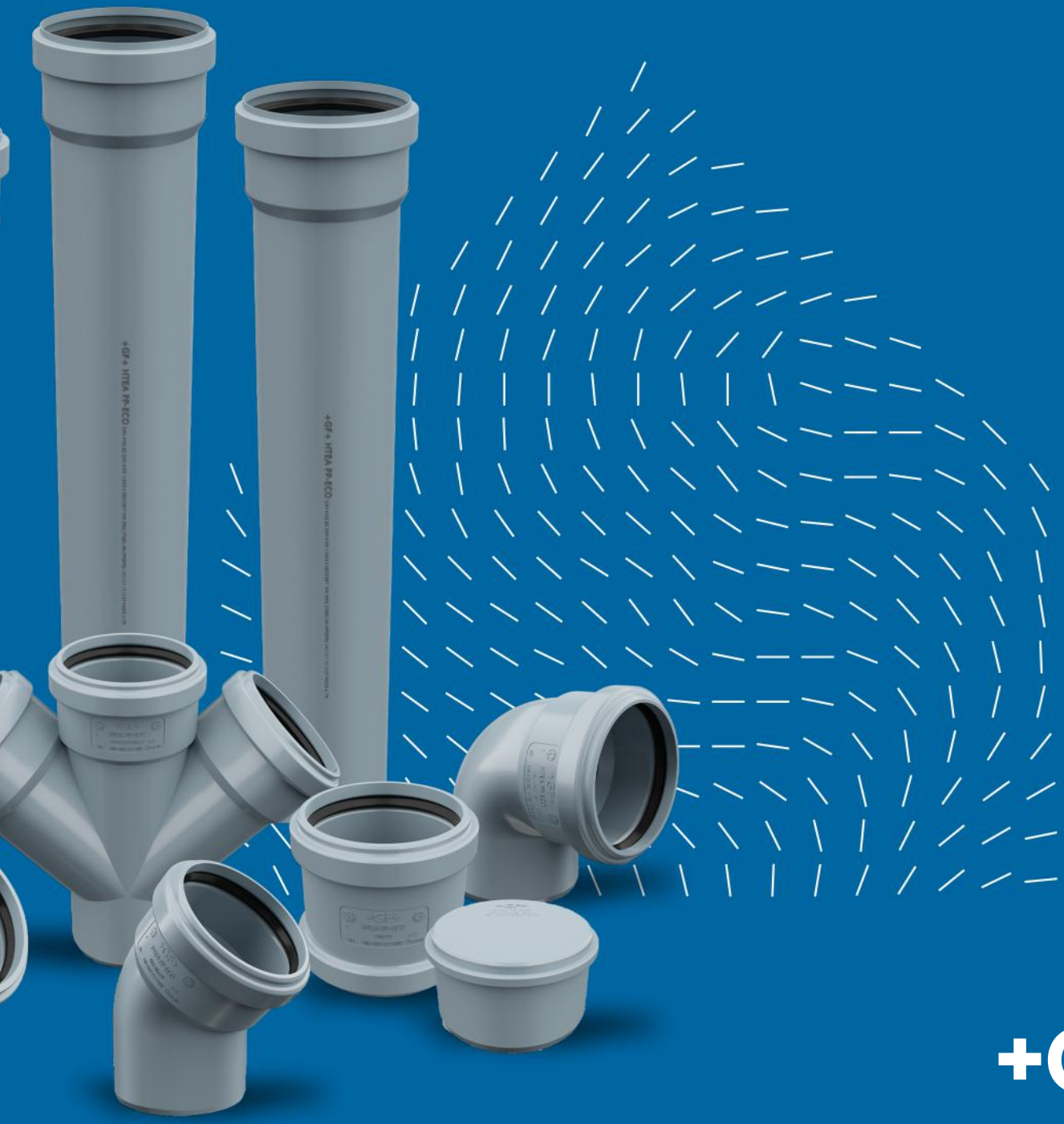
GF Building Flow Solutions

HT-PP

Product Range



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Contents

Leading with Water

GF Building Flow Solutions

We make water flow in buildings, empowering customers in residential and commercial spaces to boost productivity and sustainability while enhancing comfort, health, and efficiency. Our reliable hot and cold water, waste water, and energy-efficient heating and cooling solutions are available in over 80 countries. Through GF Building Flow Solutions, we bring together two powerful global brands: GF and Uponor.

+ **1.3 bn CHF**
total revenues 2023

+ **> 4’200**
employees worldwide

+ **30**
countries

+ **13**
productions sites

Innovation Champion in sound-proof waste water systems

The GF waste water production sites are pioneers in manufacturing soundproofed pipes. GF Building Flow Solutions continues to be the expert for robust and reliable plastic pipes for waste water application.

Waste water systems produced to the highest GF standards – for more than 50 years

Çerkezköy, TR

Superior Supply Chain Processes

GF Building Flow Solutions, a division of GF, is a leading global provider of sustainable and innovative solutions, making water flow in buildings. The division, stemming from the 2023 acquisition of Uponor by GF, provides safe solutions for hot and cold water supply and control, noise-reducing waste water systems, as well as energy-efficient heating and cooling. Its focus is to enable its customers in the residential and commercial space to be more productive and sustainable, while ensuring comfort, health and efficiency. GF Building Flow Solutions has sales companies in 30 countries and production sites in 13 locations across Europe and the Americas.

Anticipating with expertise and trust

Reliability is essential in waste water management. Our advanced solutions exceed industry expectations. With cutting-edge materials and over 100 years of expertise, we offer systems that are durable, easy to install, and require minimal maintenance. From noise-reducing technology to odor-blocking valves, every feature is designed to enhance com-fort and usability.

C

Choosing GF Building Flow Solutions means embracing a future where waste water systems are not a challenge – they are a seamless part of modern, comfortable living.

The right choice for speed and excellence

The full GF Building Flow Solutions Waste Water competence

The right solution for every application.

GF Building Flow Solutions Waste Water Systems

In construction, every detail counts. Installers and planners face more than just technical demands when designing drainage systems. Noise, fire safety, and long-term reliability are critical concerns. Buildings need more than efficient solutions; they require systems that guarantee comfort and safety for those who live and work in them.

Turning challenges into comfort

At GF Building Flow Solutions, we understand these challenges. For decades, we've developed waste water systems that go beyond basic functionality. Our solutions reduce noise, improve fire safety, and ensure long-lasting performance. Whether for single-family homes or multi-story buildings, we create systems that ensure peace, quiet, and security for occupants. Our solutions include:

- Acoustic House Drainage
- House Drainage
- Air Admittance Valves
- Drain Inlets

Anticipating with expertise and trust

Reliability is essential in waste water management. Our advanced solutions exceed industry expectations. With cutting-edge materials and over 100 years of expertise, we offer systems that are durable, easy to install, and require minimal maintenance. From noise-reducing technology to odor-blocking valves, every feature is designed to enhance comfort and usability.

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Benefits of Plastics

Plastics are polymers created by the chemical conversion of natural products or synthesized from organic materials. The primary components that make up the building blocks of plastics are long chains of carbon (C) and hydrogen (H) known as monomers.

The raw materials used for the production of plastics are natural compounds such as cellulose, coal, oil and natural gas. In the plastics industry, around 6 % of the petroleum products that come out from refineries is used.

Plastics fall into three main categories on the basis of their internal structure and the resulting mechanical characteris tics: thermoplastics, thermosetting plastics and elastomers.

Thermoplastics in turn can be split into two main categories as partially-regulated (semi-crystalline) and iregular (amorphous) molecular structures.

Semicrystalline thermoplastics, which have a partially ordered molecular structure: this category includes the polyolefins (polypropylene, polyethylene, polybutylene) and fluoropolymers (PVDF, PTFE, etc.)

Amorphous thermoplastics, which have no crystalline regions and no packed molecular structure: this category includes the vinyl chlorides (PVC- U, PVCC, etc.) and styrenes (ABS, polystyrene, etc.]

Semi crystalline materials are more suitable for hot welding, while amorphous thermoplastics are ideal for cement ing or cold welding (solvent cementing).

Advantages of Plastic Systems

Thermoplastics obviously demonstrate different characteristics than those of the metals traditionally used for piping.

