Punjab State Power Corporation Limited

GURU HARGOBIND THERMAL PLANT, LEHRA MOHABBAT
Regd. office :PSEB Head Office, The Mall, Patiala-147001.
Corporate Identity Number:U40109PB2010SGC033813, Website: www.pspcl.in
Phone: 0164-2756347 e-mail: se-hq-op-lehra@pspcl.in.
GSTIN 03AAFCP5120Q1ZC

To

The Joint Secretary/ Computerization **E-mail: tender@pspcl.in**
PSPCL, The Mall,
Patiala-147001

Memo No 2935 /PC-2685
Dated 12/6/25

Subject: Uploading of 1 No. Tender on PSPCL's Website.

Enclosed please find herewith the attachment of the following tender issued by this office, for uploading the same on the PSPCL's web site immediately.

Sr. No	Description	Tender Enquiry No & Dated	Tender Type
1	CPVC (Chlorinated polyvinyl chloride) pipes/fittings for acid/alkali storage and injection system of DM Plant Stage-I & II.	18/2/MAMC/O&M/PC-2685 Dated 12/06/2025	Limited tender

D/A as above

12/06/25
Dy. Chief Engineer/HQ,
For Chief Engineer/O&M,
GHTP, Lehra Mohabbat.

For Swarn Enterprises

Partner

Punjab State Power Corporation Limited

GURU HARGOBIND THERMAL PLANT, LEHRA MOHABBAT
Regd. office: PSEB Head Office, The Mall, Patiala-147001.
Corporate Identity Number:U40109PB2010SGC033813, Website: www.pspcl.in
Phone:0164-2756347,96461-17659,96461-20640,e-mail:se-hq-op-lehra@pspcl.in.
GSTIN 03AAFCP5120Q1ZC

Enquiry No. 1812 /O&M/PC-2685 Dated 12/6/25

From

Chief Engineer/O&M,
(Procurement Cell),
GHTP,Lehra Mohabbat-151111.

To

Regd. **ENQUIRY LETTERS TO KNOWN FIRMS**

Memo No. /PC-2685 Dated:

Subject: - Enquiry for the procurement of **CPVC(Chlorinated polyvinyl chloride) pipes /fittings for acid /alkali storage and injection system of DM plant stage I and II**

Date & Time of Receipt of tender -Upto 11.30 AM dt. – **11-07-2025**

Date & Time of opening of tender-12.00 PM dt. : **11-07-2025**

(In case opening date happens to be a holiday tenders shall be received & opened on next working day at the same time).

Dear Sirs,

Please send your quotation in duplicate on firm prices for supply and delivery of items in accordance with general terms and conditions given in Annexure-'B' attached. The unit rates should be quoted in the same order as given in the schedule of requirement attached as Annexure-'A'. While quoting the enquiry number and date of opening of tenders must be legibly mentioned at right top corner of sealed cover.

Also please note that:-

xi) Competent authority may divide the quantities to be procured and place order on more than one firm.

"Certified that the rates quoted are reasonable and these are not more than those being charged from other Govt. Departments.

DA/Annexure A&B 2932/34 12/6/25

Xerox 12/6/25

For Dy. Chief Engineer/HQs,
Chief Engineer/O&M,
GHTP, Lehra Mohabbat.

CC:

1 Dy. CE/SE/_____, GHTP, Lehra Mohabbat. He is requested to check up the specifications and intimate if there is any discrepancy.
2 Notice Board, GHTP, Lehra Mohabbat.
3 Tender upload at P.S.P.CL. website.

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ANNEXURE-'A'

Enquiry No. 1812/ MAMC/O&M/PC-2685
Dated: 16-06-2025
Due on 11-07-2025

SCHEDULE OF REQUIREMENT

Sr. No.	GHTP Store Code	Description of material (Astral Corzon make)	Size	Unit	Qty. Reqd.
1	15323001	CPVC Industrial Pipe SCH-80	2"	Mtr.	150
2	15323002	CPVC Industrial Pipe SCH-80	1-1/2"	Mtr.	60
3	15323015	CPVC Industrial Pipe SCH-80	1"	Mtr.	60
4	15323021	CPVC Industrial Pipe SCH-80	2-1/2"	Mtr.	20
5	15323022	CPVC Industrial Pipe SCH-80	3"	Mtr.	05
6	15323035	CPVC Industrial Pipe SCH-80	4"	Mtr.	10
7	15323023	CPVC Industrial Coupling (SOC) SCH-80	2-1/2"	No.	04
8	15323003	CPVC Industrial Coupling (SOC) SCH-80	2"	No.	35
9	15323004	CPVC Industrial Coupling (SOC) SCH-80	1-1/2"	No.	20
10	15323016	CPVC Industrial Coupling (SOC) SCH-80	1"	No.	15
11	15323025	CPVC Industrial Reducer Coupling (SOC) SCH-80	2" x 1"	No.	06
12	15323026	CPVC Industrial Reducer Coupling (SOC) SCH-80	2" x 2-1/2"	No.	02
13	15323027	CPVC Industrial Reducer Coupling (SOC) SCH-80	1" x 1-1/2"	No.	08
14	15323006	CPVC Industrial Elbow 90^0 (SOC) SCH-80	2"	No.	40
15	15323007	CPVC Industrial Elbow 90^0 (SOC) SCH-80	1-1/2"	No.	25
16	15323017	CPVC Industrial Elbow 90^0 (SOC) SCH-80	1"	No.	10
17	15323028	CPVC Industrial Elbow 90^0 (SOC) SCH-80	2-1/2"	No.	02
18	15323008	CPVC Industrial Tee (SOC x SOC x SOC) SCH-80	2"	No.	20
19	15323036	CPVC Industrial Tee (SOC x SOC x SOC) SCH-80	2" x 1-1/2"	No.	05
20	15323037	CPVC Industrial Tee (SOC x SOC x SOC) SCH-80	1" x 1-1/2"	No.	05
21	15323009	CPVC Industrial Tee (SOC x SOC x SOC) SCH-80	1-1/2"	No.	15
22	15323010	CPVC Industrial Flange one piece (SOC) SCH-80	2"	No.	30
23	15323011	CPVC Industrial Flange one piece (SOC) SCH-80	1-1/2"	No.	25
24	15323018	CPVC Industrial Flange one piece (SOC) SCH-80	1"	No.	25
25	15323030	CPVC Industrial Flange one piece (SOC) SCH-80	2-1/2"	No.	04
26	15323012	CPVC Industrial Jointing Compound/Cement for SCH-80 CPVC pipes/fittings, 946 ml Tin (Make: Weld-On)	946 ml Tin	No.	02

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27	15323013	CPVC Industrial Jointing Primer for SCH-80 CPVC pipes/fittings, 473 ml Tin (Make: Weld-On)	473 ml Tin	No.	02

NOTE:

- **The above CPVC Pipes/fittings should be of make Astral Corzan Industrial pipes/fittings or equivalent.**
- **The above CPVC Pipes/fittings should be suitable for Hydrochloric Acid (HCl), 30% concentrated and Salphuric acid and Sulphuric Acid (H2SO4), 98% concentrated.**
- **CPVC material should conform to ASTM D 1784.**
- **CPVC Pipes should conform to ASTM F-441.**
- **CPVC Fittings should conform to ASTM F-439 standards.**
- **CPVC Valves should conform to ASTM F 1970 standard.**
- **CPVC Solvent Cement should conform to ASTM F 493.**
- **CPVC Primer should conform to ASTM F 656.**

Notes:-1. (i) The firm must have **GST Registration number & PAN No.** and same should be provided while quoting the rates. If the firm is registered under 'Composite Levies' then the same should be clearly mentioned in the quotation.

(ii) The firm must provide HSN Code in price schedule Performa in Annexure' C'.

(iii) Bidder have to submit the documentary evidence (Latest copy of memorandum of Micro Small & Medium Enterprises field under section-8 of MSMED Act, 2006 duly acknowledged by competent authority) of being a Micro, Small & Medium Enterprise, If the bidder does not submit the proof at the time of submission of its bid, it shall be considered as a Large Enterprise.

(iv) Tax Rate as provided in quotation shall be final.

(v) Any change in GST Rate after the submission of quotation and before the supply (with in delivery period) will be in PSPCL account. However no extra payment on account of increase in GST Rate after the delivery period or supply of material will be made whichever is earlier.

(vi) Due to misclassification of HSN code increase in tax will be in supplier account. However due to misclassification of HSN code decrease in tax will be refunded to the PSPCL.

2. Negotiations, if at all required, shall be held only with the lowest tenderer.
3. Rates should be quoted by the suppliers in their quotations both in figures as well as in words as per Annexure-'C'.
4. Attached price break up schedule must be filled and prices must be type written.
5. **For Tendering value less than Rs. 5 lac EMD will not be applicable. Tendering value Rs. 5 Lac and above EMD @2% of the Tender value rounding to the multiple of Rs.10/- on higher side subject to minimum of Rs.10,000/- and maximum of Rs. 20 Lac.**

   Note:- Tender value is to considered including all taxes and other charges. EMD will be applicable on Standardized Firms also.
6. **SECURITY DEPOSIT-** The successful Tenderers shall be required to submit Security deposit for faithful execution of the purchase order/Contract of value exceeding Rs. 1,00,000/- at the rate of three percent (3%) of ordered value rounded off to a multiple of Rs. 10/- on the higher side. Tenderers exempted from EMD up to Rs. 5.0 Lac will have to submit security deposit for Purchase Orders valued above 1.0 Lac.

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Note:- As security deposit will not be applicable on supply of proprietary items and firms supplying material under DGS& D rate contract. Security deposit will be applicable on Standardized Firms also.

7. **The payment will be made through RTGS system of digital payments only instead of Cheque/DD. The firm must submit Bank A/c details with the quotation.**
8. **Your quotation must be valid for at least 120 days from the date of opening.**
9. Hand written/conditional quotation shall not be accepted.
10. All other terms and conditions of Annexure-B (attached) and PSEB/PSPCL Purchase Regulations, 2017, amended upto date, shall be applicable.
11. The firm should not be blacklisted by PSEB/PSPCL or any other Govt. Deptts./ Organizations.
12. Quantity mentioned in schedule of requirement can be divided and ordered on more than one supplier.
13. **The quotation/tender may be submitted either in person or through registered post but not through courier as courier service is not available at GHTP, Lehra Mohabbat.**
14. **"TDS u/s 194Qof Income Tax Act shall be deducted, as applicable."**

IMPORTANT NOTE:-

EMD IS PAYABLE THROUGH CASH RECEIPT OR THROUGH DEMAND DRAFT PAYABLE AT LEHRA MOHABBAT/RAMPURA PHUL IN FAVOUR OF AO/O&M,GHTP, LEHRA MOHABBAT .

Dy.Chief Engineer/HQ,
For Chief Engineer/O&M,
GHTP, Lehra Mohabbat.

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ANNEXURE – 'B'

GENERAL INSTRUCTIONS & TERMS AND CONDITIONS TO BE OBSERVED BY TENDERS

All tenders must carefully observe the following instructions. Quotations/tenders not strictly in accordance with these instructions are liable to be rejected: -

1. **Submission of tenders:**

i) The tenders will be submitted as per NIT/ Tender Specifications complete in all respects and deviation from NIT/ Tender specifications shall be clearly brought out by the Tenderers. No post tender development shall be allowed regarding any change in terms of prices or technical specifications.

The following points should carefully be studied in order to ensure submission of a complete & comprehensive tender. Failure to comply with any of these instructions or to offer brief explanation for non-compliance is likely to render effective comparison of the tender as a whole impossible and may lead to rejection of an otherwise competitively lowest offer.

ii) **TWO part BID**: Tenders shall be submitted in two Parts,

Part-I: Earnest Money

Part-II: Commercial, Technical Conditions & price bid.

The tenders shall seal original or each part of the tender separately in double envelopes duly marked as Part-1, or Part-II. The inner envelope of each part of the tender shall indicate the name and address of the tenderer to enable the tender to be returned unopened , if it does not meet the NIT requirements. Tenders shall be submitted in duplicate, triplicate or quadruplicate as desired. Other copies of the tender shall be similarly sealed and marked.

iii) **TIIREE part BID**: Tenders shall be submitted in three Parts in duplicate or as specifically desired.

Part-I: Earnest Money

Part-II: Commercial & Technical Conditions (Qualifying financial effects).

Part-III: Price Bid.

Each part shall be sealed in separate envelope duly subscribed on the envelope as Part-I, Part-II & Part-III, envelope marked 'Part- I' Earnest Money' shall be opened and if the earnest money is found in order then the envelope marked - Part-II Commercial & Technical conditions (Qualifying financial effects) shall be opened. In case financial effects are unambiguous and without any reservations specified and offer is technically acceptable, only then Part-III Price Bid's shall be opened.

iv) Quotations received by email/ fax will not be accepted except for proprietary items.

v) Tenders with hand written prices shall not be accepted.

vi) In case of e-Tendering, Part-I shall be submitted manually till e-payment gateway is made operational. When e-payment gateway is made operational, then the EMD/PEMD shall be submitted online only. Part-II and Part-III shall be submitted online through e-Tendering portal only. While opening the Tenders, Earnest Money deposit shall be evaluated first and in case the deposit of Earnest Money is in accordance with the terms of Notice Inviting Tender only then Part II of the Tender shall be opened.

2. The officer inviting Tenders Contracting/Purchasing Agency/PSPCL (Here in after referred to as purchaser) reserve the right to modify the schedule of requirements, technical particulars and the specifications at any time and to place the order as a whole or in parts and to reject any or all the tender received without assigning reasons. He will not be responsible for and will not pay for expenses or losses that may be incurred by tenderer in the preparation of the tenders.

3. Quotations/tenders should be enclosed in double covers both addressed to Purchaser, i.e. to Chief Engineer (Procurement Cell), O&M. GHTP, Lehra Mohabat, Distt. Bathinda (PB) - 151 111. Both (inner & outer) covers shall be sealed and superscribed with Tender No. as given at the right hand top corner of the tender enquiry or in the tender notice together with the date on which the tender is due and the items of material covered.

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4. Quotations/Tenders shall be received in the office as mentioned at Sr. No.3, above upto 11:30 hours on the due date given in the tender notice and shall be opened at 12:00 noon on the same day in the presence of tenders or their authorized representative who may like to be present. In the case the due date of opening tender happens to be a holiday, the due date for receiving and opening of tenders will be the next working day.

5. **PRICES:**

i) The unit rates should be quoted F.O.R. destination at GHTP stores (For road transportation) OR at nearest railway station, in case of rail transportation (The nearest Railway Station in Rampura Phul). The break up of the F.O.R. Destination prices should be given as under: -

a) The prices of material inclusive of packing & forwarding cost, which is a part of production cost.

b) Other charges covered in F.O.R. destination cost which are not part of production cost, such as packing and forwarding, handling, cartage freight, transit risk insurance etc., should be shown separately.

ii) All taxes and duties leviable on the price of finished goods as per sub-clause (i) (a) shall be paid extra and the same should be shown separately as prevalent on the date of opening of tenders to be paid at the rate as may be actually prevalent at the time of supply otherwise these elements shall be deemed to be included in the quoted prices and will not be paid extra. No taxes and duties will be payable on the element of cost quoted under sub-clause (i)(b)except freight & insurance.

In addition to the break up of total price i.e. Ex-works cost, Goods and Services Tax, Freight, Insurance and Packing the bidder should also split up of ex-works price. The break up of price shall be indicated in the respective proforma attached with specification. The filling up of the proforma shall be mandatory for the tenderers. The split up of ex-works prices shall indicate the cost of raw material, labour component and over head expenses. Raw material can further be divided into 3-4 parts depending upon type of material. This break-up of prices will not be considered for the purposes of comparative statement. The Proforma for price schedule should be duly typed and hand written prices shall not be accepted.

iii) In case or rates Ex-Works/ Ex-Godown and for imported material, freight charges, transit risk insurance, handing and clearing charges, F.O.B. & C.I.F., Commission of clearing agents at Ports, should also be indicated in part –III of the tender.

iv) "Firm Prices" are preferable. However, where variable prices are quoted prescribed formula for plus variation on the basic price of component elements as prevailing on the first working day of the calendar month, three months prior to the date of opening, should form the basis for quoting variable rates, However price adjustment shall be made on corresponding rates of variable elements prevailing on the first working day of one month before dispatch or date of contractual delivery whichever is earlier. Wherever the prices of raw material are controlled by the Government, the basis shall be government Notifications from time to time and in the remaining case the certificate given by Chartered Accountant. Where tenderer does not specify whether the prices are firm or variable then their prices would be treated as firm.

iv) The rates quoted FOR destination or Ex-works should be given in both figures and words and any writing, erasing, cutting etc. should be avoided or if made should be signed legibly.

6. **VALIDITY:** The offer should be kept valid for atleast 120 days from the date of opening and any with drawl or modification of the offer shall not be permitted after opening of the tenders.

7. **TERMS OF PAYAMENT:** -

(a) 95% payment of contract value pro-rata for each consignment of operationally complete equipment dispatched after approval of Inspecting Authority/Test Certificate etc. along with taxes & duties and Other Statutory levies as per contract shall be paid within 45 days (circular 15/2011) against receipted challans & submission of requisite documents. The balance 5% Payment shall be kept as performance Guarantee which shall be released after due receipt of Goods Receipt Note

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from the concerned consignee(s) or expiry of three months from the date of receipted challans & submission of requisite documents, whichever is earlier.

In case the due date of payment in terms of payment schedule falls on a holiday including Sunday or holiday is subsequently declared on that date, the payment shall be released on the first working day falling next to the due date.

b) Payment against supplied material through proprietary/ standardized firms shall be as per purchase regulations of PSPCL issued from time to time.

c) 100% advance payment shall be permissible in respect of purchase of vehicles/contingent and other essentially required items including purchases at DGS & D rates.

8. **DELIVERY SCHEDULE:** The offer should clearly indicate monthly/bimonthly/quarterly schedule of deliveries, date of commencement and completion of supplies against items indicated in the Notice Inviting Tender/Specification which shall normally cover period for entire job of manufacture, testing, inspection and supply after acceptance of material after inspection and shall be reckoned from the date of dispatch in case of rail transport and Receipted Challan/Goods Receipt Note in case of road transportation by Goods Carriers. Purchase Orders shall be strictly placed on the above understanding. Ex-stock and earlier deliveries may be preferred, if required. However, The Purchaser reserves the right to defer the supplies of material, whenever deemed necessary. The necessary extension of
Contractual Delivery Period for this period of deferment shall be granted to the firm on the same terms and conditions as contained in the Purchase Order-cum-contract agreement.

