Fineflow PLASTIC INDUSTRIES

Manufacturers & Exporters

# Rigid PVC Pipes (uPVC Rigid Pipes)

## Advantages of PVC Pipes

- PVC due to non-corrosive in nature and unaffected by chemicals, electrolytic and ironic corrosion can stay for very long time than other pipes which impart it with high corrosion resistance.
- PVC pipes have a smoother bore than all other pipes (AC, CI, GI pipes) thereby the flow rate in PVC pipes is more than 30 per cent higher than the rest of pipes.
- PVC pipes are perfect for transporting potable drinking water as they do not subject to contamination as they are completely odourless and hygienic.
- PVC pipes have self-extinguishing properties, which thereby eliminates the need for fire resistant coatings.
- PVC pipes require no maintenance such as painting and coating etc.
- PVC pipes are having a high chemical resistance therefore they can resist to all kinds of acids, alkalis, oxidizing agents, oils and domestic effluents.
- Resistant to rusting, chemical reactions and free from scale formation hence PVC pipes lasts for life time.
- PVC pipes are the most cost effective as they are cheap than all other kinds of pipes which make them most economical and light in weight to carry.

## Applications of Zenith Pipes

- Irrigation (Micro & Macro).
- Drinking water & water mains supply.
- Drainage & sewerage purposes.
- Power & Telecom cable ducting.
- Tube well casings.
- Green house sprinkler & drip irrigation systems.
- Brewery pipelines.
- Underground or surface drainage.
- Industrial & chemical effluent disposal.
- Acids & slurries transportation.
- Biogas, natural gas & oil distribution.

## DIMENSIONS OF RIGID PVC PIPE (IS 4985-2000 EXTRACT)

| Nominal Outside Diameter | Tolerance on outside Diameter | Wall Thickness | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Class 1 2.5 Kgf/ Cm | | Class2 4Kgf/ $cm^2$ | | Class3 6Kgf/ $cm^2$ | | Class4 8Kgf/ $cm^2$ | | Class5 10Kgf/ $cm^2$ | | Class6 12.5Kgf/ $cm^2$ | | plumbing pipes 15Kgf/$cm^2$ | |
| | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 20 | +0.3 | - | - | - | - | - | - | - | - | 1.1 | 1.5 | 1.4 | 1.8 | 2.8 | 3.3 |
| 25 | +0.3 | - | - | - | - | - | - | 1.2 | 1.6 | 1.4 | 1.8 | 1.7 | 2.1 | 2.9 | 3.4 |
| 32 | +0.3 | - | - | - | - | - | - | 1.5d | 1.9 | 1.8 | 2.2 | 2.2 | 2.7 | 3.4 | 3.9 |
| 40 | +0.3 | - | - | - | - | 1.4 | 1.8 | 1.8 | 2.2 | 2.2 | 2.7 | 2.8 | 3.3 | 3.6 | 4.2 |
| 50 | +0.3 | - | - | - | - | 1.7 | 2.1 | 2.3 | 2.8 | 2.8 | 3.3 | 3.4 | 4.0 | 3.7 | 4.3 |
| 63 | +0.3 | - | - | 1.5 | 1.9 | 2.2 | 2.7 | 2.8 | 3.3 | 3.5 | 4.1 | 4.3 | 5.0 | -- | -- |
| 75 | +0.3 | - | - | 1.8 | 2.2 | 2.6 | 3.1 | 3.4 | 4.0 | 4.2 | 4.9 | 5.1 | 5.9 | -- | -- |
| 90 | +0.3 | 1.3 | 1.7 | 2.1 | 2.6 | 3.1 | 3.7 | 4.0 | 4.6 | 5.0 | 5.7 | 6.1 | 7.1 | -- | -- |
| 110 | +0.4 | 1.6 | 2.0 | 2.5 | 3.0 | 3.7 | 4.3 | 4.9 | 5.6 | 6.1 | 7.1 | 7.5 | 8.7 | -- | -- |
| 125 | +0.4 | 1.8 | 2.2 | 2.9 | 3.4 | 4.3 | 5.0 | 5.6 | 6.4 | 6.9 | 8.0 | 8.5 | 9.8 | -- | -- |
| 140 | +0.5 | 2.0 | 2.4 | 3.2 | 3.8 | 4.8 | 5.5 | 6.3 | 7.3 | 7.7 | 8.9 | 9.5 | 11.0 | -- | -- |
| 160 | +0.5 | 2.3 | 2.8 | 3.7 | 4.3 | 5.4 | 6.2 | 7.2 | 8.3 | 8.8 | 10.2 | 10.9 | 12.6 | -- | -- |
| 180 | +0.6 | 2.6 | 3.1 | 4.2 | 4.9 | 6.1 | 7.1 | 8.0 | 9.2 | 9.9 | 11.4 | 12.2 | 14.1 | -- | -- |
| 200 | +0.6 | 2.9 | 3.4 | 4.6 | 5.3 | 6.8 | 7.9 | 8.9 | 10.3 | 11.0 | 12.7 | 13.6 | 15.7 | -- | -- |
| 225 | +0.7 | 3.3 | 3.9 | 5.2 | 6.0 | 7.6 | 8.8 | 10.0 | 11.5 | 12.4 | 14.3 | 15.3 | 17.6 | -- | -- |
| 250 | +0.8 | 3.6 | 4.2 | 5.7 | 6.5 | 8.5 | 9.8 | 11.2 | 12.9 | 13.8 | 15.9 | 17.0 | 19.6 | -- | -- |
| 280 | +0.9 | 4.1 | 4.8 | 6.4 | 7.4 | 9.5 | 11.0 | 12.5 | 14.4 | 15.4 | 17.8 | 19.0 | 21.9 | -- | -- |
| 315 | +1.0 | 4.6 | 5.3 | 7.2 | 8.3 | 10.7 | 12.4 | 14.0 | 16.1 | 17.3 | 19.9 | 21.4 | 24.7 | -- | -- |
| 355 | +1.1 | 5.1 | 5.9 | 8.1 | 9.4 | 12.0 | 13.8 | 15.8 | 18.2 | 19.6 | 22.6 | 24.1 | 27.8 | -- | -- |
| 400 | +1.2 | 5.8 | 6.7 | 9.1 | 10.5 | 13.5 | 15.6 | 17.8 | 20.5 | 22.0 | 25.3 | 27.2 | 31.3 | -- | -- |

