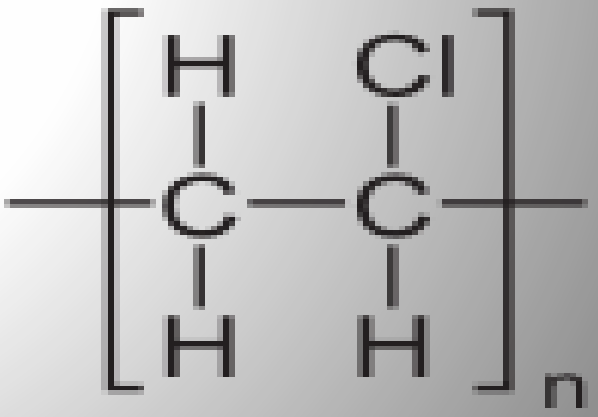
# PVC

- Made from salt (57 per cent) and oil/gas (43 per cent).
- Was first produced commercially in the late 1920s.
- Its methods and materials used in manufacture grant the characteristics making it a popular and practical choice for use in a wide variety of applications.



# TYPES OF PLASTIC

HIGH DENSITY POLYETHYLENE (HDPE)

LOW DENSITY POLYETHYLENE (LDPE)

POLYPROPYLENE (PP)

POLYSTYRENE (PS)

POLYVINYL CHLORIDE (PVC)

## CHARACTERISTICS

Compatibility with additives

Durability

Fire resistance

Electrical insulation

Oil and chemical resistance

Easy to colour

# Commercial production

- In simple terms, salt dissolved in water is chemically decomposed by passing an electric current through it. This produces chlorine, caustic soda and hydrogen. The oil or gas is refined and ‘cracked’ to give ethylene
- When the ethylene and chlorine are combined, the product is ethylene dichloride; this can again be transformed to produce vinyl chloride, the basic building block of polyvinyl chloride or PVC
- The process of `polymerisation' links together the vinyl chloride molecules to form chains of PVC.
- The PVC produced in this way is in the form of a white powder. This is not used alone, but blended with other ingredients to give formulations for a wide range of products.

# APPLICATIONS OF PVC

- Unplasticized poly(vinyl chloride)(upvc)for construction
- Electric conduit pipe
- Flooring
- Pipes
- Taps
- Water storage tank
- Covering
- Cable
- Window frames
- Fascia and weatherboarding

# Types of pvc

## Upvc

(Unplasticized Polyvinyl Chloride)

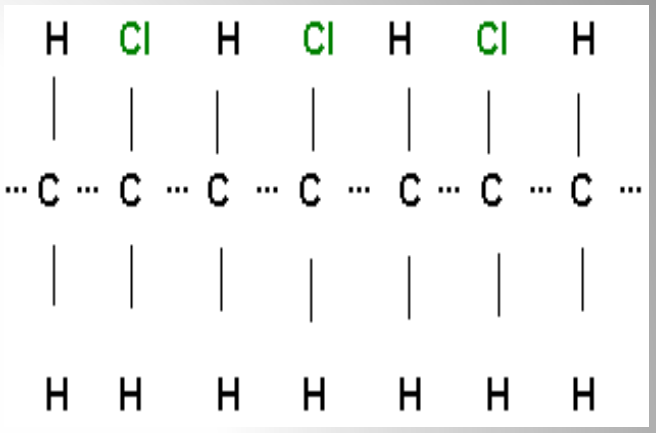
- Unplasticized Polyvinyl Chloride Pipes (UPVC) can be used in a wide range of applications including electrical and telephone cables, sewer pipes and potable water supply.
- It has an advantage over PVC in that it offers less resistance to flow than conventional pipes resulting in minimal flow loss.
- Commonly use for doors and windows frames .

## Cpvc

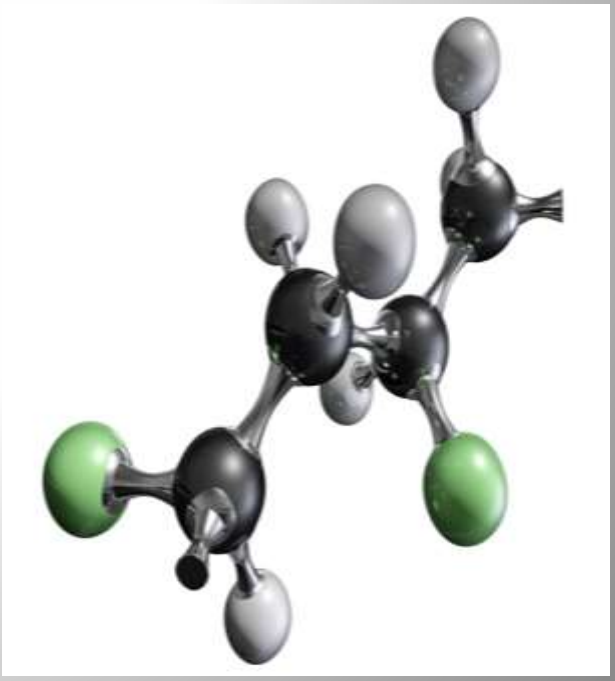
(Chlorinated polyvinyl chloride)

