



# 1ST IN INDIA TO INTRODUCE **PPRFR THERMAL FR + VO** FOR FIRE FIGHTING APPLICATIONS APPROVED BY CSIR-CBRI, ROORKEE

Largest range from **16mm to 400mm**

Mono & Triple layer | Flame Retardant | PN 10, PN 16 & PN 20

KPT Thermaplus (PPR-FR) pipes and fittings are designed specifically for fire sprinkler system. They are made from a special thermoplastic known chemically as Polypropylene Random Copolymer Flame Retardant (PPR-FR). KPT Thermaplus (PPR-FR) pipes and fittings provide unique advantages in sprinkler installations including superior hydraulics, ease of joining, increased hanger spacing in comparison to other thermoplastics and ease of assembly.

KPT Thermaplus (PPR-FR) is the new industry standard in automatic fire sprinkler piping system. KPT Thermaplus (PPR-FR) pipes and fittings are fully approved for use in all light and ordinary hazardous rooms or otherwise light hazardous applications as per NFPA 13, in both new and retrofit construction, such as:

- High-rise buildings (including apartments and hotels)
- Schools and Institutions
- One and Two family dwellings

When we talk about plastic and fire resistance, most people conjure up images of melting plastic in a campfire or bending plastic spoons with a lighter. While many plastics don't stand up well to heat and fire (namely polypropylene and polyethylene), it's not true of all thermoplastics. Specifically, Polypropylene Random Copolymer Flame Retardant (PPR-FR) is engineered to limit flammability and smoke protection.

In fact, many applications that specify PPR-FR piping because of its heat, pressure and corrosion resistance capabilities do so because it also satisfies strict regulations around flame and smoke resistance.

But what qualities should you look for in a thermoplastic piping system to ensure it satisfies your application's fire resistance requirements?

KPT Thermaplus pipe is approved from CBRI Roorkee.

KPT Thermaplus pipe has been tested to the standards in BS 476-5,6,7, IS 15061, IS 12777 and ASTM D 2863.

#### SYSTEM BENEFITS:

- No pre-cutting and expensive fabrication required
- Easily connected to other sprinkler piping system
- Flexibility in the piping for greater ease of installation
- Resistant to rust, scale and foreign contaminant build up, Inexpensive tools required for installation
- Easy repairing or modification on site
- Designed for a 50 year life expectancy

## **KPT Thermaplus (PPR-FR) pipe and fittings is:**

### **Connection by fusion welding**

No sealants or adhesives are required for this permanent connection

### **Corrosion-proof**

Prevents the clogging of the sprinkler with corrosive material. This ensures a long, low-maintenance service life as well as failure-free functioning of the system.

The production of pipes and fittings is controlled according to the highest quality standards on most modern injection moulding machines and extrusion lines. The high quality of our products is guaranteed by extensive control of incoming goods and the production process.

The KPT Thermaplus (PPR-FR) quality management system is certified according to DIN EN ISO 14001:2004, 9001:2015

### **Fusion technique - Processing**

By the fusion of pipe and fitting the plastic melts to a homogeneous material unit. Pipe and fitting are heated quickly with specially provided welding tools and joined together - finished!

Double material thickness at T-joint – giving double safety at the otherwise critical point of a pipe system.

A permanent leakproof connection is created with the KPT Thermaplus (PPR-FR) fusion technique.

### **Weld-in saddle technique - Processing**

Branches can easily be made by weld-in saddles, even post-installation. Material costs and processing time are reduced by using weld-in saddles. Whereas in case of tees three joints are to be processed, work is limited to mounting the saddle and the branch pipe only.

Simply drill the pipe; heat up the saddle, pipe wall and surface; connect the parts. Finished.

### **UV resistance**

Pipes from KPT Thermaplus (PPR-FR) should not be installed (without protection) where subject to UV-radiation. All KPT Thermaplus (PPR-FR) pipes and fittings are supplied in UV-protected packaging to bridge transport and assembly time. Ultraviolet rays have an influence on all high polymeric plastics. Hence, pipes should not be stored unprotected outside for a long time. The maximum storage time is (outside) 6 months.

### **Fire bulkheading**

All fire prevention systems which can prove equivalent licensing are suited for the KPT Thermaplus (PPR-FR) pipe system.

### **Pipe friction loss**

The pressure loss caused by friction is to be calculated hydraulically with the Hazen-Williams-formula. The value to be used for C is 150, applicable for calculations of sprinkler installations and water supply.

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### Evaluating Fire Performance

There are several factors to consider when referencing PPR-FR fire resistance. The burn test video below provides a quick overview of key PPR-FR traits that contribute to its exceptional fire performance

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### Flame the Surface Spread Resistance

Flame spread resistance is an important property because keeping flames contained helps firefighters or extinguishing systems more quickly put out blazes, limiting property and equipment damage.

KPT Thermaplus (PPR-FR) flammability is tested in accordance with BS 76-7 (Class-1) & UL 94, which determines the flammability of plastic materials used in components and parts of finished products.

Specifically, this test measures a material's resistance to burning, dripping, glow emission and burn through.

KPT Thermaplus (PPR-FR) has achieved the highest class-1, Horizontal burn rating available within the scope of the tests: 0.

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### Flammability

KPT Thermaplus (PPR-FR) is ideal for wet automatic fire sprinkler system due to its outstanding balance of properties such as light weight, excellent corrosion resistance, low friction loss and ease of fabrication. KPT Thermaplus (PPR-FR) uniquely offers outstanding resistance to fire and low smoke generation qualities. Because of these features, KPT Thermaplus (PPR-FR) system can be used in plenum spaces as defined by NBC-4, the National Building Code for the Installation of Air Conditioning and Ventilating Systems.

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### Thermal Conductivity

Extreme heat is capable of starting a fire if the proper fuel and oxygen are present. While firewalls are designed to stop the spread of smoke and flame through a building, they cannot stop heat transferred through the piping material.

Metal piping has a high thermal conductivity, and transfers heat very well. In rare circumstances, heat from a fire in one room has the potential to cause a fire in an adjacent room by transferring extreme heat through the piping. Conversely, PPR-FR has a low thermal conductivity, limiting the transference of heat through firewalls. It's worth noting that when working with highly flammable materials or if you're concerned about flammability, metal piping can stand up to heat better than PPR-FR. While PPR-FR limits burning after flame removal, it will still burn and eventually fail at a certain point before a metal system will.

If you have questions, please set up a call with our engineering support team.

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**Smoke Generation Resistance** - As with flame, confining the spread of smoke to one area limits potential smoke damage to property. This is especially important in clean rooms, where particulates can contaminate equipment and products. During burning, PPR-C will off gas and generate some smoke, but thanks to the engineering of the KPT Thermaplus (PPR-FR) polymer and compound, the amount of smoke is limited. In addition, the moment the flame is removed from the pipe, the material self extinguishes and stops any smoke production.

## Ignitability Resistance

Flash ignition temperature is the lowest temperature at which sufficient combustible gas can be ignited by a small external flame. KPT Thermaplus (PPR-FR) flash ignition temperature is 1112°F (600°C), making it far less susceptible to ignition than other thermoplastic materials.

## Flash Ignition Temperature Comparison

| MATERIAL     | °C  | °F   |
|--------------|-----|------|
| PPR-FR       | 600 | 1112 |
| CPVC         | 482 | 900  |
| Polyethylene | 343 | 650  |
| PVC Rigid    | 399 | 750  |
| Paper        | 232 | 450  |

## Burning Resistance

A material's burning resistance is measured using Limiting Oxygen Index (LOI), which is the percentage of oxygen needed in the surrounding atmosphere to sustain a flame. KPT Thermaplus (PPR-FR) pipe & fittings LOI is 24.3%. For reference, the Earth's atmosphere is made up of 21% oxygen.

Because of this, the instant a flame is extinguished from around the pipe, the material self extinguishes and burning stops. Conversely, once lit, polyethylene (PE) and ABS will continue to burn.

## Limiting Oxygen Index Comparison

| MATERIAL     | LOI  |
|--------------|------|
| PPR-C        | 24.3 |
| CPVC         | 30   |
| Polyethylene | 17   |
| ABS          | 18   |
| Paper        | 12   |

## Temperature Pressure rating

KPT Thermaplus (PPR-FR) pipes and fittings (1/2" - 16" (16 - 400 mm)) are rated for continuous service of 108 psi (7.6 Bar) at 176°F (80°C). KPT Thermaplus (PPR-FR) pipes and fittings are suitable for use in areas where ambient temperatures are within the range of 35°F (2°C) to 176° F (80°C).

## Typical Physical properties

| S.No. | Parameter                       | Method /Unit      | Value                      |
|-------|---------------------------------|-------------------|----------------------------|
| 1     | Melt Flow Index(g/10min)        | g/10min           | 0.3 to 0.6                 |
| 2     | Tensile Strength at Yield(MPa)  | MPa               | 48                         |
| 3     | Tensile Modulus (MPa)           |                   |                            |
| 4     | Modulus Elasticity              |                   |                            |
| 5     | Density                         | Kg/m <sup>3</sup> | 949.5                      |
| 6     | Flame Spread                    | ...               | Class -1                   |
| 7     | Smoke Development               | ...               |                            |
| 8     | Limiting Oxygen Index           | %                 | 24.3                       |
| 9     | Flammability                    | ...               | Flame (0)                  |
| 10    | Toxicity                        |                   |                            |
| 11    | Ignitability                    | °C                | (600) Not Easily Ignitable |
| 12    | Thermal Conductivity            | Btu/hrs           | 0.013                      |
| 13    | Coefficient of Linear Expansion | MPa               | 1.0X10 <sup>-2</sup>       |
| 14    | Flexural Modulus                | MPa               | 1300                       |
| 15    | Melting Temperature Rate        | °C                | 160 - 165                  |

### KPT PPR SDR 17.6/ S 8.3 PN 6

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 160mm     | 6m           | 160      | 9.1            | 141.8             | 15.784        |
| 200mm     | 3m           | 200      | 11.4           | 177.2             | 24.649        |
| 250mm     | 3m           | 250      | 14.2           | 221.6             | 38.549        |
| 315mm     | 3m           | 315      | 17.9           | 279.2             | 61.193        |
| 355mm     | 3m           | 355      | 20.1           | 314.8             | 77.793        |
| 400mm     | 3m           | 400      | 22.7           | 354.6             | 98.707        |

### KPT PPR SDR 11/ S 5 PN 10

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 20mm      | 240m         | 20       | 1.9            | 16.2              | 0.206         |
| 25mm      | 180m         | 25       | 2.3            | 20.4              | 0.327         |
| 32mm      | 120m         | 32       | 2.9            | 26.2              | 0.539         |
| 40mm      | 75m          | 40       | 3.7            | 32.6              | 0.834         |
| 50mm      | 45m          | 50       | 4.6            | 40.8              | 1.307         |
| 63mm      | 30m          | 63       | 5.8            | 51.4              | 2.074         |
| 75mm      | 21m          | 75       | 6.8            | 61.4              | 2.959         |
| 90mm      | 15m          | 90       | 8.2            | 73.6              | 4.252         |
| 110mm     | 12m          | 110      | 10.0           | 90.0              | 6.359         |
| 160mm     | 6m           | 160      | 14.6           | 130.8             | 13.430        |
| 200mm     | 3m           | 200      | 18.2           | 163.6             | 21.010        |
| 250mm     | 3m           | 250      | 22.7           | 204.6             | 32.861        |
| 315mm     | 3m           | 315      | 28.6           | 257.8             | 52.172        |
| 355mm     | 3m           | 355      | 32.2           | 290.6             | 66.292        |
| 400mm     | 3m           | 400      | 36.3           | 327.4             | 84.145        |
| 450mm     | 3m           | 450      | 40.9           | 368.2             | 106.423       |

### KPT PPR SDR 7.4/ S 3.2 PN 16

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 16mm      | 300m         | 16       | 2.2            | 11.6              | 0.106         |
| 20mm      | 240m         | 20       | 2.8            | 14.4              | 0.163         |
| 25mm      | 180m         | 25       | 3.5            | 18.0              | 0.254         |
| 32mm      | 120m         | 32       | 4.4            | 23.2              | 0.423         |
| 40mm      | 75m          | 40       | 5.5            | 29.0              | 0.660         |
| 50mm      | 45m          | 50       | 6.9            | 36.2              | 1.029         |
| 63mm      | 30m          | 63       | 8.6            | 45.8              | 1.647         |
| 75mm      | 21m          | 75       | 10.3           | 54.4              | 2.323         |
| 90mm      | 15m          | 90       | 12.3           | 65.4              | 3.358         |
| 110mm     | 9m           | 110      | 15.1           | 79.8              | 4.999         |
| 160mm     | 6m           | 160      | 21.9           | 116.2             | 10.599        |
| 200mm     | 3m           | 200      | 27.4           | 145.2             | 16.550        |
| 250mm     | 3m           | 250      | 34.2           | 181.6             | 25.888        |
| 315mm     | 3m           | 315      | 43.4           | 228.2             | 40.879        |
| 355mm     | 3m           | 355      | 49.0           | 257               | 51.848        |

