# UPVC PIPES \& FITTINGS SCH 40/DWV 



Tahweel products are entirely manufactured in accordance with the European standards and highly advanced technologies. Our products are durable to different water pressures and harsh environmental conditions.

Tahweel systems follow German standard. Tahweel applies a strict quality control system on all its products and provides non-corrosive, defect-free and safe pipes for a smooth flow of water for homes and industrial processes.


QUALITY ASSURANCE

TAHWEEL, high-performance extruders with advanced process control and monitoring system permit an increased rate of production over the entire diameter ranges, adhering to the highest quality. TAHWEEL, high-technology molding machines with advanced automated tooling, permit high volume production of Fittings with exceptionally high consistency in terms of dimensional accuracy, mechanical strength and surface finish. At TAHWEEL, sophisticated quality control procedures and advanced manufacturing techniques work hand-in-hand to assure the highest quality and dimensional consistency in thermoplastic piping products.

From the receipt of the bulk resins to the final stages of production, TAHWEEL maintains a stringent quality control program by qualified technical personnel using sophisticated procedures, with the latest equipment's. Both on-line Q.C. checks and in-lab tests are conducted. Permit increased the rate of production over the entire diameter ranges, adhering to the highest quality. TAHWEEL high technology molding machines with advanced automated tooling, permit high volume production of fittings with exceptionally high consistency in terms of dimensional accuracy, mechanical strength and surface finish.

Tahweel never comprises its quality. We are constantly providing the best quality. Our products and services are progressively enhanced through strict compliance with an effective quality assurance system using state of the art laboratory. We ensure that quality requirements are being fulfilled in order to deliver fittingness, effectiveness and proficiency of our products.


# UPVC PIPES \& FITTINGS <br> SCH 40 / DWV 

U-PVC SCH-40 PRESSURE \& DRAINAGE FITTINGS



Elbow $90^{\circ}$

| Size (Inches) | Ordering Code | Dimension |  |  | Socket <br> Wallthickness | Body <br> Wallihickness |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A(mm) | $\mathbf{B ( m m )}$ | $\mathbf{C ( m m )}$ | $(\mathrm{mm})$ | $(\mathrm{mm})$ |  |
| $11 / 2^{\prime \prime}$ |  | 84.4 | 84.4 | 29.5 | 4.10 | 5.90 |
| 2 " | 96.95 | 96.95 | 30.0 | 4.10 | 6.0 |  |
| 4 " |  | 176 | 176 | 53.6 | 6.10 | 6.50 |
| 110 mm | 171.4 | 171.4 | 53.6 | 6.10 | 6.50 |  |
| Socket Type |  |  |  |  | Solvent Weld |  |



| Elbow $87.5^{\circ}$ (Swept) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Size (Inches) | Ordering Code | Dimension |  |  | Socket Wallthickness | $\begin{gathered} \text { Body } \\ \text { Wallihickness } \end{gathered}$ |
|  |  | A(mm) | $\mathrm{B}(\mathrm{mm})$ | C (mm) | (mm) | (mm) |
| $6^{\prime \prime}$ |  | 307.4 | 302.3 | 83 | 7.10 | 7.50 |
| Socket Type | Solvent Weld |  |  |  |  |  |

## U-PVC SCH-40 PRESSURE \& DRAINAGE FITTINGS

STANDARD


ASTM D 2466 / 2665 / DIN


| Elbow $45^{\circ}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Size (lnches) | Ordering Code | Dimension |  |  | $\begin{gathered} \text { Socket } \\ \text { Wallthickness } \end{gathered}$ | $\begin{gathered} \text { Body } \\ \text { Wallihickness } \end{gathered}$ |
|  |  | A(mm) | B (mm) | C (mm) | (mm) | (mm) |
| 11/2" |  | 92.3 | 78.2 | 29.5 | 4.10 | 5.90 |
| $2 "$ |  | 102.23 | 90.88 | 30.0 | 4.10 | 6.0 |
| 4" |  | 179.3 | 163.8 | 53.6 | 6.10 | 6.50 |
| 110 mm |  | 177 | 159.9 | 53.6 | 6.10 | 6.50 |
| $6 "$ |  | 270 | 241 | 83.0 | 7.10 | 7.50 |
| Socket Type |  |  |  |  | t Weld |  |