- CPVC stands for Chlorinated Polyvinyl Chloride (that extra chlorination makes all the difference), and is distinctive for its yellowish colour.
- This plastic pipe is somewhat flexible and has thinner walls than standard PVC, though is more resistant to heat, and works well for hot water supply applications.
- CPVC also has an advantage over PVC in colder climates in that it acts as an insulator, thus preventing cold water pipes from forming condensation when water temps get very low.

# Properties




PVC polymer is chemically stable, neutral and non-toxic.
PVC's major benefit is its compatibility with many different kinds of additives, making it a highly versatile polymer.
PVC has excellent electrical insulation properties,fire insulation ,good impact strength and weatherproof attributes .



# WHY USE PVC IN BUILDING?

STRENGTH , HIGH RIGIDITY MODULUS

WEATHER RESISTANCE IN ALL CLIMATES

WELL ADAPTED TO SPECIFIC USE (E.G. PIPES)

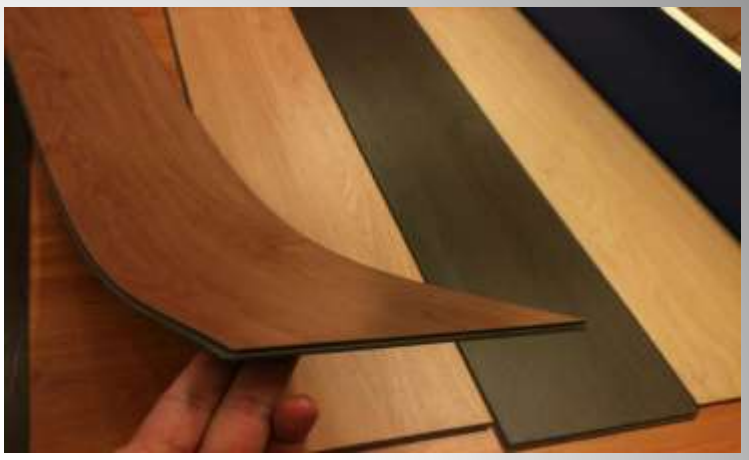
DURABILITY FROM 30 TO - 100 YEARS

COMPETITIVE COST !