### KPT PPR SDR 6/ S 2.5 PN 20

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 16mm      | 240m         | 16       | 2.7            | 10.6              | 0.088         |
| 20mm      | 210m         | 20       | 3.4            | 13.2              | 0.137         |
| 25mm      | 150m         | 25       | 4.2            | 16.6              | 0.216         |
| 32mm      | 105m         | 32       | 5.4            | 21.2              | 0.353         |
| 40mm      | 60m          | 40       | 6.7            | 26.6              | 0.555         |
| 50mm      | 36m          | 50       | 8.3            | 33.4              | 0.876         |
| 63mm      | 24m          | 63       | 10.5           | 42.0              | 1.385         |
| 75mm      | 21m          | 75       | 12.5           | 50.0              | 1.963         |
| 90mm      | 12m          | 90       | 15.0           | 60.0              | 2.826         |
| 110mm     | 9m           | 110      | 18.3           | 73.4              | 4.229         |
| 160mm     | 3m           | 160      | 26.6           | 106.8             | 8.954         |
| 200mm     | 3m           | 200      | 33.2           | 133.6             | 14.011        |

### KPT PPR SDR 26/ S 12.5 PN 4

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 40mm      | 75m          | 40       | 1.8            | 36.4              | 1.040         |
| 50mm      | 45m          | 50       | 2.0            | 46.0              | 1.661         |
| 63mm      | 30m          | 63       | 2.5            | 58.0              | 2.641         |
| 75mm      | 21m          | 75       | 2.9            | 69.2              | 3.759         |
| 90mm      | 15m          | 90       | 3.5            | 83.0              | 5.408         |
| 110mm     | 12m          | 110      | 4.2            | 101.6             | 8.103         |
| 160mm     | 6m           | 160      | 6.2            | 147.6             | 17.102        |
| 200mm     | 3m           | 200      | 7.7            | 184.6             | 26.751        |
| 250mm     | 3m           | 250      | 9.5            | 231.0             | 41.888        |
| 315mm     | 3m           | 315      | 12.1           | 290.8             | 66.383        |
| 355mm     | 3m           | 355      | 13.6           | 327.8             | 84.350        |
| 400mm     | 3m           | 400      | 15.3           | 369.4             | 107.118       |
| 450mm     | 3m           | 450      | 17.2           | 415.6             | 135.588       |
| 500mm     | 3m           | 500      | 19.1           | 461.8             | 167.409       |
| 560mm     | 3m           | 560      | 21.4           | 517.2             | 209.984       |
| 630mm     | 3m           | 630      | 24.1           | 581.8             | 265.716       |

### KPT PPR SDR 17.6/ S 8.3 PN 6

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 160mm     | 6m           | 160      | 9.1            | 141.8             | 15.784        |
| 200mm     | 3m           | 200      | 11.4           | 177.2             | 24.649        |
| 250mm     | 3m           | 250      | 14.2           | 221.6             | 38.549        |
| 315mm     | 3m           | 315      | 17.9           | 279.2             | 61.193        |
| 355mm     | 3m           | 355      | 20.1           | 314.8             | 77.793        |
| 400mm     | 3m           | 400      | 22.7           | 354.6             | 98.707        |

### KPT PPR SDR 17.6/ S 8.3 PN 6

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content |
|-----------|--------------|----------|----------------|-------------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |
| 32mm      | 120m         | 32       | 1.8            | 28.4              | 0.633         |
| 40mm      | 75m          | 40       | 2.3            | 35.4              | 0.984         |
| 50mm      | 45m          | 50       | 2.9            | 44.2              | 1.534         |
| 63mm      | 30m          | 63       | 3.6            | 55.8              | 2.444         |
| 75mm      | 21m          | 75       | 4.3            | 66.4              | 3.461         |
| 90mm      | 15m          | 90       | 5.1            | 79.8              | 4.999         |
| 110mm     | 12m          | 110      | 6.3            | 97.4              | 7.447         |
| 160mm     | 6m           | 160      | 9.1            | 141.8             | 15.784        |
| 200mm     | 3m           | 200      | 11.4           | 177.2             | 24.649        |
| 250mm     | 3m           | 250      | 14.2           | 221.6             | 38.549        |
| 315mm     | 3m           | 315      | 17.9           | 279.2             | 61.193        |
| 355mm     | 3m           | 355      | 20.1           | 314.8             | 77.793        |
| 400mm     | 3m           | 400      | 22.7           | 354.6             | 98.707        |
| 450mm     | 3m           | 450      | 25.5           | 399.0             | 124.973       |
| 500mm     | 3m           | 500      | 28.4           | 443.2             | 154.195       |
| 560mm     | 3m           | 560      | 31.7           | 496.6             | 193.590       |
| 630mm     | 3m           | 630      | 35.7           | 558.6             | 244.947       |

### KPT PPR SDR 9/ S 4 PN 12.5

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content | Weight   |
|-----------|--------------|----------|----------------|-------------------|---------------|----------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           | per mtrs |
| 20mm      | 240m         | 20       | 2.2            | 15.6              | 0.190         | 0.113    |
| 25mm      | 180m         | 25       | 2.8            | 19.4              | 0.297         | 0.176    |
| 32mm      | 120m         | 32       | 3.6            | 24.9              | 0.486         | 0.289    |
| 40mm      | 75m          | 40       | 4.4            | 31.1              | 0.760         | 0.452    |
| 50mm      | 45m          | 50       | 5.6            | 38.9              | 1.187         | 0.706    |
| 63mm      | 30m          | 63       | 7.0            | 49.0              | 1.885         | 1.120    |
| 75mm      | 21m          | 75       | 8.3            | 58.3              | 2.671         | 1.587    |
| 90mm      | 15m          | 90       | 10.0           | 70.0              | 3.847         | 2.286    |
| 110mm     | 9m           | 110      | 12.2           | 85.6              | 5.746         | 3.415    |
| 125mm     | 6m           | 125      | 13.9           | 97.2              | 7.420         | 4.410    |
| 140mm     | 6m           | 140      | 15.6           | 108.9             | 9.308         | 5.531    |
| 160mm     | 6m           | 160      | 17.8           | 124.4             | 12.157        | 7.225    |
| 180mm     | 3m           | 180      | 20.0           | 140.0             | 15.386        | 9.144    |
| 200mm     | 3m           | 200      | 22.2           | 155.6             | 18.995        | 11.288   |
| 225mm     | 3m           | 225      | 25.0           | 175.0             | 24.041        | 14.287   |
| 250mm     | 3m           | 250      | 27.8           | 194.4             | 29.680        | 17.638   |
| 280mm     | 3m           | 280      | 31.1           | 217.8             | 37.230        | 22.125   |
| 315mm     | 3m           | 315      | 35.0           | 245.0             | 47.120        | 28.003   |
| 355mm     | 3m           | 355      | 39.4           | 276.1             | 59.846        | 35.566   |
| 400mm     | 3m           | 400      | 44.4           | 311.1             | 75.980        | 45.154   |
| 450mm     | 3m           | 450      | 50.0           | 350.0             | 96.163        | 57.148   |
| 500mm     | 3m           | 500      | 55.6           | 388.9             | 118.719       | 70.553   |
| 560mm     | 3m           | 560      | 62.2           | 435.6             | 148.921       | 88.502   |
| 630mm     | 3m           | 630      | 70.0           | 490.0             | 188.479       | 112.010  |

### KPT PPR SDR 9/ S 4 PN 12.5

| Pipe      |              | Diameter | Wall Thickness | Internal Diameter | Water Content | Weight / mtrs |
|-----------|--------------|----------|----------------|-------------------|---------------|---------------|
| Dimension | Packing Unit | d(mm)    | S(mm)          | di(mm)            | l/m           |               |
| 20mm      | 240m         | 20       | 2.2            | 15.6              | 0.190         | 0.113         |
| 25mm      | 180m         | 25       | 2.8            | 19.4              | 0.297         | 0.176         |
| 32mm      | 120m         | 32       | 3.6            | 24.9              | 0.486         | 0.289         |
| 40mm      | 75m          | 40       | 4.4            | 31.1              | 0.760         | 0.452         |
| 50mm      | 45m          | 50       | 5.6            | 38.9              | 1.187         | 0.706         |
| 63mm      | 30m          | 63       | 7.0            | 49.0              | 1.885         | 1.120         |
| 75mm      | 21m          | 75       | 8.3            | 58.3              | 2.671         | 1.587         |
| 90mm      | 15m          | 90       | 10.0           | 70.0              | 3.847         | 2.286         |
| 110mm     | 9m           | 110      | 12.2           | 85.6              | 5.746         | 3.415         |
| 160mm     | 6m           | 160      | 17.8           | 124.4             | 12.157        | 7.225         |
| 200mm     | 3m           | 200      | 22.2           | 155.6             | 18.995        | 11.288        |
| 250mm     | 3m           | 250      | 27.8           | 194.4             | 29.680        | 17.638        |

## Linear expansion of KPT Thermaplus (PPPR-FR) pipes and fittings

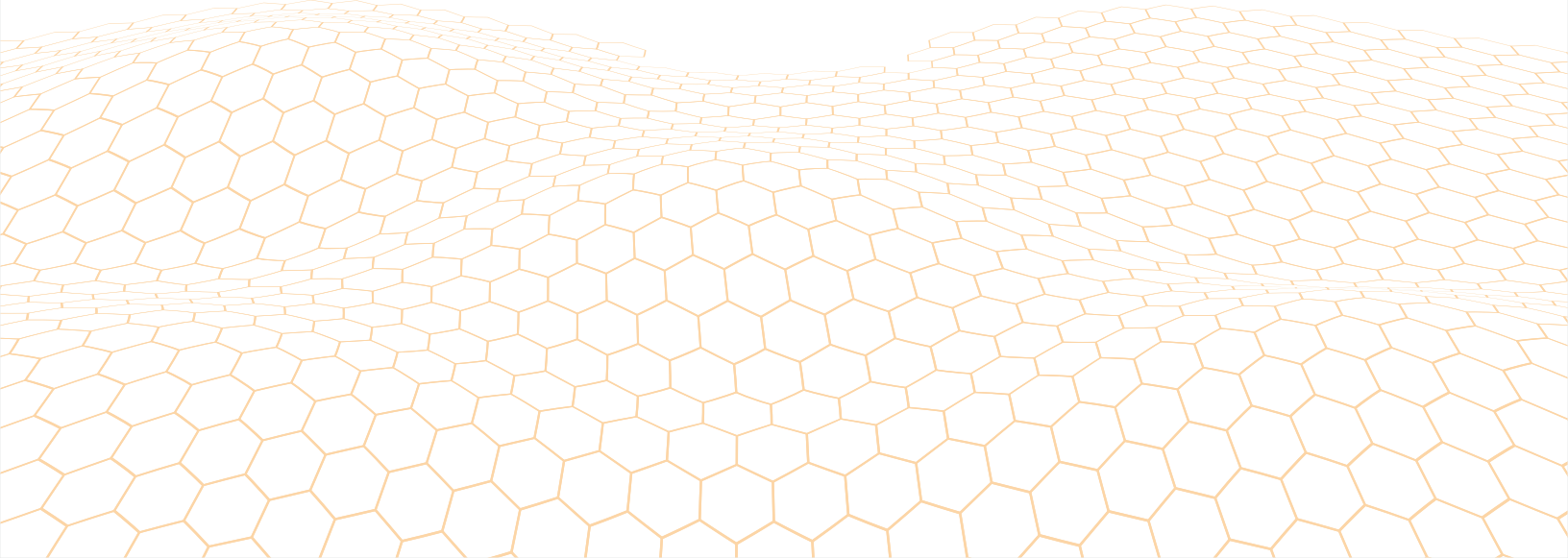
| Pipe Length | Temperature Difference DT (°C) |     |     |     |      |      |      |      |      |      |
|-------------|--------------------------------|-----|-----|-----|------|------|------|------|------|------|
| L(m)        | 10                             | 20  | 30  | 40  | 50   | 60   | 70   | 80   | 90   | 95   |
| 1           | 0.8                            | 1.5 | 2.3 | 3.0 | 3.8  | 4.5  | 5.3  | 6.0  | 6.8  | 7.5  |
| 2           | 1.5                            | 2.3 | 3.0 | 3.8 | 4.5  | 5.3  | 6.0  | 6.8  | 7.5  | 8.3  |
| 3           | 2.3                            | 3.0 | 3.8 | 4.5 | 5.3  | 6.0  | 6.8  | 7.5  | 8.3  | 9.0  |
| 4           | 3.0                            | 3.8 | 4.5 | 5.3 | 6.0  | 6.8  | 7.5  | 8.3  | 9.0  | 9.8  |
| 5           | 3.8                            | 4.5 | 5.3 | 6.0 | 6.8  | 7.5  | 8.3  | 9.0  | 9.8  | 10.5 |
| 6           | 4.5                            | 5.3 | 6.0 | 6.8 | 7.5  | 8.3  | 9.0  | 9.8  | 10.5 | 11.3 |
| 7           | 5.3                            | 6.0 | 6.8 | 7.5 | 8.3  | 9.0  | 9.8  | 10.5 | 11.3 | 12.0 |
| 8           | 6.0                            | 6.8 | 7.5 | 8.3 | 9.0  | 9.8  | 10.5 | 11.3 | 12.0 | 12.8 |
| 9           | 6.8                            | 7.5 | 8.3 | 9.0 | 9.8  | 10.5 | 11.3 | 12.0 | 12.8 | 13.5 |
| 10          | 7.5                            | 8.3 | 9.0 | 9.8 | 10.5 | 11.3 | 12.0 | 12.8 | 13.5 | 14.3 |