Metal Systems	Plastic Systems
High density • Crane needed for transport • Widely spaced fixings • High anchoring forces, fixing required	**Low density** • Can be carried by hand up to d110 • Closely spaced fixings • Limited anchoring forces, simple and economic
Thermal conductivity • Insulation is always needed to limit heat loss • Formation of condensation and resulting corrosion	**Low thermal conductivity** • Limited heat loss • Low levels of condensation and resistance to corrosion
Corrosion Behaivors • Galvanic corrosion may occur • Internal diameter is reduced due to corrosion Reduction in internal diameter leads to pressure losses	**High Corrosion Resistance** • No risk of galvanic corrosion risk • No corrosion and reduction of internal diameter No pressure losses due to lack of reduction of internal diameter
Chemical resistance • Low resistance to acids, requiring use of costly alloys • Damage from incrustation	**High chemical resistance** * In combination with correct jointing methods, at least 25 years of useful life can be warranted No incrustation

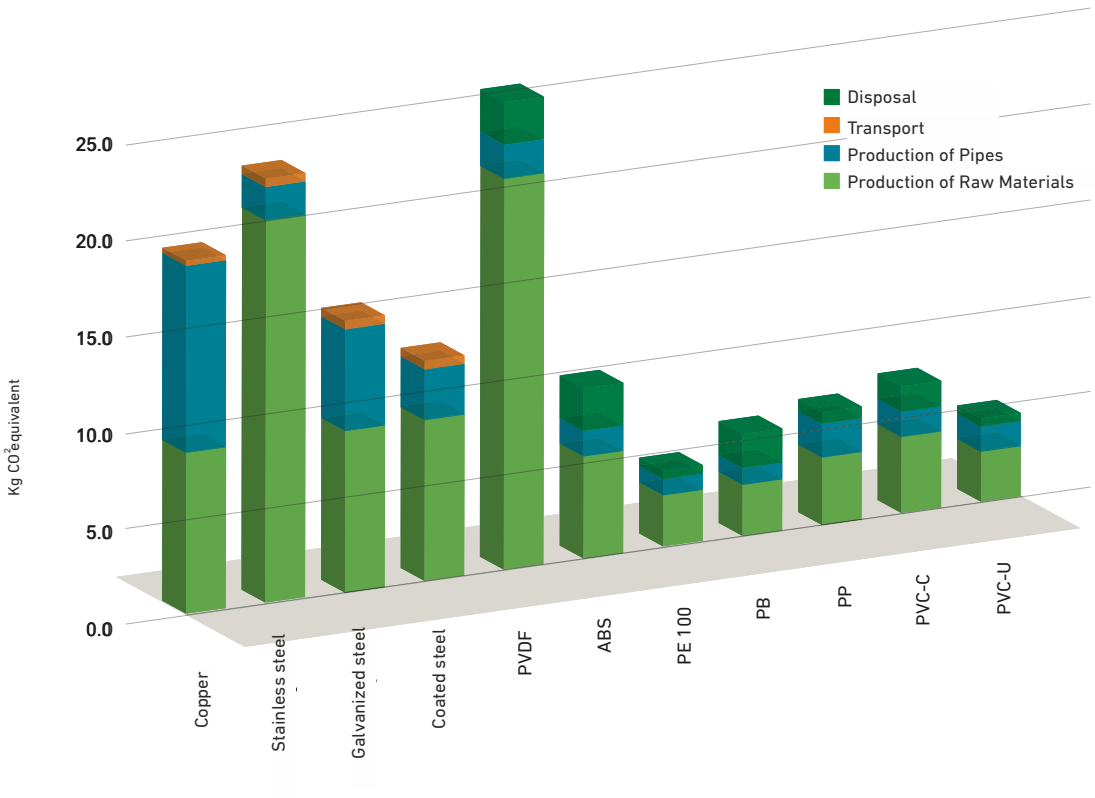
Service Life Analysis of Plastics

It is the total of all greenhouse gases emitted to the atmosphere during the entire lifetime including the processes for extracting a product having carbon footprint from under the ground, refining, producing, using and disposing of that product.

The following graphics indicate the assessment of the lifetime of thermoplastic piping systems in terms of the quality of their environmental perfomance and application of them in building technology, industry and water and gas distribution. In the analysis, the impacts of one meter long pipe was compared with the main competitor materials (DN25, DN80, DN150 and DN400) for each of the commonly used plastics. GF supplied this analysis from an independent, Swiss-based organization specialized in environmental performance analyzes, and is based on Ecoinvent, leading lifecycle inventory database in the world.

According to the main results of the study, plastic piping systems demonstrate better performance than metal systems. This finding has been confirmed by other studies conducted in this field.

The main reason for high performance of thermoplastics is that they are lightweight. This ensures key benefits during transport and installation. Fully-plastic solutions are lighter than other piping systems of conventional materials, and this creates significant impacts on carbon footprint.

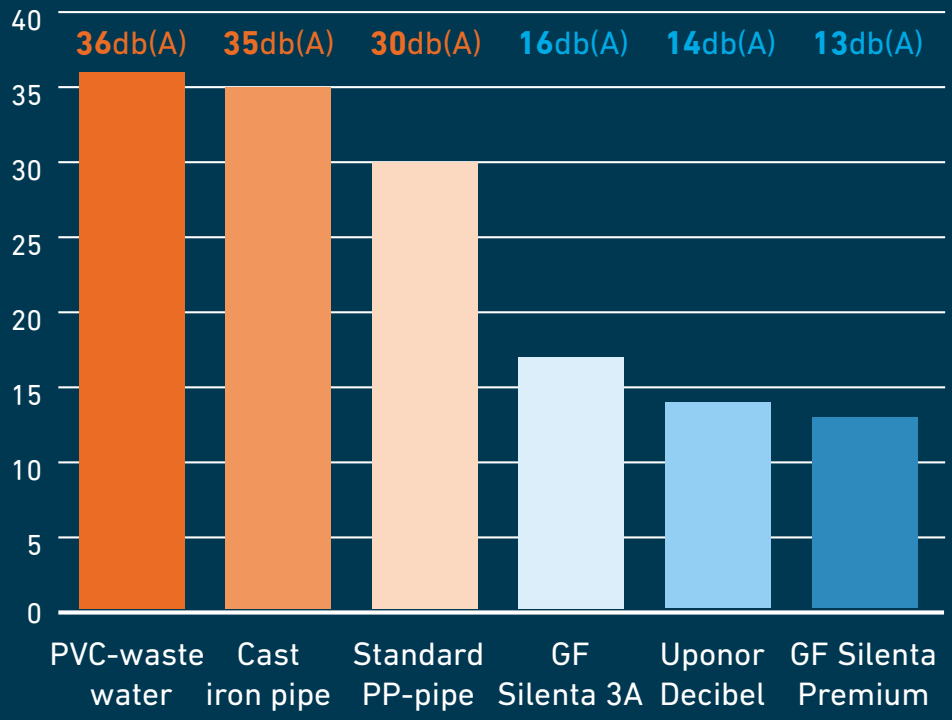


Quiet comfort, proven performance

Waste water disposal can often result in unwanted noise, both structure-borne and air-borne. At GF Building Flow Solutions, we tackle this challenge head-on with our Acoustic In-House Drainage Pipes. Designed to reduce noise at the source, our pipes ensure a quieter, more comfortable living environment. Certified by the Fraunhofer Institute for Building Physics in Stuttgart, our systems deliver top-tier acoustic performance. The graph on this page illustrates the significant reduction in noise levels, highlighting the superior soundproofing of our solutions.

With GF Building Flow Solutions, you choose silence, comfort, and proven quality.

Leader in low noise waste water systems



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> 50 %

noise reduction vs.
standard PP-pipes

Quality Certificates

Manufacturing its products in accordance with the European standards and Turkish standards equivalent to the European standards, our Company is a leading and dynamic organization in terms of continous improvement and customer satisfaction.

In addition to product quality, the process and system quality of GF Hakan Plastik is certified by BVQI through TS EN ISO 9001:2015 certificate.

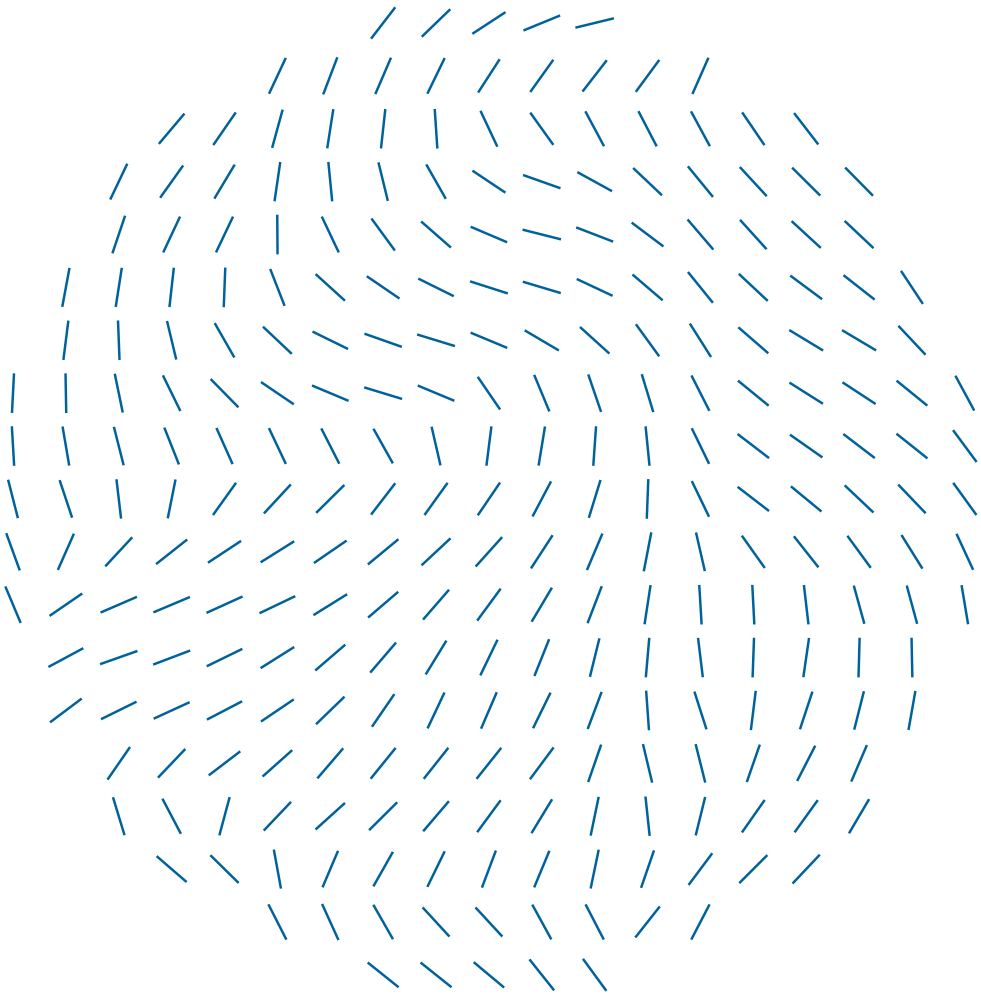
Our Company that places top priority on process and system quality also has TS EN ISO 14001:2015 and TS EN ISO 45001:2018 certificates. Our production plant in Çerkezköy have TS EN ISO/IEC 17024:2012 laboratory.