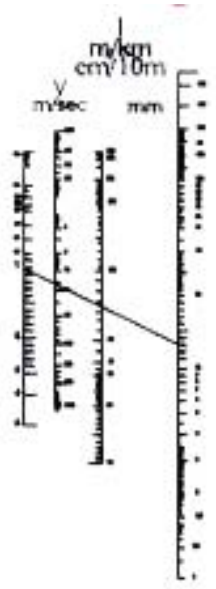
**Williams ad Hazen Constant for Flow - for pipes of same diameter**

## How to use the Nomogram for friction loss in PVC Rigid Water Pipes

**Formula i** =
9.3 x 107 Q176 D476

**Where i** =
loss of head in Mtrs. per thousands meter

**Where v** =
Velocity in Mtrs./ sec.




**Example :**
For a required flow 13$m_3$ / Hr what will be the frictional head loss for 70mm .I.D. Pipe?

Using a ruler, connect-values of flow rate and pipe I.D.and read the value of scale i. The frictional head lossis 14.0 Mtrs. per thousand meter. On scale 'v' , the velocity obtained is 0.92 Mtrs,/sec., which is well within the permissible limit.

**D** = Inside diameter of pipe in mm

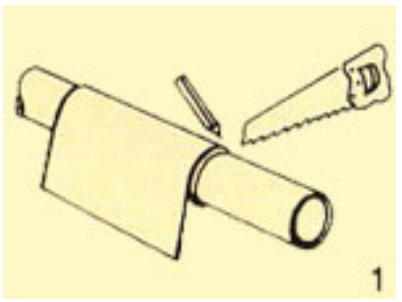
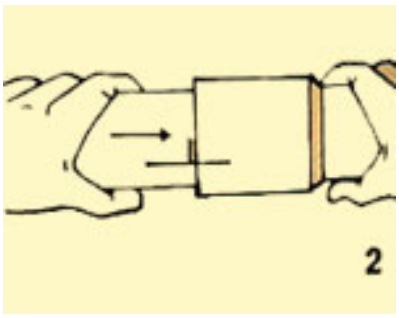
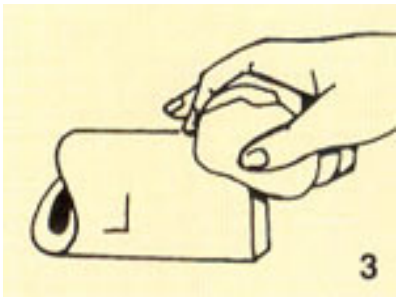
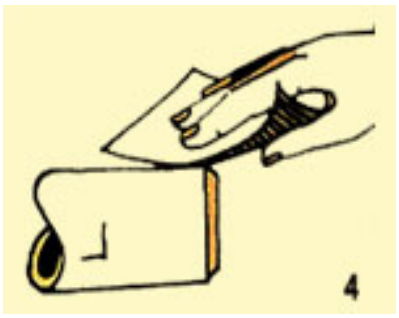
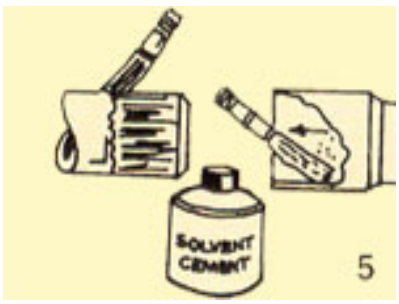
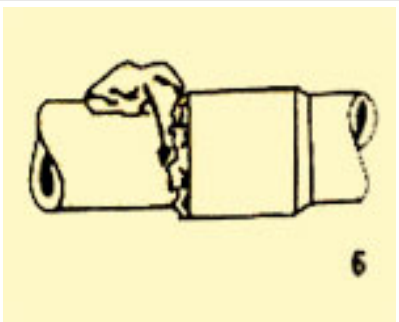
**Q** = Rate of flow in Cubic meters per hour The Values

## CONSUMPTION OF SOLVENT CEMENT

| **Diameter of pipe mm.** | 20 | 25 | 32 | 40 | 50 | 63 | 75 | 90 | 100 | 140 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355 | 400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Apx. no of joints which can be made per litre of solvent cement** | 324 | 270 | 225 | 180 | 130 | 125 | 103 | 79 | 54 | 36 | 27 | 25 | 15 | 12 | 9 | 7 | 5 | 3 | 2 |

**JOINING INSTRUCTIONS :**

Best results are derived by the PVC solvent jointing method as compared to any other method.

| | |
|---|---|
|   | Cut the pipe as square as possible. Please ensure fitment of pipe with socket is correct. |
|   | Total length of insertion of socket shall be marked on pipe. (For most of the cases, the pipe inserted should be upto the marked line and in no case shall be less than 2/3rd of the pipe end up to the marked line.) |
|   | The pipe and the socket should be clean and dry. Dust, oil, water, grease etc. should be wiped out with dry cloth and cleaner from the surface to be coated with solvent cement. |
|   | Roughen the outside of the pipe & the inside of the socket using sand paper or piece of hacksaw blade up to the entry mark. Stir adhesive i.e. solvent cement throughly. |
|   | Apply a thick coat of solvent cement using a flat clean brush evenly on the inside of the socket mouth for full length of insertion & then on outside of the pipe end upto the marked line. |
|   | Insert the pipe within one minute after application of solvent cement into the socket. Hold the joint for few seconds & ensure that pipe does not come out of the fitting. Wipe off extra cement. Let it dry. Within 24 hours, your ZENITH rigid PVC pipes are ready for use. |

## Precautions for Handing Solvent Cement :

- Highly inflammable & advised to keep in cool place, away from sunlight & fire.
- Avoid contact with skin.
- Do not breathe solvent cement.
- Shake solvent cement well before use.
- Replace lid tightly after use.

## FABRICATED FITTING DEPARTMENT

This department is created keeping in mind the needs of customer for handmade fitting in 16 mm to 400 mm sizes in 4,6,10kgf/cm$^2$. Pressure Ratings, e.g. Bend / Coupler / Tee Reducers, End Caps, Reducing Tee & Tail Piece, Repair coupler also. This department is equipped with all facilities to do the above & fabricate above as per customer specifications.