RECYCLABLE

# Application near ourselves…

# FLOORING



# PLUMBING

# ROOFS

# CABLE

# WINDOW FRAMES , DOOR , FACADE OR ELEVATION.

# PLASTICS BIB TAPS, PILLAR TAPS, ANGLE VALVES AND STOP VALVES SPECIFICATION IS 9763 :2000

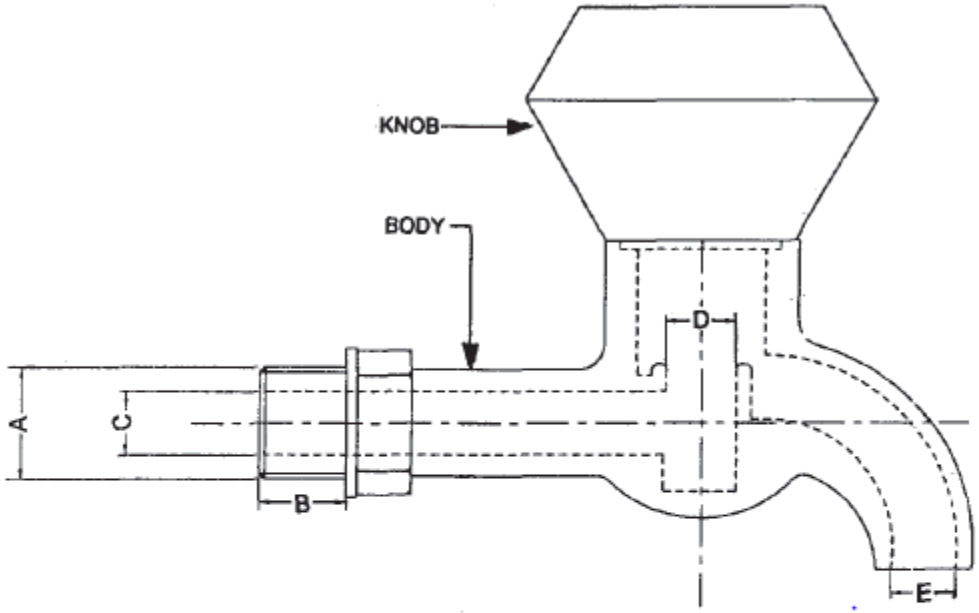
Construction Workmanship And Finish –

- Coloured moulded plsatic
- Silver, gold , chromium , powder coating or vapour curing
- Surfaces shall be smooth and clean
- All parts should be sound,free form cracks , blow holes, spots , etc.
- Parts shall be axial , parallel , cylindrical
- Thickness shall not be less than 2.5 mm

**Table 1 Materials**
(*Clause* 4.1)

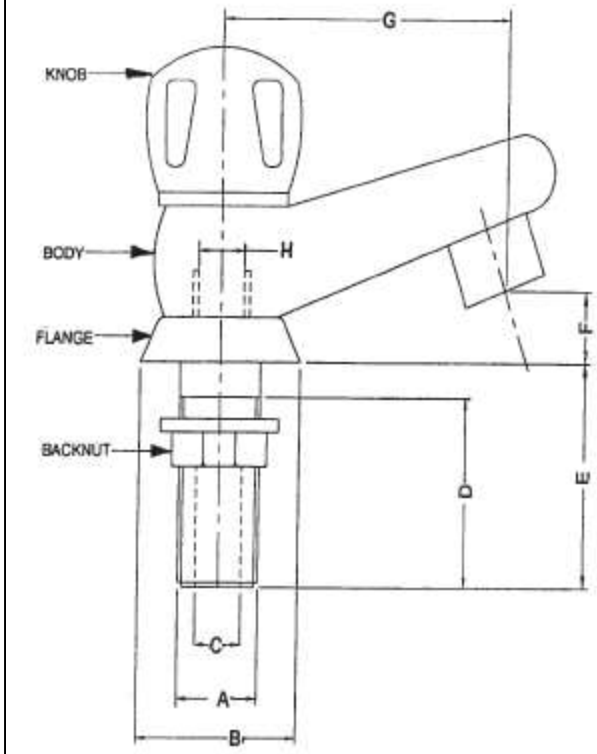
| Component | Recommended Material | Reference to IS No. |
|---|---|---|
| Body of tap/valve | PP Copolymer, Nylon 66, PBT, Nylon 66 GF, Poly-Acetal, ABS , ABS-PC Alloy, PVC. | PP – IS 10910 : 1984<br>PET/PBT – IS 13193 : 1992 |
| Bonnet of tap/valve | PP Copolymer, Nylon 66, PBT, Nylon 66 GF, Poly-Acetal, ABS , ABS-PC Alloy | Nylon 66 – IS 13464 : 1992<br>PVC – IS 9766 : 1992 |
| Spindle of tap/valve | PP Copolymer, Nylon 66, PBT, Nylon 66 GF, Poly-Acetal, ABS , ABS-PC Alloy | |
| Handle of tap/valve | PP Copolymer, PBT, Poly-Acetal, ABS, ABS-PC Alloy | |
| Seal of tap/valve | Rubber, Nitrile PVC, Thermoplastic polyester based elastomer | |

# Bib Tap



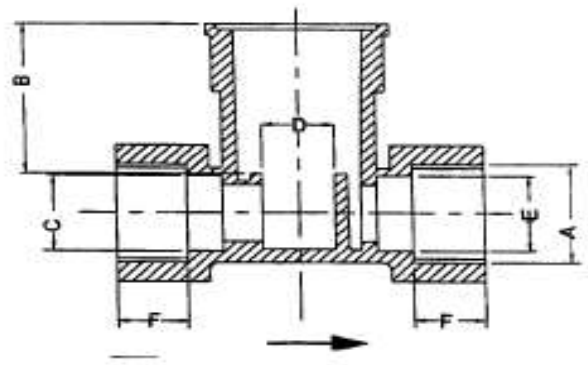

| Dimensions | Nominal Sizes | |
|---|---|---|
| | 15(½") | 20(¾") |
| *A* | G½ | G¾ |
| *B, Min* | 15 | 15 |
| *C* | 12.5 - 13.0 | 17.5 - 18.0 |
| *D, Min* | 12.6 | 18.9 |
| *E, Min* | 10 | 17.5 |