Note : Linear expansion unit in mm

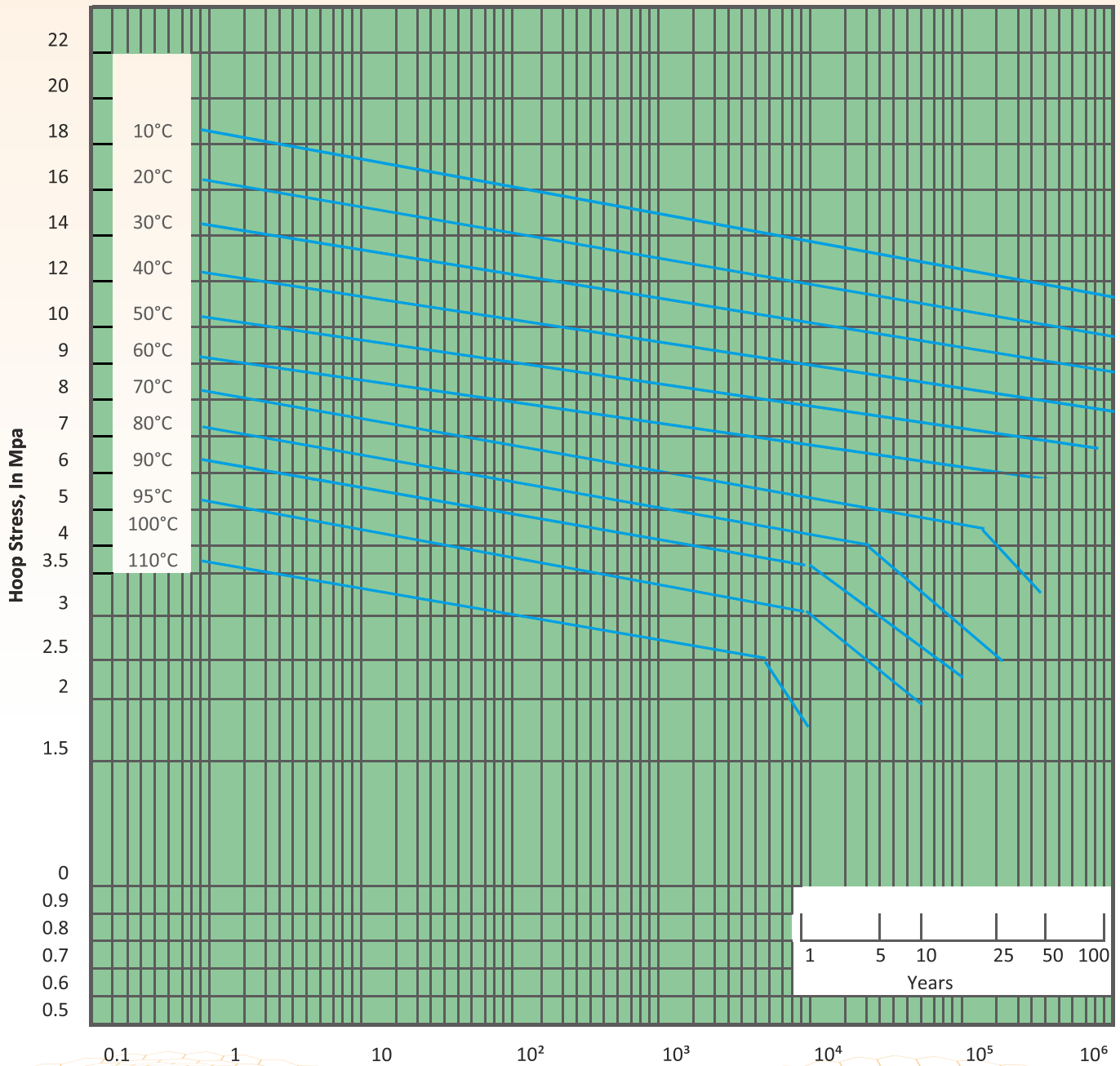
## Support Intervals

| Pipe Diameters mm | Temperature |      |      |      |      |      |      |      |      |
|-------------------|-------------|------|------|------|------|------|------|------|------|
| Size              | 0°C         | 20°C | 30°C | 40°C | 50°C | 60°C | 70°C | 80°C | 95°C |
| 16mm              | 80          | 60   | 60   | 50   | 50   | 45   | 40   | 30   | 25   |
| 20mm              | 90          | 65   | 65   | 60   | 60   | 55   | 50   | 40   | 35   |
| 25mm              | 110         | 80   | 75   | 70   | 70   | 65   | 60   | 50   | 45   |
| 32mm              | 120         | 95   | 95   | 85   | 80   | 75   | 70   | 60   | 55   |
| 40mm              | 145         | 110  | 110  | 90   | 90   | 85   | 80   | 70   | 60   |
| 50mm              | 170         | 130  | 120  | 110  | 110  | 100  | 95   | 75   | 70   |
| 63mm              | 190         | 150  | 140  | 130  | 120  | 110  | 100  | 90   | 75   |
| 75mm              | 210         | 160  | 150  | 140  | 130  | 120  | 110  | 100  | 85   |
| 90mm              | 220         | 160  | 160  | 150  | 150  | 140  | 125  | 105  | 90   |
| 110mm             | 250         | 180  | 180  | 170  | 170  | 160  | 140  | 125  | 110  |
| 160mm             | 260         | 210  | 210  | 190  | 180  | 170  | 150  | 135  | 120  |
| 200mm             | 270         | 250  | 240  | 230  | 220  | 210  | 200  | 190  | 150  |
| 250mm             | 290         | 280  | 270  | 260  | 250  | 240  | 230  | 215  | 170  |
| 315mm             | 325         | 315  | 305  | 295  | 285  | 270  | 260  | 245  | 205  |
| 355mm             | 345         | 335  | 325  | 315  | 300  | 285  | 275  | 260  | 215  |
| 400mm             | 365         | 355  | 345  | 335  | 320  | 305  | 290  | 275  | 230  |

*Support Intervals(CM)*



## Long Term behaviour of Thermaplus pipes



## For all size of KPT Thermaplus (PPR-FR) Pipe and Fittings

Allowable working pressure for KPT Thermaplus (PPR-FR) Pipe and Fittings

| Temperature,<br>in °C | Years of<br>Service | Standard Dimension Ratio (SDR)     |       |       |       |
|-----------------------|---------------------|------------------------------------|-------|-------|-------|
|                       |                     | 17.6                               | 11    | 7.4   | 6     |
|                       |                     | PN-6                               | PN-10 | PN-16 | PN-20 |
|                       |                     | Allowable working pressure, in bar |       |       |       |
| 10                    | 1                   | 12.7                               | 21.1  | 33.4  | 42.0  |
|                       | 5                   | 12.0                               | 20.0  | 31.6  | 39.8  |
|                       | 10                  | 11.6                               | 19.3  | 30.6  | 38.5  |
|                       | 25                  | 11.2                               | 18.7  | 29.6  | 37.3  |
|                       | 50                  | 10.9                               | 18.2  | 28.8  | 36.3  |
| 20                    | 1                   | 10.8                               | 18.0  | 28.6  | 36.0  |
|                       | 5                   | 10.2                               | 16.9  | 26.8  | 33.8  |
|                       | 10                  | 9.9                                | 16.4  | 26.1  | 32.8  |
|                       | 25                  | 9.6                                | 16.0  | 25.3  | 31.8  |
|                       | 50                  | 9.3                                | 15.5  | 24.5  | 30.9  |
| 30                    | 1                   | 9.2                                | 15.3  | 24.3  | 30.6  |
|                       | 5                   | 8.6                                | 14.4  | 22.8  | 28.7  |
|                       | 10                  | 8.4                                | 13.9  | 22.0  | 27.7  |
|                       | 25                  | 8.1                                | 13.4  | 21.3  | 26.8  |
|                       | 50                  | 7.9                                | 13.1  | 20.7  | 26.1  |
| 40                    | 1                   | 7.8                                | 12.9  | 20.5  | 25.8  |
|                       | 5                   | 7.3                                | 12.1  | 19.2  | 24.2  |
|                       | 10                  | 7.1                                | 11.8  | 18.7  | 23.6  |
|                       | 25                  | 6.8                                | 11.3  | 18.0  | 22.6  |
|                       | 50                  | 6.6                                | 11.0  | 17.5  | 22.0  |
| 50                    | 1                   | 6.6                                | 11.0  | 17.5  | 22.0  |
|                       | 5                   | 6.1                                | 10.2  | 16.2  | 20.4  |
|                       | 10                  | 6.0                                | 9.9   | 15.7  | 19.7  |
|                       | 25                  | 5.8                                | 9.6   | 15.2  | 19.1  |
|                       | 50                  | 5.6                                | 9.3   | 14.7  | 18.5  |
| 60                    | 1                   | 5.6                                | 9.3   | 14.7  | 18.5  |
|                       | 5                   | 5.2                                | 8.6   | 13.7  | 17.2  |
|                       | 10                  | 5.0                                | 8.3   | 13.2  | 16.6  |
|                       | 25                  | 4.8                                | 8.0   | 12.6  | 15.9  |
|                       | 50                  | 4.6                                | 7.7   | 12.1  | 15.3  |
| 70                    | 1                   | 4.7                                | 7.8   | 12.4  | 15.6  |
|                       | 5                   | 4.3                                | 7.2   | 11.4  | 14.3  |
|                       | 10                  | 4.2                                | 7.0   | 11.1  | 14.0  |
|                       | 25                  | 3.6                                | 6.1   | 9.6   | 12.1  |
|                       | 50                  | 3.1                                | 5.1   | 8.1   | 10.2  |
| 80                    | 1                   | 3.9                                | 6.5   | 10.4  | 13.1  |
|                       | 5                   | 3.5                                | 5.7   | 9.1   | 11.5  |
|                       | 10                  | 2.9                                | 4.8   | 7.6   | 9.6   |
|                       | 25                  | 2.3                                | 3.8   | 6.1   | 7.6   |
| 95                    | 1                   | 2.8                                | 4.6   | 7.3   | 9.2   |
|                       | 5                   | 1.8                                | 3.0   | 4.8   | 6.1   |
|                       | 10                  | 1.5                                | 2.6   | 4.0   | 5.1   |
| 110                   | 1                   | 1.0                                | 2.1   | 4.1   | 5.0   |
|                       | 5                   | 0.6                                | 1.8   | 2.9   | 3.1   |

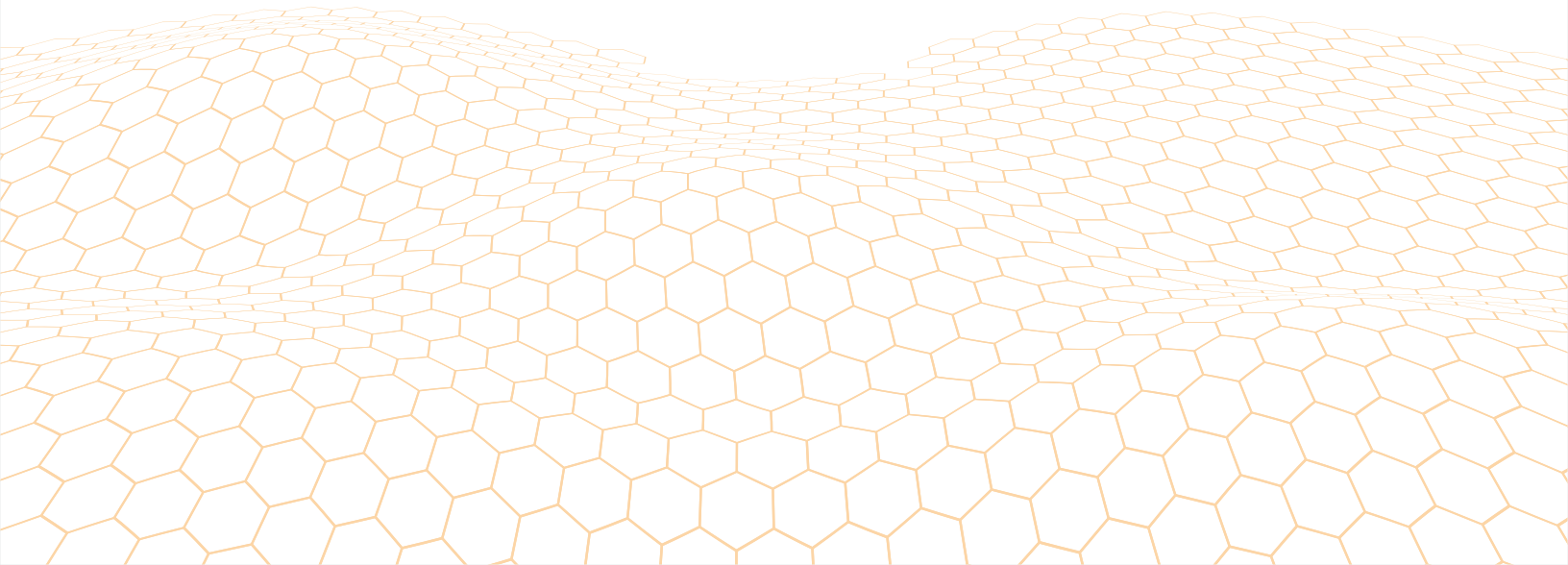
The bracketed values apply where testing can be shown to have been carried out for longer than one year at 110°C.