| Coupling |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Size (nches) | Ordering Code | Dimension |  |  | $\begin{gathered} \text { Socket } \\ \text { Wallihickness } \end{gathered}$ | $\begin{gathered} \text { Body } \\ \text { Wallithickness } \end{gathered}$ |
|  |  | A(mm) | $\mathrm{B}(\mathrm{mm})$ | C (mm) | (mm) | (mm) |
| 11/2" |  | 62 | 56.8 | 29.5 | 4.10 | 4.10 |
| 2 " |  | 65 | 68.9 | 30.0 | 4.10 | 4.10 |
| $4{ }^{\text {" }}$ |  | 107 | 127 | 51.0 | 6.10 | 6.10 |
| 110 mm |  | 107 | 122.8 | 51.0 | 6.10 | 6.10 |
| $6 "$ |  | 167.5 | 183.0 | 80.0 | 7.10 | 7.10 |
| Socket Type |  |  |  |  | ent Weld |  |



| Wye-Branch |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Size (nches) | Ordering Code | Dimension |  |  |  |  |
|  |  | $\mathrm{A}(\mathrm{mm})$ | B (mm) | C (mm) | (mm) | (mm) |
| 11/2" |  | 133 | 112.1 | 31.4 | 4.10 | 4.50 |
| $2 "$ |  | 153 | 133.4 | 31.8 | 4.10 | 4.50 |
| 4" |  | 275 | 245.11 | 53.6 | 6.10 | 6.50 |
| 110 mm |  | 270 | 237.33 | 53.6 | 6.10 | 6.50 |
| $6 "$ |  | 410 | 359.8 | 83 | 7.10 | 7.50 |
| Socket Type | Solvent Weld |  |  |  |  |  |


| Siphon (P-Trap) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Size (Inches) | Ordering Code | Dimension |  |  | $\begin{gathered} \text { Socket } \\ \text { Wallthickness } \end{gathered}$ | $\begin{aligned} & \text { Body } \\ & \text { Wallihickness } \end{aligned}$ |
|  |  | A(mm) | B (mm) | C (mm) | (mm) | (mm) |
| $4{ }^{4}$ |  | 163.2 | 255.5 | 53.6 | 6.10 | 6.50 |
| 110 mm |  | 159.6 | 247.94 | 53.6 | 6.10 | 6.50 |
| Socket Type | Solvent Weld |  |  |  |  |  |

## U-PVC SCH-40 PRESSURE \& DRAINAGE FITTINGS



Access cap (Female)

| Size (Inches) | Ordering Code | Dimension |  |  | Socket <br> Wallthickness | Body <br> Wallithickness |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A(mm) | $B(\mathrm{~mm})$ | $C(\mathrm{~mm})$ | $(\mathrm{mm})$ | $(\mathrm{mm})$ |  |
| 4 " | 120.4 | 120.4 | 30 | 5.50 | 6.0 |  |

## UPVC PRESSURE PIPES

| UPVC Pipes According to ASTM D-1785, Schedule 40 \& 80 |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STANDARD : |  |  | ASTM D - 1785, Schedule 40 \& 80 |  |  |  |  |  |
| Nominal Size | Nominal OD (mm) |  | Wall Thickness (mm) \& Pressure Rating (PSI) |  |  |  |  |  |
| Nominal Size |  |  | Schedule 40 |  |  | Schedule 80 |  |  |
| Inches | Min | Max | Min | Max | PSI | Min | Max | PSI |
| $1{ }^{\prime \prime}$ | 33.27 | 33.53 | 3.38 | 3.89 | 450 | 4.55 | 5.08 | 630 |
| 11/4" | 42.03 | 42.29 | 3.56 | 4.07 | 370 | 4.85 | 5.43 | 520 |
| $11 / 2^{\prime \prime}$ | 48.11 | 48.41 | 3.68 | 4.19 | 330 | 5.08 | 5.69 | 470 |
| 2 " | 60.17 | 60.47 | 3.91 | 4.42 | 280 | 5.54 | 6.20 | 400 |
| $3 "$ | 88.70 | 89.10 | 5.49 | 6.15 | 260 | 7.62 | 8.53 | 370 |
| 4" | 114.07 | 114.53 | 6.02 | 6.73 | 220 | 8.56 | 9.58 | 320 |
| $6 "$ | 168.00 | 168.56 | 7.11 | 7.97 | 180 | 10.97 | 12.29 | 280 |

Notes: Pipe Length
Color
Socket Type
5.8 meters (Other lengths are available on request)
:Schedule 40 -White \& Schedule 80 - Dark Grey
S (Solvent weld)
$1 \mathrm{Bar}=14.50 \mathrm{PSI}=1.02 \mathrm{Kg} / \mathrm{Cm} 2=0.10 \mathrm{M} \mathrm{Pa}$.