# Pillar Tap

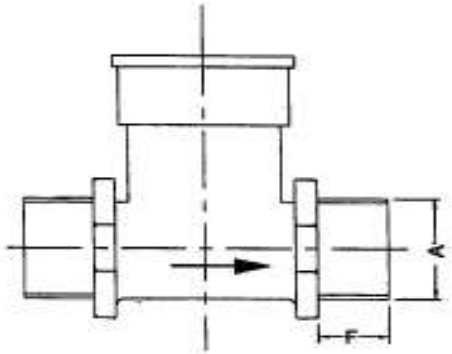



| Dimensions | Nominal Size 15 mm(½") |
|---|---|
| *A* | G ½ |
| *B, Min* | 42 |
| *C* | 12.5 - 13.0 |
| *D, Min* | 42 |
| *E, Min* | 50 |
| *F, Min* | 25 |
| *G, Min* | 80 |
| *H, Min* | 12.6 |

# Stop Valve



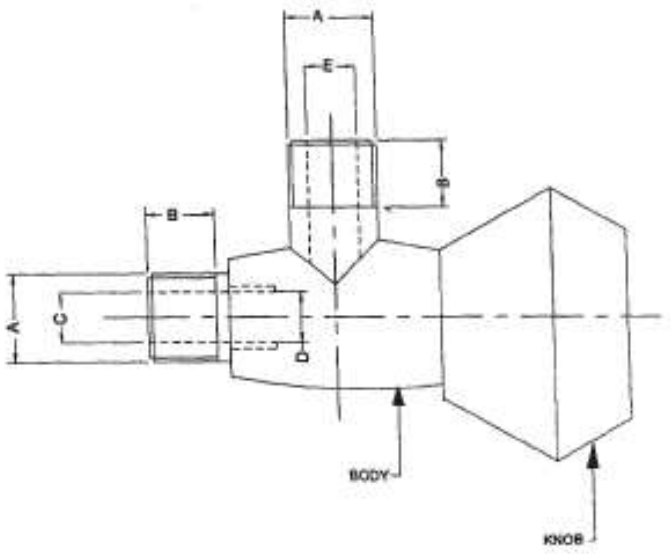

WITH INTERNAL THREAD




WITH EXTERNAL THREAD

| Dimensions | Nominal Sizes | |
|---|---|---|
| | 15(½") | 20(¾") |
| *A* | G½ | G¾ |
| *B, Min* | 21 | 28 |
| *C* | 12.5 - 13.0 | 17.5 - 18.0 |
| *D, Min* | 12.6 | 18.9 |
| *E, Min* | 12.5 - 13.0 | 17.5 |
| *F, Min* | 12.0 | 15.0 |

# Angle Valve




| Dimensions | Nominal Sizes | |
|---|---|---|
| | 15(½") | 20(¾") |
| *A* | G½ | G¾ |
| *B, Min* | 12.5 | 15 |
| *C* | 12.5 - 13.0 | 17.5 - 18.0 |
| *D, Min* | 12.6 | 18.9 |
| *E, Min* | 10 | 17.5 |