ISO 9001
BUREAU VERITAS

ISO 14001
BUREAU VERITAS

ISO 45001
BUREAU VERITAS

ISO 50001
BUREAU VERITAS



Worldwide Quality Compliance for HT-PP

Some certifications around the world

TÜRKİYE
TSE

SCANDINAVIAN
COUNTRIES
INSTACERT

GERMANY
HOCH

GF HT-PP

HT-PP pipes and fittings are made from high-quality polypropylene, ensuring lightweight construction and exceptional resistance to chemical agents and abrasion. These properties make them ideal for building waste and drainage systems, as well as other underground applications, in compliance with EN1451-1. Additionally, they feature a B2 flammability class for fire resistance, as per DIN 4102, providing enhanced safety and reliability in a variety of installations.

Features

- High impact resistance
- Low weight
- Easy and cost-efficient jointing technology

Benefits

- No product loss during logistics and assembly
- Simplifies logistics and installation process
- High time- and effort-efficiency

Field of application

Type	Details
Work areas	Office buildings, hospitals, conference halls, etc.
Public domains	Schools, colleges libraries, community centers, tutoring centers, etc.
Residential buildings	Houses, residences, apartments, hotels, etc.
Sustainable/green archicture	

Technical facts

Type	Details
Diameter	Ø 32 mm - Ø 160 mm
Length	0.15mt - 3mt
Color	Dark grey
Flammability class	B2 acc. to DIN 4102
Socket	Single and double socket
Standard	EN 1451-1

HT-PP

HT-PP Pipe with Socket (S 20)

Dia. (mm)	Leng. (mm)	Code	Packing Type	Pc
32	250	**4801003200221**	Base Box	300
32	500	**4801003200321**	Base Box	150
32	1000	**4801003200421**	Wodden	10
32	2000	**4801003200621**	Wodden	10
32	3000	**4801003200721**	Wodden	10
40	500	**4801004001221**	Base Box	140
40	1000	**4801004001321**	Wodden	10
40	2000	**4801004001521**	Wodden	10
40	3000	**4801004001621**	Wodden	10
50	150	**4801005002021**	Base Box	200
50	250	**4801005002121**	Base Box	150
50	500	**4801005002221**	Base Box	90
50	1000	**4801005002321**	Wodden	10
50	2000	**4801005002521**	Wodden	10
50	3000	**4801005002621**	Wodden	10
75	150	**4801007503021**	Base Box	100
75	250	**4801007503121**	Base Box	70
75	500	**4801007503221**	Base Box	40
75	1000	**4801007503321**	Wodden	10
75	2000	**4801007503521**	Wodden	10
75	3000	**4801007503621**	Wodden	10
90	500	**4801009004221**	Base Box	30
110	150	**4801011004021**	Base Box	45
110	250	**4801011004121**	Base Box	35
110	500	**4801011004221**	Base Box	20
110	1000	**4801011004321**	Wodden	4
110	2000	**4801011004521**	Wodden	4
110	3000	**4801011004621**	Wodden	4
125	150	**4801012505021**	Base Box	40
125	250	**4801012505121**	Base Box	20
125	500	**4801012505221**	Base Box	16
125	1000	**4801012505321**	Wodden	4
125	2000	**4801012505421**	Wodden	4
125	3000	**4801012505521**	Wodden	4
160	250	**4801016006121**	Base Box	14
160	500	**4801016006221**	Base Box	8
160	1000	**4801016006321**	Wodden	1
160	2000	**4801016006421**	Wodden	1
160	3000	**4801016006521**	Wodden	1

HT-PP Pipe with Double Socket (S 20)

Dia. (mm)	Leng. (mm)	Code	Packing Type	Pc
50	500	**4801005020121**	Base Box	50
50	1000	**4801005020421**	Wodden	10
50	2000	**4801005020221**	Wodden	10
50	3000	**4801005020321**	Wodden	10
75	3000	**4801007520621**	Wodden	10
110	500	**4801011020621**	Base Box	15
110	1000	**4801011020721**	Wodden	4
110	2000	**4801011020821**	Wodden	4
110	3000	**4801011020921**	Wodden	4
125	3000	**4801012521321**	Wodden	4

HT-PP Elbow 15°

Dia. (mm)	Code	Packing Type	Pc
32	**4901103200121**	Base Box	1000
40	**4901104001021**	Base Box	500
50	**4901105002021**	Base Box	300
75	**4901107503021**	Base Box	150
110	**4901111004021**	Base Box	60

HT-PP Elbow 30°

Dia. (mm)	Code	Packing Type	Pc
32	**4901103200221**	Base Box	1000
40	**4901104001121**	Base Box	500
50	**4901105002121**	Base Box	300
75	**4901107503121**	Base Box	150
110	**4901111004121**	Base Box	60
160	**4901116005621**	Base Box	20

HT-PP Elbow 45°

Dia. (mm)	Code	Packing Type	Pc
32	**4901103200321**	Base Box	1000
40	**4901104001221**	Base Box	500
50	**4901105002221**	Base Box	300
75	**4901107503221**	Base Box	150
110	**4901111004221**	Base Box	50
125	**4901112505021**	Base Box	40
160	**4901116006021**	Base Box	20

HT-PP Elbow 67.5°

Dia. (mm)	Code	Packing Type	Pc
40	**4901104001421**	Base Box	500
50	**4901105002321**	Base Box	300
75	**4901107503321**	Base Box	150
110	**4901111004321**	Base Box	50

HT-PP Elbow 87.5°

Dia. (mm)	Code	Packing Type	Pc
32	**4901103200421**	Base Box	1000
40	**4901104001321**	Base Box	500
50	**4901105002421**	Base Box	300
75	**4901107503421**	Base Box	100
110	**4901111004421**	Base Box	40
125	**4901112505121**	Base Box	30
160	**4901116006121**	Base Box	15

HT-PP Double Branch 45°

Dia. (mm)	Code	Packing Type	Pc
50-50	**4901205012021**	Base Box	100
75-50	**4901207513021**	Base Box	80
110-50	**4901211042621**	Base Box	35
110-110	**4901211014021**	Base Box	16
160-110	**4901216042021**	Base Box	8

HT-PP

HT-PP Double Branch 87.5°

Dia. (mm)	Code	Packing Type	Pc
110-110	**4901211014121**	Base Box	20

HT-PP Branch 45°

Dia. (mm)	Code	Packing Type	Pc
32-32	**4901203200121**	Base Box	500
40-40	**4901204001021**	Base Box	250
50-32	**4901205042721**	Base Box	250
50-40	**4901205041121**	Base Box	200
50-50	**4901205002021**	Base Box	150
75-50	**4901207503021**	Base Box	75
75-75	**4901207503121**	Base Box	60
110-50	**4901211004021**	Base Box	40
110-75	**4901211004121**	Base Box	30
110-110	**4901211004221**	Base Box	20
125-50	**4901212505021**	Base Box	30
125-75	**4901212505121**	Base Box	24
125-110	**4901212505221**	Base Box	15
125-125	**4901212505321**	Base Box	16
160-110	**4901216006021**	Base Box	10
160-125	**4901216006121**	Base Box	10
160-160	**4901216006221**	Base Box	8

HT-PP Branch 67.5°

Dia. (mm)	Code	Packing Type	Pc
110-110	**4901211041221**	Base Box	25

HT-PP Branch 87.5°

Dia. (mm)	Code	Packing Type	Pc
32-32	**4901203241321**	Base Box	500
40-40	**4901204042821**	Base Box	200
50-40	**4901205007021**	Base Box	200
50-50	**4901207508021**	Base Box	150
75-50	**4901207508121**	Base Box	100
75-75	**4901211009021**	Base Box	80
110-50	**4901211009121**	Base Box	50
110-75	**4901211009221**	Base Box	30
110-110	**4901212510321**	Base Box	30
125-125	**4901216010921**	Base Box	20
160-110	**4901212510321**	Base Box	14
160-160	**4901216011121**	Base Box	10

HT-PP Corner Double Branch 87,5°

Dia. (mm)	Code	Packing Type	Pc
110-110	**4901211015521**	Base Box	20

HT-PP Clean Out (Circular)

Dia. (mm)	Code	Packing Type	Pc
75	**4901307530921**	Base Box	64
110	**4901311031321**	Base Box	30

HT-PP Clean Out (Rectangular)

Dia. (mm)	Code	Packing Type	Pc
160	**4901916041821**	Base Box	8

HT-PP Reducer

Dia. (mm)	Code	Packing Type	Pc
40-32	**4901404017021**	Base Box	750
50-32	**4901405016521**	Base Box	500
50-40	**4901405017021**	Base Box	500
75-50	**4901407517121**	Base Box	200
110-50	**4901411017221**	Base Box	100
110-75	**4901411017321**	Base Box	100
125-110	**4901412517421**	Base Box	50
160-110	**4901416017521**	Base Box	40
160-125	**4901416041021**	Base Box	50