## CHEMICAL RESISTANCE CHART

 Unaffected to little affected

 Unaffected

 Little affected but recommendable

**X** Not recommendable

| Chemicals | Concentration % | Temperature $^0$C | | |
|---|---|---|---|---|
| | | 20 | 40 | 60 |
| Inorganic Acid | | -- | -- | -- |
| Sulfurous acid | 100 |  | -- | X |
| Hydrocloric acid | Below 30 |  |  |  |
| | Above 30 |  |  |  |
| Chloric acid | Below 30 |  |  |  |
| Chlorine water | Sat.. |  |  | -- |
| Perchloric acid | Below 10 |  |  |  |
| | 20 |  | -- |  |
| Mixed chromic acid | | -- |  | -- |

| | | | | |
|---|---|---|---|---|
| CrO (25) : $H_{2SO4(20)}$ :aq. (55) | | ✧ | ✧ | ✧ |
| CrO, (40) : H2SO2 (20) : aq. (40) | | ☆ | ☆ | ✧ |
| Chromic acid | 10 | ☆ | ☆ | ❑ |
| | 50 | ☆ | ✧ | x |
| Chlorosulfonic acid | 100 | ☆ | ☆ | ✧ |
| Hydrofluosilicic acid | 34 | ☆ | ☆ | ❑ |
| Mixedacid | | -- | -- | -- |
| H2SO4 (57) : HNO3 (28) : aq. (15) | | ☆ | ✧ | -- |
| H2SO4 (15) : HNO3 (20) : aq. (65) | | ☆ | ☆ | ✧ |
| H2SO4 (50) : HNO3 (33) : aq. (17) | | ☆ | ✧ | -- |
| H2SO4 (48) : HNO3 (49) : aq. (3) | | ☆ | ✧ | -- |
| H2SO4 (50) : HNO3 (50) : aq. (0) | | ☆ | x | -- |
| H2SO4 (10) : HNO3 (20) : aq. (70) | | ☆ | ☆ | -- |
| H2SO4 : (11) HNO3 (87) : aq. (2) | | ✧ | -- | -- |
| Hydromic acid | 40 | ☆ | ☆ | ✧ |
| Bromine | 100 | x | -- | -- |
| Bromine acid | 10 | ☆ | -- | -- |
| Nitric acid | Below 50 | ☆ | ☆ | ✧ |
| | 50-60 | ☆ | ✧ | -- |
| | 70 | ❑ | ❑ | -- |
| | 96 | x | -- | -- |
| Blue acid | 100 | ☆ | -- | -- |
| Carbonic acid | 100 | ☆ | ☆ | ☆ |
| Fuming sulfuric acid | 10 | x | -- | -- |
| Arsenic acid | Below 30 | ☆ | ☆ | ✧ |
| | 75 | ✧ | -- | x |
| Hydrofluonic acid | 10 | ☆ | -- | -- |
| | 20 | ✧ | ✧ | ✧ |

| | | | | |
|---|---|---|---|---|
| | 40 | ✧ | -- | x |
| Boric acid | sat. | ☆ | ☆ | ✧ |
| Sulfuric acid anhydride | 100 | ☆ | -- | -- |
| Sulfuric acid | Below90 | ☆ | ☆ | ✧ |
| | 96 | ☆ | ☆ | ❒ |
| | 98 | ✧ | ❒ | -- |
| Phosphoric acid | Below30 | ☆ | ☆ | ✧ |
| | Above30 | ☆ | ✧ | ✧ |
| Organic Acids | | -- | -- | -- |
| Adipic acid | sat. | ☆ | ☆ | ✧ |
| Bensoic acid | sat. | ☆ | ☆ | ❒ |
| Oleic acid | 100 | ☆ | ☆ | ✧ |
| Formic acid | Below50 | ☆ | ☆ | ❒ |
| Above50 | 0 | -- | x | -- |
| Ciltric acid | 25 | ☆ | ☆ | ☆ |
| Succinc acid | sat. | ☆ | ☆ | ✧ |
| Acetic acid | Below60 | ☆ | ☆ | ✧ |
| | 85-95 | ☆ | ✧ | -- |
| | Above95 | ✧ | x | x |
| Mercury | 100 | ☆ | ☆ | ☆ |
| Ammonium carbonate | sat. | ☆ | ☆ | ☆ |
| Potassium carbonate | sat. | ☆ | ☆ | ☆ |
| Potassium ferrocyanide | sat. | ☆ | ☆ | ☆ |
| Ammonium flouride | sat. | ☆ | -- | -- |
| Potassium iodide | sat. | ☆ | ☆ | ☆ |
| Sodium sulfide | sat. | ☆ | ☆ | ☆ |
| Zinc sulfate | 28 | ☆ | ☆ | ☆ |