DRAINAGE AND SEWERAGE SYSTEMS

| UPVC Drain, Waste, Vent Pipes According to ASTM D 2665 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| STANDARD : |  | ASTM D 2665 |  |  |
| Nominal Size | Nominal OD (mm) |  | Wall Thickness (mm) |  |
| Inches | Min | Max | Min | Max |
| 11/4" | 42.03 | 42.29 | 3.56 | 4.07 |
| 11/2" | 48.11 | 48.41 | 3.68 | 4.19 |
| $2 "$ | 60.18 | 60.47 | 3.91 | 4.42 |
| $3 "$ | 88.70 | 89.10 | 5.49 | 6.15 |
| $4 "$ | 114.07 | 114.53 | 6.02 | 6.73 |
| $6{ }^{\prime \prime}$ | 168.00 | 168.56 | 7.1 | 7.97 |

Notes:

## Pipe Length Color

 Socket Type5.8 meters (Other lengths are available on request)
:Schedule 40 -White \& Schedule 80 - Dark Grey
S (Solvent weld)
$1 \mathrm{Bar}=14.50 \mathrm{PSI}=1.02 \mathrm{Kg} / \mathrm{Cm} 2=0.10 \mathrm{M} \mathrm{Pa}$.

UPVC PRESSURE PIPES

| (1) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| UPVC Pipes According to ASTM D - 1785, Schedule 40 \& 80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| STANDARD : |  |  | ASTM D-1785, Schedule 40 \& 80 |  |  |  |  |  |  |  |  |  |  |  |
| Nominal Size | Nominal OD (mm) |  | Wall Thickness (mm) \& Pressure Rating (PSI) |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | $\begin{aligned} & \text { SDR } 41 \\ & \hline 100 \text { PSI } \end{aligned}$ |  | $\begin{gathered} \text { SDR } 32.5 \\ \hline 125 \mathrm{PSI} \end{gathered}$ |  | $\begin{gathered} \text { SDR } 26 \\ \hline 160 \text { PSI } \end{gathered}$ |  | $\begin{aligned} & \text { SDR } 21 \\ & \hline 200 \text { PSI } \end{aligned}$ |  | $\begin{aligned} & \text { SDR } 17 \\ & \hline 250 \text { PSI } \end{aligned}$ |  | $\begin{gathered} \hline \text { SDR } 13.5 \\ \hline 315 \mathrm{PSI} \end{gathered}$ |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inches | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| $1{ }^{17}$ | 33.27 | 33.53 | - | - | - | - | 1.52 | 2.03 | 1.60 | 2.11 | 1.96 | 2.46 | 2.46 | 2.97 |
| 11/4" | 42.03 | 42.29 | - | - | 1.52 | 2.03 | 1.63 | 2.13 | 2.01 | 2.52 | 2.49 | 3.00 | 3.12 | 3.60 |
| $11 / 2^{\prime \prime}$ | 48.11 | 48.41 | - | - | 1.52 | 2.03 | 1.85 | 2.36 | 2.29 | 2.80 | 2.84 | 3.35 | 3.58 | 4.09 |
| $2^{\prime \prime}$ | 60.17 | 60.47 | - | - | 1.85 | 2.36 | 2.31 | 2.82 | 2.87 | 3.38 | 3.56 | 4.06 | 4.47 | 4.98 |
| $21 / 2^{\prime \prime}$ | 72.84 | 73.26 | - | - | 2.23 | 2.74 | 2.79 | 3.30 | 3.48 | 4.00 | 4.29 | 4.80 | 5.41 | 6.07 |
| $3^{\prime \prime}$ | 88.70 | 89.10 | 2.16 | 2.67 | 2.74 | 3.25 | 3.43 | 3.94 | 4.24 | 4.75 | 5.23 | 5.87 | 6.58 | 7.37 |
| 4" | 114.07 | 114.53 | 2.80 | 3.30 | 3.51 | 4.01 | 4.39 | 4.90 | 5.44 | 6.10 | 6.73 | 7.54 | 8.46 | 9.47 |
| $6^{\prime \prime}$ | 168.00 | 168.56 | 4.11 | 4.62 | 5.18 | 5.79 | 6.48 | 7.26 | 8.03 | 9.00 | 9.91 | 11.10 | 12.47 | 13.97 |