HT-PP S Siphon 45°

Dia. (mm)	Code	Packing Type	Pc
75	**4901507592421**	Base Box	50
110	**4901611015021**	Base Box	20

HT-PP S Siphon 87,5°

Dia. (mm)	Code	Packing Type	Pc
110	**4901611015121**	Base Box	15

HT-PP Sliding Socket

Dia. (mm)	Code	Packing Type	Pc
32	**4901503241521**	Base Box	600
50	**4901505031721**	Base Box	400
75	**4901507531821**	Base Box	200
110	**4901511040621**	Base Box	80
160	**4901516032021**	Base Box	30

HT-PP Socket with Central Register

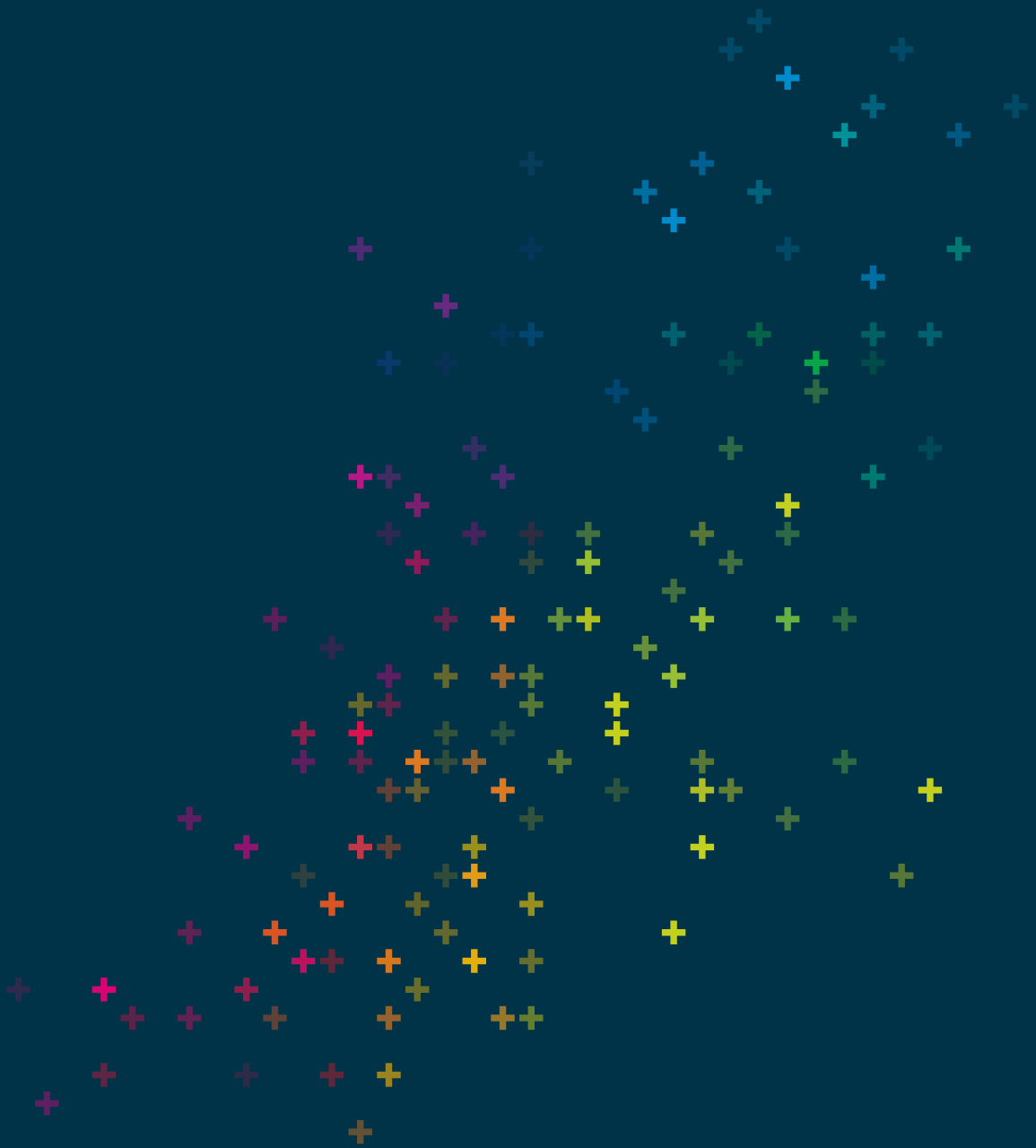
Dia. (mm)	Code	Packing Type	Pc
32	**4901503241421**	Base Box	600
40	**4901504041521**	Base Box	500
50	**4901505031621**	Base Box	400
75	**4901507531721**	Base Box	200
110	**4901511031821**	Base Box	80
160	**4901516031921**	Base Box	30

HT-PP Socket Plug

Dia. (mm)	Code	Packing Type	Pc
32	**4901903241621**	Base Box	1250
40	**4901904041721**	Base Box	1000
50	**4901905040721**	Base Box	1000
75	**4901907540821**	Base Box	200
110	**4901911016021**	Base Box	200
160	**4901916016121**	Base Box	60

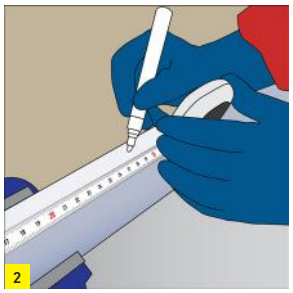
Building Technology (BT) Solid and Waste Water Pipe Range Installation Instructions

- HT-PP Waste Water Pipe Systems

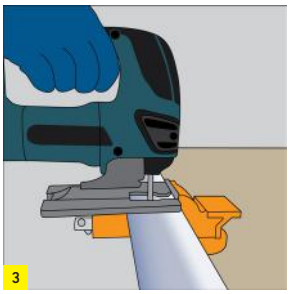


Installation

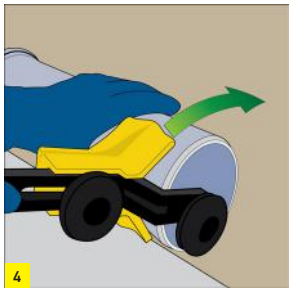
Make sure that your products are clean. If necessary, wipe the jointing points with a dry cloth.



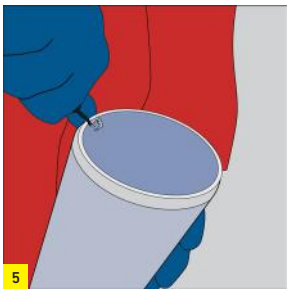
When interval measurements are required, mark the pipe with the desired measurements.



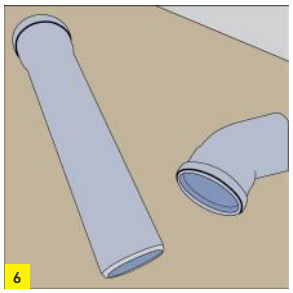
Cut in 90° angle by using a coping saw or a proper cutter.



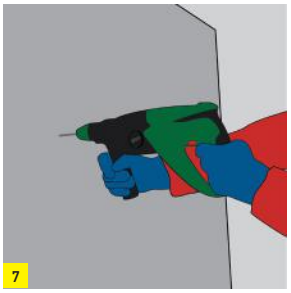
Chamfer the spigot of pipe by using a chamfering device or thick riffler.



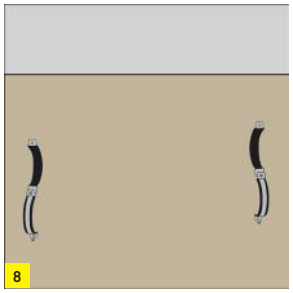
Remove the burrs on the external edges with a knife or scraper.



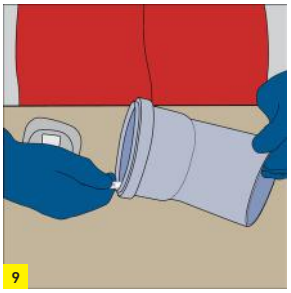
Now, your pipe is ready for installation.



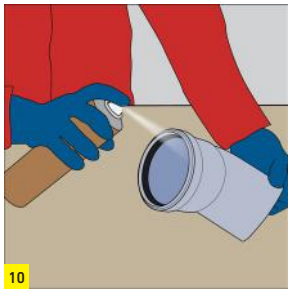
Drill the marked points with a driller and place dowels into the holes.



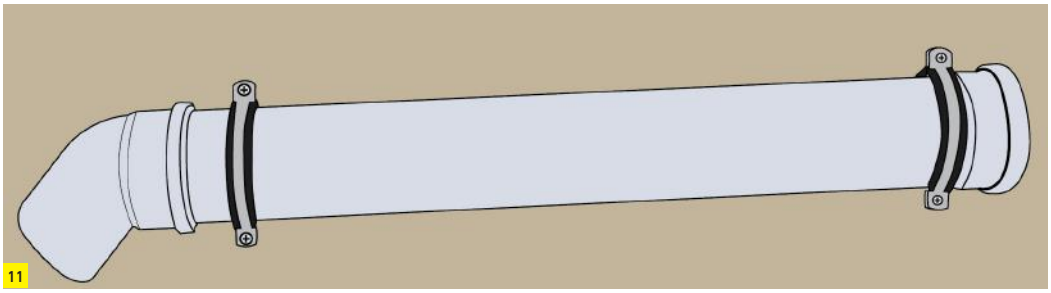
Mark the pipe clamp distances properly with 1% inclination on the wall or ceiling where they will be installed. (as flat wall)



Mark the part of the pipe that will be attached to the fitting as much as the jointing distance.