# Water Storage Tanks
# IS 12701 : 1996

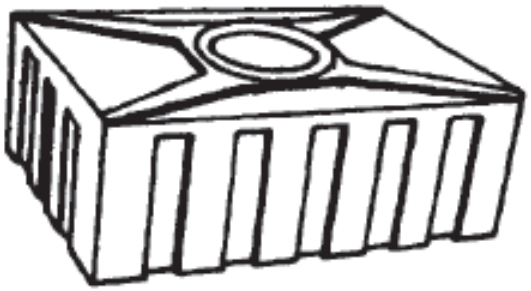
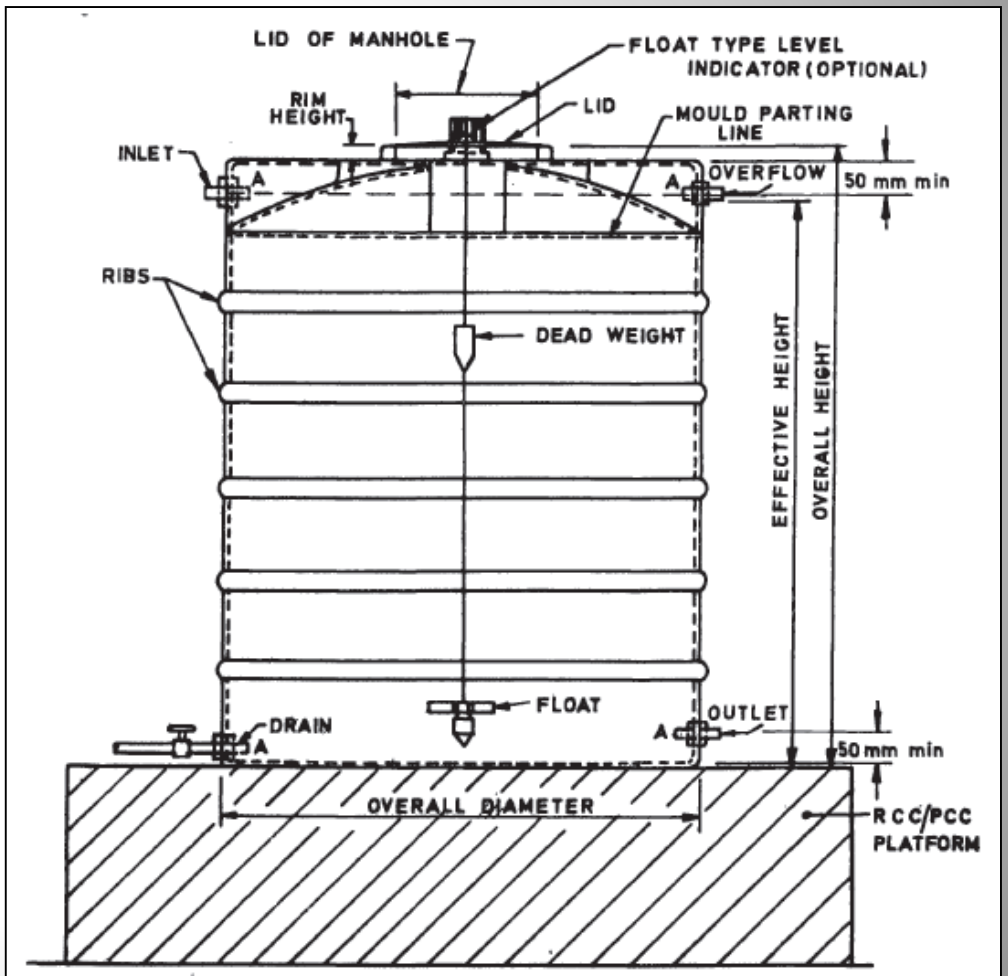


FIG. 2 RECTANGULAR LOFT TANK

Features and Advantages
- Light weight ease of handling , transportation and cleaning
- Leak and rust proof
- UV treatment
- Virgin polymers
- Hygenic
- Maintenance free , no paint or water proofing
- Extra strength and durability




NOTE — A 25 mm wide band shall be painted around the tank at the inlet/overflow level and outlet level. Centre line of the band shall be 50 mm minimum from top/inner bottom of the tank.

*A* — Male threaded G.I. brass or PVC connections.

FIG. 1 TYPICAL DETAILS OF CYLINDERICAL VERTICAL TANK

Features and Advantages

- Adaptive to GI / PVC / brass fittings
- Attractive colours
- Can be used in houses, offices, commercial, industries etc

- Material – Polyethylene resin
- Comes in various capacities ranging from 200 – 20000 litres
- Density : – 932 - 943 kg/cubic m
- Wall thickness :- 2.75 – 15 mm
- Finish – smooth , clean ,free from bubbles , no internal defects .
- Tensile strenght :- > 12 N/mm sq
- Flexural modelus :- > 300 n / mm sq

**Table 2 Dimensions of Rectangular Loft Tanks**

( *Clause* 5.2 )

| Sl No. | Minimum Net Capacity | Overall Length | Overall Width | Overall Height | Minmum Internal Dia of Hand Hole | Minimum Wall Thickness (Measured on) Rectangular Vertical Port and Bottom Thickness | Minmum Weight Weight of Tank (Without Lid) |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| i) | 150 | 620 - 820 | 620 - 820 | 285 - 485 | 300 | 2.75 | 6.6 |
| ii) | 200 | 930 - 1 130 | 620 - 820 | 285 - 485 | 300 | 2.75 | 7.7 |
| iii) | 300 | 995 - 1 200 | 620 - 820 | 285 - 485 | 300 | 2.75 | 11.0 |
| iv) | 400 | 1 150 - 1 350 | 855 - 1150 | 335 - 535 | 300 | 2.75 | 13.0 |
| v) | 500 | 1 150 - 1 500 | 900 - 1250 | 335 - 535 | 300 | 2.75 | 17.5 |

NOTE — The gross capacity of the tanks shall be at least 5 percent in excess of the minimun net capacity.