| | | | | |
|---|---|---|---|---|
| Aluminium sulfate | 25 | ☆ | ☆ | ☆ |
| Aluminium potassium | sat. | ☆ | ☆ | ☆ |
| Sulfate (alum) | | -- | -- | -- |
| | | -- | -- | -- |
| Ammonium sulfate | 40 | ☆ | -- | ✧ |
| Feeroas sulfate | sat. | ☆ | ☆ | ☆ |
| Ferric sulfate | sat. | ☆ | ☆ | ☆ |
| Copper sulfate | 15 | ☆ | ☆ | ☆ |
| Sodium sulfate | sat. | ☆ | ☆ | ☆ |
| Nickel sulfate | sat. | ☆ | ☆ | ☆ |
| Mognesium sulfate | sat. | ☆ | ☆ | ☆ |
| Ammonium phospate | sat. | ☆ | ☆ | ☆ |
| Sodium phosphate | sat. | ☆ | ☆ | ☆ |
| Organic Solvent and other Organics | | -- | -- | -- |
| Acetaldehyde | 100 | x | -- | -- |
| Acetone | 100 | x | -- | -- |
| Anitine | 100 | x | -- | -- |
| Amylalcohol | 100 | ✧ | -- | ❑ |
| Aylalcohol | 100 | ✧ | -- | x |
| Isopropyl alcohol | 100 | ☆ | -- | -- |
| Ethyl alcohol | 100 | ☆ | ☆ | ✧ |
| Ethyl ether | 100 | x | -- | -- |
| Ethyl hexanol | 100 | ✧ | -- | -- |
| Ethyl benzene | 100 | x | -- | -- |
| Ethylene glycol | 100 | ☆ | ☆ | -- |
| Ethylene chloride | 100 | x | -- | -- |
| Methylene chloride | 100 | x | -- | -- |
| Octane | 100 | ☆ | -- | -- |

| | | | | |
|---|---|---|---|---|
| Octanol | 100 | ☆ | ☆ | ☆ |
| Xylene | 100 | x | -- | -- |
| Glycerine | 100 | ☆ | ☆ | ☆ |
| Cresol | sat. | ❑ | -- | -- |
| Chlorobenzene | 100 | x | -- | -- |
| Chloroform | 100 | x | -- | -- |
| Amyl acetate | 100 | x | -- | -- |
| Ammonium acetate | sat. | ☆ | ☆ | ☆ |
| Ethyl acetate | 100 | x | -- | -- |
| Butyl acetate | 100 | x | -- | -- |
| Carbon tetrachloride | 100 | x | -- | -- |
| Dioctyl phthalate (DOP) | 100 | x | -- | -- |
| Cyclohexanone | 100 | x | -- | -- |
| Cyclohexanol | 100 | ✧ | -- | ❑ |
| Dibutyl phthalate (DBP) | 100 | x | -- | -- |
| Dimethyl formamide | 100 | x | -- | -- |
| Tetrachloroethylene | 100 | x | -- | -- |
| Trichloroethy lene | 100 | x | -- | -- |
| Toluene | 100 | x | -- | -- |
| Glacial acetic acid | 100 | ✧ | x | x |
| Diglycolic acid | 20 | ☆ | ☆ | ☆ |
| Oxalic acid | 9 | ☆ | ☆ | ☆ |
| Tartaric acid | 50 | ☆ | ☆ | ☆ |
| Lactic acid | 50 | ☆ | ☆ | ☆ |
| | 90 | x | -- | -- |
| Picric acid | 5 | ✧ | -- | -- |
| Phenol | sat. | ❑ | -- | x |
| Benzene ssulfonic acid | 10 | ☆ | ☆ | ✧ |
| | 50 | ✧ | -- | -- |