Apply a lubricating liquid (silicone etc.) to the socket part of the pipe.



After the pipe and fittings are jointed, place them and tighten the clamps.

Rubber Ring (Push Fit) Jointing

1- Mouth of the pipe should be absolutely chamfered. If the mouth of the pipe was cut, it should be chamfered.
2- Check if the sealing gasket is accurately placed on the pipe or fitting socket groove.
3- All installation parts should be dry and clean. There should be no deformation, notches or similar scratches on the pipes or fittings.
4- Apply a proper silicone-based lubricating liquid on the spigot end of the pipe or fitting. Do not use liquid soap, grease or similar petroleum derivatives.
5- Parts to be jointed should be levelled.
6- Push the spigot end of the pipe or fitting into the socket completely. If the application is longer than 2 m, pull the spigot end 10 mm back after placing it into the socket completely, to prevent the effects of thermal expansion.
7- Finally, check again if the gap left for thermal expansion still exists or not.

Pipe Hanging and Clamping

Always use GF Hakan silent pipe clamp to minimize the sound caused by vibration. Maximum clamping distances of the pipes should always comply with the values provided in the following table.

1- While fixing the pipe with clamps, pay special attention to not cause any tension and stress on pipes.
2- Pipe cannot move after tightening the screws of the fixed clamps. For sliding clamps, pipe will continue to move inside the clamp even after tightening the screws.
3- For each line longer than 2 m, use 1 fixed clamp immediately after the muff part.
4- In vertical lines, always place the fixed clamp on the top point of the pipe and below the socket part.
5- While fitting the fixed clamp, pay attention to keep 10 mm distance left on the flat end for expansion.
6- Use a fixed clamp after each fitting or fitting group.
7- All clamps to be added to the system apart from the fixed clamps in the horizontal or vertical line should be sliding clamp that allows for thermal expansion caused by temperature changes.
8- Pipes and fittings should be fixed in short distances so that they do not slide and release.

Maximum distances between the clamps

Nominal External Diameter DN [mm]	Clamp Distance	
	For Horizontal Pipe Directions* Dmax m (max. 15 x da)	For Vertical Pipe Directions* Dmax. m
50	0,75	1,50
75	1,10	2,00
90	1,35	2,00
110	1,65	2,00
125	1,85	2,00
160	2,40	2,00
200	3,00	2,00
250	3,00	2,00

Silent Pipe Clamp

Silent waste water piping systems are tested by the German Fraunhofer Building Physics Institute in accordance with EN 14366 standard, and the reports about sound level are issued by this institute.
In the test equipment used in this institute, sound levels are measured at different flows and different parts of the building.

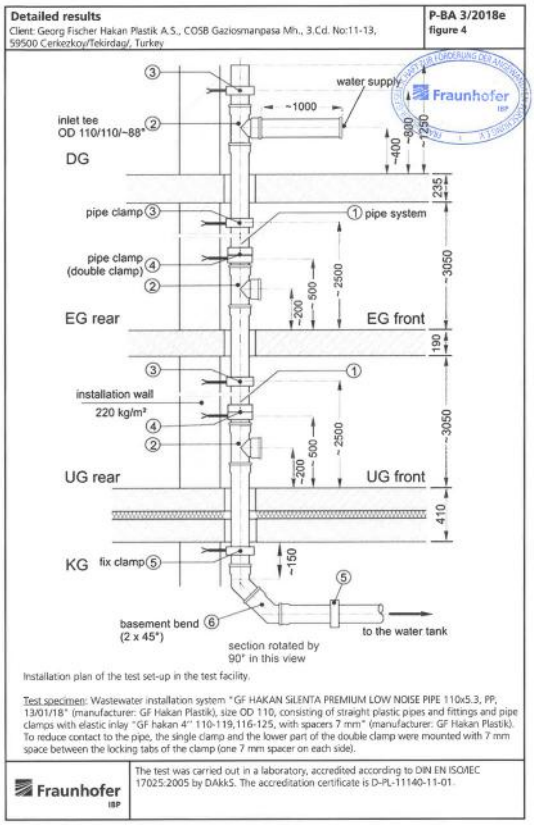
The test equipment in the institute laboratory is standard and the tests related to all waste water systems are conducted here. As seen in the test equipment below, pipe, fittings, installation wall thickness, water discharge amount as well as silent pipe clamp systems are also significant factors in the test report.

In the vertical lines, one group double and one single clamp should be used on each floor. In the horizontal lines, it is more suitable to use single clamp.

Clamp Details

The clamp on top, which is one of the double clamps used in the vertical lines, is fully tightened and grasps the pipe. The lower clamp is tightened up to the plastic wedges on the clamp. It is ensured that the rubber surfaces of the clamp are not jointed. In this system, the purpose is to absorb the vibration transmitted from waste water to pipe inside the first clamp and to minimize the vibration on the wall through the second clamp.

The single clamp in the vertical lines is tightened up to the plastic wedges on the clamp and it is ensured that the pipe is fixed to the wall. The single clamp in the horizontal lines is tightened up to the plastic wedges on the clamp and it is ensured that the pipe is fixed to the ceiling or wall.



Installation plan of the test set-up in the test facility.

Test specimen: Wastewater installation system "GF HAKAN SILENTA PREMIUM LOW NOISE PIPE 110x5.3, PP, 13/01/18" (manufacturer: GF Hakan Plastik), size OD 110, consisting of straight plastic pipes and fittings and pipe clamps with elastic inlay "GF hakan 4" 110-119,116-125, with spacers 7 mm" (manufacturer: GF Hakan Plastik). To reduce contact to the pipe, the single clamp and the lower part of the double clamp were mounted with 7 mm space between the locking tabs of the clamp (one 7 mm spacer on each side).

Fraunhofer IBP

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2005 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

To achieve maximum acoustic performance, the silent pipe clamps used in the test should be used in the installations as well.

Although there are different types of silent pipe clamps, they are available in two kinds as fixed and movable.

The noise created in the waste water systems is transmitted by two methods as air born and structure born.

1- Sound waves transmitted through air cause pressure in the ambient and result in vibration on the objects and surfaces that they hit. Thanks to the special formulas used in GF Hakan Plastik Silenta products, these vibrations are absorbed and prevented from being transferred out of pipe.

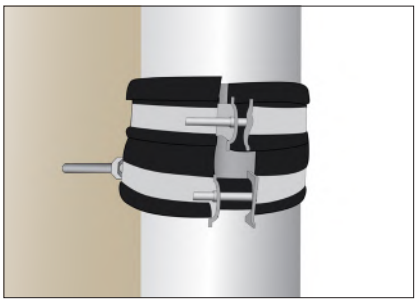
2- Sound waves transmitted through contact occur as a result of the waste water and waste hitting the pipe wall. These vibrations are transferred on the wall of the installation through contact. The sound created by contact is significantly absorbed by the special molecular structure of Silenta and specially-designed GF Hakan silent clamps.

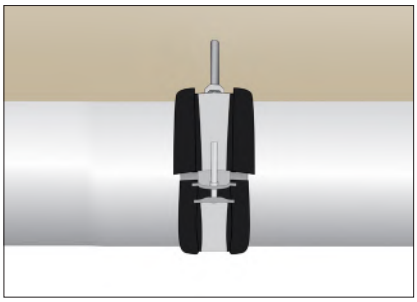
Installation

GF Hakan silent waste water pipe clamps ensure EN 14366 silence norms. In the waste water systems within buildings, cused clamps, their positions and distances are as important as silent pipes and fittings.

The clamp on top, which is one of the double clamps used in the vertical lines, is fully tightened and grasps the pipe. The lower clamp is tightened up to the plastic wedges on the clamp. It is ensured that the rubber surfaces of the clamp are not jointed. In this system, the purpose is to absorb the vibration transmitted from waste water to pipe inside the first clamp and to minimize the vibration on the wall through the second clamp.

The single clamp in the horizontal lines is tightened up to the plastic wedges on the clamp and it is ensured that the pipe is fixed to the ceiling or wall.

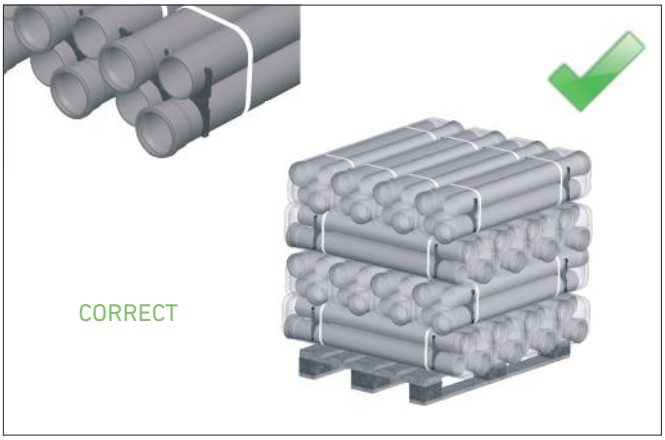




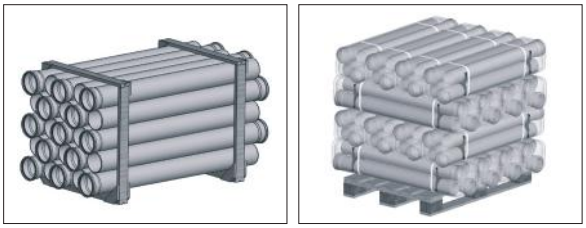
Packaging, Storage and Transportation

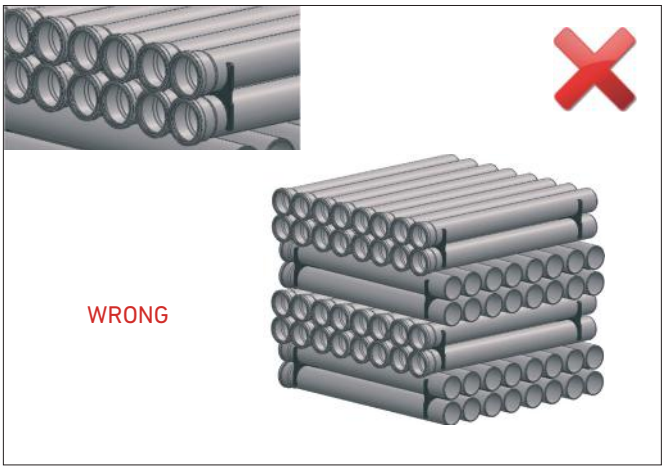
Packaging

GF Hakan Plastik pipes and fittings are packed as ready for transport in a customer-friendly way. Packing ensures safety, efficient storage and easy transport.