9. **PENALTY/DAMAGES FOR DELAY IN DELIVERY:** If the supplier fails to deliver the material/equipment with in the stipulated delivery period of the Purchase order/contract the same is liable to be rejected and if accepted, the supplier shall be liable to pay as penalty @½ % (half of one percent) of the cost of undelivered supply./incomplete equipment per week of delay or part thereof, not exceeding maximum limit of 10% of the cost of complete unit of undelivered equipment/material so delayed.
There will be no slack period.

10. **EXTENSION IN THE DELIVERY PERIOD:** Any genuine delay in approval of technical details, drawings, samples issuance of amendment of Purchase order, conducting inspection and approval of Inspection Test Report/Test Certificates for allowing dispatches etc. will count towards extension of the delivery period by corresponding period other than admissible under Force Majeure conditions, if any substantiated by the supplier and duly accepted by the purchaser. No extension in delivery shall be granted in case of delay in payments. However for delayed payments beyond stipulated period as per terms of payment clause compensation shall be credited @ 0.5% of the payment so delayed per month or part of thereof to be adjusted against penalties levied or to be levied subject to maximum of penalty leviable due to delay in deliveries under the contract.

11. **NEGLIGENCE & DEFAULT:**
   i) In case of negligence on the part of supplier/contractor to execute the order/contract with due diligence and expedition and to comply with any reasonable Orders/Contractor given in writing by: the purchaser in connection with the purchaser order/contract of any contravention in the provisions of the purchase order/contractor, the purchaser may given 21 days notice in writing to the supplier/contractor to make good the failure or neglect or contravention and if the supplier/contractor fails to comply with the notice within time considered to be reasonable by the purchaser, he will suspended/terminate the business dealing with the firm for a specific period.
   ii) Further in case, of such default by the supplier/contractor, the purchaser may also suspend business dealings with supplier/contract apart from claiming reasonable compensation/damages forfeiture of security etc.

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12. FORCE MAJEURE: During the pendency of the contract/purchase order, if the performance in whole/part by either party on any obligation there under, is prevented/delayed by the causes arising out of any war, hostilities, Civil Commotion, Acts of the Public enemy, Sabotage, Fire, Floods, Explosions, epidemics or non-availability of Government controlled raw material under orders/instructions of Central/State Govt. regulations, strikes, lockouts, embargo acts of Civil/Military/Authorities or any other causes beyond their reasonable control, neither of the two parties shall be made liable for loss or damages due to delay or failure to perform the contract during the currency of Force Majeure conditions provided that the happening is notified in writing (with documentary proof) within 30 days from the date of occurrence.

The supplies shall be resumed under the contract as soon as practicable after the happening (Event) ceases to exist.

13. EARNEST MONEY:

i) In case of open and Limited Tenders, the Tenderer shall be required to submit Earnest Money at the following rates in the form of Punjab State Power Corporation Ltd. cash receipt/Demand Draft/E-payment along with the Tenders:-

a) Tender valuing less than Rs. 5,00,000 and Spot Tender	Nil
b) Tenders valuing Rs. 5,00,000 & above (Other than Spot Tender)	@ 2% of Tender value rounded off to a multiple of Rs 10/- on the higher side subject to a minimum of Rs 10,000/- and maximum of Rs 20 lac.

(ii) The following shall be exempted from depositing the Earnest Money:-

(a) Public Sector Undertakings owned by Pb. Govt./Central Govt./Other State Govts. supplying material directly through units owned by them subject to submission of documentary evidence of Government ownership. Exemption shall not be applicable if the Tender is submitted for supply of material through private unit/manufacturer.

(b) Suppliers having Permanent Earnest Money Deposit of Rs.25 lac with the PSPCL provided that a certificate to this effect issued by the Nodal Authority i.e. AO/CPC(MM) of PSPCL, during six months immediately preceding the due date for Tender opening and showing the Serial. No./Account No. allotted in the Permanent Earnest Money Deposit Register shall be submitted by the Tenderers in the envelope for Earnest Money.

c) Suppliers of Proprietary items/ firms supplying items under DGS & D rate contract.

(iii) (a) In case of Tenders not accompanied by full amount of Earnest Money for the items Tendered but not less than 25% of the amount due, the order/contract shall be awarded only for part of material/equipment/service limited to a value corresponding to the actual amount of Earnest Moneysubmitted with the Tender provided the placing of such part order is otherwise feasible and is in the interest of the PSPCL, otherwise such Tenders shall be ignored.

(iii) (b)The amount due, as referred to in clause 13(iii) (a) shall be calculated @ 2% of the Tender value and shall not be taken as 20,00,000/-i.e. the maximum amount payable as Earnest Money. Therefore 25% of earnest money shall thus be worked out on the basis of the entire amount so calculated, which shall, of course, be subject to maximum of Rs. 20,00,000/- and minimum of Rs. 10000/-.

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In order to dispel any doubt, the correct amount payable of earnest money, in cases covered in clause 13(iii)(a) shall be worked out as per illustration given here under :-

Sr. No	Tender Value (say)	EMD @ 2% of Tender value (Rs)	EMD @ 25% of Col.(3)	Correct Amt.of 25% EMD to be deposited for qualifying to get 25%	Correct Amount full EMD to be deposited	Remarks
1	upto Rs. 5 Lacs	Nil	Nil	Nil	Nil	EMD exempted below 5 Lacs
2	5 lac	10,000	2500	10,000	10,000	Min EMD as per clause 13(i)(b)
3	10 lac	20,000	5,000	10,000	20,000	
4	25 lac	50,000	12,500	12,500	50,000	
5	50 lac	1,00,000	25,000	25,000	1,00,000	
6	1 crore	2,00,000	50,000	50,000	2,00,000	
7	5 crore	10,00,000	2,50,000	2,50,000	10,00,000	
8	6 crore	12,00,000	3,00,000	3,00,000	12,00,000	
9	10 crore	20,00,000	5,00,000	5,00,000	20,00,000	
10	25 crore	50,00,000	12,50,000	12,50,000	20,00,000	Max. EMDas per clausel3(i) (b)

(iv)Earnest Money shall be forfeited in case of withdrawal/modification of an offer within the validity period, as required in the NIT/Tender Specification after opening of Tender.

(v)In case of successful Tenders, Earnest Money shall be converted Security Deposit and shortfall, if any shall be got deposited for faithful execution of Purchase Order/Contract.

(vi)In case of Tenders not accepted, the Earnest Money shall be refunded within 30 days of the award of order/contract of the successful Tenders.

In case of firms not falling within the zone of consideration earnest money may be refunded immediately wherever possible.

14. **INTIMATION TO CHIEF ACCOUNTS OFFICER & CONSIGNEE:** The supplier will have to intimate the probable date of dispatch followed by **e-mail** advance intimation regarding the actual date of RR to DEPUTY CHIEF ACCOUNTS OFFICER (O&M), GHTP , LEHRA MOHABAT, DISTT. BATHINDA (PB) –151 111 to enable him to arrange payment, failing which demurrage wharfage etc. will be to suppliers account. A copy of such intimation should be sent to the Consignee and Chief Engineer (Procurement Cell) GHTP , LEHRA MOHABAT also for reference immediately.

15. **GOODS AND SERVICES TAX:**

PSPCL is registered centrally in the state under GSTN 03AAFCP5120Q1ZC

i) GST, as applicable, will be paid as per prevailing provisions of GST Act & Laws against submission of documentary proof at rate(s) prevailing during the contracted delivery period on the basis of actual. The following certificates shall have to be furnished along with invoice – cum-gate pass duly signed by the authorized agent /signatory. The first invoice should

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accompany the specimen signatures of the authorized signatory duly attested by the Managing Director of the factory with a copy of orders regarding his appointment as authorized signatory:-

- Certified that the transaction on which the GST is claimed has been/shall be included in the return submitted / to be submitted to the GST Authorities and the amount claimed from the Punjab State Power Corporation Ltd. has been / shall be paid to the GST Authorities.
- Certified that the goods on which GST has been charged have not been exempted under GST Act or rule made there under and that the GST charged on these goods is not more than what is payable under the provisions of relevant act.
- Certified that we shall indemnify the Punjab State Power Corporation Ltd. in case, it is found, at a later stage that wrong or incorrect payment had been received on account of GST; the same will be refunded.
- Certified that we are registered dealer under the GST Act and our Registration No. is_____

ii) In case the GST is applicable and is required to be paid extra as referred to Para-(i) above, the tenderer should clearly indicate HSN code of item along with present rate (in percentage) applicable to their company.

iii) The maximum rate (in percentage) up-to which the GST may become leviable/ payable under the prevailing Rules & Regulations applicable to their company, should also be clearly indicated in their tender.

iv) In case the GST is applicable /payable, necessary certificate of GST claimed / GST Gate Pass duly authenticated by the authorized representative of GST Authorities, shall however, be furnished by the supplier along with each consignment. The supplier should, therefore, clearly indicate in their tender that whether such GST Gate Passes/Certificates shall be furnished by them or not.

NOTE: The firms indicating nil or concessional rate of GST in their tenders (if any) will have to absorb GST up to the full rate applicable at the time of tendering.

v) FURTHER any loss due to non-availability of ITC or levy of penalty/ interest payable by PSPCL on account of non-filling of return or non-compliance or any miss-statement given under the provisions of GST ACT by the firms shall be recoverable from them.

vi) Further GST at applicable rates on principal supply shall be payable on Freight and Insurance

16. INSURANCE

i) The rates are required to be quoted on F.O.R. Destination basis and it is responsibility of the supplier to deliver the goods in sound condition on F.O.R. destination and for that purpose the supplier may at his option insure the material against all risks at his own cost during transit for full delivered value of the material upto the Destination. All works in connection with making and setting of claims, if any with railway authorities and for insurance company shall be carried out by the contractor for which the Board shall make no extra payment. However necessary assistance required in connection with making and setting of such claims, if any, shall be provided by the consignee.

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ii) All damages and /or shortages during transit as covered by; the insurance shall be made goods, immediately on receipt of such information from the consignee, without waiting for settlement of claims, However, in case of apparent damages and or shortages, the consignee shall obtain the loss/damage certificate from the Railway Authorities and send the same to the contractor wit in a period of 30 days from the date of receipt of material. A certificate shall be submitted by the supplier / contractor with each bill to the effect that the material has been duly insured.

iii) The consignee shall report losses and damages to the firm, within 30 days of the arrival of the equipment/spares at the site, it will, however, be supplier, responsibility to prefer timely claims on the insurance underwriter and to arrange replacement there of to the consignee.

iv) The suppliers shall be wholly responsible for the loss, shortage, and damage etc. during transit, such shortages and damages etc. will have to replaced/repaired by the supplier's free of cost immediately without waiting for maturing of the supplier claims with the road transport/railway authorities.

v) In case replacement /repair of defective materials is not carried out with six months of intimation of damages suppliers shall have to pay interest at the rate of 12% per Annum on the advance payment made by the PSPCL from the date of its payment up to the date of recommissioning of the equipment after replacement/repair or to the date the default is made good.

17. **WARRANTY**: The Supplier /Contractor shall be responsible to replace free of cost with no transportation and insurance expense to the purchaser up to the destination of material/equipment the whole of any part of the material, which under normal and proper use and maintenance, proves defective in material or workmanship within 12 months from the date it is taken over by the purchaser or 18 months from the date of dispatch in respect of indigenous equipment, 24 months from the date of shipment for imported material, which ever expires earliest, provided the purchaser gives prompt written notice of such defects to the supplier, such replacement shall be effected by the supplier within a reasonable time not exceeding 6 months of the intimation of defects. Suppliers responsibility arising of supply of material or its use whether on warranties or otherwise shall not in any case exceed the cost of correction the defects or replacing the defective part /material and upon the expiry of the warranty period stipulated above all such liabilities shall terminate.
The above provision shall equally apply to the material so replaced, repaired by the supplier under this clause. In case the same is again found to be defective within 12 months of its replacement/repair.

In case the replacement/repair to the defective material is not carried out within six months of intimation of defects, the supplier shall have to pay interest @ 12% per annum on the value of each complete operational units of equipment beginning from the date of its becoming defective up to date of its recommissioning after replacement /repair

18. **CHANGES:** No variation or modification or waiver off any of the terms & provisions shall be deemed valid unless mutually agreed upon in writing by both the Purchaser and Supplier.

19. **DESPATCH INSTRUCTIONS:** The material will be required to be dispatched as per the dispatch instructions issued by the PSPCL. However, efforts shall be made to rationally consign the material on truck load basis to as minimum number of stores as possible.

20. **RAW MATERIAL:** The raw material to be used in the manufacture of the goods/equipment to be supplied against Purchase Order/Contract shall be new and of the best quality of its kind available in the market. The Supplier/Contractor shall be solely responsible for the procurement of raw material required for the purpose.

21. **SAMPLES:** whenever asked for the suppliers free of cost at the purchaser's office must supply samples. Ordinarily sample will not be returned to the Contractor/Supplier, However, expensive samples, the return of which is desired by the Supplier/Contractor will be returned to him at risk and cost.

22. **INSPECTION AND TESTS:**

1. The purchaser shall inspect, examine and test the equipment/material through its official(s) and/or through an outside agency nominated by the purchaser at the manufacture's works, during or after the manufacture of goods prior to dispatch, on receipt of clear notice of minimum two week in advance to be reckoned from the date of receipt by the purchaser. The supplier/contractor shall

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provide, all facilities as may be required to carry out the test in accordance with approved standards, free of cost.

2. On receipt of material in the stores/workshops, PSPCL shall inspect the material at random as per provision of the Purchase order/contract irrespective of the fact whether or not, it has been inspected before dispatch. If the shortage/deviation from declared quantity /specification is noticed, the same shall be reported immediately by the consignee to the supplier, under intimation to all concerned. On receipt of such intimation from consignee(s), the CE in charge of the stores/workshops shall fix a date and time for joint verification under intimation to the supplier& all concerned giving minimum 10 days-time. The checking shall be carried out in the presence of firm's representative at Destination Station and in case the firm's representative does not happen to be present at destination on the specified date & time so fixed, then PSPCL shall be at liberty to do joint verification in his absence. The shortage/discrepancies so detected shall be applied on the full lot. In case shortage/discrepancies, in particular lot supplied to various consignees, are also noticed by different consignees, the above procedure shall be followed for joint verification by each and all such consignees. The maximum shortages/discrepancies detected by any of the consignees shall be applied to the entire lot of material supplied to various consignees. In case of any failure of material during random checking, PSPCL reserves the right to reject the entire lot at the risk and cost of the supplier.

In case of repeated shortages/discrepancies the firm shall be liable for suspension of business dealings/black listing. This is without prejudice to the other rights arising/accruing to the purchaser under various clauses of the Tender specification & Purchase Order-Cum-Contract.

23. TEST CERTIFICTE AND INSTRUCTION BOOK:

The Supplier/Contractor shall be required to furnish to the Purchaser/consignees, wherever necessary, the following documents along with consignment :-

(i)	Printing Pamphlets/ Catalogues	Copies
(ii)	Instruction Book	Copies
(iii)	Drawings	Copies
(iv)	Any other relevant information (to be incorporated at the time of placing the purchase Order)	

In case, the goods have not been inspected/tested at the manufacturer's works by a representative of PSPCL, the Supplier/Contractor shall furnish the following certificates to purchaser/ consignee along with consignment.

a) Type test certificate/ Acceptance Test Certificates
b) Routine test certificate.

24. FAKE INSPECTION CALLS

The purchasing authority will get the material inspected and issue dispatch instructions within 20 days of the date of receipt of call offering the material for inspection or date of readiness of material, whichever is later. In case date of readiness is not mentioned in the offer letter, then date of receipt of call shall be considered as date of readiness of material. In case the inspecting officer finds on arrival at the supplier's premises that the material less than 80% of the quantity offered in the inspection call is ready for inspection or material of the firm is rejected during testing/inspection, then the call shall be treated as fake call and the firm shall be responsible to pay fake call charges @ 10% of the value of the offered lot calculated as per P.O. rate subject to a maximum of Rs. 30,000/- per such occasion. Besides this, a letter of warning shall be issued and it shall be counted towards their

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performance for all intents and purposes. In case multiple sizes are to be inspected against a single inspection requisition, then the fake call charges shall be applicable on proportionate basis based on the PO value of items which were offered by the firm for inspection.

25. CANCELLATION:

The purchaser reserves the right to cancel the purchase order/ contract as a whole or in part at any time without any financial liability on either side prior to the receipt of intimation regarding taking in hand the manufacture of material.

During the pendency of the Purchase order/ contract, if lower rates are received against the subsequent Tender Enquiry/Enquiries, then the supplier, whose overall contractual delivery period has expired, shall be offered to supply the material at either of the following rates, whichever is lower, along withany other terms and conditions at variance from the conditions as contained in the original purchase order, if any:

a) Rates payable as per the terms and conditions of the Purchase Order less penalty as applicable
b) Rates received against subsequent Tender Enquiry/Enquiries

In case the supplier refuses to accept the offer, then the purchase order shall be cancelled without any financial liability on PSPCL. However, if the supplier is debarred as per Regulation 37 , then the cancellation of purchase order shall not have any effect on the debarred status of the supplier.

26. JURISDICTION: All legal proceedings in connection with this Purchase Order/Contract shall be subject to the territorial Jurisdiction of local Civil Court at Bathinda, only.