| | | | | |
|---|---|---|---|---|
| Maliec acid | 44 | ☆ | ☆ | ✧ |
| Methyl sulfuric acid | 10 | ☆ | -- | ❑ |
| Butyric acid | 20 | ☆ | -- | -- |
| | 100 | x | -- | -- |
| Alkalles | | -- | -- | -- |
| Ammonia water | 30 | ☆ | ☆ | ✧ |
| Potassium hydroxide | Below40 | ☆ | ☆ | ✧ |
| | Above40 | ☆ | ☆ | ☆ |
| Calcium hydroxide | sat. | ☆ | ☆ | -- |
| (Slaked lime) | | -- | -- | -- |
| Sodium hydroxide | Below40 | ☆ | ☆ | ✧ |
| (caustic soda) | 40-60 | ☆ | ☆ | ☆ |
| Magnesium hydroxide | sat. | ☆ | ☆ | ☆ |
| Inorganic Salts and other | | -- | -- | -- |
| Inorganics | | -- | -- | -- |
| Soldium sulfate | 40 | ☆ | ☆ | ☆ |
| Zinc chloride | sat. | ☆ | ☆ | ☆ |
| Aluminum chloride | 25 | ☆ | ☆ | ❑ |
| Ammonium chloride | 27 | ☆ | ☆ | ☆ |
| Potassium chloride | sat. | ☆ | ☆ | ☆ |
| Calcium chloride | sat. | ☆ | ☆ | ☆ |
| Mercuric chloride | sat. | ☆ | ☆ | ☆ |
| Stannic chloride | 25 | ☆ | -- | ❑ |
| Ferric chloride | sat. | ☆ | ☆ | ☆ |
| Cupric chloride | sat. | ☆ | ☆ | ☆ |
| Sodium chloride (common salt) | sat. | ☆ | ☆ | ☆ |
| Barium chloride | sat. | ☆ | ☆ | ☆ |

| | | | | |
|---|---|---|---|---|
| Magnesium chloride | 25 | ☆ | ☆ | ☆ |
| Sodium chlorate | sat. | ☆ | ☆ | ☆ |
| Potassium chlorate | 15 | ☆ | ☆ | ☆ |
| Potassium perchlorate | 1 | ☆ | ✧ | -- |
| Hydrogen proxide | 20 | ☆ | ☆ | ✧ |
| | 40 | ✧ | ✧ | -- |
| Potassium pemanganate | 15 | ☆ | ☆ | ✧ |
| Potassium persulfate | sat. | ☆ | ☆ | ✧ |
| Antimony trioxide | sat. | ☆ | ☆ | ☆ |
| Potassium hypochlorite | 30 | ☆ | -- | -- |
| (bleaching powder) | | -- | -- | -- |
| Potassium bichromate | 5 | ☆ | -- | -- |
| | 10 | ✧ | -- | -- |
| Potassium bisulfite | sat. | ☆ | ☆ | ☆ |
| Potassium nitrate | sat. | ☆ | ☆ | -- |
| Calcium nitrate | 50 | ☆ | ☆ | -- |
| Soldium nitrate | sat. | ☆ | ☆ | ☆ |
| Nitro benzene | 100 | x | -- | -- |
| Urea | sat. | ☆ | ☆ | ☆ |
| Carbon bisulfide | 100 | x | -- | -- |
| Pyridine | 100 | x | -- | -- |
| Butane (liquid) | 100 | ☆ | -- | -- |
| Butanonediol | Below10 | ☆ | -- | -- |
| | 60 | x | -- | -- |
| Butylalcohol | 100 | ☆ | -- | -- |
| Furfural | 100 | x | -- | -- |
| Furfurylalcohol | 100 | ☆ | -- | -- |

| | | | | |
|---|---|---|---|---|
| Propane (liquid) | 100 | ☆ | -- | -- |
| Benzalbehyde | sat. | x | -- | -- |
| Benzene | 100 | x | -- | -- |
| Methyl alcohol | 100 | ☆ | -- | -- |
| Methyl ethy ketone | 100 | x | -- | -- |
| Gases | | -- | -- | -- |
| Sulfur dioxide gas | 100 | ☆ | ☆ | ☆ |
| Ammonia | 100 | ☆ | ☆ | ☆ |
| Methyl chlorida | 100 | x | -- | -- |
| Chlorine dry | 10 | ❑ | ❑ | x |
| Chlorine wet | 10 | ❑ | ❑ | x |
| Ozone | 1 | ☆ | -- | -- |
| Hydrogen | 100 | ☆ | ☆ | ☆ |
| Carbon dioxide | 100 | ☆ | ☆ | ☆ |
| Propane | 100 | ☆ | -- | -- |
| Butane | 100 | ☆ | -- | -- |
| Phosgene | 100 | ☆ | -- | -- |
| Hydrogene sulfide | 100 | ☆ | ☆ | ☆ |
| Roasting fumace gas | 100 | ☆ | ☆ | ☆ |