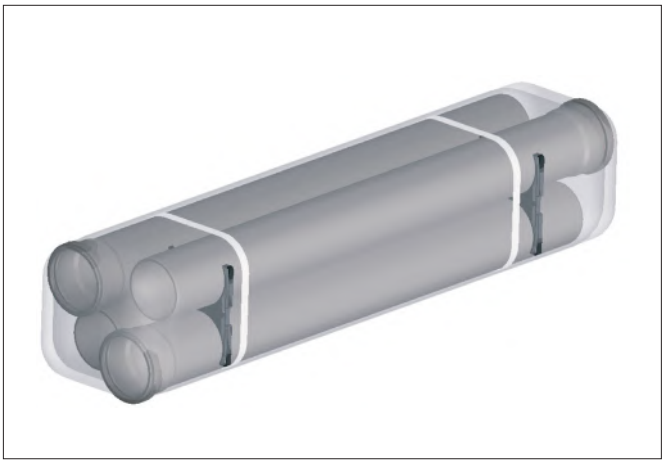
Waste water pipes are shipped on wooden frames or pallets according to the demands of customers.





Pipes and fittings with socket are placed in a way that they will not stay on top of each other.

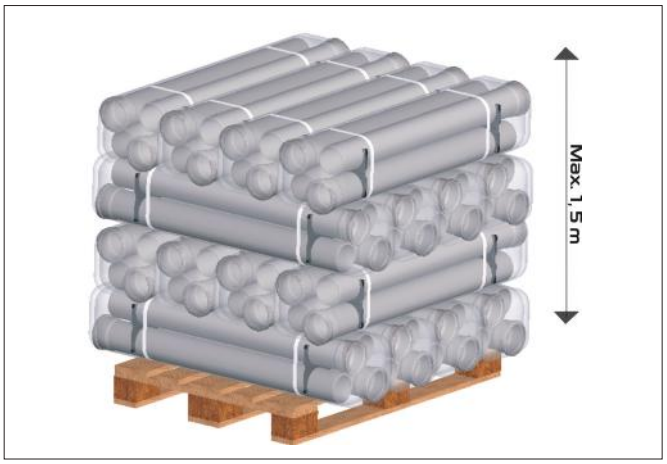
Short parts with the length of 150, 250 and 500 mm are packed in carton boxes like connection parts.



Pipes are packed by plastic clamps to hold them together. Stretch film is applied to protect pipes from pipes dust and stains.

All product ranges are identified in the Warehouse Management System (WMS) by barcode label. Barcode system ensures management of products and prevents complexity and errors during storage and loading.

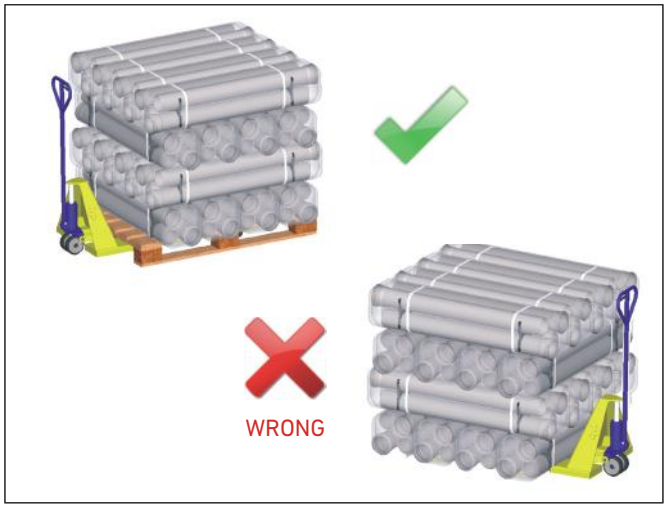
Storage



Method of storage should not cause any outflow and should not damage the pipes. As long as they are stored properly, no permanent deformations or damages will occur on the pipes and fittings. Pipes should not be stacked above 1,5 m. Pipes should be safe against sliding.

Pipes and fittings packed in carton boxes should be protected against moisture.
Carton boxes should be sealed and stored in a dry area.

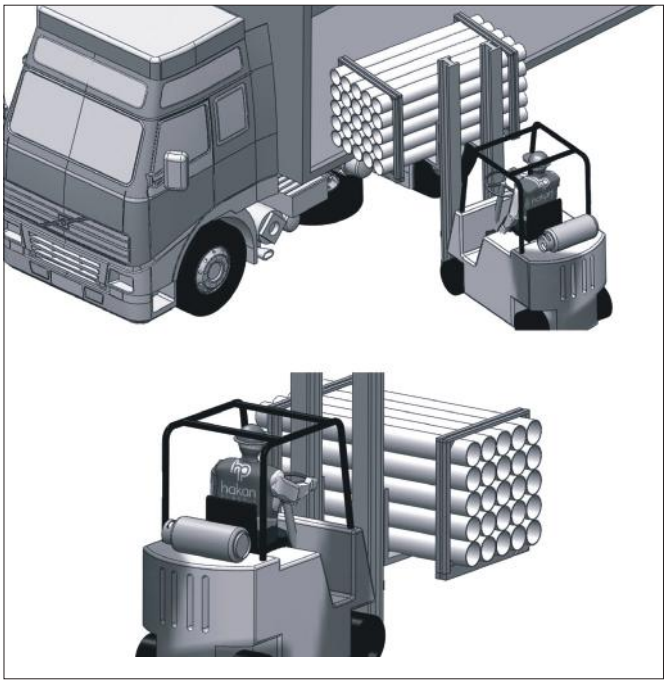
Pipes packed in the factory might be stacked on wooden frames. Appropriate materials such as pallet etc. should be used to prevent any damage on the socket parts of the pipes stored for a long time. This also makes it easier to lift the pipes by from the flor.



Products that are not resistant to UV should not be stored outdoors and should be protected against sunlight.