27. ARBITRATION:

a). If at any time any question, dispute or difference, whatsoever, shall arise, between the Purchaser/PSPCL and the Contractors/Suppliers, upon or in relation, to or in connection with the Purchase Order/Contract, either party may forthwith give to the other, notice in writing of the existence of such question dispute or difference and the same shall be referred for sole arbitration as per the provisions of the Indian Arbitration Act,1996 (amended upto date) who shall give a reasoned/speaking awards. The award of the Sole Arbitrator shall be final and binding on the parties under the provisions of the Indian Arbitration Act, 1996 (amended upto date) and of the rules there-under. Any statutory amendment, modification or re-enactment thereof for the time being inforce, shall be deemed to apply to and be incorporated in the Contract/Purchase Order.

b). Upon every or any such reference, the cost and incidental expenses to the reference and award shall be at the discretion of the Sole Arbitrator so appointed who may determine the amount thereof or direct the same to be taxed as between Solicitor and Client or as between party and party shall direct by whom and to whom and in what manner the same is to be borne and paid.

c). The work under the Contract shall, if reasonably possible, be continued during the proceedings of the arbitration and no payment due/ payable to the firm by the Purchaser/PSPCL shall be with-held on account of such proceedings.

28. ORDER PREFERENCE: PSPCL shall allow an order preference as per the procedure laid down as under to such bidders whose works are situated within the State of Punjab:-

a) The rate of Punjab based firms shall be de-escalated by 15% for all the units (i.e. 100* Quoted Rates/115). For these firms quantity upto 50% of the total ordered quantity may be reserved provided their de-escalated rates fall below the lowest rates considered for the placement of purchase orders/ contract. For the purpose of allocation of quantity against Order Preference, the merit position of the Punjab based eligible firms shall be prepared separately. However, where the Punjab based firms qualify amongst the lowest bidders on their own quoted rates, they shall also form part of the original merit list without order preference for the purpose of allocation of quantity.

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b) Purchase order on the Punjab firm claiming order preference& found eligible as per clause (a) above would be placed on the lowest rates (L-1) considered for the placement of purchase orders/ contract

c) The Punjab based firms claiming order preference shall be required to furnish an undertaking in prescribed form (Annexure-II) on a non-judicial stamp papers of appropriate value duly notarized to the effect that they shall execute the order if placed on them under 'Order Preference' as per the Tender specification. Such undertaking shall be submitted by the Punjab based firms latest by 5:00 PM on the day of opening of price bid and duly acknowledged by the concerned office.

d)In case no such undertaking is furnished by the Punjab based firms, who are otherwise eligible for claiming 'Order Preference' as per the Tender specification, their Tender shall not be considered for placement of any order under Order Preference. In the event of refusal by the Punjab based firms to execute the purchase order/contract at their quoted rates or offers made under Order Preference as per 'a' and 'b' above as the case may after furnishing the above undertaking as per Annexure II their earnest money shall be forfeited apart from initiating further administrative action, such as suspending business dealings blacklisting etc.

29. **CONSTITUTION, EXPERIENCE AND FINANCIAL STANDING:** The Tenderers shall invariably supply the following information with the Tenders :

(a) Constitution and Composition of the firms

(i) If a Joint Stock Company, copy of its Memorandum and articles of Association and other particulars.

(ii) If a partnership firm, a copy of the partnership deed and particulars of its partners.

(iii) If a proprietary concern, the standing of the proprietor and if registered with the Registrar of Companies/Firms, their registration No etc.

(iv) Documentary evidence (Latest copy of memorandum of Micro Small & Medium Enterprises filed under section-8 of MSMED Act, 2006 duly acknowledged by competent authority.) of being a Micro, Small & Medium Enterprise. If the bidder docs not submit the proof at the time of submission of its bid, it shall be considered as a Large Enterprise.

(v) A certificate for the last financial year, duly signed by any Director/Partner/Proprietor and Chartered Accountant that investment in Plant & Machinery of the enterprise does not exceed Rs. 25 Lac in case of micro and Rs. 5.00 Cr in case of small enterprise as prescribed in section 7 (1) a (i) & (ii) of the MSMED Act, 2006.

(b) In case of authorized representative.

(i) Name and particulars of manufacturers

(ii) Certified copy of the instrument of authorization of the Supplier/Manufacturers.

(iii) Experience and standing in the market.

(c) Particulars of the Purchase order/ Contracts executed with PSPCL and/or performance certificates of having executed Purchase Order/Contract of other State/ Central utilities.

(d) **Financial Position**

(i) Balance sheets etc. for the last three years, including Trading, manufacturing, Profit and Loss Account should be duly certified by the Charted Accountant.

(ii) Copy of PAN Card of the firm and director(s) and IT returns of last 3 years

(iii) Bank references

(iv) Solvency certificate not more than 12 months old.

30. **INFORMATION REGARDING LIST OF BANKERS THE PURCHASER DEALS WITH:**

1. The Railway receipt/goods receipt and invoices etc. should be sent to the authorities to be specified in the Purchase Order.

For Swarn Enterprises

Partner

2. Any demurrage occurring as result of sending Railway Receipt/goods receipt through a Bank other than the one with which the accounts of the Purchaser are operated will be to the account of supplier/contractor.

3. No goods will be accepted by the consignee unless accompanied by price challans or invoices.

31. The firm should give the following undertaking with their offer otherwise their tender is liable to the rejected.

"We shall not pay commission etc. or engage any Commission Agent or liason Agent for dealing with the PSPCL in any matter including purchase of equipment/Spares etc."

32. **REJECTION OF TENDERS:**

The following types of tender shall be rejected:

a. Tender from firms/Contractors who are blacklisted or with whom business dealings are suspended.

b. Tenders submitted by firms who did not purchase a set of tender documents / specifications as required.

c. Tenders submitted by a person directly or indirectly connected with service, under the government, Corporation/Board or local authority.

d. Tenders not accompanied by the required amount of earnest money as per Clause-13.

e. Tenders received late.

33. **SUPPLY TO THERMAL PLANTS:**

Tenderers should enclose copies of Orders / Contractors against which they have supplied similar material to 210 MW or larger Unit Thermal Plants.

34. **IMPORTANT NOTES:**

a. Make of each item/Manufacturer's details should be given for each item.

b. Rate should be quoted F.O.R. Destination only.

c. The goods should be packed suitably at Contractor's /Supplier's own responsibility.

35. The PSPCL reserves the right to divide the order amongst more than one firm without assigning any reason thereof.

36. The prices bid or price schedule enclosed with specifications shall be filled by tenderers duly typed and hand written prices shall not be accepted.

37. The bidders shall not indicate over all discount on the quoted price for which split up has been given . However, discount can be given by the tenderer in the main tender. Any firm offering discount on the quoted price or after the opening of the tenders will be out-rightly rejected.

38. Any firm which at the time of opening of the Tender enquiry, falls in any of the following categories, shall be regarded as defaulter and shall not be eligible for participation in any new Tender enquiry for a period of three years from the date of issue of Purchase Order in which it has defaulted:-

i) The Firm is a defaulter for the supply of 35% or more quantity on the date of expiry of the Contractual Delivery Period for the total ordered quantity.

ii) The Firm is a defaulter for the supply of any quantity for more than 6 months from the date of expiry of the Contractual Delivery Period for the total ordered quantity.

This clause shall be applicable item wise (all types, sizes and ratings) against which the firm has become defaulter under the above said conditions.

39 **Free Storage**:- The material shall be booked with atleast 30 days free storage period at transporter's delivery godown. This should be clearly mentioned on the L.R. by the transporter.

40. The tender is liable to be rejected if any of the above terms are not complied with.

Dy.CE/ SE/ HQS
For Chief Engineer/O&M,
GHTP,Lehra Mohabat (SVBin Enterprises

Scanned with CamScanner

ANNEXURE-'C'

PRICE SCHEDULE PERFORMA

Sr. No.	Description	HSN Code	Ex-Works Cost				P&F	Insurance	Freight	Total	Taxable Value for GST Purpose	GST		Total Amount After GST
			Cost of Raw Material	Labour Charges	Overhead Charges	Total Ex-Works Cost						Rate	Amt	

Note:
1. Price Schedule Performa shall be filled by the tenderers duly typed. Hand written prices shall not be accepted.
2. Bidder should not indicate overall discount on quoted price for which split up has been given. However quantity/payment discount can be given by the tenderers in the main tender.
3. **Your quotation must be valid for atleast 120 days from the date of opening.**
4. Firm must provide landed cost to PSPCL.

For Swarn Enterprises

Partner

ANNEXURE-II

Referred to in Clause -27 (e) of schedule –E

UNDERTAKING FORM

(To be entered on a non –Judicial Stamped Paper)

Of Rs.....only)

We .....state that our works are situated in the state of Punjab and we Claim " Order Preference " as stipulated in the PSPCL tender specification No. .....due on.....against which we have submitted our Tender No.....dated .....we undertake to execute the order/contract if placed /awarded on to us even by counter offer at the rates worked out by Punjab State Power Corporation Limited in accordance with its Purchase Regulations. It is further understood that in the event of refusal by us or failure on our part to execute the order/contract (full or part) placed /awarded on to us under "Order Preference" on any account what -so - ever, the Punjab State Power Corporation Limited, Shall have the right to forfeit the earnest money deposited by us and we shall have no claim for the refund thereof . The Punjab State Power Corporation Limited also have the right to suspend business dealing with us and to black list our firm, without prejudice to other rights according to the Punjab State Power Corporation Limited under the Purchase Order/ Contract, If placed /awarded on to us.

Signature of
Constituted attorney

For Swarn Enterprises

Partner

To,

The Joint Secretary/Computerization
PSPCL, The Mall
Patiala - 147001

Tender Enquiry No.- 18/2/MAMC/O&M/PC-2685 Date- 12/06/2025

Technical Sheet

Sr No	GHTP STORE CODE	DESCRIPTION OF MATERIAL	SIZE	UNIT	QTY RED	Material Code	Material Description
1	15323001	CPVC INDUSTRIAL PIPE SCH 80	2"	MTR	150	70006266	50 MM 2" SCH 80-5M CPVC INDUSTRIAL PIPE
2	15323002	CPVC INDUSTRIAL PIPE SCH 80	1 1/2"	MTR	60	70006265	40 MM 1½" SCH 80-5M CPVC INDUSTRIAL PIPE
3	15323015	CPVC INDUSTRIAL PIPE SCH 80	1"	MTR	60	70006253	25 MM 1" SCH 80-5M CPVC INDUSTRIAL PIPE
4	15323021	CPVC INDUSTRIAL PIPE SCH 80	2 1/2"	MTR	20	70006267	65 MM 2½" SCH 80-5M CPVC INDUSTRIAL PIPE
5	15323022	CPVC INDUSTRIAL PIPE SCH 80	3"	MTR	5	70006268	80 MM 3" SCH 80-5M CPVC INDUSTRIAL PIPE
6	15323035	CPVC INDUSTRIAL PIPE SCH 80	4"	MTR	10	70006269	100 MM 4" SCH 80-5M CPVC INDUSTRIAL PIPE
7	15323023	CPVC INDUSTRIAL COUPLING (SOC) SCH-80	2 1/2"	No	4	70006299	65 MM 2½" COUPLER SCH -80 CPVC -IF
8	15323003	CPVC INDUSTRIAL COUPLING (SOC) SCH-80	2"	No	35	70006494	50MM 2" COUPLER SCH -80 CPVC-IF
9	15323004	CPVC INDUSTRIAL COUPLING (SOC) SCH-80	1 1/2"	No	20	70006493	40MM 1½" COUPLER SCH -80 CPVC-IF
10	15323016	CPVC INDUSTRIAL COUPLING (SOC) SCH-80	1"	No	15	70006491	25MM 1" COUPLER SCH -80 CPVC-IF
11	15323025	CPVC INDUSTRIAL REDUCER COUPLING (SOC) SCH-80	2"X1"	No	6	70006586	2 X 1 REDUCER COUPLER SCH -80 CPVC-IF
12	15323026	CPVC INDUSTRIAL REDUCER COUPLING (SOC) SCH-80	2"X2 1/2"	No	2	70006307	2 1/2" X 2" MM REDUCER SOC SCH -80 CPVC -IF
13	15323027	CPVC INDUSTRIAL REDUCER COUPLING (SOC) SCH-80	1"X 1 1/2"	No	8	70006582	1½ X 1 REDUCER COUPLER SCH -80 CPVC-IF
14	15323006	CPVC INDUSTRIAL ELBOW 90 (SOC) SCH-80	2"	No	40	70006506	50MM 2" ELBOW 90' SCH -80 CPVC-IF
15	15323007	CPVC INDUSTRIAL ELBOW 90 (SOC) SCH-80	1 1/2"	No	25	70006505	40MM 1½" ELBOW 90' SCH -80 CPVC-IF
16	15323017	CPVC INDUSTRIAL ELBOW 90 (SOC) SCH-80	1"	No	10	70006503	25MM 1" ELBOW 90' SCH -80 CPVC-IF
17	15323028	CPVC INDUSTRIAL ELBOW 90 (SOC) SCH-80	2 1/2"	No	2	70006261	65 MM 2½" ELBOW 90' SCH -80 CPVC -IF
18	15323008	CPVC INDUSTRIAL TEE (SOC X SOC X SOC) SCH-80	2"	No	20	70006512	50MM 2" TEE SCH -80 CPVC-IF
19	15323036	CPVC INDUSTRIAL TEE (SOC X SOC X SOC) SCH-80	2"X1-1/2"	No	5	70006542	2" X2"X1½" REDUCER TEE SCH -80 CPVC-IF
20	15323037	CPVC INDUSTRIAL TEE (SOC X SOC X SOC) SCH-80	1"X 1 1/2"	No	5	70006536	1½"X1½"X1" REDUCER TEE SCH -80 CPVC-IF
21	15323009	CPVC INDUSTRIAL TEE (SOC X SOC X SOC) SCH-80	1"X 1/2"	No	15	70006529	1"X1" X ½" REDUCER TEE SCH -80 CPVC-IF
22	15323010	CPVC INDUSTRIAL FLANGE ONE PIECE (SOC) SCH-80	2"	No	30	70007337	50MM 2"FLANGE-END CAP OPEN SCH80-CPVC-IF
23	15323011	CPVC INDUSTRIAL FLANGE ONE PIECE (SOC) SCH-80	1 1/2"	No	25	70007336	40MM 1½"FLANGE-END CAP OPEN SCH80CPVC-IF
24	15323018	CPVC INDUSTRIAL FLANGE ONE PIECE (SOC) SCH-80	1"	No	25	70007334	25MM 1"FLANGE-END CAP OPEN SCH80 CPVC-IF
25	15323030	CPVC INDUSTRIAL FLANGE ONE PIECE (SOC) SCH-80	2 1/2"	No	4	70006332	65MM2½"FLANGE END CAP OPEN SCH80 CPVC-IF
26	15323012	CPVC INDUSTRIAL JOINTING COMPOUND /CEMENT	946 ML TIN	No	2	70002476	946 ML CPVC ORANGE SOLVENT CEMENT
27	15323013	CPVC INDUSTRIAL JOINTING PRIMER	473 ML TIN	No	4	70002496	237 ML PURPLE PRIMER SOLVENT CEMENT

For Swarn Enterprises

Partner

aliaxis

ashirvad
by aliaxis

Certificate

THIS IS TO CERTIFY THAT

SWARN ENTERPRISES

LUCKNOW, UTTAR PRADESH

IS AN ASHIRVAD AUTHORISED DISTRIBUTION PARTNER FOR

INDUSTRIAL RANGE OF PRODUCTS

FY 2025 - 2026

Ramkumar Kullai
VP-Enterprise & Industrial Infra

Date: 10.07.2025

To,
Punjab State Power Corporation Limited
Guru Hargobind Thermal Plant,
Lehra Mohabbat, Regd. Office: PSEB Head Office
The Mall, Patiala - 147001

Ref: Bid Number: 18/2/MAMC/O&M/PC-2685

Sub: Manufacturers Authorization Form

Dear Sir,

We, Ashirvad Pipes Pvt. Ltd. having our registered office at Plot No: 27-P, 28-P, 29 & 30, Bommasandra - Jigani Link Road, Industrial Area, Bandenallasandra, Jigani, Bangalore – 560105. We are established and reputable manufacturer of HDPE, UPVC/CPVC Pipes ect. And having our factories across India do hereby authorize M/S. Swarn Enterprises, 110/76, Latouche Road, Naya Gaon East, Lucknow, Uttar Pradesh - 226018 to contract with you against the above tender.

This authorization letter will remain valid till 9th October 2025.

Thanking you,

For Ashirvad Pipes Pvt. Ltd.

ASHIRVAD PIPES PVT. LTD. BANGALORE

Harendra Bisht
(VP – Agri & Exports, Infra & Industrial)

ashirvad
by aliaxis

TO WHOM SO EVER IT MAY CONCERN

In line with Government Public Procurement Enquiry No. **18/2/MAMC/O&M/PC-2685** Dt: 12/06/2025, we hereby certify that we, M/s. Ashirvad Pipes Pvt. Ltd., Bangalore are local manufacturer and supplier of, industrial grade CPVC pipe, fittings and Water Tanks, meeting the requirement of minimum local content (95%) as defined in the tender for the material.

Details of location at which local value addition will be made as follows:

ASHIRVAD PIPES PRIVATE LIMITED
PLOT NO. 27-P, 28-P, 29&30,
BOMMASANDRA-JIGANI LINK ROAD,
INDUSTRIAL AREA, BANDENALLASANDRA,
JIGANI, BANGALORE - 560105

Thanking you,

Yours truly,
For Ashirvad Pipes Pvt Ltd

Harendra Bisht
Vice President (Agri and Exports, Industrial and Infra)

Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number : 09AAXFS7336L1Z5

1.	**Legal Name**	SWARN ENTERPRISES			
2.	**Trade Name, if any**	M/S SWARN ENTERPRISES			
3.	**Constitution of Business**	Partnership			
4.	**Address of Principal Place of Business**	110/76, Latouche Road, Naya Gaon East, Lucknow, Uttar Pradesh, 226018			
5.	**Date of Liability**	01/07/2017			
6.	**Period of Validity**	From	01/07/2017	To	NA
7.	**Type of Registration**	Regular			
8.	**Particulars of Approving Authority**				
Signature		Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK 1 Date: 2018.07.28 04:20:28 IST			
Name					
Designation					
Jurisdictional Office					
9. Date of issue of Certificate		28/07/2018			
Note: The registration certificate is required to be prominently displayed at all places of business in the State.					

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 01/07/2017 .