### Recommended Time For Thermaplus Pipes Fusion Joints.

| PIPE DIA.<br>(MM) | WELDING DEPTH<br>(MM) | HEATING<br>TIME (SEC) | WELDING<br>TIME (SEC) | COOLING<br>TIME (MIN) |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 16                | 14.0                  | 6                     | 4                     | 2                     |
| 20                | 14.5                  | 6                     | 4                     | 2                     |
| 25                | 16.0                  | 7                     | 4                     | 2                     |
| 32                | 18.0                  | 8                     | 6                     | 4                     |
| 40                | 20.5                  | 12                    | 6                     | 4                     |
| 50                | 23.5                  | 18                    | 6                     | 4                     |
| 63                | 27.5                  | 24                    | 8                     | 6                     |
| 75                | 30.0                  | 30                    | 8                     | 6                     |
| 90                | 32.5                  | 40                    | 8                     | 6                     |
| 110               | 37.0                  | 50                    | 10                    | 8                     |
| 160               | 42.0                  | 60                    | 15                    | 10                    |

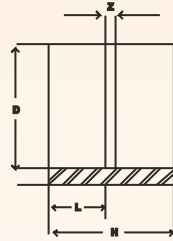
### Recommended Time For Thermaplus Pipes Butt Joints.

| PIPE DIA.<br>(MM) | WELDING<br>MACHINE<br>TEMPERATURE °C | HEATING<br>TIME (MIN) | WELDING<br>TIME (SEC) | COOLING<br>TIME (MIN) |
|-------------------|--------------------------------------|-----------------------|-----------------------|-----------------------|
| 200               | 220-240                              | 30                    | 180                   | 15-20                 |
| 250               | 220-240                              | 30                    | 240                   | 16-24                 |
| 315               | 225-240                              | 30                    | 300                   | 20-25                 |
| 355               | 225-240                              | 30                    | 360                   | 25-30                 |
| 400               | 223-240                              | 30                    | 420                   | 30-35                 |



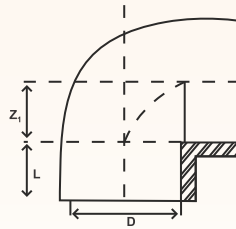
## KPT PPR C Fittings

### COUPLING



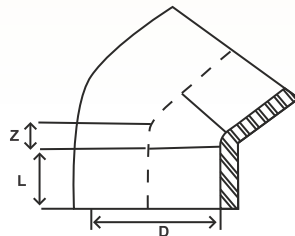
| CODE       | SIZE   | D     | L    | Z   | H    |
|------------|--------|-------|------|-----|------|
| KPT C-0001 | 20 MM  | 19.2  | 14.5 | 3.9 | 32.9 |
| KPT C-0002 | 25 MM  | 24.1  | 18.0 | 2.6 | 38.6 |
| KPT C-0003 | 32 MM  | 31.0  | 18.4 | 3.0 | 39.8 |
| KPT C-0004 | 40 MM  | 38.9  | 20.7 | 3.4 | 44.8 |
| KPT C-0005 | 50 MM  | 48.0  | 24.4 | 3.1 | 51.9 |
| KPT C-0006 | 63 MM  | 60.7  | 28.2 | 8.2 | 64.6 |
| KPT C-0007 | 75 MM  | 71.9  | 31.5 | 4.0 | 67.0 |
| KPT C-0008 | 90 MM  | 86.4  | 32.5 | 6.1 | 71.1 |
| KPT C-0009 | 110 MM | 106.8 | 38.8 | 3.0 | 80.6 |
| KPT C-0010 | 160 MM | 153.0 | 42.5 | 5.4 | 90.4 |

### ELBOW 90°



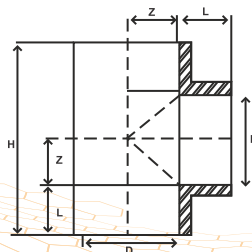
| CODE         | SIZE   | D     | L    | Z    |
|--------------|--------|-------|------|------|
| KPT E90-0021 | 20 MM  | 19.1  | 15.5 | 10.9 |
| KPT E90-0022 | 25 MM  | 24.2  | 16.9 | 14.1 |
| KPT E90-0023 | 32 MM  | 31.1  | 18.0 | 16.4 |
| KPT E90-0024 | 40 MM  | 39.5  | 20.0 | 20.0 |
| KPT E90-0025 | 50 MM  | 48.4  | 23.8 | 26.2 |
| KPT E90-0026 | 63 MM  | 60.5  | 27.4 | 32.2 |
| KPT E90-0027 | 75 MM  | 72.6  | 31.5 | 38.0 |
| KPT E90-0028 | 90 MM  | 86.8  | 33.0 | 44.7 |
| KPT E90-0029 | 110 MM | 106.5 | 39.0 | 54.8 |
| KPT E90-0030 | 160 MM | 153.6 | 45.0 | 78.7 |
| KPT E90-0031 | 200MM  | ...   | ...  | ...  |
| KPT E90-0032 | 250MM  | ...   | ...  | ...  |
| KPT E90-0033 | 315MM  | ...   | ...  | ...  |
| KPT E90-0034 | 355MM  | ...   | ...  | ...  |
| KPT E90-0035 | 400MM  | ...   | ...  | ...  |

### ELBOW 45°



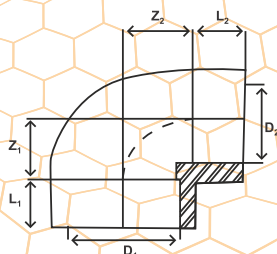
| CODE         | SIZE   | D     | L    | Z    |
|--------------|--------|-------|------|------|
| KPT E45-0041 | 20 MM  | 19.3  | 15.5 | 6.0  |
| KPT E45-0042 | 25 MM  | 23.7  | 17.6 | 7.0  |
| KPT E45-0043 | 32 MM  | 30.6  | 16.5 | 8.0  |
| KPT E45-0044 | 40 MM  | 38.2  | 21.3 | 9.0  |
| KPT E45-0045 | 50 MM  | 47.7  | 22.5 | 12.0 |
| KPT E45-0046 | 63 MM  | 60.0  | 26.0 | 13.0 |
| KPT E45-0047 | 75 MM  | 72.5  | 26.7 | 20.0 |
| KPT E45-0048 | 90 MM  | 86.8  | 34.5 | 32.0 |
| KPT E45-0049 | 110 MM | 106.2 | 35.3 | 40.0 |
| KPT E45-0050 | 160 MM | 154.9 | 48.2 | 50.0 |
| KPT E45-0051 | 200MM  | ...   | ...  | ...  |
| KPT E45-0052 | 250MM  | ...   | ...  | ...  |
| KPT E45-0053 | 315MM  | ...   | ...  | ...  |
| KPT E45-0054 | 355MM  | ...   | ...  | ...  |
| KPT E45-0055 | 400MM  | ...   | ...  | ...  |

### EQUAL TEE



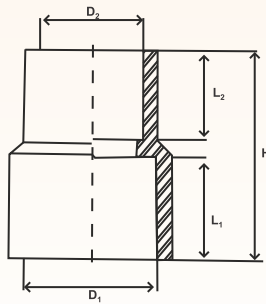
| CODE        | SIZE   | D     | L    | Z    | H     |
|-------------|--------|-------|------|------|-------|
| KPT ET-0061 | 20 MM  | 19.3  | 15.8 | 10.5 | 52.6  |
| KPT ET-0062 | 25 MM  | 24.2  | 18.0 | 12.7 | 61.4  |
| KPT ET-0063 | 32 MM  | 31.4  | 20.2 | 16.3 | 72.5  |
| KPT ET-0064 | 40 MM  | 39.0  | 20.3 | 20.9 | 82.4  |
| KPT ET-0065 | 50 MM  | 48.6  | 24.4 | 24.5 | 97.8  |
| KPT ET-0066 | 63 MM  | 61.7  | 27.4 | 32.6 | 120.0 |
| KPT ET-0067 | 75 MM  | 72.2  | 31.3 | 36.7 | 136.0 |
| KPT ET-0068 | 90 MM  | 86.9  | 32.9 | 47.1 | 160.0 |
| KPT ET-0069 | 110 MM | 106.7 | 38.8 | 55.3 | 188.2 |
| KPT ET-0070 | 160 MM | 153.7 | 45.0 | 85.0 | 260.0 |
| KPT ET-0071 | 200MM  | ...   | ...  | ...  | ...   |
| KPT ET-0072 | 250MM  | ...   | ...  | ...  | ...   |
| KPT ET-0073 | 315MM  | ...   | ...  | ...  | ...   |
| KPT ET-0074 | 355MM  | ...   | ...  | ...  | ...   |
| KPT ET-0075 | 400MM  | ...   | ...  | ...  | ...   |

### REDUCING ELBOW



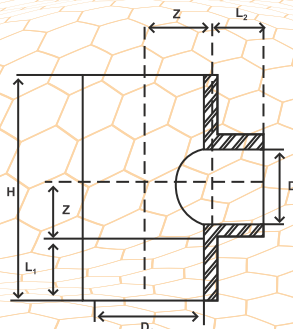
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|-------------|-------|------|------|------|------|------|------|
| KPT RE-0121 | 25/20 | 24.0 | 19.2 | 18.5 | 16.0 | 17.8 | 14.4 |
| KPT RE-0122 | 32/20 | 31.3 | 19.2 | 21.1 | 16.0 | 18.3 | 18.0 |
| KPT RE-0123 | 32/25 | 31.3 | 24.2 | 20.0 | 17.8 | 22.2 | 20.7 |
| KPT RE-0124 | 40/20 | 38.7 | 19.2 | 21.6 | 16.3 | 19.6 | 24.2 |
| KPT RE-0125 | 40/25 | 38.7 | 24.2 | 21.6 | 17.8 | 21.4 | 20.7 |
| KPT RE-0126 | 40/32 | 38.6 | 31.2 | 21.9 | 19.8 | 24.2 | 25.3 |

## REDUCER



| CODE         | SIZE    | D1    | D2    | L1   | L2   | H    |
|--------------|---------|-------|-------|------|------|------|
| P-KPT R-0081 | 25/20   | 24.0  | 19.2  | 18.5 | 15.7 | 38.1 |
| P-KPT R-0082 | 32/20   | 31.3  | 19.2  | 20.0 | 15.7 | 39.3 |
| P-KPT R-0083 | 32/25   | 31.4  | 24.4  | 21.0 | 18.4 | 41.7 |
| P-KPT R-0084 | 40/20   | 38.7  | 19.3  | 22.9 | 16.9 | 48.0 |
| P-KPT R-0085 | 40/25   | 39.0  | 24.2  | 24.2 | 18.0 | 48.5 |
| P-KPT R-0086 | 40/32   | 38.6  | 31.0  | 21.1 | 18.8 | 44.9 |
| P-KPT R-0087 | 50/20   | 48.0  | 18.8  | 24.6 | 16.6 | 44.5 |
| P-KPT R-0088 | 50/25   | 48.0  | 23.8  | 24.5 | 16.2 | 45.6 |
| P-KPT R-0089 | 50/32   | 48.0  | 31.1  | 24.4 | 18.0 | 48.1 |
| P-KPT R-0090 | 50/40   | 48.2  | 38.8  | 24.3 | 20.9 | 48.2 |
| P-KPT R-0091 | 63/20   | 60.9  | 19.2  | 28.2 | 15.9 | 48.3 |
| P-KPT R-0092 | 63/25   | 60.7  | 24.1  | 28.2 | 18.0 | 49.5 |
| P-KPT R-0093 | 63/32   | 60.6  | 30.7  | 28.0 | 18.0 | 48.0 |
| P-KPT R-0094 | 63/40   | 60.8  | 38.3  | 25.3 | 25.5 | 56.8 |
| P-KPT R-0095 | 63/50   | 60.9  | 48.2  | 29.2 | 25.8 | 64.8 |
| P-KPT R-0096 | 75/20   | 72.5  | 19.0  | 42.7 | 21.1 | 63.8 |
| P-KPT R-0097 | 75/25   | 72.5  | 24.3  | 42.7 | 21.1 | 63.8 |
| P-KPT R-0098 | 75/32   | 72.5  | 31.0  | 42.7 | 21.1 | 63.8 |
| P-KPT R-0099 | 75/40   | 72.2  | 38.7  | 31.6 | 22.5 | 63.6 |
| P-KPT R-0100 | 75/50   | 72.1  | 48.4  | 31.7 | 27.0 | 63.2 |
| P-KPT R-0101 | 75/63   | 71.8  | 60.9  | 31.4 | 30.0 | 67.0 |
| P-KPT R-0102 | 90/20   | 87.3  | 19.0  | 43.5 | 27.0 | 70.5 |
| P-KPT R-0103 | 90/25   | 87.3  | 24.1  | 43.5 | 27.0 | 70.5 |
| P-KPT R-0104 | 90/32   | 87.3  | 31.0  | 42.5 | 27.0 | 70.5 |
| P-KPT R-0105 | 90/40   | 87.3  | 38.9  | 42.5 | 27.0 | 70.5 |
| P-KPT R-0106 | 90/50   | 86.5  | 48.1  | 33.0 | 26.3 | 70.0 |
| P-KPT R-0107 | 90/63   | 86.6  | 60.9  | 32.8 | 29.9 | 68.8 |
| P-KPT R-0108 | 90/75   | 86.7  | 72.7  | 37.2 | 31.5 | 71.7 |
| P-KPT R-0109 | 110/20  | 106.8 | 19.0  | 58.1 | 19.5 | 76.0 |
| P-KPT R-0110 | 110/25  | 106.8 | 24.0  | 53.3 | 19.2 | 76.0 |
| P-KPT R-0111 | 110/32  | 106.8 | 31.0  | 57.6 | 19.5 | 76.0 |
| P-KPT R-0112 | 110/40  | 106.8 | 39.0  | 56.6 | 19.3 | 76.0 |
| P-KPT R-0113 | 110/50  | 106.8 | 48.4  | 38.9 | 26.0 | 76.0 |
| P-KPT R-0114 | 110/63  | 106.8 | 61.2  | 38.9 | 30.1 | 76.0 |
| P-KPT R-0115 | 110/75  | 106.8 | 72.6  | 38.9 | 31.8 | 76.0 |
| P-KPT R-0116 | 110/90  | 106.8 | 86.6  | 38.9 | 33.0 | 76.0 |
| P-KPT R-0117 | 160/20  | 155.3 | 18.9  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0118 | 160/25  | 155.3 | 23.9  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0119 | 160/32  | 155.3 | 30.6  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0120 | 160/40  | 155.3 | 38.7  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0121 | 160/50  | 155.3 | 48.5  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0122 | 160/63  | 155.3 | 61.8  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0123 | 160/75  | 155.3 | 73.5  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0124 | 160/90  | 155.3 | 88.5  | 61.8 | 29.5 | 91.2 |
| P-KPT R-0125 | 160/110 | 155.3 | 106.3 | 61.8 | 29.5 | 91.2 |