# UNPLASTICIZED PVC PIPES FOR POTABLE WATER SUPPLIES — SPECIFICATION IS 4985 : 2000

The marking on pipe shall show the following :-

- Manufacturer's name or trade mark
- Outside dia
- Class of pipe and pressure rating
- Batch or lot no.
- Colour mark for different class
- Length :- 4 – 5 m
- Various sizes

| *Class of Pipe* | *Colour* |
|---|---|
| Class 1 | Red |
| Class 2 | Blue |
| Class 3 | Green |
| Class 4 | Brown |
| Class 5 | Yellow |
| Class 6 | Black |
| Plumbring pipes | Pink |

## ADVANTAGE OF PVC PIPES

- PRESSURE RESISTANCE
- LONG TERM DURABILITY
- PVC PRESSURE PIPES ARE DESIGNED THEORETICALLY FOR 50 YEARS BUT CAN LAST MORE THAN 100 YEARS
- NO MODIFICATION OF THE WATER QUALITY
- NO TASTE OR SMELL TRANSFERRED TO WATER
- EXCELLENT RESISTANCE TO BACTERIA GROWTH

## TEE (SOC)

- SIZE (MM) – 15,20,25,32,40,50,…,150
- RS. – 10.30 RS. TO 1115 RS
- USE – TEE JOINT IN THREE SIDES FOR JOINT WITH PIPE AND ALL SIDESHAVE TEE SAME SIZE.

## REDUCER TEE (SOC)

- SIZE (MM) – 20*15,25*15,….,50*40.
- RS. – 14.70 TO 87.10
- USE – REDUCER TEE IN ONE SIDE 15MM SO ANOTHER TWO SIDE 20MM THAT’S CALLED REDUCER TEE.

## FBT TEE

- SIZE(MM) – 15,20,25,32,40,50
- RS. – 86.60RS TO 237.00 RS
- USE – ONE SIDE JOINT WITH TAP.

## ELBOW 90 (THREAD)

SIZE(MM) – 15,20,25,…,50

RS. -8.50 TO 54.10

USE – ONE SIDE OF THREAD AND 90 DEGREE TURN.

## ELBOW 90 (SOC)

- SIZE (MM) -15,20,25,32,….,150
- RS. – 7.80 RS TO 820.00 RS
- USE – 90 DEGREE TURN USED FOR SMALL TURN.

## BRASS ELBOW

- SIZE(MM) – 15*15,20*20,…,25*20
- RS. -76.00 TO 135.00
- USE – ONE SIDE OF BRASS

# ELBOW 45 (SOC)

- SIZE (MM) – 15,20,25,..,50
- RS. -8.50 RS TO 49.70
- USE – 45 DEGREE TURN.

# CROSS(SOC)

- SIZE (MM) – 15,20
- RS. – 13.20 RS TO 18.50
- USE – CROSS JOINT FOUR SIDE JOINT

# COUPLER(SOC)

- SIZE(MM) - 15,20,25,32,…,150
- RS. -5.20RS TO 447.00 RS
- USE – JOINT TWO PIPES TWO SIDE

# REDUCER COUPLING(SOC)

- SIZE(MM) – 20*15,25*15,….,50*40
- RS. 7.25RS TO 39.00
- USE – ONE SIDE 25MM SO ANOTHER 15. USE FOR HIGH TO LAW WATER SUPPLY THA’S CALLED REDUCER .

## FAPT (PVC THREAD)

- SIZE – 15,20,25,….,100
- RS. 5.20RS TO 158.00RS
- USE – JOINT
  TWO LINES IN TIGHT FITTING
  BOTH SIDES HAVE A THREAD.

## END CAP (SOC)

SIZE (MM) – 15,20,25,…,100

RS. – 3.80 TO 160.

USE – TO END THE LINE.

## FABT (BRASS THREAD ) (FEMALE)

- SIZE(MM) – 15,20,25,32,..,50,25*15
- RS. -80.30RS TO296.30 RS
- USE – ONE SIDE JOINT WITH MAPT BRASS THREAD AND ANOTHER JOINT WITH PIPE.

## MAPT (MALE) ( BRASS PVC THREAD)

- SIZE (MM) – 15,20,…,50,25*15
- RS. 4.10RS TO 161.00RS
- USE- ONE SIDE JOINT WITH FABT BRASS THREAD AND ANOTHER WITH PIPE.

## BALL VALVE

- SIZE (MM) – 15,20,25,..,50
- RS. – 111.00RS TO 629.00RS
- USE – UP SIDE JOINT WITH VALVE FOR CLOSE WATER SUPPLY.