Annexure A

GSTIN	09AAXFS7336L1Z5
Legal Name	SWARN ENTERPRISES
Trade Name, if any	M/S SWARN ENTERPRISES

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	0

Annexure B

GSTIN	09AAXFS7336L1Z5
Legal Name	SWARN ENTERPRISES
Trade Name, if any	M/S SWARN ENTERPRISES

Details of Managing / Authorized Partners

1		Name	Deepak Seghal
		Designation/Status	Partner
		Resident of State	Uttar Pradesh
2		Name	Chetan Sehgal
		Designation/Status	Partner
		Resident of State	Uttar Pradesh
3		Name	Shinu Sehgal
		Designation/Status	Partner
		Resident of State	Uttar Pradesh
4		Name	Neetu Sehgal
		Designation/Status	Partner
		Resident of State	Uttar Pradesh

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

सूक्ष्म , लघु एवं मध्यम उद्यम
MICRO, SMALL & MEDIUM ENTERPRISES

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER — **UDYAM-UP-50-0021494**

NAME OF ENTERPRISE — **M/S SWARN ENTERPRISES**

TYPE OF ENTERPRISE *

SNo.	Classification Year	Enterprise Type	Classification Date
1	2024-25	Small	27/04/2024
2	2023-24	Small	09/05/2023
3	2022-23	Small	26/06/2022
4	2021-22	Small	29/06/2021

MAJOR ACTIVITY — **SERVICES**

SOCIAL CATEGORY OF ENTREPRENEUR — **GENERAL**

NAME OF UNIT(S)

S.No.	Udyog Aadhaar Memorandum	Unit(s) Name
1	UP50E0019542	SWARN ENTERPRISES

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	110/76 KHA	Name of Premises/ Building	NAYA GAON EAST
Village/Town	LATOUCHE ROAD	Block	110/76 KHA
Road/Street/Lane	NAYAGAON EAST	City	LCUKNOW
State	UTTAR PRADESH	District	LUCKNOW , Pin 226018
Mobile	9554668899	Email:	swarnenterpriselko@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE	**01/11/2001**
DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS	**01/11/2001**

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	33 - Repair and installation of machinery and equipment	3320 - Installation of industrial machinery and equipment	33200 - Installation of industrial machinery and equipment	Manufacturing

DATE OF UDYAM REGISTRATION **29/06/2021**

* **In case of graduation (upward/reverse) of status of an enterprise, the benefit of the Government Schemes will be availed as per the provisions of Notification No. S.O. 2119(E) dated 26.06.2020 issued by the M/o MSME.**

Disclaimer: This is computer generated statement, no signature required. Printed from https://udyamregistration.gov.in & Date of printing:- 27/08/2024

For any assistance, you may contact:

1. District Industries Centre: **LUCKNOW (UTTAR PRADESH)**

2. MSME-DFO: **KANPUR (UTTAR PRADESH)**

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

सूक्ष्म, लघु एवं मध्यम उद्यम
MICRO, SMALL & MEDIUM ENTERPRISES

Udyam Registration Number : UDYAM-UP-50-0021494

Type of Enterprise	SMALL	**Major Activity**	Services
Type of Organisation	Partnership	**Name of Enterprise**	M/S SWARN ENTERPRISES
Owner Name	M/S SWARN ENTERPRISES	**PAN**	AAXFS7336L
Do you have GSTIN	Yes	**Mobile No.**	9554668899
Email Id	swarnenterpriselko@gmail.com	**Social Category**	General
Gender	Male	**Specially Abled(DIVYANG)**	No
Date of Incorporation	01/11/2001	**Date of Commencement of Production/Business**	01/11/2001

Bank Details

Bank Name	IFS Code	Bank Account Number
KOTAK MAHINDRA BANK	KKBK0005194	8311619584

Employment Details

Male	Female	Other	Total
9	0	0	9

Investment in Plant and Machinery OR Equipment (in Rs.)

S.No.	Financial Year	Enterprise Type	Written Down Value (WDV)	Exclusion of cost of Pollution Control, Research & Development and Industrial Safety Devices	Net Investment in Plant and Machinery OR Equipment[(A)-(B)]	Total Turnover (A)	Export Turnover (B)	Net Turnover [(A)-(B)]	Is ITR Filled?	ITR Type
1	2022-23	Small	3050233.00	0.00	3050233.00	167322404.00	0.00	167322404.00	Yes	ITR - 3, 5, 6
2	2021-22	Small	3313768.00	0.00	3313768.00	136861350.00	0.00	136861350.00	Yes	ITR - 3, 5, 6
3	2020-21	Small	2444753.00	0.00	2444753.00	106585401.00	0.00	106585401.00	Yes	ITR - 3, 5, 6
4	2019-20	Small	2795294.00	0.00	2795294.00	125113983.00	0.00	125113983.00	Yes	ITR - 3, 5, 6

Unit(s) Details

SN	Unit Name	Flat	Building	Village/Town	Block	Road	City	Pin	State	District
1	SWARN ENTERPRISES	110/76, KHA,	.	LATOUCHE ROAD		NAYAGAON EAST	LUCKNOW	226018	UTTAR PRADESH	LUCKNOW

Official address of Enterprise

Flat/Door/Block No.	110/76 KHA	**Name of Premises/ Building**	NAYA GAON EAST
Village/Town	LATOUCHE ROAD	**Block**	110/76 KHA
Road/Street/Lane	NAYAGAON EAST	**City**	LCUKNOW
State	UTTAR PRADESH	**District**	LUCKNOW , **Pin :** 226018
Mobile	9554668899	**Email:**	swarnenterpriselko@gmail.com
Latitude		**Longitude:**	

National Industry Classification Code(S)

SNo.	Nic 2 Digit	Nic 4 Digit	Nic 5 Digit	Activity

1	33 - Repair and installation of machinery and equipment	3320 - Installation of industrial machinery and equipment	33200 - Installation of industrial machinery and equipment	Manufacturing

Are you interested to get registered on Government e-Market (GeM) Portal	Yes
Are you interested to get registered on TReDS Portals(one or more)	No
Are you interested to get registered on National Career Service(NCS) Portal	N/A
Are you interested to get registered on NSIC B2B Portal	N/A
Are you interested in availing Free .IN Domain and a business email ID	N/A
Are you interested in getting registered on Skill India Digital Portal	N/A
District Industries Centre	LUCKNOW (UTTAR PRADESH)
MSME-DFO	KANPUR (UTTAR PRADESH)
Date of Udyam Registration	29/06/2021
Date of Printing	27/08/2024

IEC Details	
IEC Number	
IEC Status	Inactive
IEC Registration Date	
IEC Modifification Date	

DATE :28.06.2025

ASHIRVAD PIPES PVT. LTD., BANGALORE

(AN ISO 9001:2015 COMPANY)

TECHNICAL DATA SHEET OF KORROSAFE INDUSTRIAL CPVC PIPES

Sl. No.	PARAMETER	UNIT	SPECIFICATION
1	PIPE MATERIAL	_	CPVC (Chlorinated Polyvinyl chloride)
2	SIZE	Inch	½",¾" ,1",1¼",1½" 2",2½",3",4",6",8" & 10"
3	PIPE TYPE	_	SCH 40 & SCH 80
4	REFERENCE STANDARD	_	ASTM F441
5	DIMENSION	mm	As per Table -1 & Table-2 of ASTM F441
6	COLOUR	_	Gray
7	BURST PRESSURE TEST	kg/cm^2	(At 23^0C,Duration=60-70Sec) As per Table -4 of ASTM F441
8	FLATTENING TEST	_	There will not be any sign of cracking, Splitting, and Breaking.

Ashirvad Pipes Pvt. Ltd.

Regd. Office: Plot No. 27P, 28P, 29 & 30, Bommasandra-Jigani Link Road, Industrial Area, Bommasandra, Jigani Bengaluru-560105 Karnataka, India. Ph: +918061342222

For queries: Toll Free: 1800 572 8900 M: +91 9902 333 333 E: Customercare@ashirvad.com

W: www.ashirvad.com

CIN: UB5110KA1997PTC021831

CREAT BETTER TOMORROWS | AGRI · BUILDING · INFRA

ASHIRVAD PIPES PVT. LTD. ATTIBELE Bangalore (DIST.)

aliaxis

WHATEVER THE NEXT WAVE OF TECHNOLOGY HOLDS, WE'LL HELP UNTAP IT.

ashirvad
by aliaxis

INDUSTRIAL PIPES & FITTINGS

Korrosafe
Industrial CPVC Piping System

EXCELLENT CHEMICAL RESISTANCE

About Aliaxis

Aliaxis group is a leading global manufacturer and distributor of plastic fluid handling systems used in residential, commercial and industrial buildings.

Head quartered in Brussels, Belgium. Aliaxis is present in over 45 countries, has more than 100 manufacturing and commercial entities and employs over 16,000 people.

Aliaxis leverages local and global knowledge of the industry as well as regulations and building habits to provide consistently excellent customer service through distribution partners to builders, installers, infrastructure contractors and others. The group is in the Indian plumbing and sanitary market through a partnership with Ashirvad Pipes since 2013.

Aliaxis at a glance

€ 3.1 billion
Revenue

120+
Distribution centres

1.400+
Injection machines

16.000+
Colleagues

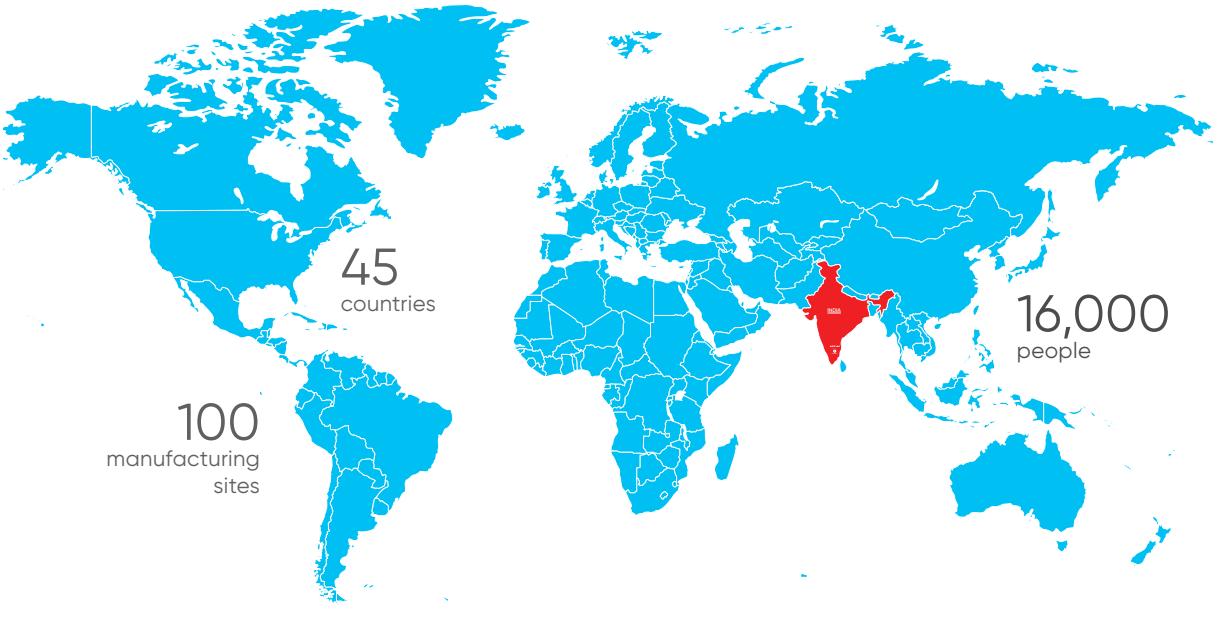
45+
Countries

600+
Extruders

€ 87 million
Capex

80+
Manufacturing sites

10
Commercial brands



About Ashirvad

Ashirvad, an Aliaxis group company, setup its Bengaluru units in 1998 and is a wholly owned company of Aliaxis group. Aliaxis group is a global leading manufacturer and distributor of plastic fluid handling systems used in residential, commercial and industrial buildings. Headquartered in Brussels, Belgium, Aliaxis is present over 40 countries with more than 75 manufacturing and commercial entities, employees over 16,100 people and generates more than 3 billion Euro
(₹. 21, 600 crores approx.) in annual sales.

Ashirvad has always been relentless in its commitment to quality and service. Ashirvad pipes is a leading manufacturer and supplier of uPVC, CPVC, SWR plumbing systems and is also the pioneer in designing and manufacturing uPVC column pipes, which are used in the erection of submersible borehole pumps. Today Ashirvad is the world's largest manufacturer of uPVC column pipes and is also successfully exporting to over 50 countries. The CPVC Hot and Cold plumbing system is manufactured in collaboration with Lubrizol, USA (a Berkshire Hathaway company) and is best suited for the clean and hygienic supply of potable water. Ashirvad is the world's largest selling CPVC and uPVC pipes and fittings company.

Ashirvad has expanded its product range with an innovative triple layer low noise (silent and silent plus) SWR and a foam core underground drainage system along with the widest range of locally manufactured speciality items and accessories such as – manholes, inspection chambers and non-return valves. Furthermore, the company has successfully entered into the sanitary and fire safety space with its leading range of traps and couplings, pan connectors and concealed valves.

Ashirvad s has consistently grown year on year and aims to become a one stop shop for all Plumbing, Industrial, Sanitary, Agriculture, Fire Safety and Drainage products in the country.

Capabilities:

- Manufacturing capacity of more than 2,00,000 MT per annum
- State of the art facility spread across 50 acres
- 500+ Strong Sales & Marketing Team
- 200+ Strong Central Support Office Team
- Over 4,500 Manufacturing Workforce
- 10 Warehouses, 1,500 Distributors, 60,000 + Dealers across India
- Exporting to more than 50 Countries
- 4 manufacturing facility in Bengaluru, Bhiwadi, Durgapur and Cuttack

CIDC - 2017

Construction Industry Database (CIDC) - 2017 Has been enlisted as an **Approved Vendor** for providing the following Service /Products Manufacturing of CPVC & uPVC Pipes & Fittings.

WCRC Leaders Summit - 2014

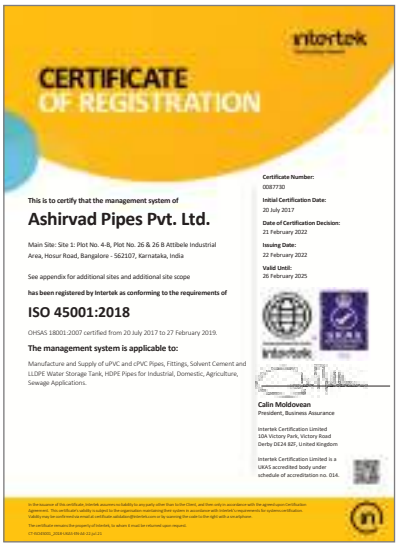
WCRC Leaders Summit - 2014 Ashirvad Pipes, "One Of The 100 Fastest Growing Marketing Brands In Asia" (Evaluated and selected by KPMG) The Global Audit Firm.

The National Award - 2007

The National Award - 2007 Ashirvad won the National Award for "Outstanding Entrepreneurship in Medium Enterprises". The award was presented by the Prime Minister of India.

ashirvad
by aliaxis

Certifications


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of

Ashirvad Pipes Pvt. Ltd.

Main Site: Site 1: Plot No. 4-B, Plot No. 26 & 26 B Attibele Industrial Area, Hosur Road, Bangalore - 562107, Karnataka, India

See appendix for additional sites and additional site scope

has been registered by Intertek as conforming to the requirements of

ISO 45001:2018

OHSAS 18001:2007 certified from 20 July 2017 to 27 February 2019.

The management system is applicable to:

Manufacture and Supply of uPVC and cPVC Pipes, Fittings, Solvent Cement and LLDPE Water Storage Tank, HDPE Pipes for Industrial, Domestic, Agriculture, Sewage Applications.

Certificate Number: 0087730

Initial Certification Date: 20 July 2017

Date of Certification Decision: 21 February 2022

Issuing Date: 22 February 2022

Valid Until: 26 February 2025

Calin Moldovean
President, Business Assurance

Intertek Certification Limited
10A Victory Park, Victory Road
Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Ashirvad Pipes Pvt Ltd

Main Site: Site 1: Plot No. 4-B, Plot No. 26 & 26 B Attibele Industrial Area, Hosur Road, Bangalore - 562107, Karnataka, India

See appendix for additional sites and additional site scope

has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

The management system is applicable to:

Manufacture and Supply of uPVC and cPVC Pipes, Fittings, Solvent Cement and LLDPE Water Storage Tank, HDPE Pipes for Industrial, Domestic, Agriculture, Sewage Applications.

Certificate Number: 0087727

Initial Certification Date: 30 March 2016

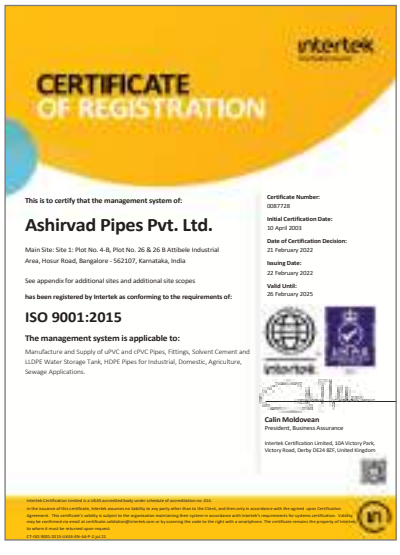
Date of Certification Decision: 21 February 2022

Issuing Date: 22 February 2022

Valid Until: 26 February 2025

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF


intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Ashirvad Pipes Pvt. Ltd.

Main Site: Site 1: Plot No. 4-B, Plot No. 26 & 26 B Attibele Industrial Area, Hosur Road, Bangalore - 562107, Karnataka, India

See appendix for additional sites and additional site scopes

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Manufacture and Supply of uPVC and cPVC Pipes, Fittings, Solvent Cement and LLDPE Water Storage Tank, HDPE Pipes for Industrial, Domestic, Agriculture, Sewage Applications.

Certificate Number: 0087726

Initial Certification Date: 10 April 2003

Date of Certification Decision: 21 February 2022

Issuing Date: 22 February 2022

Valid Until: 26 February 2025

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom


Steady Worker AG

SN EN ISO 9001 : 2015
SN EN ISO 14001 : 2015


IQNet

CERTIFICATE

Quality Management System

ISO 9001:2015


bsi.