## REDUCING TEE



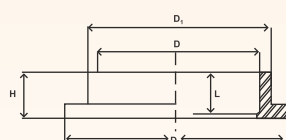
| CODE          | SIZE        | D1    | D2    | L1   | L2   | Z    | H     |
|---------------|-------------|-------|-------|------|------|------|-------|
| P-KPT RT-0141 | 25/20/25    | 24.2  | 19.1  | 17.6 | 16.2 | 10.8 | 56.8  |
| P-KPT RT-0142 | 32/20/32    | 31.1  | 19.1  | 19.8 | 16.5 | 11.3 | 62.2  |
| P-KPT RT-0143 | 32/25/32    | 31.4  | 24.2  | 20.0 | 17.8 | 13.4 | 66.8  |
| P-KPT RT-0144 | 40/20/40    | 39.0  | 19.1  | 21.4 | 16.5 | 11.1 | 65.0  |
| P-KPT RT-0145 | 40/25/40    | 38.8  | 24.2  | 21.4 | 17.6 | 13.5 | 69.8  |
| P-KPT RT-0146 | 40/32/40    | 38.8  | 31.0  | 21.4 | 19.5 | 16.8 | 76.4  |
| P-KPT RT-0147 | 50/20/50    | 48.4  | 19.1  | 24.4 | 18.1 | 24.5 | 97.7  |
| P-KPT RT-0148 | 50/25/50    | 48.6  | 24.1  | 24.3 | 17.9 | 24.7 | 98.0  |
| P-KPT RT-0149 | 50/32/50    | 48.6  | 30.5  | 24.3 | 18.8 | 24.6 | 97.8  |
| P-KPT RT-0150 | 50/40/50    | 48.6  | 38.7  | 22.4 | 22.0 | 26.1 | 96.9  |
| P-KPT RT-0151 | 63/20/63    | 61.2  | 19.0  | 27.5 | 16.2 | 32.2 | 119.4 |
| P-KPT RT-0152 | 63/25/63    | 61.3  | 23.8  | 27.5 | 19.4 | 32.2 | 119.4 |
| P-KPT RT-0153 | 63/32/63    | 61.3  | 30.8  | 27.5 | 19.3 | 32.2 | 119.4 |
| P-KPT RT-0154 | 63/40/63    | 61.3  | 38.9  | 27.3 | 22.5 | 32.4 | 119.4 |
| P-KPT RT-0155 | 63/50/63    | 61.2  | 48.0  | 27.4 | 25.8 | 32.3 | 119.4 |
| P-KPT RT-0156 | 75/20/75    | 72.5  | 19.0  | 31.4 | 15.9 | 26.4 | 115.5 |
| P-KPT RT-0157 | 75/25/75    | 72.5  | 24.0  | 31.4 | 17.6 | 26.4 | 115.5 |
| P-KPT RT-0158 | 75/32/75    | 72.5  | 30.9  | 31.4 | 19.7 | 26.4 | 115.5 |
| P-KPT RT-0159 | 75/40/75    | 72.3  | 38.4  | 31.4 | 20.3 | 26.4 | 115.5 |
| P-KPT RT-0160 | 75/50/75    | 72.3  | 47.9  | 31.4 | 29.8 | 26.4 | 115.5 |
| P-KPT RT-0161 | 75/63/75    | 72.2  | 60.2  | 31.4 | 29.8 | 26.4 | 115.5 |
| P-KPT RT-0162 | 90/20/90    | 86.5  | 19.0  | 32.8 | 15.6 | 31.3 | 128.1 |
| P-KPT RT-0163 | 90/25/90    | 86.5  | 24.0  | 32.8 | 17.6 | 31.3 | 128.1 |
| P-KPT RT-0164 | 90/32/90    | 86.5  | 31.0  | 32.8 | 19.5 | 31.3 | 128.1 |
| P-KPT RT-0165 | 90/40/90    | 86.5  | 38.6  | 32.8 | 21.2 | 31.3 | 128.1 |
| P-KPT RT-0166 | 90/50/90    | 86.5  | 48.1  | 32.8 | 26.0 | 31.3 | 128.1 |
| P-KPT RT-0167 | 90/63/90    | 86.5  | 61.2  | 32.8 | 30.1 | 31.3 | 128.1 |
| P-KPT RT-0168 | 90/75/90    | 86.5  | 72.4  | 32.9 | 31.7 | 46.9 | 159.5 |
| P-KPT RT-0169 | 110/20/110  | 106.5 | 19.0  | 38.7 | 15.8 | 38.5 | 154.3 |
| P-KPT RT-0170 | 110/25/110  | 106.5 | 24.2  | 38.7 | 17.7 | 38.5 | 154.3 |
| P-KPT RT-0171 | 110/32/110  | 106.5 | 31.0  | 38.7 | 19.7 | 38.5 | 154.3 |
| P-KPT RT-0172 | 110/40/110  | 106.5 | 38.9  | 38.7 | 21.5 | 38.5 | 154.3 |
| P-KPT RT-0173 | 110/50/110  | 106.5 | 48.6  | 38.9 | 26.2 | 38.3 | 154.3 |
| P-KPT RT-0174 | 110/63/110  | 106.7 | 61.3  | 39.0 | 30.2 | 38.2 | 154.3 |
| P-KPT RT-0175 | 110/75/110  | 106.4 | 72.5  | 39.0 | 32.0 | 38.2 | 154.3 |
| P-KPT RT-0176 | 110/90/110  | 106.7 | 87.1  | 38.9 | 33.0 | 54.8 | 187.4 |
| P-KPT RT-0177 | 160/20/160  | 155.4 | 19.0  | 45.0 | 15.8 | 80.9 | 251.8 |
| P-KPT RT-0178 | 160/25/160  | 155.4 | 23.8  | 45.0 | 18.5 | 80.9 | 251.8 |
| P-KPT RT-0179 | 160/32/160  | 155.4 | 31.0  | 45.0 | 19.5 | 80.9 | 251.8 |
| P-KPT RT-0180 | 160/40/160  | 155.4 | 38.9  | 45.0 | 21.5 | 80.9 | 251.8 |
| P-KPT RT-0181 | 160/50/160  | 155.4 | 48.8  | 45.0 | 25.4 | 80.9 | 251.8 |
| P-KPT RT-0182 | 160/63/160  | 157.5 | 61.9  | 45.0 | 27.6 | 80.9 | 251.8 |
| P-KPT RT-0183 | 160/75/160  | 157.5 | 73.9  | 45.0 | 32.1 | 80.9 | 251.8 |
| P-KPT RT-0184 | 160/90/160  | 157.5 | 88.5  | 45.0 | 33.0 | 80.9 | 251.8 |
| P-KPT RT-0185 | 160/110/160 | 157.5 | 107.4 | 45.0 | 44.9 | 80.9 | 251.8 |

### FLANGE CORE(STUB END)



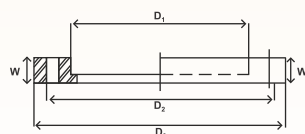
| CODE         | SIZE   | D1    | D3    | W    | No. of Bolt |
|--------------|--------|-------|-------|------|-------------|
| P-KPT F-0221 | 90 MM  | ...   | ...   | ...  | ...         |
| P-KPT F-0222 | 110 MM | ...   | ...   | ...  | ...         |
| P-KPT F-0223 | 160 MM | ...   | ...   | ...  | ...         |
| P-KPT F-0224 | 200 MM | 217.0 | 292.1 | 24.5 | 8           |
| P-KPT F-0225 | 250 MM | 267.0 | 355.0 | 27.5 | 8           |
| P-KPT F-0226 | 315 MM | 323.0 | 406.4 | 32.6 | 12          |

### FLANGE CORE(STUB END)



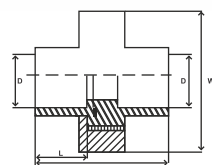
| CODE          | SIZE   | D     | D1    | D2    | L    | H     |
|---------------|--------|-------|-------|-------|------|-------|
| P-KPT FC-0201 | 32 MM  | 31.1  | 42.9  | 50.5  | 19.9 | 23.3  |
| P-KPT FC-0202 | 40 MM  | 31.1  | 49.6  | 60.2  | 20.3 | 25.8  |
| P-KPT FC-0203 | 50 MM  | 48.1  | 62.6  | 72.3  | 22.2 | 27.2  |
| P-KPT FC-0204 | 63 MM  | 61.0  | 80.7  | 95.0  | 20.9 | 35.4  |
| P-KPT FC-0205 | 75 MM  | 72.6  | 95.0  | 111.3 | 31.9 | 39.0  |
| P-KPT FC-0206 | 90 MM  | 87.1  | 111.8 | 129.4 | 24.2 | 42.1  |
| P-KPT FC-0207 | 110 MM | 106.8 | 133.3 | 151.0 | 25.4 | 43.3  |
| P-KPT FC-0208 | 160 MM | 155.0 | 194.4 | 214.0 | 31.0 | 52.8  |
| P-KPT FC-0209 | 200MM  | 166.1 | 211.0 | 251.5 | 54.8 | 80.3  |
| P-KPT FC-0210 | 250MM  | 213.8 | 261.4 | 312.0 | 80.5 | 84.4  |
| P-KPT FC-0211 | 315MM  | 253.5 | 310.5 | 380.0 | 71.0 | 94.0  |
| P-KPT FC-0212 | 355MM  | 300.0 | 355.0 | 427.0 | 63.8 | 119.0 |
| P-KPT FC-0213 | 400MM  | 352.0 | 400.0 | 477.0 | 70.0 | 117.0 |

### SLIP-ON (PPR FLANGES)



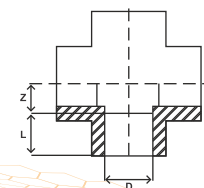
| CODE         | SIZE   | D1    | D2    | D3    | W    |
|--------------|--------|-------|-------|-------|------|
| P-KPT F-0221 | 32 MM  | 43.6  | 97.0  | 115.7 | 20.6 |
| P-KPT F-0222 | 40 MM  | 50.0  | 109.0 | 128.0 | 21.6 |
| P-KPT F-0223 | 50 MM  | 62.5  | 122.0 | 140.7 | 22.5 |
| P-KPT F-0224 | 63 MM  | 83.0  | 141.4 | 157.4 | 24.3 |
| P-KPT F-0225 | 75 MM  | 97.0  | 175.3 | 172.3 | 26.2 |
| P-KPT F-0226 | 90 MM  | 113.7 | 178.3 | 194.8 | 26.4 |
| P-KPT F-0227 | 110 MM | 135.7 | 197.9 | 216.0 | 30.6 |
| P-KPT F-0228 | 160 MM | 195.8 | 266.0 | 292.0 | 35.5 |

### PLAIN UNION



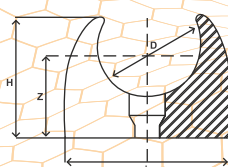
| CODE         | SIZE  | D    | L    | W    | H     |
|--------------|-------|------|------|------|-------|
| P-KPT U-0241 | 20 MM | 19.2 | 17.7 | 52.2 | 44.4  |
| P-KPT U-0242 | 25 MM | 24.2 | 18.6 | 51.4 | 55.2  |
| P-KPT U-0243 | 32 MM | 31.2 | 22.1 | 61.5 | 67.5  |
| P-KPT U-0244 | 40 MM | 39.2 | 29.2 | 79.0 | 79.9  |
| P-KPT U-0245 | 50 MM | 47.7 | 23.6 | 78.0 | 96.1  |
| P-KPT U-0246 | 63 MM | 60.7 | 27.7 | 89.0 | 107.6 |

### 4WAY/CROSS TEE



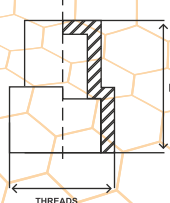
| CODE          | SIZE  | D    | L    | Z    |
|---------------|-------|------|------|------|
| P-KPT CT-0261 | 20 MM | 18.8 | 15.5 | 15.4 |
| P-KPT CT-0262 | 25 MM | 24.1 | 17.1 | 24.9 |
| P-KPT CT-0263 | 32 MM | 30.6 | 17.8 | 32.2 |
| P-KPT CT-0264 | 40 MM | 38.0 | 20.8 | 39.2 |
| P-KPT CT-0265 | 50 MM | 48.0 | 21.3 | 52.2 |
| P-KPT CT-0266 | 63 MM | 60.7 | 23.3 | 63.6 |