Notes:

Pipe Length
Socket type SDR
5.8 meters (Other lengths are available on request)

White
S (Solvent Weld)
= Outside Diameter/Wall Thickness (min)
Note: The maximum pressure rating given above is based on water at $73^{\circ} \mathrm{F} / 23^{\circ} \mathrm{C}$ and for unthreaded pipes.

## UPVC PRESSURE PIPES

| UPVC pipes according to (DIN 8061/62, DIN 19532) |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STANDARD : |  |  | DIN 8061/8062, DIN 19532 |  |  |  |  |  |  |  |  |  |
| Nominal Size | Nominal OD (mm) |  | Wall Thickness (mm) \& Pressure Rating (Bars) |  |  |  |  |  |  |  |  |  |
|  |  |  | Ventilation |  | $\begin{gathered} \text { Class } 2 \\ \hline \text { (4 Bar) / PN } 4 \\ \hline \end{gathered}$ |  | $\frac{\text { Class } 3}{(6 \mathrm{Bar}) / \text { PN } 6}$ |  | $\frac{\text { Class } 4}{(10 \text { Bar) / PN } 10}$ |  | $\frac{\text { Class } 5}{(16 \text { Bar) / PN } 16}$ |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| mm | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| 32 | 32.0 | 32.2 | - | - | - | - | - | - | 1.6 | 2.0 | 2.4 | 2.9 |
| 40 | 40.0 | 40.2 | - | - | - | - | - | - | 1.9 | 2.3 | 3.0 | 3.5 |
| 50 | 50.0 | 50.2 | - | - | - | - | 1.5 | 1.9 | 2.4 | 2.9 | 3.7 | 4.3 |
| 63 | 63.0 | 63.3 | - | - | - | - | 1.9 | 2.3 | 3.0 | 3.5 | 4.7 | 5.4 |
| 75 | 75.0 | 75.3 | - | - | 1.5 | 1.9 | 2.2 | 2.7 | 3.6 | 4.2 | 5.6 | 6.4 |
| 90 | 90.0 | 90.3 | - | - | 1.8 | 2.2 | 2.7 | 3.2 | 4.3 | 5.0 | 6.7 | 7.6 |
| 110 | 110.0 | 110.4 | 1.8 | 2.2 | 2.2 | 2.7 | 3.2 | 3.8 | 5.3 | 6.1 | 8.1 | 9.2 |
| 160 | 160.0 | 160.5 | 1.8 | 2.2 | 3.2 | 3.8 | 4.7 | 5.4 | 7.7 | 8.7 | 11.8 | 13.2 |

Notes: Pipe Length Color

Socket Type
5.8 meters (Other lengths are available on request)

Grey for Class 1
S or RR (Solvent weld or Rubber seal ring produced on request) Nominal pressure PN based on service (design) coefficient $\mathrm{C}=2,5$