Certificate of Registration


GOVERNMENT OF INDIA

DIRECTORATE GENERAL OF FOREIGN TRADE


Index

Industrial Products

Korrosafe Industrial uPVC Piping System | Korrosafe Industrial CPVC Piping System | ashirvad by aliaxis

ASTM PIPES & FITTINGS
SCH - 40 & 80

straub the right connection

PIPE COUPLINGS

jimfen

FILTRATION SYSTEMS

Durapipe UK

SUPER FLOW ABS, PLX, AIR-LINE XTRA

FRIATEC

ELECTRO - FUSION FITTINGS

IPEX Committed to Excellence

DOUBLE CONTAINMENT SYSTEMS

FIP

FLS INSTRUMENTATION

FIP

MANUAL / AUTOMATION VALVES
(UPVC, CPVC, PPH & PVDF)

Industrial Applications

Korrosafe Industrial uPVC Piping System | Korrosafe Industrial CPVC Piping System | ashirvad by aliaxis

- Power Generation – WT/ WWT
- Chemical Processing – Process Piping
- Metals & Mining – WWT/WT and Slurry Transport
- Shipbuilding & Marine – Ballast Water, WT
- Turf & Agricultural Irrigation – Pre Filtration

ASTM PIPES & FITTINGS
SCH - 40 & 80

straub the right connection

- Aerospace & Defence – Water Distribution
- Automotive – Water Treatment
- Engineering & Construction – Process Piping
- Oil & Gas – Process Piping
- Utilities – Water Treatment, ETP

PIPE COUPLINGS

jimten

- Cooling Towers - Prefiltration
- Effluent Treatment Plants- WWT
- Process Water Filtration – Water Recycling

FILTRATION SYSTEMS

Durapipe UK

- Chemical Processing – Process Piping
- Oil & Gas Processing – Product Transfer
- Fuel Transfer – White Oil Transfer
- Pressure Air - Process Air Piping
- Hazardous Chemical Transfer – Product Transfer

SUPER FLOW ABS, PLX, AIR-LINE XTRA

FRIATEC

- Gas Distribution – City Gas Distribution
- Water Distribution – City Water Distribution
- Waste Water – Sewage and ETP

ELECTRO - FUSION FITTINGS

IPEX Committed to Excellence

- Chemical Processing – Process Piping
- Metals & Mining – WT/WWT & Process Piping
- Oil & Gas Processing – WT/WWT & Process Piping
- Oil Extraction – Process Piping
- Shipbuilding & Marine – WT/WWT

DOUBLE CONTAINMENT SYSTEMS

FIP

- Power Generation & Manufacturing – WT/ WWT
- Chemical Industry – Process Piping
- Irrigation & Agriculture – Pre Treatment
- Swimming pool & SPA – Pre Treatment
- Aquarium – Pre Treatment & Recycle

FLS INSTRUMENTATION

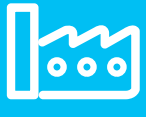
FIP

- Power Generation & Manufacturing – WT/ WWT
- Chemical Industry – Process Piping
- Mining – Slurry Transport, WT/WWT
- Marine – WT/WWT, Ballast Water
- Irrigation & Agriculture – Pre Treatment

MANUAL / AUTOMATION VALVES
(UPVC, CPVC, PPH & PVDF)

10 Assurances

Ashirvad's stringent quality checks ensure premium products and maximum customer satisfaction



#01

STATE OF THE ART MANUFACTURING FACILITIES

#06

STRINGENT QUALITY CHECKS AT EVERY LEVEL OF PRODUCTION

#02

ADVANCED MACHINERY FOR SUPERIOR QUALITY

#07

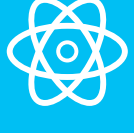
100% FINISHED GOODS INSPECTION

#03

ADVANCED MATERIAL HANDLING SYSTEMS

#08

MULTIPLE QUALITY CHECKS IN PLACE FOR EVERY INDUSTRIAL PVC FITTINGS THAT LEAVES THE ASHIRVAD FACTORY



#04

100% INCOMING RAW MATERIAL INSPECTION

#09

EVERY BATCH OF PRODUCTS LAB TESTED

#05

HIGH DIMENSIONAL ACCURACY TO MAINTAIN QUALITY OF EACH PIECE, TO ENSURE A DEFECT FREE SYSTEM

#10

REGULAR EXTERNAL LAB TESTING OF PRODUCTS IN INDIA

About Ashirvad Industrial

Ashirvad's Industrial Division (erstwhile Aliaxis Utilities and Industry Pvt Ltd.) deals with all types of Thermo Plastics Piping systems viz CPVC, uPVC, PPH, PVDF & ABS Pipes, Fittings, Valves with both Pneumatic and Electric Actuators & Accessories as per ISO-DIN Metric, ASTM standards, High Performance Metal Pipe Coupling, Pipe Clamps, Double Containment Piping System, Instrumentation products, Acid Waste system, Compressed air conveying Piping System, Pre Filtration System, Chemical Drainage system Etc. to cater the service in Industries of different segments in India and across the Globe.

We at Ashirvad by Aliaxis give packaged solutions for industrial, process plants & water treatment projects with following products:

- FIP - Italy make uPVC, CPVC, PPH & PVDF manual & auto valves, pipes & fittings.
- ASHIRVAD- Indian make uPVC & CPVC Pipes and fittings
- FIP make instrumentation like flowmeters, PH, ORP conductivity meters etc.
- IPEX - Canada make uPVC, CPVC, ABS, natural & unpigmented PP piping system for process piping, double containment piping, acid waste systems, high purity applications etc.
- DURAPIPE - UK make ABS (Acrylonitrile Butadiene Styrene) piping system & valves for chilled, cold water & flexible ABS for compressed air applications
- STRAUB - Switzerland make mechanical couplings
- JIMTEN - Spain make non-metallic filtration systems, pipe couplings & Air release valves.
- FRIATEC - Germany made Electrofusion fittings.

"Industrial" in Ashirvad today

In order to address customer needs and growth, we have a segment approach to reach to customers

Market segmentation leads to profitable growth based on:

- Better tailored product service offering/develop new offers
- Better resource management (e.g., salesforce, marketing) with specific segments
- Customized value proposition
- Better price allocation for specific segments
- Distinguished and better use of different channels
- Efficient tracking of global projects

Today thermoplastic pipes play an important role in virtually every industrial process. The reason for this is the vast variety of solutions plastic pipes offer because plastic pipes can be adapted for each application. High chemical resistance, advanced jointing techniques and a comprehensive standardisation framework ensure efficient, economical and safe solutions.

Introduction - Product

Ashirvad is vey proud to introduce ASTM CPVC solvent weld Ashirvad Korrosafe Industrial CPVC Piping System under the brand name Ashirvad.

PRODUCT	SIZE RANGE	STANDARDS	PROPERTIES
Ashirvad Korrosafe Industrial CPVC Pipes SCH 40 & 80	1/2" - 6"	ASTM F 441	• Strong and light weight • Easy to install • Fire Resistant • Durable • UV Stabilised • Simple and leak proof • Suitable for Potable Water • Chemical Resistance • Maximum Flow rate • Good Insulator
Threaded Fittings	1/2" - 6"	ASTM F437	
Socket Type Fittings	1/2" - 6"	ASTM F439	
Solvent Cement	Heavy	ASTM F 493	

Key Physical Properties

CPVC (Chlorinated Poly Vinyl Chloride)

PROPERTIES	CPVC	STANDARDS
Cell classification	24448	ASTM D1784
Specific gravity	1.50 - 1.53	ASTM D792
Tensile strength, psi at 73°F	8,000	ASTM D638
Modulus of elasticity tensile, psi at 73°F	3,90,000	ASTM D638
Flexural strength, psi	15,100	ASTM D790
Izod impact, ft.lbs./in. at 73°F, notched	6	ASTM D256
Compressive strength, psi	10,100	ASTM D695
Poisson's ratio	0.33	-
Working stress, psi at 73°F	2,000	-
Coefficient of thermal expansion in./in./°F (x 10-5)	3.4x10-5	ASTM D696
Linear expansion, in./10°F per 100' of pipe	0.41	-
Maximum operating temperature under pressure °F	199.4	-
Deflection temperature under load, °F at 264 psi	235	ASTM D648
Thermal conductivity, BTU.in./hr. ft2.°F	0.95	ASTM C177
Burning rate	Self Extinguish	ASTM D 635
Burning class	V-0	UL-94
Flash ignition, °F	900	-
Limited oxygen index (%)	60%	ASTM D2863
Water absorption, %, (24 hrs. at 73°F)	0.03%	ASTM D570

* The properties listed in this table represent general material properties and should be used as a guideline only.

Ashirvad Korrosafe Industrial CPVC

CPVC Sch 40 - 1/2" - 6" (15mm - 150mm)
CPVC Sch 80 - 1/2" - 6" (15mm - 150mm)

OUR SYSTEM ADVANTAGE

The Ashirvad system provide a complete line of pipe, fittings, flanges, strainers and valves to meet all your process system requirements.

Ashirvad developed the Ashirvad Korrosafe Industrial (CPVC) systems to meet industry demands for a complete Pipe, Valves and Fittings (CPVC) package that is designed, produced and backed by a single manufacturer.

These systems are engineered and manufactured to strict quality, performance and dimensional standards, and therefore eliminate the problems inherent in purchasing and installing piping system components manufactured by several different companies

Our high-performance vinyl systems are designed to meet the temperature, pressure and size requirements of piping systems used in chemical processes and other industrial applications. They feature outstanding resistance to photodegradation, creep stress and immunity to oxidation, and are exceptionally suited for use with a wide range of acids, alcohols, salts and halogens. The perfect extended service, low maintenance alternative to common and exotic metal systems.

Ashirvad Korrosafe Industrial CPVC Pipes are available in SCH 40 & 80 and Fittings are available in SCH 80.

FIELDS OF APPLICATIONS

- Plant chemical distribution lines
- Water and wastewater
- Acid systems for refineries, pickling lines and plating shops
- Chlorine injection, chlorine dioxide and chloralkali plant piping
- Steel wire plants
- Battery manufacturing
- Bleach lines in textile and paper mills
- Alum and caustic handling systems
- Circuit board manufacturing
- Semiconductor
- Pharmaceutical
- Cooling water and cooling tower systems
- Tailing and slurry lines
- Washwater recovery systems
- Plant water supply
- Brine and seawater systems
- Fish farming
- Waterworks
- Aquariums and swimming pools
- Irrigation systems in golf courses, greenhouses, etc.

Caution: Do not use or test CPVC with compressed air or other gases including air-over-water boosters.

Standards and Specificatons

ASTM D 1784	-	Specification for Rigid Polyvinyl chloride (PVC) compounds and Chlorinated Polyvinyl chloride(CPVC) compounds
ASTM F 441	-	Standard spection for chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe,Schedule 40 and 80
ASTM F 437	-	Specification for Threaded Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM F 439	-	Specification for Socket Type Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80
ASTM F 493	-	Specification for Solvent Cements for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe and Fittings
ASTM F 1498	-	Taper Pipe threads 60° for Thermoplastics Pipe & Fittings
ASTM D 2774	-	Underground Installation of Thermoplastic Pipes

Codes – Description

ASTM	-	American Society for Testing and Materials.
ANSI	-	American National Standards Institute
BSP	-	British Standard Pipe
IPS	-	Iron Pipe Size (ASTM)
NPT	-	National Pipe Threads (ANSI)
FIPT	-	Female Iron Pipe Threads
MIPT	-	Male Iron Pipe Threads.
SOCKET	-	Solvent Weld Socket
SPIGOT	-	Spigot End (IPS)
PVC	-	Poly Vinyl Chloride
CPVC	-	Chlorinated Poly Vinyl Chloride

Why Ashirvad Korrosafe Industrial System?

Lower Installation Costs, Easy Handling

In addition to a lower material cost, Industrial CPVC pipe can significantly reduce labour and transportation costs on a typical installation. The reason? They are lightweight, easily handled, stored, cut and joined.

Extended Life

Industrial CPVC provide years of maintenance free service. Our materials will not rust, pit, scale or corrode on either interior or exterior surfaces. Thermoplastic piping systems in a variety of demanding industrial applications have operated successfully for over 45 years.

Superior Underground Performance

Industrial CPVC is immune to damage from naturally corrosive soil conditions as well as electrochemical and galvanic corrosion. This is particularly advantageous in underground installations where galvanic reaction often causes damage to metal piping products.

Exceptional Chemical Resistance

The vinyl systems, including pipe, valves and fittings provide outstanding resistance to a wide range of chemicals such as most acids, alcohols, alkalies, salt solutions, halogens and more.

Improved Flow

Industrial CPVC have a substantially lower Roughness Factor than metal and other materials, and since they do not rust, pit, scale or corrode, the interior walls remain smooth in virtually any service.

Exceptional Temperature Range

The vinyl systems are designed to meet a broad range of service temperatures. Industrial CPVC has a recommended maximum service temperature of 199.4°F (93°C) in pressure.

Lower Thermal Conductivity

With a low thermal conductivity factor, the vinyl systems have less heat loss or gain, thus sustaining service temperature more efficiently than metal piping. As a result, pipe insulation needs may be reduced.

Environmentally Responsible

With energy conservation a prime concern, you can rely on the fact that our manufacturing process for Industrial CPVC piping materials requires less than half the energy needed to produce the equivalent size of carbon steel or steel alloy materials.

DID YOU KNOW?

One of the outstanding characteristics of CPVC is its resistance to ignition. This is demonstrated by its flash point of 730°F (388°C), compared to 400°F (204°C) for wood chips.

Dimension and Water Pressure Rating of Ashirvad Korrosafe Industrial CPVC Pipes & Fittings

Dimensions of CPVC Pipes SCH 40 and SCH 80 (As per ASTM F441)

Sizes				Schedule 40			Schedule 80		
Diameter (in)	Diameter (mm)	Avg OD (mm)	Avg OD Min/Max (mm)	Min Wall Thickness (mm)	*Max. work Pressure at 23°C (kg/cm²)	Burst Pressure at 23°C (kg/cm²)	Min Wall Thickness (mm)	*Max. work Pressure at 23°C (kg/cm²)	Burst Pressure at 23°C (kg/cm²)
½	15	21.30	21.20/21.40	2.77	42.18	134.28	3.73	59.76	191.23
¾	20	26.70	26.60/26.80	2.87	33.74	108.27	3.91	48.51	154.67
1	25	33.40	33.27/33.53	3.38	31.63	101.24	4.55	44.29	142.02
1¼	32	42.20	42.07/42.33	3.56	26.01	82.96	4.85	36.55	116.70
1½	40	48.30	48.15/48.45	3.68	23.20	74.52	5.08	33.04	106.16
2	50	60.30	60.15/60.45	3.91	19.68	62.57	5.54	28.12	90.69
2½	65	73.00	72.82/73.18	5.16	21.09	68.19	7.01	29.52	95.61
3	80	88.90	88.72/89.08	5.49	18.27	59.05	7.62	26.01	84.36
4	100	114.30	114.10/114.50	6.02	15.46	49.91	8.56	22.49	73.11
6	150	168.30	168.02/168.58	7.11	12.65	39.37	10.97	19.68	62.57

Tapered Socketed Dimension for CPVC Pipe Fittings, Schedule 80 (as per ASTM F439)

Nominal Size (in)	Socket Entrance Diameter (A)		Socket Bottom Diameter (B)		Socket Length - Minimum (mm)	Inside Diameter - Minimum (mm)	Wall Thickness - Minimum (mm)	
	Diameter (mm)	Tolerance on Diameter (mm)	Diameter (mm)	Tolerance on Diameter (mm)	C	D	Middle if the Socket "E"	Beyond the Socket "F"
½	21.54	±0.10	21.23	±0.10	22.22	12.75	3.73	4.67
¾	26.87	±0.10	26.57	±0.10	25.40	17.73	3.91	4.90
1	33.66	±0.13	33.27	±0.13	28.58	23.11	4.55	5.69
1¼	42.42	±0.13	42.04	±0.13	31.75	31.17	4.85	6.07
1½	48.56	±0.15	48.11	±0.15	34.93	36.73	5.08	6.35
2	60.63	±0.15	60.17	±0.15	38.10	47.78	5.54	6.93
2½	73.38	±0.18	72.85	±0.18	44.45	57.15	7.01	8.76
3	89.28	±0.18	88.67	±0.18	47.63	71.63	7.62	9.53
4	114.73	±0.20	114.04	±0.20	57.15	94.92	8.56	10.67
6	168.83	±0.28	168.00	±0.28	76.20	143.41	10.97	13.72

Burst pressure requirements for CPVC fittings SCH 80 are same as burst pressure of CPVC SCH 80 pipes.