### PIPE CLAMP



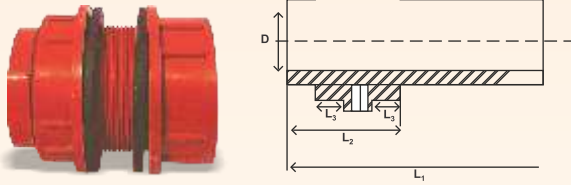
| CODE          | SIZE  | D    | L    | Z    | H    |
|---------------|-------|------|------|------|------|
| P-KPT PC-0281 | 20 MM | 18.9 | 27.0 | 19.2 | 31.0 |
| P-KPT PC-0282 | 25 MM | 24.0 | 32.0 | 21.0 | 36.0 |
| P-KPT PC-0283 | 32 MM | 30.7 | 39.5 | 27.5 | 43.5 |
| P-KPT PC-0284 | 40 MM | 39.1 | 48.3 | 30.9 | 49.8 |
| P-KPT PC-0285 | 50 MM | 50.0 | 60.0 | 37.3 | 61.5 |
| P-KPT PC-0286 | 63 MM | 63.0 | 74.7 | 45.0 | 75.3 |

### LONG PLUG



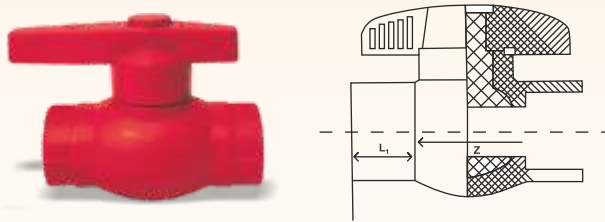
| CODE          | SIZE | THREADS | H    |
|---------------|------|---------|------|
| P-KPT LP-0301 | 1/2" | 1/2"    | 69.7 |
| P-KPT LP-0302 | 3/4" | 3/4"    | 62.2 |
| P-KPT LP-0303 | 1"   | 1"      | 73.6 |

### TANK CONNECTOR



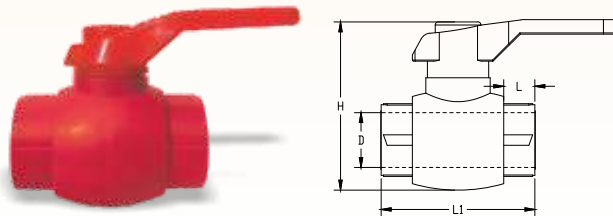
| CODE          | SIZE  | D    | L1    | L2   | L3   |
|---------------|-------|------|-------|------|------|
| P-KPT TC-0321 | 20 MM | 19.2 | 69.0  | 43.6 | 15.2 |
| P-KPT TC-0322 | 25 MM | 24.1 | 69.0  | 52.5 | 19.5 |
| P-KPT TC-0323 | 32 MM | 30.6 | 74.3  | 54.5 | 21.5 |
| P-KPT TC-0324 | 40 MM | 38.4 | 88.4  | 55.3 | 25.6 |
| P-KPT TC-0325 | 50 MM | 48.3 | 96.7  | 58.4 | 24.6 |
| P-KPT TC-0326 | 63 MM | 60.7 | 101.5 | 65.5 | 27.0 |

### BALL VALVE



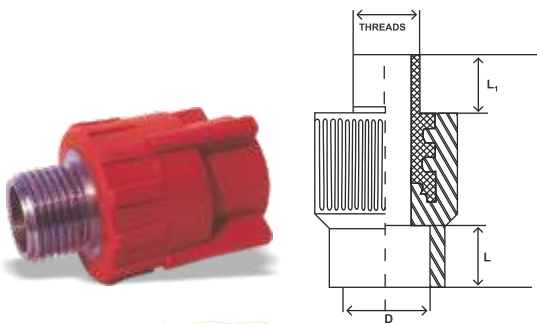
| CODE        | SIZE   | D     | L    | Z     | H     |
|-------------|--------|-------|------|-------|-------|
| KPT BV-0341 | 20 MM  | 19.1  | 23.0 | 32.4  | 78.4  |
| KPT BV-0342 | 25 MM  | 24.1  | 24.8 | 39.6  | 89.2  |
| KPT BV-0343 | 32 MM  | 31.0  | 25.1 | 51.8  | 102.0 |
| KPT BV-0344 | 40 MM  | 38.9  | 29.6 | 53.7  | 112.9 |
| KPT BV-0345 | 50 MM  | 49.2  | 34.5 | 60.8  | 129.8 |
| KPT BV-0346 | 63 MM  | 61.6  | 37.3 | 70.9  | 145.5 |
| KPT BV-0347 | 75 MM  | 73.4  | 40.5 | 85.7  | 166.7 |
| KPT BV-0348 | 90 MM  | 87.4  | 40.7 | 97.2  | 178.6 |
| KPT BV-0349 | 110 MM | 106.6 | 41.9 | 107.9 | 191.7 |

### BALL VALVE PLASTIC (SINGLE LEVER)



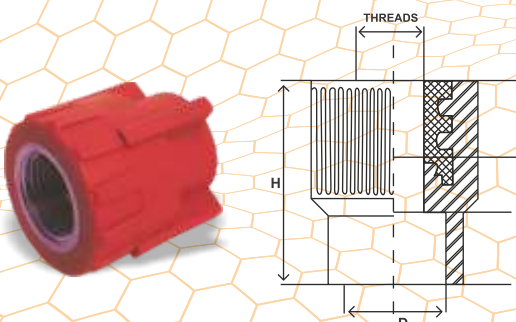
| CODE          | SIZE   | D    | L     | L1   | H     |
|---------------|--------|------|-------|------|-------|
| P-KPT BV-0351 | 20 MM  | 19.4 | 66.0  | 17.0 | 65.0  |
| P-KPT BV-0352 | 25 MM  | 24.4 | 73.2  | 17.3 | 75.9  |
| P-KPT BV-0353 | 32 MM  | 31.5 | 85.3  | 20.9 | 83.9  |
| P-KPT BV-0354 | 40 MM  | 39.4 | 111.8 | 24.5 | 112.6 |
| P-KPT BV-0355 | 50 MM  | 49.5 | 116.3 | 27.5 | 120.0 |
| P-KPT BV-0356 | 63 MM  | 61.7 | 149.0 | 37.0 | 141.7 |
| P-KPT BV-0357 | 75 MM  | ...  | ...   | ...  | ...   |
| P-KPT BV-0358 | 90 MM  | ...  | ...   | ...  | ...   |
| P-KPT BV-0359 | 110 MM | ...  | ...   | ...  | ...   |

### MALE THREADED COUPLING



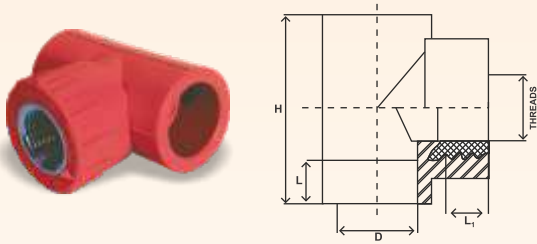
| CODE           | SIZE     | THREADS | D     | L    | L1   | H     |
|----------------|----------|---------|-------|------|------|-------|
| P-KPT MTC-0360 | 16*1/2   | 1/2"    | 15.7  | 17.0 | 13.9 | 57.3  |
| P-KPT MTC-0361 | 20*1/2   | 1/2"    | 19.2  | 16.2 | 14.2 | 57.0  |
| P-KPT MTC-0362 | 25*1/2   | 1/2"    | 23.8  | 18.3 | 14.2 | 56.0  |
| P-KPT MTC-0363 | 25*3/4   | 3/4"    | 24.1  | 18.2 | 14.1 | 59.1  |
| P-KPT MTC-0364 | 32*1/2   | 1/2"    | 31.1  | 19.8 | 14.0 | 64.5  |
| P-KPT MTC-0365 | 32*3/4   | 3/4"    | 31.1  | 20.3 | 14.2 | 67.8  |
| P-KPT MTC-0366 | 32*1     | 1"      | 31.1  | 20.2 | 28.0 | 71.8  |
| P-KPT MTC-0367 | 40*1     | 1"      | 38.7  | 21.6 | 28.0 | 76.0  |
| P-KPT MTC-0368 | 40*1-1/4 | 1 1/4"  | 38.8  | 22.1 | 14.1 | 76.0  |
| P-KPT MTC-0369 | 50*1-1/2 | 1 1/2"  | 48.9  | 25.5 | 21.3 | 80.0  |
| P-KPT MTC-0370 | 63*2     | 2"      | 62.2  | 29.5 | 26.3 | 95.2  |
| P-KPT MTC-0371 | 75*2-1/2 | 2 1/2"  | 72.0  | 32.4 | 24.9 | 100.5 |
| P-KPT MTC-0372 | 90*3     | 3"      | 86.4  | 38.2 | 24.6 | 109.2 |
| P-KPT MTC-0373 | 110*4    | 4"      | 104.9 | 38.1 | 25.5 | 119.0 |

### FEMALE THREADED COUPLING



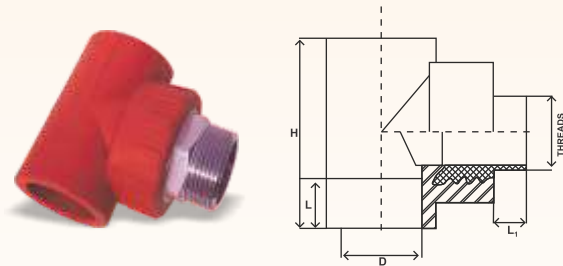
| CODE           | SIZE     | THREADS | D     | L    | L1   | H     |
|----------------|----------|---------|-------|------|------|-------|
| P-KPT FTC-0390 | 16*1/2   | 1/2"    | 15.7  | 17.0 | 15.0 | 43.4  |
| P-KPT FTC-0391 | 20*1/2   | 1/2"    | 19.2  | 16.0 | 15.0 | 43.2  |
| P-KPT FTC-0392 | 20*3/4   | 3/4"    | 23.6  | 18.0 | 14.9 | 41.8  |
| P-KPT FTC-0393 | 25*1/2   | 1/2"    | 23.6  | 18.0 | 14.9 | 41.8  |
| P-KPT FTC-0394 | 25*3/4   | 3/4"    | 24.1  | 18.1 | 15.7 | 45.0  |
| P-KPT FTC-0395 | 32*1/2   | 1/2"    | 31.1  | 20.0 | 15.0 | 50.5  |
| P-KPT FTC-0396 | 32*3/4   | 3/4"    | 31.1  | 20.4 | 16.0 | 52.0  |
| P-KPT FTC-0397 | 32*1     | 1"      | 31.1  | 20.2 | 17.8 | 54.7  |
| P-KPT FTC-0398 | 40*1     | 1"      | 38.7  | 21.6 | 27.0 | 62    |
| P-KPT FTC-0399 | 40*1-1/4 | 1 1/4"  | 38.8  | 22.1 | 18.0 | 62.0  |
| P-KPT FTC-0400 | 50*1-1/2 | 1 1/2"  | 48.8  | 25.3 | 18.5 | 58.0  |
| P-KPT FTC-0401 | 63*2     | 2"      | 61.5  | 28.6 | 25.6 | 68.1  |
| P-KPT FTC-0402 | 75*2-1/2 | 2 1/2"  | 71.8  | 31.7 | 20.2 | 89.2  |
| P-KPT FTC-0403 | 90*3     | 3"      | 86.5  | 38.0 | 21.9 | 101.5 |
| P-KPT FTC-0404 | 110*4    | 4"      | 106.1 | 38.2 | 26.3 | 116.8 |

## FEMALE THREADED TEE



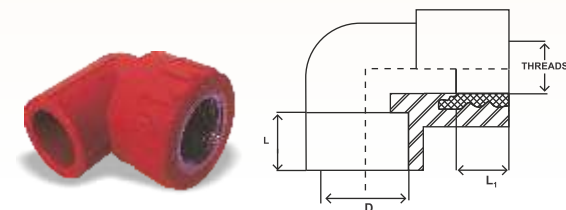
| CODE           | SIZE     | THREADS | D    | L    | L1   | H    |
|----------------|----------|---------|------|------|------|------|
| P-KPT FTT-0421 | 20*1/2   | 1/2"    | 19.2 | 15.0 | 14.0 | 58.2 |
| P-KPT FTT-0422 | 20*3/4   | 3/4"    | 19.2 | 15.0 | 14.0 | 58.2 |
| P-KPT FTT-0423 | 25*1/2   | 1/2"    | 24.2 | 14.9 | 14.0 | 62.2 |
| P-KPT FTT-0424 | 25*3/4   | 3/4"    | 24.2 | 16.2 | 13.9 | 63.8 |
| P-KPT FTT-0425 | 32*1/2   | 1/2"    | 31.3 | 15.0 | 14.2 | 78.0 |
| P-KPT FTT-0426 | 32*3/4   | 3/4"    | 31.3 | 16.2 | 14.2 | 78.2 |
| P-KPT FTT-0427 | 32*1     | 1"      | 31.2 | 17.7 | 15.8 | 77.8 |
| P-KPT FTT-0428 | 40*1-1/4 | 1 1/4"  | 39.0 | 17.6 | 15.2 | 91.0 |