## UPVC PRESSURE PIPES

## BSEN 1452-2 : 2009 - Plastics Piping Systems (PVC-U) - Metric Sizes

| STANDARD : |  | BSEN 1452-2 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Nominal OD | Nominal Wall Thickness (mm) minimum |  |  |  |  |  |  |  |
|  |  |  |  | Pipe Series |  |  |  |  |
|  | S 20 | S 16.7 | S 16 | S 12.5 | S 10 | S 8 | S 6.3 | S 5 |
|  | SDR 41 | SDR 34.4 | SDR 33 | SDR 26 | SDR 21 | SDR 17 | SDR 13.6 | SDR 11 |
| mm | - | PN 6 | PN 6 | PN 8 | PN 10 | PN 12.5 | PN 16 | PN 20 |
| 32 | - | - | - | 1.5 | 1.6 | 1.9 | 2.4 | 2.9 |
| 40 | - | - | 1.5 | 1.6 | 1.9 | 2.4 | 3.0 | 3.7 |
| 50 | - | 1.5 | 1.6 | 2.0 | 2.4 | 3.0 | 3.7 | 4.6 |
| 63 | - | 1.9 | 2.0 | 2.5 | 2.5 | 3.8 | 4.7 | 5.8 |
| 75 | - | 2.2 | 2.3 | 2.9 | 2.9 | 4.5 | 5.6 | 6.8 |
| 90 | - | 2.7 | 2.8 | 3.5 | 3.5 | 5.4 | 6.7 | 8.2 |
|  | PN 6 | PN 7.5 | PN 8 | PN 10 | PN 12.5 | PN 16 | PN 20 | PN 25 |
| 110 | 2.7 | 3.2 | 3.4 | 4.2 | 5.3 | 6.6 | 8.1 | 10.0 |
| 125 | 3.1 | 3.7 | 3.9 | 4.8 | 6.0 | 7.4 | 9.2 | 11.4 |
| 140 | 3.5 | 4.1 | 4.3 | 5.4 | 6.7 | 8.3 | 10.3 | 12.7 |
| 160 | 4.0 | 4.7 | 4.9 | 6.2 | 7.7 | 9.5 | 11.8 | 14.6 |

Notes: Pipe Length Color

Socket type
5.8 meters (Other lengths are available on request)

Grey

Nominal pressure PN based on service (design) coefficient C=2.5 (size upto 90mm) Nominal pressure PN based on service (design) coefficient $\mathrm{C}=2.0$ (Size from 110 mm )

GENERAL PROPERTIES OF TAHWEEL PIPES \& FITTINGS MADE OF RIGID UPVC

## Material:

Unplasticised Polyvinylchloride.

## Standard Length:

Available in the length of 6 Meters or at any other lengths as per customer's request. Pipes are with or without socket. Socket are either solvent cement welding type or rubber ring joining type.

Color:
Black, gray, white, blue, orange or any other colours or request.
Specific Gravity: $1.42 \pm 0.02$
Flammability: Will not support combustion.

| MATERIAL TECHNMAL DATA |  |  |  |
| :---: | :---: | :---: | :---: |
| Properties | Unit | uPVC | Test Method |
| Physical Properties |  |  |  |
| Specific Farvity ( Compound) | $\mathrm{g} / \mathrm{cm}^{3}$ | 1.4-1.42 | ASTM D 792 |
| Water Absorption (24 H Boiling Water) | $\mathrm{mg} / \mathrm{cm}^{2}$ | < 4 | ISO 2508 |
| Water Absorption ( 24 H at $23^{\circ} \mathrm{C}$ ) | \%weight gain | 0.05 | ASTM D 570 |
| Flammability | N/A | Self extinguishing | - |
| Resistance To Burning | Sec | < 5 | ASTM D 635 |
| Vicat Softening Temperature (VST 5 Kgf ) | ${ }^{\circ} \mathrm{C}$ | $>80$ | ISO 306 |
| Thermal Conductivity | W K ${ }^{-1} \mathrm{~m}^{-1}$ | 0.15 | DIN 52612-1 |
| Co-Efficient Of Thermal Leniar Expansion | $\mathrm{mm} / \mathrm{mm}{ }^{\circ} \mathrm{C}$ | $0.8 \times 10^{-4}$ | ASTN D 696 |
| Specific Heat | $\mathrm{Cal} / \mathrm{g}^{\circ} \mathrm{C}$ | 0.25 | - |
| Mechanical Properties |  |  |  |
| Tensile Strength @ $23^{\circ} \mathrm{C}$ Minimum | Mpa | 50 | ASTM D 638 |
| Tensile Modules Of Elasticity @ $23{ }^{\circ} \mathrm{C}$ | Mpa | 3000 | ASTM D 638 |
| Compressive Strength @ $23^{\circ} \mathrm{C}$ | Mpa | 65 | ASTM D 695 |
| Flexural Strength @ $23^{\circ} \mathrm{C}$ | Mpa | 89 | ASTM D 790 |
| Poisson's Ratio @ $23^{\circ} \mathrm{C}$ | - | 0.38 | - |
| Izod Impact Strength (Notched) @ $23^{\circ} \mathrm{C}$ | $\begin{gathered} \mathrm{J} / \mathrm{m} \\ \mathrm{Ft} . \mathrm{lbs} / \mathrm{in} . \end{gathered}$ | $\begin{aligned} & 53 \\ & 1.0 \end{aligned}$ | ASTM D 256 |
| Hardness Strength @ $23^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { Durometer "D" } \\ & \text { R}^{\circ} \mathrm{Ckwell} \text { "R" } \end{aligned}$ | $\begin{gathered} 80 \\ 110 \end{gathered}$ | ASTM D 2240 ASTM D 785 |
| Electrical Properties |  |  |  |
| Volume Resistivity @ $23{ }^{\circ} \mathrm{C}$ | Ohm/cm | $3 \times 10^{15}$ | ASTM D 257 |
| Surface Resistivity | Ohm | $>10^{12}$ | DIN IEC60093 |
| Power Factor @ 60Hz | \% | 1.255 | ASTM D 150 |
| Dielectric Strength | Volts / mm | 1400 | ASTM D 147 |
| Dielectric Constant 60Hz @ $30{ }^{\circ} \mathrm{F}$ | - | 3.70 | ASTM D 150 |