Industrial CPVC Pipes (SCH 40)

(as per ASTM F 441)

IN	MM	LENGTH	SAP CODE
½	15	5 meter	70003488
¾	20	5 meter	70003489
1	25	5 meter	70003490
1¼	32	5 meter	70003491
1½	40	5 meter	70003492
2	50	5 meter	70003493
2½	65	5 meter	70003500
3	80	5 meter	70003501
4	100	5 meter	70003502
6	150	5 meter	70003503

Industrial CPVC Pipes (SCH 80)

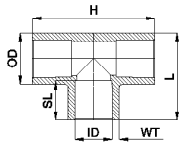
(as per ASTM F 441)

IN	MM	LENGTH	SAP CODE
½	15	5 meter	70003494
¾	20	5 meter	70003495
1	25	5 meter	70003496
1¼	32	5 meter	70003497
1½	40	5 meter	70003498
2	50	5 meter	70003499
2½	65	5 meter	70003504
3	80	5 meter	70003505
4	100	5 meter	70003506
6	150	5 meter	70003507

Industrial Fittings (SCH. 80)

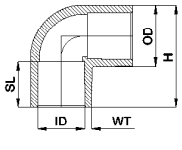
(as per ASTM F 439)

TEE (SOC X SOC X SOC)



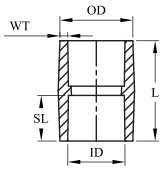
SIZE	ID	OD	WT	SL	L	H
½	21.64	29.1	3.73	22.23	50	72
¾	26.97	34.79	3.91	25.4	57	79
1	33.78	42.88	4.55	28.58	67	93
1¼	42.55	52.25	4.85	31.75	80	108
1½	48.72	58.88	5.08	34.93	90	121
2	60.78	71.86	5.54	38.1	107	138
2½	73.56	87.58	7.01	44.45	130	174
3	89.5	106.5	8.50	47.63	152	200
4	114.99	134.0	9.56	57.15	188	245
6	168.83	191.03	11.10	77.25	250	330

ELBOW 90 DEGREE (SOC X SOC)



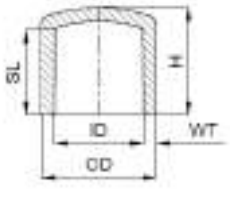
SIZE	ID	OD	WT	SL	H
½	21.64	29.1	3.73	22.23	49
¾	26.97	34.79	3.91	25.4	58
1	33.78	42.88	4.55	28.58	68
1¼	42.55	52.25	4.85	31.75	81
1½	48.72	58.88	5.08	34.93	90
2	60.78	71.86	5.54	38.1	107
2½	73.56	87.58	7.01	44.45	128
3	89.5	106.5	8.4	47.63	150
4	114.99	134.2	9.5	57.15	188
6	168.83	191.03	11.10	77.25	261

COUPLING (SOC X SOC)



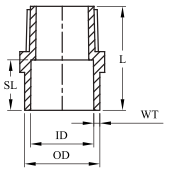
SIZE	ID	OD	WT	SL	L
½	21.64	29.1	3.73	22.23	47
¾	26.97	34.79	3.91	25.4	54
1	33.78	42.88	4.55	28.58	60
1¼	42.55	52.25	4.85	31.75	67
1½	48.72	58.88	5.08	34.93	73
2	60.78	71.86	5.54	38.1	80
2½	73.56	87.58	7.01	44.45	96
3	89.5	106.5	8.50	47.63	102
4	114.99	132.11	8.56	57.15	121
6	168.83	191.03	11.10	77.25	160

END CAP (SOC)



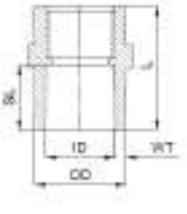
SIZE	ID	OD	WT	SL	L
½	21.64	29.1	3.73	22.23	28
¾	26.97	34.79	3.91	25.4	32
1	33.78	42.88	4.55	28.58	36
1¼	42.55	52.25	4.85	31.75	42
1½	48.72	58.88	5.08	34.93	45
2	60.78	71.86	5.54	38.1	54
2½	73.56	87.58	7.01	44.45	60
3	89.5	104.74	7.62	47.63	66
4	114.99	132.11	8.56	57.15	80
6	168.83	191.03	11.10	77.25	100

MAPT



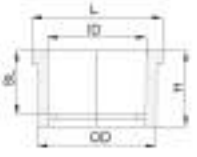
SIZE	ID	OD	WT	SL	L
½	21.64	29.1	3.73	22.23	41
¾	26.97	34.79	3.91	25.40	48
1	33.78	42.88	4.55	28.58	56
1¼	42.55	52.24	4.85	31.75	58
1½	48.72	58.88	5.08	34.93	66
2	60.78	71.86	5.54	38.10	69
2½	73.56	87.58	7.01	44.45	81
3	89.50	104.74	7.62	47.63	87
4	114.99	132.11	8.56	57.15	108

FAPT



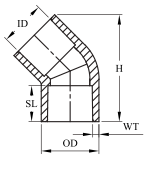
SIZE	ID	OD	WT	SL	L
½	21.64	29.1	3.73	22.23	42
¾	26.97	34.79	3.91	25.4	48
1	33.78	42.88	4.55	28.58	56
1¼	42.55	52.25	4.85	31.75	58
1½	48.72	58.88	5.08	34.93	66
2	60.78	71.86	5.54	38.1	69
2½	73.56	87.58	7.01	44.45	77
3	89.5	104.74	7.62	47.63	87
4	114.99	132.11	8.56	57.15	105

REDUCER BUSH



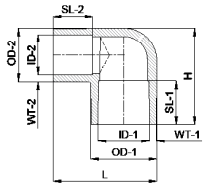
SIZE	OD	ID	SL	L	H
¾ x ½	26.97	21.64	22.23	34	28
1 x ½	33.78	21.64	22.23	43	32
1 x ¾	33.78	26.97	25.4	43	32
1¼ x ½	42.55	21.64	22.23	53	36
1¼ x ¾	42.55	26.97	25.4	53	36
1¼ x 1	42.55	33.78	28.58	53	36
1½ x ½	48.30	21.64	22.23	58	39
1½ x ¾	48.30	26.97	25.4	58	39
1½ x 1	48.30	33.78	28.58	58	39
1½ x 1¼	48.30	42.55	31.75	58	40
2 x ½	60.32	21.64	22.23	72	43
2 x ¾	60.32	26.97	25.4	72	43
2 x 1	60.32	33.78	28.58	72	43
2 x 1¼	60.32	42.55	31.75	72	43
2 x 1½	60.32	48.72	34.93	72	43
2½ x 2 (CTS)	73.56	54	43.33	87	52
2½ x 2	73.56	60.78	38.1	87	52
3 x 2 (CTS)	89.3	54	43.33	105	56
3 x 2	89.3	60.78	38.1	105	56
3 x 2½	89.3	73.56	44.45	98	56
4 x 2 (CTS)	114.60	54	43.33	134	66
4 x 2	114.60	60.78	38.1	134	66
4 x 2½	114.60	73.56	44.45	134	66
4 x 3	114.60	89.5	47.63	134	66
6 x 3	167.92	89.31	48	170.8	85
6 x 4	168.27	114.99	51	170.8	85

ELBOW SOC X SOC 45°



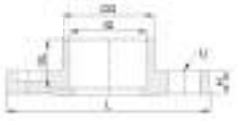
SIZE	ID	OD	WT	SL	H
½	21.64	29.1	3.73	22.23	59
¾	26.97	34.79	3.91	25.4	68
1	33.78	42.88	4.55	28.58	78
1¼	42.55	52.25	4.85	31.75	88
1½	48.72	58.88	5.08	34.93	100
2	60.78	71.86	5.54	38.1	106
2½	73.56	87.58	7.01	44.45	158
3	89.5	104.74	7.62	47.63	178
4	114.99	132.11	8.56	57.15	228

REDUCER ELBOW



SIZE	ID-1	OD-1	WT-1	SL-1	ID-2	OD-2	WT-1	SL-2	L	H
¾ x ½	26.97	34.79	3.91	25.40	21.64	29.1	3.73	22.23	57	54
1 x ½	33.78	42.88	4.55	28.58	21.64	29.1	3.73	22.23	65	64
1 x ¾	33.78	42.88	4.55	28.58	26.97	34.79	3.91	25.40	68	66

FLANGE END CAP OPEN (SOC X SOC)

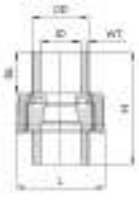


SIZE	ID	OD	SL	L	H	U
1	33.78	42.88	28.58	115	15	4
1½	48.72	58.88	34.93	136	18	4
2	60.78	71.86	38.1	160	18	4
2½	73.56	87.58	44.45	176	23	4
3	89.5	104.74	47.63	188	23	4
4	114.99	134.2	57.15	225	28	8
6	168.83	191.03	77.25	278	28	8

FLANGE END CAP – CLOSED

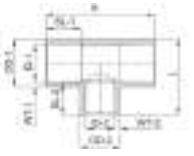
SIZE	L	H	U
1	115	15	4
1½	136	18	4
2	160	18	4
2½	176	23	4
3	188	23	4
4	225	28	8
6	278	28	8

UNION



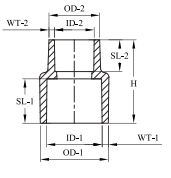
SIZE	ID	OD	WT	SL	L	H
½	21.64	29.1	3.73	22.23	47	62
¾	26.97	34.79	3.91	25.4	55	65
1	33.78	42.88	4.55	28.58	67	69
1¼	42.55	52.25	4.85	31.75	73	85
1½	48.72	58.88	5.08	34.93	81	87
2	60.78	71.86	5.54	38.1	95.5	100
2½	73.38	88.54	7.58	45.45	125.8	101
3	89.31	106.5	8.5	48.63	146.7	107
4	114.76	134.2	9.43	58.15	176.2	126

REDUCER TEE



SIZE	ID-1	OD-1	WT-1	SL-1	ID-2	OD-2	WT-2	SL-2	L	H
¾ x ¾ x ½	26.97	34.79	3.91	25.4	21.64	29.1	3.73	22.23	56	80
1 x 1 x ½	33.78	42.88	4.55	28.58	21.64	29.1	3.73	22.23	62	86
1 x 1 x ¾	33.78	42.88	4.55	28.58	26.97	34.79	3.91	25.4	70	92
1¼ x 1¼ x ½	42.55	52.25	4.85	31.75	21.64	29.1	3.73	22.23	70	108
1¼ x 1¼ x ¾	42.55	52.25	4.85	31.75	26.97	34.79	3.91	25.4	73	108
1¼ x 1¼ x 1	42.55	52.25	4.85	31.75	33.78	42.88	4.55	28.58	77	108
1½ x 1½ x ½	48.72	58.88	5.08	34.93	21.64	29.1	3.73	22.23	77	117
1½ x 1½ x ¾	48.72	58.88	5.08	34.93	26.97	34.79	3.91	25.4	82	117
1½ x 1½ x 1	48.72	58.88	5.08	34.93	33.78	42.88	4.55	28.58	82	117
1½ x 1½ x 1¼	48.72	58.88	5.08	34.93	42.55	52.25	4.85	31.75	87	117
2 x 2 x ½	60.78	71.86	5.54	38.1	21.64	29.1	3.73	22.23	89	130
2 x 2 x ¾	60.78	71.86	5.54	38.1	26.97	34.43	3.73	25.4	93	135
2 x 2 x 1	60.78	71.86	5.54	38.1	33.78	42.88	4.55	28.58	95	135
2 x 2 x 1¼	60.78	71.86	5.54	38.1	42.55	52.25	4.85	31.75	100	135
2 x 2 x 1½	60.78	71.86	5.54	38.1	48.72	58.88	5.08	34.93	102	135
2½ x 2½ x 2	73.56	87.58	7.01	44.45	60.78	71.86	5.54	44.45	126	161
3 x 2	89.31	105.55	7.62	48.63	60.78	88.54	5.54	44.45	147.5	181
3 x 3 x 2½	89.51	105.55	7.62	48.63	73.38	83.7	7.01	44.45	147.5	181

REDUCER COUPLER



SIZE	ID-1	OD-1	WT-1	SL-1	ID-2	OD-2	WT-2	SL-2	H
¾ x ½	26.97	34.79	3.91	25.4	21.64	29.1	3.73	22.23	56
1 x ½	33.78	42.88	4.55	28.58	21.64	29.1	3.73	22.23	62
1 x ¾	33.78	42.88	4.55	28.58	26.97	34.79	3.91	25.4	63
1¼ x ½	42.55	52.25	4.85	31.75	21.64	29.1	3.73	22.23	68
1¼ x ¾	42.55	52.25	4.85	31.75	26.97	34.79	3.91	25.4	68
1¼ x 1	42.55	52.25	4.85	31.75	33.78	42.88	4.55	28.58	67
1½ x ½	48.72	58.88	5.08	34.93	21.64	29.1	3.73	22.23	74
1½ x ¾	48.72	58.88	5.08	34.93	26.97	34.79	3.91	25.4	75
1½ x 1	48.72	58.88	5.08	34.93	33.78	42.88	4.55	28.58	75
1½ x 1¼	48.72	58.88	5.08	34.93	42.55	52.25	4.85	31.75	74
2 x ½	60.78	71.86	5.54	38.1	21.64	29.1	3.73	22.23	84
2 x ¾	60.78	71.86	5.54	38.1	26.97	34.43	3.73	25.4	85
2 x 1	60.78	71.86	5.54	38.1	33.78	42.88	4.55	28.58	85
2 x 1¼	60.78	71.86	5.54	38.1	42.55	52.25	4.85	31.75	83
2 x 1½	60.78	71.86	5.54	38.1	48.72	58.88	5.08	34.93	83
2½ x 2	73.56	87.58	7.01	44.45	60.78	71.86	5.54	38.1	104
3 x 2	89.31	105.55	7.62	48.63	60.78	88.54	5.54	44.45	106
3 x 2½	89.51	105.55	7.62	48.63	73.38	88.54	7.01	44.45	107

Pressure De-Rating Factor

Temperature Derating Factors at Working Pressure for CPVC pipe

Working Temperature		Pipe De-rating Factors
Fahrenheit (°F)	Centigrade °C	Korrosafe CPVC
73	23	1.00
80	27	0.96
90	32	0.91
100	38	0.82
110	43	0.74
120	49	0.65
130	54	0.58
140	60	0.50
150	66	0.45
160	71	0.40
170	77	0.33
180	82	0.25
200	93	0.20

Ashirvad Korrosafe Industrial CPVC Piping System pressure ratings are dependent on the pipe diameter and the operating temperature of the system. As temperatures increase, the pressure rating of the system decreases. Refer to the table for de-rating factors. CPVC piping to carry a maximum service temperature of 200°F when appropriate temperature/ pressure de-rating factors are applied.

Handling and Storage

Proper Handling of Pipes

Please check and inspect the pipes on receipt. The pipes should be checked for any forms of transport damage due to shift in loads or improper handling/treatment. Visually examine the ends of pipes for any cracks or damage.

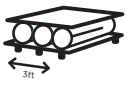
The pipes should be handled with care. The tendency to throw or drop the pipes to the floor should be avoided. Do not drag or push the pipes from a truck bed. Contact of the pipes with any sharp object should be totally avoided.

Storage of Pipes

The pipes should preferably be stored indoors. When this is not possible, please ensure to

Protect the pipes from sun light, to reduce the effect of UV rays.

The pipes should be stored on level ground and on dry surface.



If pipes of same diameter but different classes are being stacked together, place the thicker pipes below. i.e., stack Sch 80 below Sch 40.

If placing pipes on racks, ensure the spacing between the supports does not exceed 3 feet.

Safe Handling of Solvent Cement

When using solvent cement, primers and cleaners, there are some basic safety measures all users should keep in mind.

After every application of solvent on the pipe / fitting ensure to put the lid back on the solvent cement containers and tighten the lid slightly to avoid evaporation and escape of solvent.

Avoid prolonged breathing of solvent vapours. When pipe and fittings are being joined in enclosed areas, please ensure sufficient ventilation.

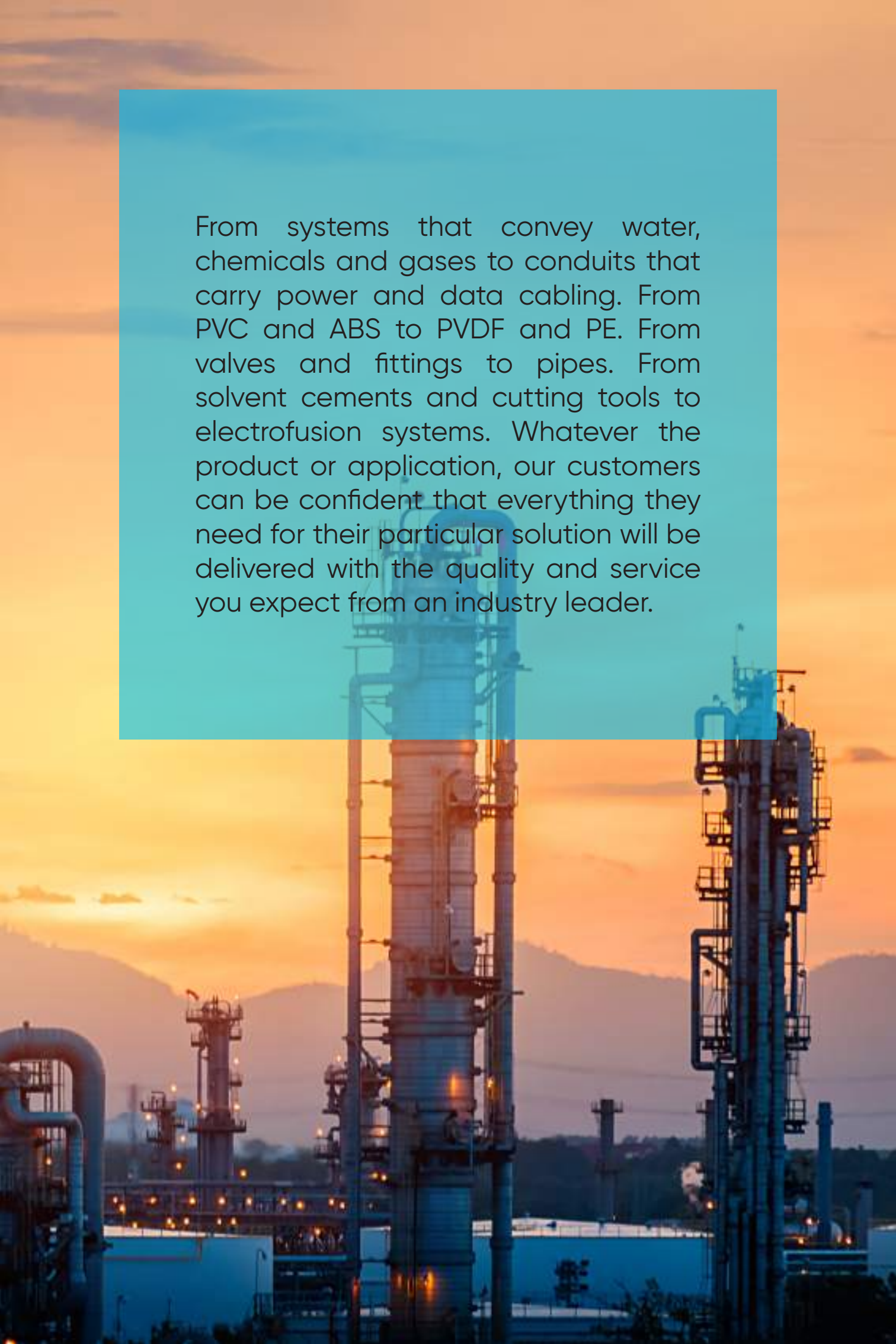
Keep the primers, cleaners and solvent cement away from all sources of ignition, heat, sparks and open flame.