## MALE THREADED TEE



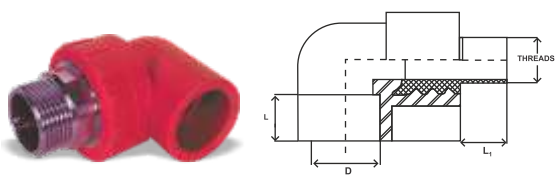
| CODE           | SIZE     | THREADS | D    | L    | L1   | H    |
|----------------|----------|---------|------|------|------|------|
| P-KPT MTT-0441 | 20*1/2   | 1/2"    | 19.2 | 16.5 | 14.0 | 58.2 |
| P-KPT MTT-0443 | 25*1/2   | 1/2"    | 24.2 | 18.2 | 14.0 | 62.2 |
| P-KPT MTT-0444 | 25*3/4   | 3/4"    | 24.2 | 17.6 | 13.9 | 63.8 |
| P-KPT MTT-0445 | 32*1/2   | 1/2"    | 31.3 | 20.0 | 14.2 | 78.0 |
| P-KPT MTT-0446 | 32*3/4   | 3/4"    | 31.3 | 20.0 | 14.2 | 78.2 |
| P-KPT MTT-0447 | 32*1     | 1"      | 31.2 | 20.0 | 15.8 | 77.8 |
| P-KPT MTT-0448 | 40-1-1/4 | 1 1/4"  | 39.0 | 21.4 | 15.2 | 91.0 |

## FEMALE THREADED ELBOW



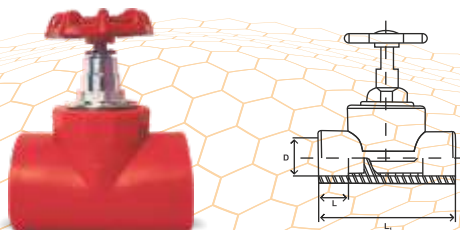
| CODE           | SIZE     | THREADS | D    | L    | L1   |
|----------------|----------|---------|------|------|------|
| P-KPT FTE-0461 | 20*1/2   | 1/2"    | 19.2 | 16.1 | 16.0 |
| P-KPT FTE-0463 | 25*1/2   | 1/2"    | 24.1 | 17.9 | 15.0 |
| P-KPT FTE-0464 | 25*3/4   | 3/4"    | 24.2 | 17.9 | 16.0 |
| P-KPT FTE-0465 | 32*1/2   | 1/2"    | 31.2 | 20.2 | 15.0 |
| P-KPT FTE-0466 | 32*3/4   | 3/4"    | 31.2 | 20.2 | 16.1 |
| P-KPT FTE-0467 | 32*1     | 1"      | 31.2 | 20.3 | 18.3 |
| P-KPT FTE-0468 | 40*1-1/4 | 1 1/4"  | 39.1 | 21.3 | 17.9 |

## MALE THREADED ELBOW



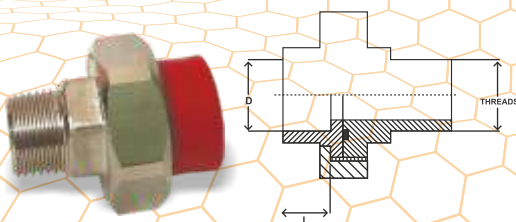
| CODE           | SIZE     | THREADS | D    | L    | L1   |
|----------------|----------|---------|------|------|------|
| P-KPT MTE-0481 | 20*1/2   | 1/2"    | 19.2 | 16.1 | 15.0 |
| P-KPT MTE-0483 | 25*1/2   | 1/2"    | 24.1 | 17.9 | 15.0 |
| P-KPT MTE-0484 | 25*3/4   | 3/4"    | 24.2 | 18.0 | 14.2 |
| P-KPT MTE-0485 | 32*1/2   | 1/2"    | 31.3 | 21.0 | 14.3 |
| P-KPT MTE-0486 | 32*3/4   | 3/4"    | 31.3 | 20.4 | 15.2 |
| P-KPT MTE-0487 | 32*1     | 1"      | 31.3 | 20.1 | 27.0 |
| P-KPT MTE-0488 | 40*1-1/4 | 1 1/4"  | 39.0 | 24.5 | 21.8 |

## GATE VALVE



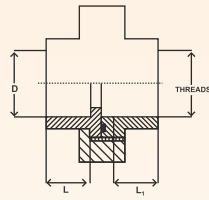
| CODE          | SIZE  | D    | L    | L1    |
|---------------|-------|------|------|-------|
| P-KPT GV-0501 | 20 MM | 19.0 | 15.0 | 60.5  |
| P-KPT GV-0502 | 25 MM | 24.0 | 16.8 | 69.2  |
| P-KPT GV-0503 | 32 MM | 31.1 | 20.0 | 79.5  |
| P-KPT GV-0504 | 40 MM | 39.0 | 21.4 | 92.5  |
| P-KPT GV-0505 | 50 MM | 48.0 | 24.0 | 112.2 |
| P-KPT GV-0506 | 63 MM | 60.6 | 26.0 | 119.1 |

## MALE THREADED UNION



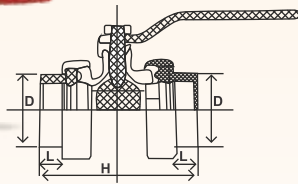
| CODE           | SIZE     | THREADS | D    | L    |
|----------------|----------|---------|------|------|
| P-KPT MTU-0521 | 20*1/2   | 1/2"    | 19.2 | 17.8 |
| P-KPT MTU-0522 | 25*3/4   | 3/4"    | 24.2 | 19.0 |
| P-KPT MTU-0523 | 32*1     | 1"      | 31.3 | 23.5 |
| P-KPT MTU-0524 | 40*1-1/4 | 1 1/4"  | 39.2 | 28.5 |
| P-KPT MTU-0525 | 50*1-1/2 | 1 1/2"  | 47.6 | 24.6 |
| P-KPT MTU-0526 | 63*2     | 2"      | 60.6 | 28.1 |

## FEMALE THREADED UNION



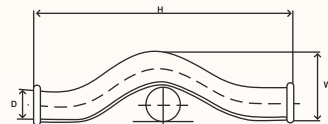
| CODE           | SIZE     | THREADS | D    | L    | L1   |
|----------------|----------|---------|------|------|------|
| P-KPT FTU-0541 | 20*1/2   | 1/2"    | 19.2 | 17.5 | 18.0 |
| P-KPT FTU-0542 | 25*3/4   | 3/4"    | 24.2 | 19.0 | 18.5 |
| P-KPT FTU-0543 | 32*1     | 1"      | 31.2 | 23.6 | 20.4 |
| P-KPT FTU-0544 | 40*1-1/4 | 1 1/4"  | 39.2 | 28.4 | 23.0 |
| P-KPT FTU-0545 | 50*1-1/2 | 1 1/2"  | 47.7 | 23.6 | 31.5 |
| P-KPT FTU-0546 | 63*2     | 2"      | 60.6 | 28.4 | 28.7 |

## DOUBLE UNION BALL VALVE



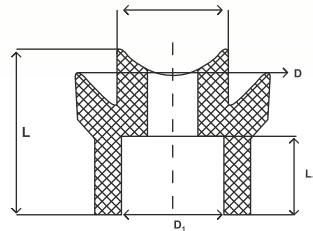
| CODE            | SIZE  | D    | L    | H     |
|-----------------|-------|------|------|-------|
| P-KPT DUBV-0561 | 20 MM | 18.7 | 16.3 | 84.1  |
| P-KPT DUBV-0562 | 25 MM | 23.8 | 17.4 | 95.7  |
| P-KPT DUBV-0563 | 32 MM | 30.8 | 21.8 | 107.3 |
| P-KPT DUBV-0564 | 40 MM | 38.9 | 25.2 | 125.3 |
| P-KPT DUBV-0565 | 50 MM | 48.7 | 27.3 | 147.0 |
| P-KPT DUBV-0566 | 63 MM | 61.4 | 29.0 | 168.5 |

## BY PASS BEND



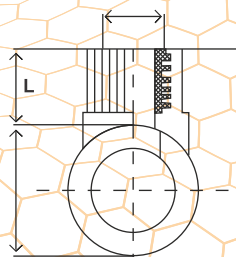
| CODE           | SIZE  | D    | W    | H     |
|----------------|-------|------|------|-------|
| P-KPT BPB-0581 | 25 MM | 23.9 | 47.0 | 94.9  |
| P-KPT BPB-0582 | 32 MM | 31.2 | 58.0 | 106.0 |

## WELD IN SADDLE REDUCER



| CODE             | SIZE   | D    | D1   | L    | L1   |
|------------------|--------|------|------|------|------|
| P-KPT WIS R-0629 | 63/32  | 48.8 | 30.8 | 40.2 | 19.9 |
| P-KPT WIS R-0630 | 75/32  | 48.8 | 30.8 | 40.2 | 19.9 |
| P-KPT WIS R-0631 | 90/20  | 78.5 | 19.1 | 62.1 | 15.5 |
| P-KPT WIS R-0632 | 90/25  | 78.5 | 24.2 | 62.1 | 17.5 |
| P-KPT WIS R-0633 | 90/32  | 78.5 | 31.0 | 62.1 | 19.1 |
| P-KPT WIS R-0634 | 90/40  | 79.2 | 38.9 | 62.1 | 21.4 |
| P-KPT WIS R-0635 | 90/50  | 79.2 | 48.8 | 62.1 | 21.7 |
| P-KPT WIS R-0636 | 90/63  | 79.2 | 62.7 | 62.1 | 27.5 |
| P-KPT WIS R-0637 | 110/20 | 88.0 | 19.0 | 66.7 | 15.5 |
| P-KPT WIS R-0638 | 110/25 | 88.0 | 24.0 | 66.7 | 17.3 |
| P-KPT WIS R-0639 | 110/32 | 88.0 | 31.0 | 66.7 | 19.3 |
| P-KPT WIS R-0640 | 110/40 | 88.0 | 39.1 | 66.7 | 21.5 |
| P-KPT WIS R-0641 | 110/50 | 88.0 | 48.8 | 66.7 | 25.2 |
| P-KPT WIS R-0642 | 110/63 | 88.0 | 62.4 | 66.7 | 27.4 |
| P-KPT WIS R-0643 | 160/20 | 89.8 | 19.0 | 62.0 | 15.6 |
| P-KPT WIS R-0644 | 160/25 | 89.8 | 23.9 | 62.0 | 17.3 |
| P-KPT WIS R-0645 | 160/32 | 89.8 | 31.2 | 62.0 | 19.4 |
| P-KPT WIS R-0646 | 160/40 | 89.8 | 38.8 | 62.0 | 21.3 |
| P-KPT WIS R-0647 | 160/50 | 89.8 | 49.1 | 62.0 | 21.5 |
| P-KPT WIS R-0648 | 160/63 | 89.8 | 62.5 | 62.0 | 27.3 |
| P-KPT WIS R-0649 | 200/20 | 90.2 | 19.1 | 66.0 | 15.6 |
| P-KPT WIS R-0650 | 200/25 | 90.2 | 24.1 | 66.0 | 17.7 |
| P-KPT WIS R-0651 | 200/32 | 90.2 | 31.2 | 66.0 | 19.4 |
| P-KPT WIS R-0652 | 200/40 | 90.2 | 39.0 | 66.0 | 21.4 |
| P-KPT WIS R-0653 | 200/50 | 90.2 | 48.8 | 66.0 | 25.0 |
| P-KPT WIS R-0654 | 200/63 | 90.2 | 62.5 | 66.0 | 27.3 |

## WELD IN SADDLE FEMALE THREADED COUPLING

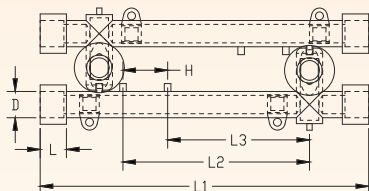


| CODE             | SIZE    | THREADS | L    | L1   | H    |
|------------------|---------|---------|------|------|------|
| P-KPT WIS M-0671 | 160*1/2 | 1/2"    | 16.3 | 49.2 | 41.3 |
| P-KPT WIS M-0672 | 110*1/2 | 1/2"    | 16.3 | 49.2 | 41.3 |
| P-KPT WIS M-0673 | 90*1/2  | 1/2"    | 16.3 | 49.2 | 41.3 |
| P-KPT WIS M-0674 | 75*1/2  | 1/2"    | 16.3 | 49.2 | 41.3 |
| P-KPT WIS M-0675 | 63*1/2  | 1/2"    | 16.3 | 49.2 | 41.3 |
| P-KPT WIS M-0676 | 160*3/4 | 3/4"    | 16.0 | 49.1 | 41.3 |
| P-KPT WIS M-0677 | 110*3/4 | 3/4"    | 16.0 | 49.1 | 41.3 |
| P-KPT WIS M-0678 | 90*3/4  | 3/4"    | 16.0 | 49.1 | 41.3 |
| P-KPT WIS M-0679 | 75*3/4  | 3/4"    | 16.0 | 49.1 | 41.3 |
| P-KPT WIS M-0680 | 63*3/4  | 3/4"    | 16.0 | 49.1 | 41.3 |

## DOUBLE BATTERY TAP CONNECTOR



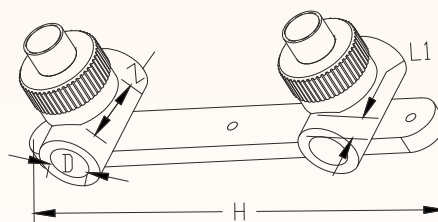
| CODE            | SIZE   | THREADS | D    | L    | L1  | L2  | H  |
|-----------------|--------|---------|------|------|-----|-----|----|
| KPT DBTC F-0681 | 20*1/2 | 1/2"    | 19.1 | 17.3 | 248 | 101 | 30 |
| KPT DBTC F-0682 | 25*1/2 | 1/2"    | 24   | 18.5 | 248 | 101 | 30 |