Above mentioned values may varied according to conpounds ans products*

THERMAL DE-RATING FACTORS FOR UPVC PRESSURE PIPES AND FITTINGS

| Maximum service temperature <br> $\left({ }^{\circ} \mathrm{C}\right)$ | Multiply working pressure at <br> $\left(20{ }^{\circ} \mathrm{C}\right)$ by these factors |
| :---: | :---: |
| 20 | 1 |
| 25 | 0.9 |
| 30 | 0.8 |
| 35 | 0.7 |
| 40 |  |
|  |  |
|  |  |

UPVC PIPE LENGTH VARIATION DUE TO TEMPERATURE CHANGE ( ${ }^{\circ} \mathrm{C}$ )

| Temperature Change <br> $\left({ }^{\circ} \mathrm{C}\right)$ | Length Variation <br> $\mathrm{mm} / \mathrm{meter}$ |
| :---: | :---: |
| 5 | 0.4 |
| 10 | 0.8 |
| 15 | 1.2 |
| 20 | 1.6 |
| 25 | 2.0 |
| 30 | 2.4 |
| 35 | 2.8 |
| 40 | 3.2 |
| 45 | 3.6 |
| 50 | 4.0 |
| 55 | 4.4 |
| 60 | 4.8 |



ALLOWABLE WORKING PRESSURE FOR PIPES MADE OF UPVC CONVEYING WATER
Safety factor $\mathbf{C}=2.5$

| $\begin{aligned} & \text { Temperature } \\ & { }^{\circ} \mathrm{C} \text { 保 } \end{aligned}$ | Year of Service | Pipe Series S |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Standard dimension ratio (SDR) |  |  |  |
|  |  | 51 | 34.4 | 21 | 13.6 |
|  |  | Class 2 | Class 3 | Class 4 | Class 5 |
|  |  | Allowable working presuure (bar) |  |  |  |
| 10 | 5 | 5.2 | 7.8 | 13 | 20.9 |
|  | 10 | 5.1 | 7.6 | 12.7 | 20.4 |
|  | 25 | 4.9 | 7.4 | 12.3 | 19.7 |
|  | 50 | 4.8 | 7.2 | 12.0 | 19.3 |
|  | 100 | 4.7 | 7.1 | 11.8 | 18.8 |
| 20 | 5 | 4.4 | 6.6 | 11.0 | 17.5 |
|  | 10 | 4.3 | 6.4 | 10.7 | 17.1 |
|  | 25 | 4.1 | 6.2 | 10.3 | 16.4 |
|  | 50 | 4.0 | 6.0 | 10.0 | 16.0 |
|  | 100 | 3.9 | 5.8 | 9.7 | 15.6 |
| 30 | 5 | 3.5 | 5.3 | 8.8 | 14.1 |
|  | 10 | 3.4 | 5.1 | 8.6 | 13.7 |
|  | 25 | 3.3 | 4.9 | 8.2 | 13.2 |
|  | 50 | 3.2 | 4.8 | 8.0 | 12.7 |
| 40 | 5 | 2.7 | 4.1 | 6.8 | 10.8 |
|  | 10 | 2.6 | 3.9 | 6.5 | 10.4 |
|  | 25 | 2.5 | 3.7 | 6.2 | 9.9 |
|  | 50 | 2.4 | 3.6 | 6.0 | 9.6 |
| 50 | 5 | 1.9 | 2.9 | 4.8 | 7.6 |
|  | 10 | 1.8 | 2.7 | 4.6 | 7.3 |
|  | 25 | 1.7 | 2.6 | 4.3 | 6.9 |
| 60 | 5 | 1.2 | 1.8 | 3.0 | 4.8 |
|  | 10 | 1.1 | 1.7 | 2.8 | 5.4 |
|  | 25 | 1.1 | 1.6 | 2.6 | 4.2 |