Keep containers of solvent cement, primers and cleaners tightly closed except when the product is being used.

Dispose of all rags used with solvents in a proper outdoor waste bin.

Avoid eye and skin contact. In case of eye contact, flush with plenty of water for 15 minutes and call a doctor.

Refer to ASTM F402, Standard Practice for Safe Handling of Solvent cement, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings.



From systems that convey water, chemicals and gases to conduits that carry power and data cabling. From PVC and ABS to PVDF and PE. From valves and fittings to pipes. From solvent cements and cutting tools to electrofusion systems. Whatever the product or application, our customers can be confident that everything they need for their particular solution will be delivered with the quality and service you expect from an industry leader.

Quality Control Procedures at Ashirvad

Pipes and fittings manufactured at Ashirvad, follow a stringent quality control process before being rolled out into the market, in order to supply a defect free system to its users.

The various quality control checks regularly being done at Ashirvad follow the highest specifications of BIS (India) and ASTM (USA) as given below.

PIPES

Effect on Water
To ensure the quality of water passing through the pipes.

Heat Reversion Test
How much the pipe changes in length when heated in an oven and left to cool. This is a measure of residual stresses left in the pipe during production process.

Drop Impact Test
Weights are dropped on the pipe to observe for any cracks or failures.

Flattening Test
Samples are compressed so that opposite walls are brought together without the pipe cracking, which is a good measure of correct extrusion techniques during production.

Tensile Strength
The maximum stress that a pipe can withstand while being stretched or pulled.

FITTINGS

Stress Relief Test
To determine the level of internal stress by heating the fitting in an aircirculated oven @ 150°C. There should not be any blisters, weld line splitting or any cracking.

PIPES AND FITTINGS

Burst Pressure Check
Maximum pressure before the fittings burst. This must be over three times the normal pressure rating.

Visual Appearance
To ensure that all pipes and fittings are uniform in colour and free visual effects such as black dots, scratches, burn marks, etc.

Dimensions
To ensure that all pipes and fittings conform to the appropriate standards.

Opacity
To measure the percentage of light flux passing through the wall and to ensure it is below 0.2%.

Vicat Softening Temperature
The temperature at which 1 mm^2 needle penetrates 1 mm through the wall of the pipe.

Density
Density of pipes and fittings is to be determined.

Important Notes for Installers and Users

1. Water Hammer

   Plastic piping systems be designed and constructed to avoid excessive WATER HAMMER. Water hammer can cause damage and failure to pipe, valves and fittings within the piping system.

2. THREADED CONNECTIONS

   Use a quality grade thread sealant. Do not use substances that could cause stress cracking to plastic. Major attention must be given while making plastic thread joints. 1 to 2 turns beyond FINGER TIGHT is generally all that is required to make a sound plastic connection. Unnecessary OVER TIGHTENING will cause DAMAGE TO BOTH PIPES & FITTINGS

3. SEAL & GASKET LUBRICANTS

   Some Lubricants, including vegetable oils are known to cause stress cracking in thermoplastics materials. A mild soap or commercially available pipe gasket lubricants suitable for CPVC is recommended where lubrication is required for installation or maintenance service (especially with Flange joints). Choice of lubricant is at the discretion of the installer.

4. FLOW VELOCITIES

   System should not be operated or flushed out at flow velocities greater than 5 feet per second.

Installation Procedure

Easy and 100% leakproof installation.

Step 1: Cutting

Measure the pipe length accurately and make a visible marking using a felt tip pen. Ensure that the pipe and fittings are size compatible. You can easily cut with a plywood cutting saw/ ratchet cutter or a wheel cutter. Cutting the pipe as squarely as possible (at 90°) provides optimal bonding area within a joint. Inspect pipe ends thoroughly prior to making a joint. If a crack or splintering is noticed cut-off a minimum of 25 mm beyond the visible crack before proceeding.

Step 2: Deburring/Beveling

Burrs in and on pipe end can obstruct flow/proper contact between the pipe and socket of the fitting during assembly and should be removed from both in and outside of the pipe. A 15 mm dia half round file/a pen knife or a deburring tool are suitable for this purpose. A slight bevel on the end of the pipe will
ease entry of the pipe into the socket of the fitting socket.

Step 3: Fitting Preparation

Using a clean dry rag, wipe the dirt and moisture from the fitting sockets and pipe end. Dry fit the pipe to ensure total entry into the bottom of the fittings socket and make a visible marking using a felt tip pen.

Step 4: One Step Solvent adhesive Procedure

Use only Ashirvad CPVC Solvent adhesive conforming to
ASTM D2564 to ensure a perfect solvent weld joint. When making a joint,
apply an even coat of solvent adhesive at the end of the pipe and also inside the fitting socket. Do not use thickened or lumpy solvent adhesive. It should have a flow consistency like that of syrup or paint.

Two Step Solvent adhesive Procedure

4a: Apply primer to socket keeping surfaces wet and applicator wet and in motion until the entire joining surface is properly softened. Avoid puddling.

4b: Apply to pipe surface in the same manner equal to depth of socket.

4c: Apply again to the fitting socket. Avoid puddling.

4d: While the primer is still wet and the surfaces are soft, apply a full, even layer of solvent adhesive to the pipe end, equal to the depth of the fitting socket. Like the primer, be aggressive. Remember to apply enough solvent adhesive to fill the gap between the pipe and fitting.

4e: Apply a thin layer of solvent adhesive to the inside of the fitting socket. This will prevent puddling of the solvent adhesive inside of the pipe or fitting. Excessive solvent adhesive applied to the fitting socket can cause the joint to clog and the wall of the pipe or fitting to weaken due to softening by the trapped solvents.

4f: Apply a second full, even layer of solvent adhesive to the pipe end. Excessive solvent adhesive on the pipe outer diameter (O.D.) can be wiped away after assembly.

Step 5: Assembly

Immediately insert the pipe into the fitting socket, rotate the pipe 1/4 to 1/2 turn while inserting. This motion ensures an even distribution of solvent adhesive within the joint. **Properly align the fittings as per patented alignment system shown with picture diagram on the right side.** Hold the assembly for 3 seconds to allow the joint to setup and avoid push-out.

A bead of One-Step solvent adhesive must be formed around the entire socket fitting entrance. With a clean, dry cloth remove the excess solvent adhesive from the surface of the pipe and fitting.

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Selection of Solvent Cement

JOINT SETTING & CURING TIME

RECOMMENDED INITIAL SET TIME

Temperature Range	Pipe Size **½"-1¼"** (15 mm – 32 mm)	Pipe Size **1½"-3"** (40 mm – 80 mm)	Pipe Size **4"-6"** (100 mm – 150 mm)
15.5°C – 37.7°C	15 minutes	30 minutes	1 hours
4.4°C – 15.5°C	1 hours	2 hours	4 hours

RECOMMENDED INITIAL CURE TIME

Temperature Range	Pipe Size **½"-1¼"** (15 mm – 32 mm)	Pipe Size **1½"-3"** (40 mm – 80 mm)	Pipe Size **4"-6"** (100 mm – 150 mm)
15.5°C – 37.7°C	6 hours	12 hours	24 hours
4.4°C – 15.5°C	12 hours	24 hours	48 hours

TESTING PRESSURE SYSTEM

1. Conduct pressure testing with water. DO NOT USE AIR OR OTHER GASES for pressure testing.

2. The piping system should be adequately anchored to limit movement. Water under pressure exerts thrust forces in piping systems. Thrust blocking should be provided at changes of direction, change in size and at dead ends.

3. Please refer tables given for initial set & cure times before pressure testing.

4. The piping systems should be slowly filled with water, taking care to prevent surge and air entrapment. The flow velocity should not exceed 1 feet per second.

5. All trapped air must be slowly released. Vents must be provided at all high points of the piping system. All valves and air relief mechanisms should be opened so that the air can be vented while the system is extremely dangerous and it must be slowly and completely vented prior to testing.

6. For sizes 4" & above, we recommend to use automatic air relief valves at every 300 - 400 mtr. distance & at furthest & highest points of pipeline to avoid any damage to the piping system.

7. The piping system can be pressurized to 125% of its designed working pressure. However care must be taken to ensure the pressure does not exceed the working pressure of the lowest rated component in the system (valves, unions, flanges, threaded parts etc.)

8. The pressure test should not exceed one hour. Any leaking joints or pipe must be cut out and replaced and the line recharged and retested using the same procedure.

Support Spacing for CPVC Pipe

Adequate supports for any piping system is a matter of great importance. In practice, support spacings are a function of pipe size operating temperatures, the location of heavy valves or fittings and the mechanical properties of the pipe material. To ensure the satisfactory operation the location and type of hangers should be carefully considered. Hangers should not compress, distort, cut or abrade the piping. All piping should be supported with an approved hanger at intervals sufficiently close to maintain correct pipe alignment and to prevent sagging or grade reversal. Pipe should also be supported at all branch ends and at all changes of direction. Support trap arms as close as possible to the trap.

1. Concentrated loads should be supported directly so as to eliminate high stress concentrations. Should this be impractical then the pipe must be supported immediately adjacent to the load.

2. In systems where large fluctuations in temperature occur, allowances must be made for expansion and contraction of the piping system. Since changes in direction in the system are usually sufficient to allow for expansion and contraction hangers must be placed so as not to restrict this movement.

3. Since plastic pipe expands or contracts approximately five times greater than those of steel, hangers should not restrict this movement.

4. Hangers should provide as much bearing surface as possible. To prevent damage to the pipe, file smooth any sharp edges or burrs on the hangers or supports.

5. Support spacing for horizontal piping systems is determined by the maximum operating temperature the system will encounter. The piping should be supported on uniform centers with supports that do not restrict the axial movement.

6. For vertical lines, it is recommended that an engineer should design the vertical supports according to the vertical load involved.

Schedule 40 – Recommended Support Spacing (In Feet)

NOM. PIPE SIZE		TEMPRATURE °C						
Diameter (in)	Diameter (mm)	15.5	26.6	37.7	48.8	60	82	92
½	15	4½	4½	4	2½	2½	2.6	2.4
¾	20	5	4½	4	2½	2½	2.9	2.7
1	25	5½	5	4½	3	2½	3.3	3.1
1¼	32	5½	5½	5	3	3	3.8	3.5
1½	40	6	5½	5	3½	3	4.0	3.8
2	50	6	5½	5	3½	3	4.5	4.2
2½	65	6½	6	5½	4	3	5.2	4.9
3	80	7	7	6	4	3½	5.8	5.4
4	100	7½	7	6½	4½	4	6.6	6.2
6	150	8½	8	7½	5	4½	8.1	7.5

Schedule 80 – Recommended Support Spacing (In Feet)

NOM. PIPE SIZE		TEMPRATURE °C						
Diameter (in)	Diameter (mm)	15.5	26.6	37.7	48.8	60	82	92
½	15	4½	4½	4	2½	2½	2.7	2.5
¾	20	5	4½	4	2½	2½	3.0	2.8
1	25	5½	5	4½	3	2½	3.5	3.3
1¼	32	5½	5½	5	3	3	4.0	3.7
1½	40	6	5½	5	3½	3	4.3	4.0
2	50	6	5½	5	3½	3	4.9	4.5
2½	65	6½	6	5½	4	3	5.6	5.2
3	80	7	7	6	4	3½	6.2	5.8
4	100	7½	7	6½	4½	4	7.1	6.7
6	150	8½	8	7½	5	4½	9.0	8.4

Chemical Resistance Chart - CPVC

The chemical resistance information for CPVC pipe provided in the following tables is based on short term immersion of unstressed strips of CPVC in various chemicals (usually undiluted), and may be useful in assessing the suitability of CPVC under unusual or specific operating environments.

Results of this type of test can be used only as a guide to estimate the response of CPVC. These tables provide guidance to industrial users of pipe for conveying the chemicals listed, rather than design criteria for sewers that may experience occasional exposures or when diluted by other wastewater discharges.

An additional source of information on the chemical resistance of CPVC pipe is the National Association of Corrosion Engineers publication entitled, "Corrosion Data Survey, Nonmetals Section." For critical applications it is recommended that testing be performed under conditions that approximate the anticipated field conditions. In applications where exposure to harmful chemicals is frequent, of long duration or in high concentrations, further testing is recommended.

The following chemical resistance legend is used in the following CPVC tables:

R – Recommended
N – Not Recommended
S – Satisfactory Resistance
E – Possible ESC
- (blank) – Insufficient Data

Chemical	23°C (73°F)	Max. Temp. °F (°C)
A		
Acetaldehyde	N	N
Acetic Acid, up to 10%	R	180°F (82°C)
Acetic Acid, Greater than 10%	E	E-180°F (82°C)
Acetic Acid, Glacial (pure)	N	N
Acetic Anhydride	N	N
Acetone, up to 5%	R	180°F (82°C)
Acetone, greater than 5%	E	E-180°F (82°C)
Acetone, Pure	N	N
Acetonitrile	N	N
Acetophenone	N	N
Acetyl Chloride	N	N
Acrylic Acid	N	N
Acrylonitrile	N	N
Adipic Acid, sat'd in water	R	200°F (93°C)
Allyl Alcohol	R	200°F (93°C)
Allyl Chloride	N	N
Alum, all varieties	R	200°F (93°C)
Aluminum Acetate	R	200°F (93°C)
Aluminum Chloride	R	200°F (93°C)
Aluminum Fluoride	R	200°F (93°C)
Aluminum Hydroxide	R	200°F (93°C)
Aluminum Nitrate	R	200°F (93°C)
Aluminum Sulfate	R	200°F (93°C)
Ammonia	N	N
Ammonium Acetate	R	200°F (93°C)
Ammonium Benzoate	R	200°F (93°C)
Ammonium Bifluoride	R	200°F (93°C)
Ammonium Carbonate R	N	N
Ammonium Chloride	R	200°F (93°C)
Ammonium Citrate	R	200°F (93°C)
Ammonium Dichromate	R	200°F (93°C)
Ammonium Fluoride	R	200°F (93°C)
Ammonium Hydroxide, 28%	N	N
Ammonium Hydroxide, 10%	N	N
Ammonium Hydroxide, 3%	R	N
Ammonium Nitrate	R	200°F (93°C)
Ammonium Persulfate	R	-
Ammonium Phosphate	R	S-180°F (82°C)
Ammonium Sulfamate	R	200°F (93°C)
Ammonium Sulfate	R	200°F (93°C)
Ammonium Sulfide	R	200°F (93°C)
Ammonium Thiocyanate	R	200°F (93°C)
Ammonium Tartrate	R	200°F (93°C)
Amyl Acetate	N	N
Amyl Alcohol	E	E-180°F (82°C)
Amyl Chloride	N	N
Aniline	N	N
Aniline Hydrochloride	-	-
Anthraquinone	R	R
Antimony Trichloride	R	200°F (93°C)
Aqua Regia	R	N
Arsenic Acid	R	-
Aryl Sulfonic Acid	R	180°F (82°C)
B		
Barium Carbonate	R	200°F (93°C)
Barium Chloride	R	200°F (93°C)
Barium Hydroxide	R	200°F (93°C)
Barium Nitrate	R	200°F (93°C)
Barium Sulfate R	R	200°F (93°C)
Barium Sulfide	R	200°F (93°C)
Beer	R	200°F (93°C)
Beet Sugar Liquors	R	200°F (93°C)
Benzaldehyde	N	N
Benzene	N	N
Benzene Sulfonic Acid	R	180°F (82°C)
Benzoic Acid	R	180°F (82°C)
Benzyl Alcohol	E	E-180°F (82°C)
Benzyl Chloride	N	N
Bismuth Carbonate	R	200°F (93°C)
Black Liquor	R	200°F (93°C)
Bleach, Household (5% Cl)	R	200°F (93°C)
Bleach, Industrial (15% Cl)	R3,4	200°F (93°C)
Blood	R	200°F (93°C)
Borax	R	200°F (93°C)
Boric Acid	R	200°F (93°C)

R – Recommended N – Not Recommended S – Satisfactory Resistance E – Possible ESC - (blank) – Insufficient Data

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Brine Acid	R	200°F (93°C)
Bromic Acid	R	-
Bromine	N	N
Bromine, aqueous, sat'd	R	200°F (93°C)
Bromobenzene	N	N
Bromotoluene	N	N
Butanol	E	E-180°F (82°C)
Butyl Acetate N N	N	N
Butyl Carbitol™	N	N
Butyl Cellosolve™	N	N
Butyl Phenol	R	-
Butyric Acid, up to 1%	R	180°F (82°C)
Butyric Acid, greater than 1%	E	E-180°F (82°C)
Butyric Acid, pure	N	N
C		
Cadmium Acetate	R	200°F (93°C)
Cadmium Chloride	R	200°F (93°C)
Cadmium Cyanide	R	200°F (93°C)
Cadmium Sulfate	R	200°F (93°C)
Calcium Acetate	R	200°F (93°C)
Calcium Bisulfide	R	200°F (93°C)
Calcium Bisulfite	R	200°F (93°C)
Calcium Carbonate	R	200°F (93°C)
Calcium Chlorate	R	200°F (93°C)
Calcium Chloride	R	200°F (93°C)
Calcium Hydroxide	R	200°F (93°C)
Calcium Hypochlorite	R3,4	200°F (93°C)
Calcium Nitrate	R	200°F (93°C)
Calcium Oxide	R	200°F (93°C)
Calcium Sulfate	R	200°F (93°C)
Cane Sugar Liquors	R	200°F (93°C)
Caprolactam	N	N
Caprolactone	N	N
Carbitol™	N	N
Carbolic Acid R -	R	-
Carbon Dioxide	R2	200°F (93°C)
Carbon Disulfide	N	N
Carbon Monoxide	R2	200°F (93°C)