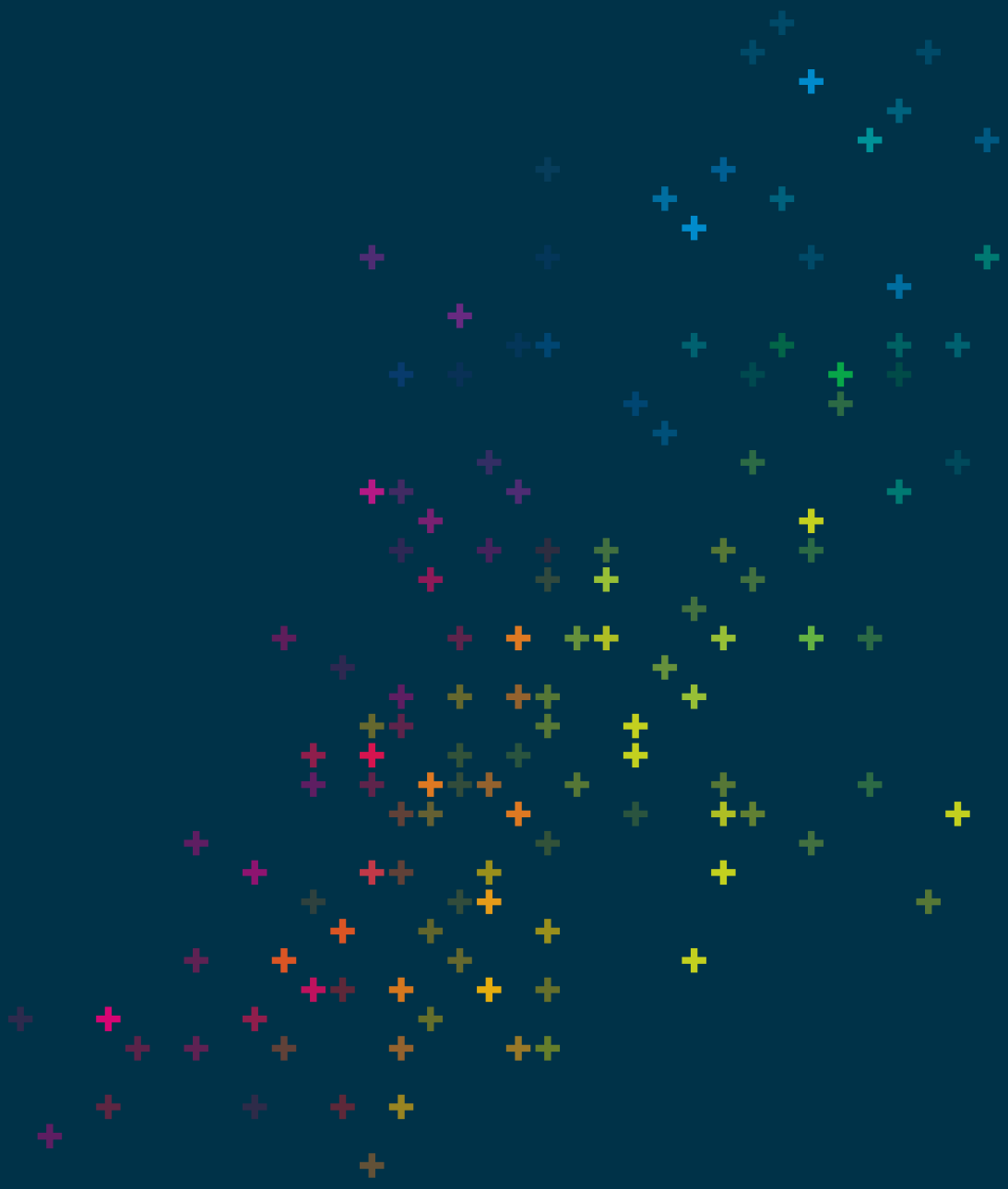
Transportation

Pipes should be carefully transported to prevent any damages. Avoid sudden and hard pressures on pipes and fittings that might cause freezing in cold weather conditions. Ensure that pipes are not slided and dropped on the floor. Loading and unloading and packing of pipes in a block should be carried out by means of forklifts having flat threads and extensions.



Technical Tables

- Chemical Resistance Tables



Chemical Resistance Tables

++ Resistant
+ Limited Resistance
0 Contact GF Hakan Plastik
- Not Resistant

2-Chloroethanol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	+	0	
PP	++	+	0	-

Acetaldehyde	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	0	-		

Acetaldehyde, 0-40% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	0	-

Acetic acid, > 80 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	+	0	-	
PP	0	0	-	

Acetic acid, >10-50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	+	-
PE	+	+	0	-
PP	+	+	0	0

Acetic acid, >50-60 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	0	0	-
PE	+	+	0	-
PP	+	+	0	0

Acetic acid, >60-80 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	0	0	-
PE	+	+	0	-
PP	+	+	0	0

Acetic acid, 0-10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	+	-
PE	+	+	0	-
PP	+	+	0	0

Acetic acid anhydride	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	

Acetone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	-
PP	++	++	++	0

Acetone, up to 10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	++	-
PP	++	++	++	0

Acetonitrile	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		

Acetophenone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		

Acrylic acid ethylester	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	-			

Acrylic acid methylester	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		

Acrylonitrile	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	++	-
PP	++	0	0	-

Adipic acid, aqueous, saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	-	
PE	++	++	++	-
PP	++	++	++	++

Allyl alcohol, 96% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	++	++	0	-
PP	0	0	-	

Aluminium salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++

Ammonia, gaseous, dry / wet	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0

Ammonium Acetate, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++

Ammonium hydroxide, aqueous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0

Ammonium salts, various concentrations, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++

Amyl acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	0	-		

Amyl alcohol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0

Aniline	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	0	-
PP	++	++	0	-

Antimony trichloride, 0-80 % aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0

Chemical Resistance

Aqua regia	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	-			
PP	-			
Arsenic acid, 80% aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Barium salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Beer	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Benzaldehyde	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Benzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Benzene sulfonic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Benzoic acid, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Benzyl alcohol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	++	++	0	-
PP	++	++	0	-
Beryllium salts, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Boric acid, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Brine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Bromine water, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Bromine, pure, liquid or gaseous, dry and wet	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Butadiene, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	0	-		
PP	0	-		
Butane, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Butanediol-1,4,	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	++	++	++	-
PP	++	++	++	0
Butanediol-1,4, technically pure	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	
PE	++	++	0	
PP	++	++	0	
Butanol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Butyl acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	+	0	-	
PP	0	-		
Butyl phenol, p-tertiary	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	0	-		
PP	0	-		
Cadmium salts, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Caesium salts, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Calcium hydroxide, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Calcium salts, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Carbon dioxide, gaseous, anhydrous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Carbon tetrachloride	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			

Chemical Resistance

Carbonic acid, CO2 in H2O	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Chloric acid, >10-20% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	0	-		
PP	0	-		
Chloric acid, 0-10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	0	-		
PP	0	-		
Chlorine, gaseous, dry, pure	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Chlorine, gaseous, wet	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Chlorine water, <= 2 ppm Chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	0	-
PP	++	++	++	0
Chlorine water, saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	-			
PP	-			
Chloroacetic acid, 100 %	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	++	++	0	-
PP	++	++	0	-
Chloroacetic acid, 50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	0	-
PE	++	++	0	-
PP	++	++	++	0
Chlorobenzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Chlorosulfonic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	-			
PP	-			
Chromic acid, <10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Chromic acid, > 30 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	-			
PP	-			

Chromic Acid, >=10-30 %, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Chromium (II) -salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	0	-
PP	++	++	0	-
Citric acid, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Compressed air, containing oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	0	0	-
PP	0	0	0	-
Copper I/II salts, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	0	-
PP	++	++	++	0
Crotonaldehyde	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	0	-
PP	++	0	-	-
Cyclohexane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	0	-	
PP	++	0	-	
Cyclohexanol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Cyclohexanone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	0	0	-	
Dextrine, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Dibrombenzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Dibutyl ether	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	0	-	
PP	0	0	-	
Dibutyl phthalate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	0	-	
Dichloroacetic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C

Chemical Resistance

PVC-U	++	0	-	
PE	0	-		
PP	0	-		
Dichloroacetic acid, <= 50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Dichloroacetic acid methyl ester	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	-
PP	++	++	++	0
Dichlorobenzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Dichlorodifluoromethane, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Dichloroethylene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Diesel oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	0	0	-	
PP	0	-		
Diethanolamine, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Diethyl ether	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Diethylamine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Diisobutyl ketone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Diisopropyl ether	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Dimethyl formamide	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	-
PP	++	++	++	0
Dimethylamine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	

Dioxane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	0	-		
Ethanol, <= 50% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Ethyl alcohol, 96%	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Ethanolamine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Ethyl benzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Ethylacetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Ethylchloride, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Ethylene diamine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	++	-
PP	++	++	++	0
Ethylene glycol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	+	+	0	-
PP	+	+	0	-
Ethylene glycol, <= 50% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	+	+	0	-
PP	+	+	+	0
Ethylenediamine tetraacetic acid, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	+	+	0	-
PP	+	+	0	-
Ferric chloride	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Fluorosilicic acid, < = 32 % aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0

Chemical Resistance

Formaldehyde, <= 40 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	+	+	0	-
Formamide	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	++	-
PP	++	++	++	0
Formic acid, > 25-50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	+	+	0	-
Formic acid, > 60 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	+	+	0	-
PP	0	-		
Formic acid, >10-25 % aquesous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	+	+	0	-
Formic acid, >50-60 %, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	+	+	0	-
Formic acid, 0-10% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	++	+	0	-
Fuel oil, heavy fuel oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0	-		
PP	0	-		
Furfural	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	-
PP	++	0	0	0
Furfuryl alcohol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	-
PP	++	++	0	-
Gasoline	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	0	-		
PP	0	-		
Gelatine, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Glucose, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++

Glycerol, Glycerin	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Glycin, 10% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Glycolic acid, 37% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	+	+	0	-
PP	+	+	0	-
Heptane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	0	-	
PP	0	-		
Hexane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	0	-	
PP	0	-		
Hydrazine Hydrate, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	++	0	-
PP	++	0	-	
Hydrochloric acid, <= 10% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	+	-
PP	+	+	+	+
Hydrochloric acid, > 10-25 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	+	-
PP	+	+	+	+
Hydrochloric acid, > 25-30% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	+	-
PP	+	+	+	+
Hydrochloric acid, > 30 - 37 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	0	-
PP	0	0	0	0
Hydrochloric acid, > 37 %, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	0	-		
PP	0	-		
Hydrocyanic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Hydrofluoric acid, <= 10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	-
PP	+	+	0	0

Chemical Resistance

Hydrofluoric acid, > 40% - 75% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	+	+	0	-
PP	0	0		
Hydrofluoric acid, > 75 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Hydrofluoric acid, 10% - 40 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	+	+	0	-
PP	+	+	0	0
Hydrogen chloride, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Hydrogen peroxide, < 5 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	-	
PE	+	0	-	
PP	0	-		
Hydrogen peroxide, >= 5 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	-	
PE	0	-		
PP	-			
Hydrogen Sulfide gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	++	0
Hydrogen sulfide, aqueous saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Hydrogen, gas	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Hydroquinone, cold saturated aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	0	-	
PP	++	0	-	
Iron salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Isobutylacetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0	-	
PP	++	0	-	
Isooctane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	0	-	
PP	++	0	-	
Isopropyl alcohol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	-	
PE	++	++	0	-
PP	++	++	0	-
Lactic acid, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	0	-
PE	+	+	+	-
PP	+	+	+	0
Lead Acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Linseed oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	++	0
Lithium salts, aqueous saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Magnesium salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Maleic acid, cold saturated, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	++	0	
PP	++	++	0	
Mercury salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Methane, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	0		
PP	++	0		
Methanol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Methyl acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	
PP	++	++	0	
Methyl Amine, 32 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	++	0		
PP	++	0		
Methyl bromide, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C