UPVC FITTINGS ASTM SCHEDULE SERIES
ASTM D2466/ D2665 Sch. 40 PVC Pressure/DWV Fitting
TAHWEEL ASTM D-series Solvent Weld PVC Molded Fittings are manufactured to meet the needs of residential, commercial, \& industrial plumbing systems, and other pressure applications. With top quality raw materials and modern processing technology, our ASTM D-series Fittings meets all industry standards in addition to our own rigorous quality control standards. TAHWEEL Pipes and fittings shall be manufactured as a system and be the product of one manufacturer

## UNDERGROUND INSTALLATION

## TRENCH WIDTH PREPARATION COVER AND BACKFILLING

## TRENCH PREPARATION:

- Trenches should be excavated to allow for the specified depth for bedding, backfill and trench bottom should be examined for irregularities and any hard projections should removed.
- A trench should be as stable, narrow as practical but adequate to allow space for working area and for jointing and inspection.


## Trench Widths:

- Trench width should be 30 cm wider than the diameter of the pipe irrespective of soil condition.
- Below table recommended Nominal Pipe Size and Minimum Trench Width, the trench should not exceed the widths given in the Table below.

| Nominal Pipe Size $(\mathrm{mm})$ | Minimum Trench Width $(\mathrm{mm})$ |
| :---: | :---: |
| $<90$ | 300 |
| $90-630$ | Pipe OD. Plus 300 |
| $630-1600$ | Pipe OD. Plus 600 |

## Trench Depths:

- The depth of the trench must be appropriate to prevent damage to the pipe when the anticipated loads are imposed upon it.
- The recommended minimum trench depth is at least 1 m from top of pipe to ground surface which is determined by the loads imposed on the pipe such as the mass of backfill material, the excepted traffic loads and any other loads.
- Requirements for trench bottom should be smooth, stable and uniform that will provide adequate protection for all classes of pipe and prevent possible damage of pipes.




## LAYING:

- When the pipe has to be laid in hot weather, precautions should be taken to allow for the contraction of the line which will occur when it cools to its normal working temperature
- It is necessary to ensure during laying the PVC pipe under the ground to remove all rocks, boards, Empty primer and cement cans, brushes, bottles, sharp objects and other debris from the trench.
- Pipe requires more substantial earth loading immediately after laying the pipes in waterlogged ground because of the low relative density of PVC pipe and readiness to float.


## BEDDING \& SIDE FILLING:

- Proper soil support under the bottom of the pipe is also necessary to maintain grade (elevation) of the pipe. Continuous, uniform support under the pipe prevents unequal settlement of the pipeline.
- The soil must be strong enough so the pipe does not deflect significantly. The allowable amount of deflection varies according to the type of pipe.
- The bedding is the material placed in the bottom of the trench on which the pipe is laid. The bedding for pipe is an uncompact layer of select material is placed over the foundation or the replaced foundation. The thickness of this layer depends on the pipe diameter.
- Bedding should consist of free flowing material such as gravel, sand, salty sand or clay sand that is free of stones or hard particles larger than $1 \frac{1}{2}$ inch.
- Selected granular materials for bedding should then be carefully placed and compacted in uniform layers alongside and under the pipe up to a height of 150 mm or more above the crown.
- After the pipe have been laid and tested further material should be placed around the pipe and compacted in 75 mm layers up to a level at least 100 mm above the top of the pipe.
- Be ensure that the spaces between the pipes and soil faces of the trench are completely filled with well compacted granular materials in order to provide the necessary side support for the pipes and prevent excessive deformation under load. It may be helpful especially when thin wall piping is being laid if the pipe can be full of water during this operation.