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Carbon Tetrachloride	N	N
Carbonic Acid	R	200°F (93°C)
Castor Oil	E	E-180°F (82°C)
*Caustic Potash	R	180°F (82°C)
*Caustic Soda	R	180°F (82°C)
Cellosolve™, all types	N	N
Chloramine, aqueous	R	180°F (82°C)
Chloric Acid	R	180°F (82°C)
Chlorinated Water, (Hypochlorite)	R	200°F (93°C)
Chlorine, aqueous	S	S-180°F (82°C)
Chlorine, dry gas	S2	S
Chlorine, liquid	N	N
Chlorine, trace in air	R2	200°F (93°C)
Chlorine, wet gas	S2	S
Chlorine Dioxide, aqueous, sat'd	S	S-180°F (82°C)
Chloroacetic Acid	N	N
Chlorobenzene	N	N
Chloroform	N	N
Chromic Acid, 40% (Conc.)	R	180°F (82°C)
Chromium Nitrate	R	200°F (93°C)
Citric Acid	R	200°F (93°C)
Citrus Oils	N	N
Coconut Oil	E	E-180°F (82°C)
Coffee	-	-
Copper Acetate	R	200°F (93°C)
Copper Carbonate	R	200°F (93°C)
Copper Chloride	R	200°F (93°C)
Copper Cyanide	R	200°F (93°C)
Copper Fluoride	R	200°F (93°C)
Copper Nitrate	R	200°F (93°C)
Copper Sulfate	R	200°F (93°C)
Corn Oil	E	E-180°F (82°C)
Corn Syrup	R	200°F (93°C)
Cottonseed Oil	E	E-180°F (82°C)
Creosote	N	N
Cresol	N	N
Crotonaldehyde	N	N
Cumene	N	N

R – Recommended N – Not Recommended S – Satisfactory Resistance E – Possible ESC - (blank) – Insufficient Data

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Cyclohexane	R	-
Cyclohexanol	E	-
Cyclohexanone	N	N
D		
Decahydronaphthalene	R	-
Detergents	E	E-180°F (82°C)
Dextrin	R	200°F (93°C)
Dextrose	R	200°F (93°C)
Diacetone Alcohol	N	N
Dibutoxyethyl Phthalate	N	N
Dibutyl Phthalate	N	N
Dibutyl Ether	N	N
Dibutyl Sebacate	N	N
Dichlorobenzene	N	N
Dichloroethylene	N	N
Diesel Fuel	E	E-180°F (82°C)
Diethylamine	N	N
Diethyl Ether	N	N
Diglycolic Acid	R	R
Dill Oil	N	N
Dimethyl Hydrazine	N	N
Dimethyl Phthalate	N	N
Dimethylamine	N	N
Dimethylformamide	N	N
Dioctyl phthalate	N	N
Dioxane	N	N
Disodium Phosphate	R	200°F (93°C)
Distilled Water	R	200°F (93°C)
E		
EDTA, Tetrasodium	R	200°F (93°C)
Ethanol, up to 5%	R	180°F (82°C)
Ethanol, greater than 5%	E	E-180°F (82°C)
Ethanol, pure	E	E-180°F (82°C)
Ethyl Acetate	N	N
Ethyl Acetoacetate	N	N
Ethyl Acrylate	N	N
Ethyl Benzene	N	N
Ethyl Chloride	N	N
Ethyl Chloroacetate	N	N
Ethyl Ether	N	N
Ethyl Formate	N	N
Ethyl Mercaptan	N	N
Ethyl Oxalate	N	N
Ethylene Bromide	N	N
Ethylene Chloride	N	N
Ethylene Chlorohydrin	N	N
Ethylene Diamine	N	N
Ethylene Glycol, up to 50%	R	180°F (82°C)
Ethylene Glycol, greater than 50%	E	E-180°F (82°C)
Ethylene Oxide	N	N
2-Ethylhexanol	E	E-180°F (82°C)
F		
Fatty Acids	E	E-180°F (82°C)
Ferric Chloride	R	200°F (93°C)
Ferric Hydroxide	R	200°F (93°C)
Ferric Nitrate	R	200°F (93°C)
Ferric Sulfate	R	200°F (93°C)
Ferrous Chloride	R	200°F (93°C)
Ferrous Hydroxide	R	200°F (93°C)
Ferrous Nitrate	R	200°F (93°C)
Ferrous Sulfate	R	200°F (93°C)
Fish Oil	E	E-180°F (82°C)
Fluoboric Acid	R	-
Fluorine Gas	N	N
Fluorosilicic Acid, 30%	R	180°F (82°C)
Fluosilicic Acid	R	180°F (82°C)
Formaldehyde	N	N
Formic Acid, up to 25%	R	180°F (82°C)
Formic Acid, greater than 25%	E	N
Formic Acid, pure	N	N
Freons	N	N
Fructose	R	200°F (93°C)
Furfural	N	N
G		
Gallic Acid, aqueous	R	180°F (82°C)
Gasoline	N	N

R – Recommended N – Not Recommended S – Satisfactory Resistance E – Possible ESC - (blank) – Insufficient Data

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Gelatine	R	200°F (93°C)
Glucose	R	200°F (93°C)
Glycerine	R	200°F (93°C)
Glycolic Acid	N	N
Glyoxal, aqueous	R	-
Green Liquor	R	200°F (93°C)
H		
Halocarbon Oils	N	N
Heptane	R	-
Hexane	R	-
Hexanol	E	E-180°F (82°C)
Hydrazine	N	N
Hydrobromic Acid	R	-
Hydrochloric Acid	R	180°F (82°C)
Hydrocyanic Acid	R	-
*Hydrofluoric Acid, 3%	R[3]	180°F (82°C)
*Hydrofluoric Acid, 48%	S[3]	S-180°F (82°C)
Hydrofluosilicic Acid, 30%	R	180°F (82°C)
*Hydrogen Peroxide, 30%	R[1]	180°F (82°C)
*Hydrogen Peroxide, 50%	R[1]	120
Hydrogen Sulfide, Aqueous	R	180°F (82°C)
Hydroquinone, aqueous	R	-
Hydroxylamine Sulfate	-	-
Hypochlorous Acid	S	S-180°F (82°C)
I		
Iodine, aqueous	R	-
Isobutyl Alcohol	E	E-180°F (82°C)
Isophorone	N	N
Isopropanol	E	E-180°F (82°C)
Isopropyl Acetate	N	N
Isopropyl Chloride	N	N
Isopropyl Ether	N	N
K		
Kerosene	N	N
Ketchup	R	200°F (93°C)
Kraft Liquors	R	200°F (93°C)
L		

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Lactic Acid, 25%	R	200°F (93°C)
Lard Oil	E	E-180°F (82°C)
Lauryl Chloride	N	N
Lead Acetate	R	200°F (93°C)
Lead Chloride	R	200°F (93°C)
Lead Nitrate	R	200°F (93°C)
Lead Sulfate	R	200°F (93°C)
Lemon Oil	N	N
Ligroin	R	-
Limonene	N	N
Linoleic Acid	E	E-180°F (82°C)
Linseed Oil	E	E-180°F (82°C)
Lithium Bromide	R	200°F (93°C)
Lithium Chloride	R	200°F (93°C)
Lithium Hydroxide	R	-
Lithium Sulfate	R	200°F (93°C)
M		
Magnesium Carbonate	R	200°F (93°C)
Magnesium Chloride	R	200°F (93°C)
Magnesium Citrate	R	200°F (93°C)
Magnesium Fluoride	R	200°F (93°C)
Magnesium Hydroxide	R	200°F (93°C)
Magnesium Nitrate	R	200°F (93°C)
Magnesium Oxide	R	200°F (93°C)
Magnesium Sulfate	R	200°F (93°C)
Maleic Acid, 50%	R	200°F (93°C)
Malic Acid	R	200°F (93°C)
Manganese Sulfate	R	200°F (93°C)
Mercuric Chloride	R	200°F (93°C)
Mercuric Cyanide	R	200°F (93°C)
Mercuric Sulfate	R	200°F (93°C)
Mercurous Nitrate	R	200°F (93°C)
Mercury	R	180°F (82°C)
Methane Sulfonic Acid	R	180°F (82°C)
Methanol, up to 10%	R	180°F (82°C)
Methanol, grater than 10%	E	E-180°F (82°C)
Methanol, Pure	N	N
Methyl Acetate	N	N

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Chemical	23°C (73°F)	Max. Temp. °F (°C)
Methyl Chloride	N	N
Methyl Ethyl Ketone	N	N
Methyl Formate	N	N
Methyl Isobutyl Ketone	N	N
Methyl Isopropyl Ketone	N	N
Methyl Methacrylate	N	N
Methylamine	N	N
Methylene Bromide	N	N
Methylene Chloride	N	N
Methylene Chlorobromide	N	N
Methylene Iodide	N	N
Mineral Oil	R	-
Molasses	R	R
Monoethanolamine	N	N
Morpholine	N	N
Motor Oil	R	-
Muriatic Acid	R	180°F (82°C)
N		
Naphtha	R	-
Naphthalene	R	-
Nickel Acetate	R	200°F (93°C)
Nickel Chloride	R	200°F (93°C)
Nickel Nitrate	R	200°F (93°C)
Nickel Sulfate	R	200°F (93°C)
*Nitric Acid, up to 25%	R[1]	150°F (65°C)
*Nitric Acid, 25-35%	R[1]	130°F (54°C)
*Nitric Acid, 70%	R[1]	105°F (40°C)
Nitrobenzene	N	N
Nitroethane	N	N
Nitroglycerine	N	N
Nitromethane	N	N
Nitrous Acid	R	-
O		
Octane	R	-
1-Octanol	E	E-180°F (82°C)
Oils, Sour Crude	N	N
Oleum N N	N	N
Olive Oil N N	N	N
Oxalic Acid, Sat'd	R	170°F (76°C)
Oxygen	R[2]	180°F (82°C)
Ozonized Water	R	200°F (93°C)
P		
Palm Oil	E	E-180°F (82°C)
Paraffin	R	180°F (82°C)
Peanut Oil	E	E-180°F (82°C)
Peracetic Acid	N	N
Perchloric Acid, 10%	R	-
Phenol	R	-
Phenylhydrazine	N	N
Phosphoric Acid	R	180°F (82°C)
Phosphorus Pentoxide	R	-
Phosphorus Trichloride	N	N
Photographic Solutions	R	180°F (82°C)
Phthalic Acid	N	N
Picric Acid	N	N
Pine Oil	N	N
Plating Solutions	R	180°F (82°C)
Polyethylene Glycol	E	E-180°F (82°C)
Polyvinyl Alcohol	R	180°F (82°C)
Potash	R	200°F (93°C)
Potassium Acetate	R	200°F (93°C)
Potassium Bicarbonate	R	200°F (93°C)
Potassium Bichromate	R	200°F (93°C)
Potassium Bisulfate	R	200°F (93°C)
Potassium Bisulfite	R	200°F (93°C)
Potassium Borate	R	200°F (93°C)
Potassium Bromate	R	200°F (93°C)
Potassium Bromide	R	200°F (93°C)
Potassium Carbonate	R	200°F (93°C)
Potassium Chlorate	R	200°F (93°C)
Potassium Chloride	R	200°F (93°C)
Potassium Chromate	R	200°F (93°C)
Potassium Cyanate	R	200°F (93°C)

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Chemical	23°C (73°F)	Max. Temp. °F (°C)
Potassium Cyanide	R	200°F (93°C)
Potassium Dichromate	R	200°F (93°C)
Potassium Ferricyanide	R	200°F (93°C)
Potassium Ferrocyanide	R	200°F (93°C)
Potassium Fluoride	R	200°F (93°C)
*Potassium Hydroxide	R	180°F (82°C)
Potassium Hypochlorite	R[3,4]	200°F (93°C)
Potassium Iodide	R	200°F (93°C)
Potassium Nitrate	R	200°F (93°C)
Potassium Perborate	R	180°F (82°C)
Potassium Perchlorate, sat'd	R	180°F (82°C)
Potassium Permanganate, sat'd	R	180°F (82°C)
Potassium Persulfate, sat'd	R	-
Potassium Phosphate	R	180°F (82°C)
Potassium Sulfate	R	200°F (93°C)
Potassium Sulfide	R	200°F (93°C)
Potassium Sulfite	R	200°F (93°C)
Potassium Tripolyphosphate	R	200°F (93°C)
Propanol, up to 0.5%	R	180°F (82°C)
Propanol, greater than 0.5%	E	E-180°F (82°C)
Propanol, pure	E	E-180°F (82°C)
Propargyl Alcohol	E	E-180°F (82°C)
Propionic Acid, up to 2%	R	180°F (82°C)
Propionic Acid, greater than 2%	E	E-180°F (82°C)
Propionic Acid, pure	N	N
Propyl Acetate	N	N
Propyl Bromide	N	N
Propylene Dichloride	N	N
Propylene Gycol, up to 35%	R	180°F (82°C)
Propylene Gycol, greater than 35%	E	E-180°F (82°C)
Propylene Oxide	N	N
Pyridine	N	N
Pyrogallol	R	-
Pyrrole	N	N
S		
Salicylaldehyde	N	N
Sea Water	R	200°F (93°C)

Chemical	23°C (73°F)	Max. Temp. °F (°C)
Silicic Acid	R	-
Silicone Oil	R	-
Silver Chloride	R	200°F (93°C)
Silver Cyanide	R	200°F (93°C)
Silver Nitrate	R	200°F (93°C)
Silver Sulfate	R	200°F (93°C)
Soaps	R	200°F (93°C)
Sodium Acetate	R	200°F (93°C)
Sodium Aluminate	R	200°F (93°C)
Sodium Arsenate	R	200°F (93°C)
Sodium Benzoate	R	200°F (93°C)
Sodium Bicarbonate	R	200°F (93°C)
Sodium Bichromate	R	200°F (93°C)
Sodium Bisulfate	R	200°F (93°C)
Sodium Bisulfite	R	200°F (93°C)
Sodium Borate	R	200°F (93°C)
Sodium Bromide	R	200°F (93°C)
Sodium Carbonate	R	200°F (93°C)
Sodium Chlorate	R	200°F (93°C)
Sodium Chloride	R	200°F (93°C)
Sodium Chlorite	R	200°F (93°C)
Sodium Chromate	R	200°F (93°C)
Sodium Cyanide	R	200°F (93°C)
Sodium Dichromate	R	200°F (93°C)
Sodium Ferricyanide	R	200°F (93°C)
Sodium Ferrocyanide	R	200°F (93°C)
Sodium Fluoride	R	200°F (93°C)
Sodium Fluorosilicate	R	180°F (82°C)
Sodium Formate	R	200°F (93°C)
Sodium Hexametaphosphate – Saturated	R	180°F (82°C)
*Sodium Hydroxide	R	180°F (82°C)
Sodium Hypobromite	R	200°F (93°C)
Sodium Hypochlorite	R[3,4]	200°F (93°C)
Sodium Iodide	R	200°F (93°C)
Sodium Metabisulfite – Saturated	R	180°F (82°C)
Sodium Metaphosphate	R	200°F (93°C)
Sodium Nitrate	R	200°F (93°C)

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Chemical	23°C (73°F)	Max. Temp. °F (°C)
Sodium Nitrite	R	200°F (93°C)
Sodium Palmitate	R	200°F (93°C)
Sodium Perborate	R	180°F (82°C)
Sodium Percarbonate, 15%	R	180°F (82°C)
Sodium Perchlorate	R	180°F (82°C)
Sodium Permanganate, 25%	R	180°F (82°C)
Sodium Phosphate	R	200°F (93°C)
Sodium Silicate	R	200°F (93°C)
Sodium Sulfate	R	200°F (93°C)
Sodium Sulfide	R	200°F (93°C)
Sodium Sulfite	R	200°F (93°C)
Sodium Thiosulfate	R	200°F (93°C)
Sodium Tripolyphosphate	R	200°F (93°C)
Soybean Oil	E	E-180°F (82°C)
Stannic Chloride	R	200°F (93°C)
Stannous Chloride	R	200°F (93°C)
Stannous Sulfate	R	200°F (93°C)
Starch	R	200°F (93°C)
Stearic Acid	R	-
Strontium Chloride	R	200°F (93°C)
Styrene	N	N
Succinic Acid	-	-
Sugar	R	200°F (93°C)
Sulfamic Acid	R	180°F (82°C)
Sulfur	R	-
Sulfur Dioxide – Aqueous	R	-
*Sulfuric Acid, Fuming	N	N
*Sulfuric Acid, 98%	R[1]	125°F (51°C)
*Sulfuric Acid, 85%	R[1]	170°F (76°C)
*Sulfuric Acid, 80%	R	180°F (82°C)
*Sulfuric Acid, 50%	R	180°F (82°C)
*Sulfurous Acid	R	-
T		
Tall Oil	E	E-180°F (82°C)
Tannic Acid, 30%	R	-
Tartaric Acid	R	-
Tetraacetyl Ethylene Diamine, sat'd	R	180°F (82°C)
Tetrahydrofuran	N	N
Tetrahydronaphthalene	R	-
Tetrasodiumpyrophosphate	R	200°F (93°C)
Thionyl Chloride	N	N
Toluene	N	N
Tomato Juice	R	180°F (82°C)
Tributyl Citrate	N	N
Tributyl Phosphate	N	N
Trichloroacetic Acid	N	N
Trichloroethylene	N	N
Triethanolamine	N	N
Triethylamine	N	N
Trimethylpropane	R	-
Trisodium Phosphate	R	200°F (93°C)
Tung Oil	E	E-180°F (82°C)
Turpentine	N	N
U		
Urea	N	N
Urine	R	200°F (93°C)
V		
Vegetable Oil	E	E-180°F (82°C)
Vinegar	R	200°F (93°C)
Vinyl Acetate	N	N
W		
Water, Deionized	R	200°F (93°C)
Water, Demineralized	R	200°F (93°C)
Water, Distilled	R	200°F (93°C)
Water, Salt	R	200°F (93°C)
Water	R	200°F (93°C)
Whiskey	R	200°F (93°C)
White Liquor	R	200°F (93°C)
Wine	R	200°F (93°C)
X		
Xylene	N	N
Z		
Zinc Acetate	R	200°F (93°C)
Zinc Carbonate	R	200°F (93°C)
Zinc Chloride	R	200°F (93°C)
Zinc Nitrate	R	200°F (93°C)
Zinc Sulfate	R	200°F (93°C)

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These tables are meant to aid the designer in decisions as to transporting/conveyance of undiluted chemicals. Chemical resistance data is provided as a guide only. Information is based primarily on immersion of unstressed strips in chemicals and to lesser degree on field experience.

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