Chemical Resistance

PVC-U	-			
PE	-			
PP	-			
Methyl ethyl ketone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Methyl isobutyl ketone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Methyl acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	
PP	++	++	0	
Methyl Amine, 32 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	++	0		
PP	++	0		
Methyl bromide, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Methyl ethyl ketone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Methyl isobutyl ketone	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Methyl methacrylate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	
PP	++	++	0	
Milk	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Mineral oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	
PE	++	++	0	
PP	++	++	0	
50% Chromic acid / 15% sulfuric acid / 35% water	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Mixed acids: 15% nitric / 15% hydrofluoric / 18% sulfuric	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	-			
PP	-			
Mixed acids: 30% sulfuric / 60% phosphoric / 10% water	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C

PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	++	0
Mixed acids: sulfuric / nitric / water, various concentrations	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	0			
PP	0			
N-Methylpyrrolidon	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
N,N-Dimethylaniline	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	0			
Nickel salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Nitrating acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Nitric acid, > 30 - 55 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Nitric acid, > 6 - 20 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	0	-		
PP	0	0		
Nitric acid, >20 - 30 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	0	-		
PP	0	0		
Nitric acid, >55 - 65% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	-			
PP	-			
Nitric acid, ≤ 6 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	0	-		
PP	0	0	0	
Nitrobenzene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Nitrogen Gas	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++

Chemical Resistance

Nitrotoluene (o-, m-, p-)	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	0			
Nitrous acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	0		
PP	++	0		
Nitrous gases (Nitric oxide),	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	0			
PP	0			
Oleic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	0		
PP	++	0		
Oleum, <= 10 % SO3	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Olive oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	+	+	0	
PP	+	+	0	
Oxygen, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	0	
PP	++	++	0	
Palm oil, palm nut oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	0		
Peracetic acid, > 10 %	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0		
PE	0			
PP	0			
Peracetic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0		
PE	0			
PP	0			
Perchloric acid, <= 70 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	0			
PP	0			
Peroxo monosulfuric acid, 0-10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	-			
PP	-			
Phenol, <= 10 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	++	++	0	
PP	++	++	0	
Phosphoric acid, <= 60 % aqueous solution	Fluid Temperatures			

	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	0	
PP	+	+	+	0
Phosphoric acid, >60-85 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	
PP	+	+	0	
Phosphoric acid, >85-95 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	+	+	0	
PP	+	+	0	
Phosphorous chlorides: -trichloride -pentachloride -oxichloride	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Photographic fixer, commercial solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	+	+	0	-
PP	+	+	0	
Phthalic acid, aqueous saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	++	++	-
PP	++	++	++	0
Potassium aluminium salts(alum), aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Potassium cyanide, sodium Cyanide, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Potassium formiate, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	++
Potassium hydroxide <= 50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	+	+	+	+
Potassium hypochlorite, <=16% active Chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	0			
PP	0			
Potassium Permanganate, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	0	0	-	
PP	0	0	-	
Potassium persulphate, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C

Chemical Resistance

PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Propane, gaseous	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	++	0	
PP	++	0		
Propionic acid	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	0		
PP	++	0		
Propionic acid, 50% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Propylene glycol	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	+	+	0	-
PP	+	+	+	0
Propylene glycol <= 50% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	+	+	0	-
PP	+	+	+	0
Pyridine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	0			
Salicylaldehyde	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	-		
PE	0			
PP	0			
Silicic acids	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Silicone oils	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	++	++	-
PP	++	++	++	++
Silver salts, aqueous saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Sodium borate, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	
PE	++	++	++	-
PP	++	++	++	++
Sodium Carbonate, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Sodium Chloride, aqueous saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Sodium chlorite, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	+	+	0	
PP	+	+	0	
Sodium Chromate, diluted aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	
PE	0			
PP	0			
Sodium hydrogen sulfite,	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Sodium hydroxide, <=10% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	+	-
PE	++	++	++	-
PP	+	+	+	0
Sodium hydroxide, > 50 %	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0	0	-	
PE	0	0	0	-
PP	0	0	0	0
Sodium hydroxide, >10-50 % aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	+	+	0	0
Sodium Hypochlorite from electrochlorination plants	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	0			
PP	0			
Sodium hypochlorite, < 0.5 ppm active chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Sodium hypochlorite, <= 6 % active chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	0	-
PE	-			
PP	-			
Sodium hypochlorite, > 6 % active chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Sodium hypochlorite, 0.5 - 2 ppm active chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	-	
PP	++	++	-	
Sodium persulphate, aqueous, cold saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0

Chemical Resistance

Sodium salts, aqueous, saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Starch solution, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Styrene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Succinic acid, aquesous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Sulfuric acid, <= 25% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	+	+	+	0
Sulfuric acid, > 25-50% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	+	+	+	+
Sulfuric acid, > 50 - 70% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	+	-
PE	++	++	++	-
PP	+	+	+	0
Sulfuric acid, > 70 - 78% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	++	++	++	-
PP	+	+	0	0
Sulfuric Acid, > 78 - 93% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Sulfuric acid, > 93 - 96% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	+	-	
PE	-			
PP	-			
Sulfuric acid, > 96% - 98% solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	+	0	-	
PE	-			
PP	-			
Sulfurous acid, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	0	-
PP	++	++	0	-
Sulfuryl chloride	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Sulphur dioxide, gaseous, dry and moist	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	0			
PP	0			
Tannic acid, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0		
PE	++	0		
PP	++	0		
Tartaric acid, <=10% aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Tetrachloroethane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Tetrachloroethylene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Tetrachloromethane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Tetrahydrofurane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Tetramethyl ammoniumhydroxide	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	0	0	-
PE	++	0	0	-
PP	++	0	0	
Tin (II) Chloride, aqueous saturated solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	0
Toluene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Trichloroacetic acid, aqueous solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	++	++	0	
PP	++	++	0	
Trichloroethane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Trichloroethylene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Trichloromethane	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			

Chemical Resistance

Triethylamine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	0			
PP	0			
Trifluoroacetic acid, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	0		
PP	++	0		
Turpentine oil	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	0			
PE	0			
PP	-			
Urea, aqueous solution	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Urine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	0	-
PE	++	++	++	-
PP	++	++	++	0
Vinyl acetate	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	++	++	0	
PP	++	0		
Vinyl Chloride gas	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			

Mineral water	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Potable Water	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Sea water	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Water - distilled - deionised	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Water, drinking, chlorinated, ≤ 0.1 ppm Chlorine	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++
Xylene	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	-			
PE	-			
PP	-			
Zinc salts, aqueous saturated solutions	Fluid Temperatures			
	20 °C	40 °C	60 °C	80 °C
PVC-U	++	++	++	-
PE	++	++	++	-
PP	++	++	++	++

++ Resistant
\+ Limited Resistance
0 Contact GF Hakan Plastik
\- Not Resistant

References

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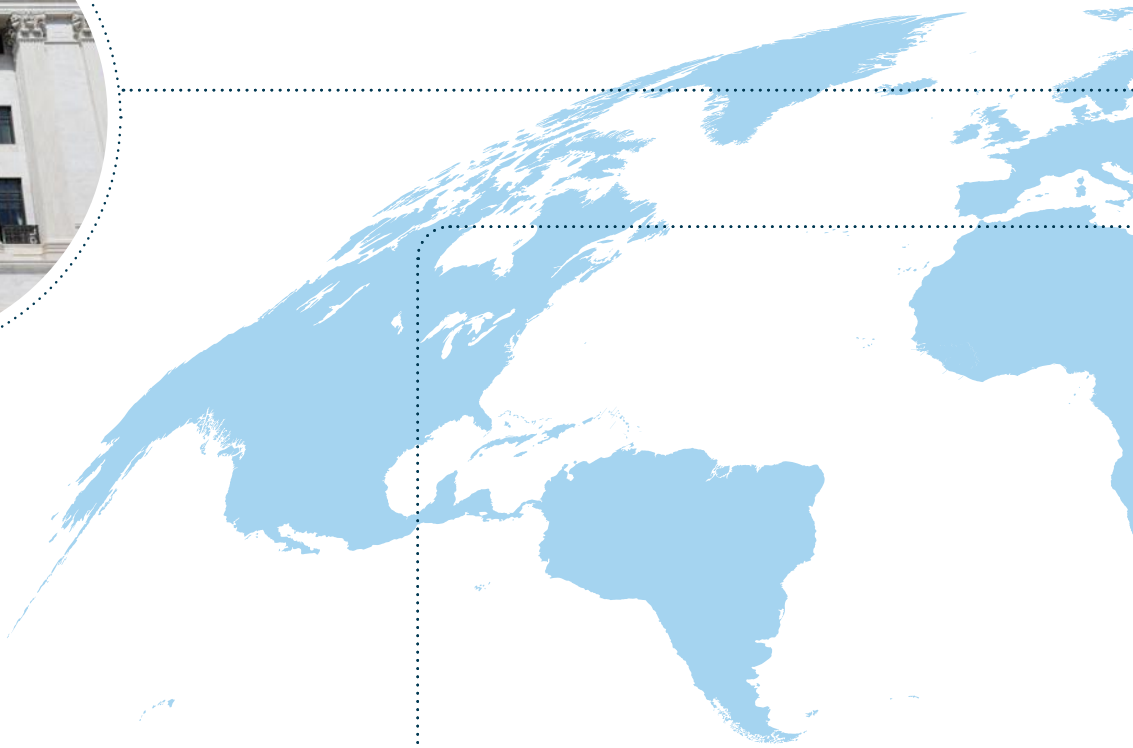

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Notes

Notes

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