## HAUNCHING:

- Placement and compaction of the haunching material are the most important factors affecting pipe performance and deflection.
- Proper placement and compaction of material in the haunch reduce voids and increase pipe support.
- Granular materials may be properly placed using techniques such as shovel slicing.
- Place material under the haunches and at least halfway up the pipe to provide side support.
- Make sure material is properly compacted. Do not disturb side support when moving sheeting or trench box.
- The side support materials must be carefully placed around the haunches of the pipes to ensure that the pipes are evenly supported.


## INITIAL BACKFILL:

- Keep the initial backfill free from rocks which could damage the pipe during final backfill.
- Depth of the initial backfill should be at least 6 inches over the top of the pipe.
- Initial backfill protects the pipe from damage during final backfill.
- Machine compaction of initial backfill directly over the pipe is not desirable unless adequate cover has been provided to protect the pipe.
- Adequate cover will depend on the type of compaction equipment. For adequate cover to prevent pipe damage or deflection, consult the project engineer


## FINAL BACKFILL:

- This zone extends from the top of the initial backfill to the top of the trench. This zone has little influence on pipe performance, but can be important to the integrity of the road and structures.
- Final backfill is often specified by the project engineer based on site design. Material selection, placement, and compaction should meet the project requirements.
- Use a high quality granular backfill, e.g. crushed gravel or road base.


## PVC Pipe Jointing Method:

## Types of Joints:

1. Plain End
2. Solvent Cement Joint
3. Rubber Ring Types of Joint
A. Solvent weld joint Method:

- To ensure an effective joint area is free from all dust and debris and is dry before you apply your solvent cement.
- Inspect the components of any sign of damage or irregularities.
- Measure the insertion depth of the socket and mark it on the pipe end.
- Actual measurements of sample should be double check to be assembled against any drawings, sketches or samples before cementing pipe together. If possible test your cutting sample of pipe and fittings first with a dry-fit to ensure dimension-ally correct.
- Cut the pipe end squarely using suitable tool, make chamfer $10^{\circ}-15^{\circ}$ on end of pipe and remove internal and external burr.
- Recommendations by solvent cement supplier must be read carefully.
- Apply a through coating of solvent cement to ensure a good weld of pipe into the fittings.
- Curing times must follow as instructions given on solvent cement. Also ensure that glue brushes and correct Personal Protective Equipment is used during assembly.

(1) CUTTING

(2) DEBURRING

(3) ROUGHENING

(5) JOINTING


## Transport, Handling \& Storage Recommendations

## The following procedure is recommended to prevent pipes from damages

## Transport

- Pipes must be transported in accordance with current traffic regulations. To optimize transport we recommend the following guidelines:
- Transportation of different diameters of pipes be ensure first place the larger diameters at the bottom.
- Depending on different nominal diameter of the pipes, wooden beddings and their specifications may vary. Leave the sockets free, alternating sockets and ends.
- The vehicles must be provided with a horizontal plain surface, free of nails, chains and other elements that can damage the pipes.
- The pipes will be conditioned over the vehicle without using metal cables or chains that are in contact with them. To prevent deformations it must not put any loads over the pipes during the transport.


## Handling

- The pipes must be stacked up in the vehicle so that the mouthpieces are not subjected to load. The pipes must not overhang from the vehicle more than 1 m .
- You must be careful both when transporting them as when unloading them and also during their manipulation, therefore they must never be thrown.


## Storage

For proper storage, the following is recommended:

- Store the pipes horizontally on a flat area on supports placed every 1.5 meters to avoid the possible bending of the product.
- In particular, avoid especially the sockets being eroded on the ground, especially if they are made of stone, concrete or asphalt.
- Do not stack more than 1.5 meters high, as this could damage the pipes on the bottom or even cause the upper pipes to fall.
- The sockets must be free, alternating sockets and ends.
- In case of prolonged sun exposition, protect the pipes with an opaque material and with ventilation to prevent overheating. White color is preferable because it avoids the over-heating of the pipes.
- Avoid covering the pipes with unventilated black tarps.
- Avoid placing the pipes close to heat sources acting permanently on the pipes.
- Prevent the pipes from constant contact with metal materials that can transmit an excess of temperature to pipes through their own conductivity.