## PVC STRAP

- SIZE (MM) – 15,20,25,…,50
- RS. – 7.60 TO 12.90
- USE – PIPE JOINT WITH THE WALL.

# UNION

- SIZE – 15,25,….50MM
- RS. 22.20 TO 127.00
- USE – JOINT TWO LINES.

# REDUCER BUSHING

- SIZE – 20*15,….,100*80
- RS. 3.00 TO 106.00
- USE - JOINT
  TWO LINES IN TIGHT FI TTING
  BOTH SIDES HAVE A THREAD.

## TANK ADAPTER

- SIZE(MM) – 15,20,25,…,50
- RS. – 19.10 TO 58.60
- USE- ONE SIDE JOINT WITH TANK AND ANOTHER SIDE AVAILABLE REDUCER.

## LONG RADIUS BEND

- SIZE (MM) – 20,25,32,..,50
- RS. – 24.70 TO 103.00
- USE - LONG TURN PIPE JOINT.

## TANK ADAPTER (LONG )

- SIZE(MM) -15,20,25,…,50
- RS. -23.00 TO 81.00
- USE – ONE SIDE JOINT WITH TANK AND ANOTHER WITH PIPE.

# ADVANTAGE OF PVC PIPES

- PRESSURE RESISTANCE
- LONG TERM DURABILITY
- PVC PRESSURE PIPES ARE DESIGNED THEORETICALLY FOR 50 YEARS BUT CAN LAST MORE THAN
  100 YEARS
- NO MODIFICATION OF THE WATER QUALITY
- NO TASTE OR SMELL TRANSFERRED TO WATER
- EXCELLENT RESISTANCE TO BACTERIA GROWTH

# UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PIPES FOR SOIL AND WASTE DISCHARGE SYSTEM FOR INSIDE AND OUTSIDE BUILDINGS INCLUDING VENTILATION AND RAIN WATER SYSTEM — SPECIFICATION

•Types of pipe :-
Type A ( Blue ) – ventilation pipe and rain water harvesting
Type B ( White ) - soil and waste discharge systems
•Standard outside dia are – 40 , 50 , 60 , 63 , 75 , 90 , 110 , 125 , 140 , 160 , 180 ,200 , 250 , 315 mm
•Colour – usually grey
•Material – PVC with other additives , K value of 64 or more
•Wall thickness ranges from 1.8 to 8 mm
•Length – 2 , 4 , 5 , 6 m

# FLOORING

- Durable
- Freedom of aesthetic effects – available in a wide range of colours and patterns
- Ease of installation, easy to clean
- Easily recyclable , reusable
- Variable thickness
- Various textures
- Cost effective

# ROOFING

- REINFORCED PVC ROOFING IS EASY TO INSTALL,
- PVC HAS LOW MAINTANENCE REQUIRMENTS AND LASTS FOR OVER 30 YEARS.
- Light weight

# ELECTRICAL CONDUIT PIPE SYSTEM

- PVC Conduit pipes as per IS:9537 part 3:

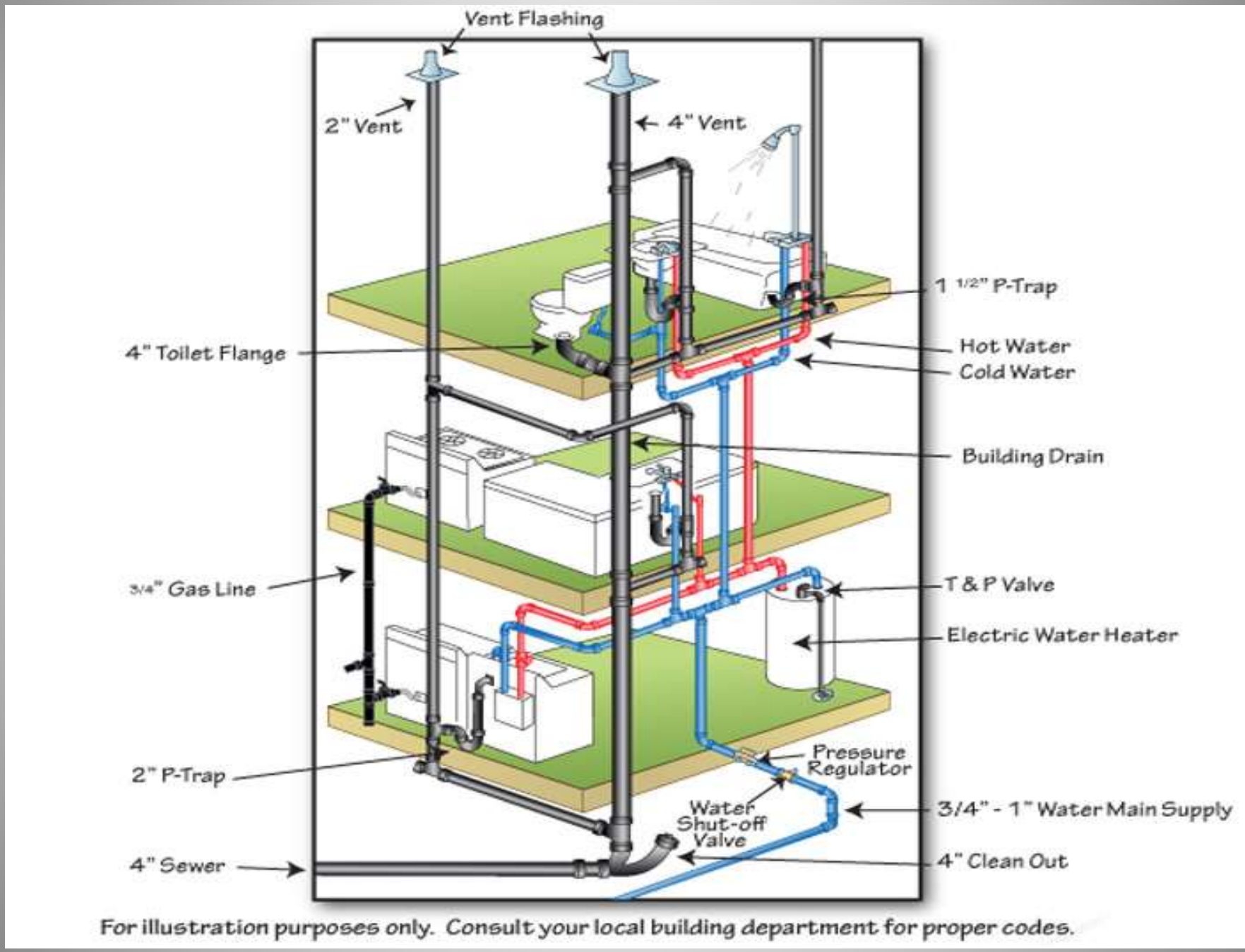
UPVC Conduit pipe fittings:
Moulded coupler, Moulded Tee, Moulded Elbow, Junction boxes, Fan boxes, Deep Junction boxes and Fabricated Long Bends are available to cater to the requirement of UPVC conduit piping system.

Applications:
Open / surface and concealed wiring in house, residential, commercial buildings and industrial plants
Telecommunications and Cable casing application
Traffic signal connections, street light & wiring at public places

Features:

- Non Conductor of Electricity and prevent Electrical shocks.
- High mechnical strength for buried and open application.
- Non corrosive in nature and are immune to Chemical and Galvanic corrosion.
- Do not support combustion and are self extinguishing.
- Light weight to handle, install and Transport.
- Smooth inner surface for easy wiring. Flexibility for long radius bending.
- Long lasting life.

# SECTION OF PLUMBING FITTING



# PVC PRODUCTS MANUFACTURERS

- ASTRAL
- SUPREME
- FINOLEX
- ASHIRCAD
- PLASTO
- DOES
- TULSI
- GODAVRI
- KASTA
- SHAKTI
- KRISHNA
- SUDHAKAR
- SYNTEX

- ANCHOR
- VINAY
- RR KABEL
- FINOLEX

# IS CODES FOR PVC

- is.5318.1969 CODE OF PRACTICE FOR LAYING OF FLEXIBLE PVC SHEET AND TILE FLOORING
- is.1554.1.198 SPECIFICATION FOR PVC INSULATED ( HEAVY DUTY ) ELECTRIC CABLES
- is.12701.1996 Indian Standard ROTATIONAL MOULDED POLYETHYLENE WATER STORAGE TANKS — SPECIFICATION
- is.4985.2000 UNPLASTICIZED PVC PIPES FOR POTABLE WATER SUPPLIES — SPECIFICATION
- is.13592.2013 UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PIPES FOR SOIL AND WASTE DISCHARGE SYSTEM FOR INSIDE AND OUTSIDE BUILDINGS INCLUDING VENTILATION AND RAIN WATER SYSTEM — SPECIFICATION
- is.9537.3.1983 SPECIFICATION FOR CONDUITS FOR ELECTRICAL INSTALLATIONS

# REFERENCES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**THANK YOU…**