## DOUBLE MALE THREADED TEE WITH DISK



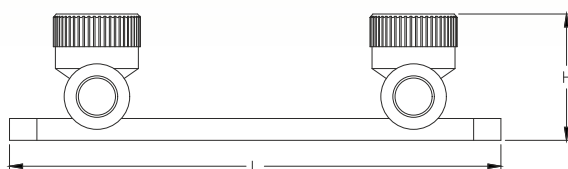
| CODE            | SIZE   | THREADS | D    | L    | Z    | T   |
|-----------------|--------|---------|------|------|------|-----|
| KPT DMTWD -0685 | 20*1/2 | 1/2"    | 19.1 | 16.0 | 25.3 | 150 |
| KPT DMTWD -0686 | 25*1/2 | 1/2"    | 24.0 | 18.0 | 25.2 | 150 |



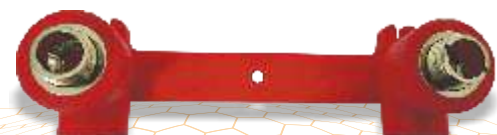
## DOUBLE FEMALE THREADED TEE WITH DISK



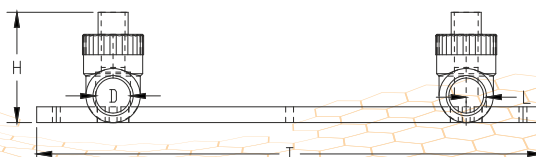
| CODE            | SIZE   | THREADS | D    | L    | Z    | T   |
|-----------------|--------|---------|------|------|------|-----|
| KPT DFTWD -0691 | 20*1/2 | 1/2"    | 19.1 | 16.0 | 25.3 | 150 |
| KPT DFTWD -0692 | 25*1/2 | 1/2"    | 24.0 | 18.0 | 25.2 | 150 |



## DOUBLE MALE ELBOW WITH DISK



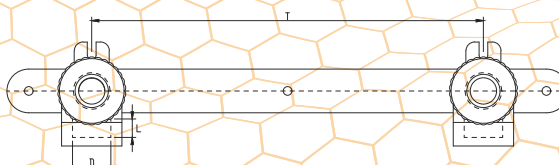
| CODE            | SIZE   | THREADS | D    | L    | Z    |
|-----------------|--------|---------|------|------|------|
| KPT DMEWD -0696 | 20*1/2 | 1/2"    | 18.7 | 15.8 | 16.0 |
| KPT DMEWD -0697 | 25*1/2 | 1/2"    | 24.0 | 17.6 | 16.2 |



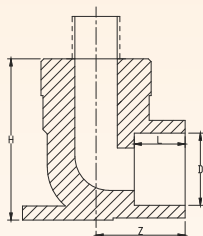
## DOUBLE FEMALE ELBOW WITH DISK



| CODE            | SIZE   | THREADS | D    | L    | Z    |
|-----------------|--------|---------|------|------|------|
| KPT DFEWD -0701 | 20*1/2 | 1/2"    | 18.7 | 15.8 | 16.0 |
| KPT DFEWD -0702 | 25*1/2 | 1/2"    | 24.0 | 17.6 | 16.2 |

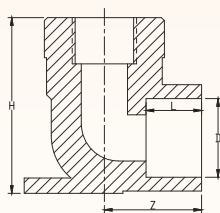


### MALE THREADED ELBOW WITH DISK



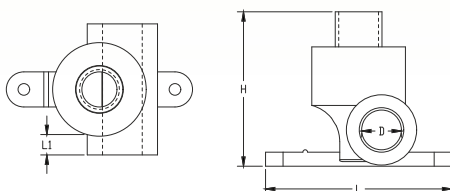
| CODE            | SIZE   | THREADS | D    | L    | Z    | H  |
|-----------------|--------|---------|------|------|------|----|
| KPT MTEWD -0701 | 20*1/2 | 1/2"    | 19.1 | 15.8 | 15.0 | 65 |
| KPT MTEWD -0702 | 25*1/2 | 1/2"    | 24.0 | 17.6 | 16.2 | 70 |

### FEMALE THREADED ELBOW WITH DISK



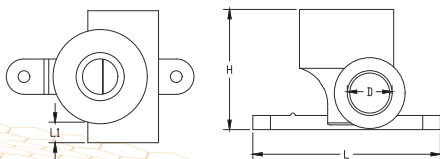
| CODE            | SIZE   | THREADS | D    | L    | Z    | H  |
|-----------------|--------|---------|------|------|------|----|
| KPT FTEWD -0706 | 20*1/2 | 1/2"    | 19.1 | 15.8 | 15.0 | 50 |
| KPT FTEWD -0707 | 25*1/2 | 1/2"    | 24.0 | 17.6 | 16.2 | 55 |

### MALE THREADED TEE WITH DISK



| CODE            | SIZE   | THREADS | D    | L    | Z    | H   |
|-----------------|--------|---------|------|------|------|-----|
| KPT MTTWD -0711 | 20*1/2 | 1/2"    | 19.1 | 16.0 | 56.0 | 165 |
| KPT MTTWD -0712 | 25*1/2 | 1/2"    | 24.0 | 17.2 | 57.7 | 170 |

### FEMALE THREADED TEE WITH DISK



| CODE            | SIZE   | THREADS | D    | L    | Z    | H   |
|-----------------|--------|---------|------|------|------|-----|
| KPT FTTWD -0716 | 20*1/2 | 1/2"    | 19.1 | 16.0 | 56.0 | 150 |
| KPT FTTWD -0717 | 25*1/2 | 1/2"    | 24.0 | 17.2 | 57.8 | 155 |

### CONCEALED VALVE



| CODE        | SIZE  | D    | L    | L1   |
|-------------|-------|------|------|------|
| KPT CV-0721 | 20 MM | 19.0 | 15.0 | 60.5 |
| KPT CV-0722 | 25 MM | 24.3 | 17.2 | 68.1 |
| KPT CV-0723 | 32 MM | 31.0 | 20.0 | 79.7 |

## FUSION METHOD

The process of joining PPR-C pipes and fittings is very simple and results in inseparable watertight joints. It is carried out using a simple welding machine that fuses the internal surface of the fitting and the external surface of the pipe, so that the material of the pipe and the fitting will be bonded together.

### THE FOLLOWING DESCRIBE THE STEPS OF THE WELDING PROCESS

Prepare the welding machine by fitting it with the welding dies of the diameters to be welded. Connect the plug to the 220V power supply socket and wait until the green light on the machine goes out indicating the welding machine has reached the working temperature.

- Cut the pipe at right angles to the pipe axis using suitable pipe cutter.
- Remove any burrs or cutting chips by deburring the cutting area.
- Mark the welding depth on the pipe using suitable marker.
- Insert the end of the pipe without turning into the heating sleeve up to the marked welding depth and at the same time slide the fitting without turning into the other side of the heating tool up to the stop. It is essential to observe the mentioned heating times (refer to the below table)
- Leave the pipe and fitting into the heating tool until the heating time is elapsed.
- At the end of the heating time, remove the pipe and fitting from the heating tool and push them immediately against each other up to the mark indicating the welding depth. At this stage the depth mark will be covered with the welding bead.
- During this process, do not rotate the pipe and fitting relative to each other.
- Allow the joint to cool fully before using.



## HOLE REPAIRING

If a hole is accidentally made in the pipe (with a drill bit or screws) and if the hole is in only one side of the pipe, it can be repaired using the hole repairing die, bearing in mind that the pipe size must be compatible with the die diameter.

### THE REPAIR PROCEDURE IS AS FOLLOWS:

- Clean and dry the part to be repaired.
- Fit the male part of the Hole repairing die into the hole; it must melt the surface to be adjusted by the operator to suit the pipe thickness, to ensure that the die cannot be inserted too far and melt the other side of the pipe. To make this adjustment, undo the screw which fixes the bush and then move it along the die.
- At same time as the male part of the die melts the area around the hole, the female part melts the repair bar usually supplied with die. Once the heating time has passed (5sec.) the repair bar must be inserted in the hole. When this operation is complete, wait for everything to cool and then cut off the excess part of the repair bar.
- If the diameter of the hole to be repaired is greater than that of the die, or both sides of the pipe are punctured, the piece of pipe must be cut out and the repair made using normal pipe fittings.



## FUSION TECHNIQUE II

### WELD-IN SADDLE TECHNIQUE

Branches can easily be made by weld-in saddles, even at a later stage of installation. By using weld-in saddles you save material and time. Whereas in case of tees three joints have to be welded, installation of saddle is restricted to mounting the saddle and branch pipe only.

#### Steps Follows

- Drill the pipe
- Warm up the saddle
- Pipe wall and outside pipe
- Connect the elements

**STEP 01**



**STEP 02**



**RESULT**



## ADVANCED BUTT WELDING TECHNOLOGY

KPT is having advanced US and Italian made machines to perform butt welding procedures on sizes above 110MM. Internationally butt jointing is the most suitable and acceptable procedure for sizes like 160MM, 200MM, 250MM and beyond to adhere to the best quality and durable international standards

**Step 01**



**Step 02**



**Step 02**



**Result**



## Jointing method of KPT piping systems

### CUTTING

1. Cut the pipe right angle to its axis using burr free cutter.
2. Ensure that pipes is free from burrs or cutting chip
3. Clean the pipe & fitting perfectly before welding.
4. Mark welding depth at the end of pipes.

### HEATING

1. Mount the suitable dies on heating element of welding machine according to the diameter of Pipe and fitting to be welded.
2. Connect the welding machine to 220/230 volts A.C. power supply.
3. Select 260 Deg. C. temperatures on the welding machine thermostat.
4. Wait for reaching the required working temperature.
5. Insert the pipe and the fitting in the dies by exerting light pressure.
6. For heating time, refer the table given for different sizes of Pipes.

### WELDING

1. After heating, quickly insert pipe into the fitting by exerting light pressure.
2. Any misalignment should be corrected immediately after insertion to avoid any Stress in the weld.
3. Allow the joint to cool as per cooling time given in table. This type of connection ensures perfect sealing even under the severe working Conditions.

## Recommended Time For PPR Systems Fusion Joints

| PIPE DIA.<br>(MM) | WELDING<br>DEPTH (MM) | HEATING TIME<br>(SEC) | WELDING TIME<br>(SEC) | COOLING TIME<br>(MIN) |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 16                | 14.00                 | 6                     | 4                     | 2                     |
| 20                | 14.50                 | 6                     | 4                     | 2                     |
| 25                | 16.00                 | 7                     | 4                     | 2                     |
| 32                | 18.00                 | 8                     | 6                     | 4                     |
| 40                | 20.50                 | 12                    | 6                     | 4                     |
| 50                | 23.50                 | 18                    | 6                     | 4                     |
| 63                | 27.50                 | 24                    | 8                     | 6                     |
| 75                | 30.00                 | 30                    | 8                     | 6                     |
| 90                | 32.50                 | 40                    | 8                     | 6                     |
| 110               | 37.00                 | 50                    | 10                    | 8                     |
| 160               | 42.00                 | 60                    | 15                    | 10                    |

## Recommended Time For PPR Systems Butt Joints

| PIPE DIA.<br>(MM) | WELDING<br>MACHINE<br>TEMPERATURE<br>°C | HEATING<br>TIME (MIN) | WELDING<br>TIME (SEC) | COOLING<br>TIME (MIN) |
|-------------------|-----------------------------------------|-----------------------|-----------------------|-----------------------|
| 200               | 220-240                                 | 30                    | 180                   | 15-20                 |
| 250               | 220-240                                 | 30                    | 240                   | 16-24                 |
| 315               | 225-240                                 | 30                    | 300                   | 20-25                 |
| 355               | 225-240                                 | 30                    | 360                   | 25-30                 |
| 400               | 223-240                                 | 30                    | 420                   | 30-35                 |

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**Project No. SSP-0521**

**BRIEF EVALUATION REPORT**

**BS: 476-Part 5: IGNITABILITY EVALUATION FOR MATERIALS**

**Date of Evaluation** : 3<sup>rd</sup> December, 2021.

**Sponsor** : M/s KPT PIPING SYSTEM PRIVATE LIMITED, KHASRA NO. 122/69, CENTRAL HOPE TOWN, SELAQUI, SAHASPUR, DEHRADUN, UTTARAKHAND-248197

**Description of Product** : **THERMAPLUS FIRE RETARDANT PIPES**  
(KPT piping system Thermaplus brand fire retardant pipes of diameter 32mm OD & 22mm ID were tested in bunch.)  
Thickness: 5 mm;  
Nominal Bulk Density: 949.5 kg/m<sup>3</sup>.  
(Product description has been prepared on the basis of the information provided by the sponsor).

**Specimen dimensions** : **228 mm x 228 mm x 32 mm**

**Results** :

**Duration of exposure to specified flame** : **10 s**

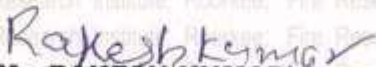
**Duration of flaming after removal of specified flame** : **NIL**

**Time for burning to reach the edge of specimen** : **Not applicable**

**Extent of burning of specimen within 20 s.** : **NIL**

**Extent of burning of specimen within 20 s.** : **' P ' Not Easily Ignitable**

The evaluation results relate only to the behaviour of the specimens of a product under the particular conditions of the evaluation, they are not intended to be the sole criterion for assessing the potential fire hazard of the materials in use.

  
**(Mr. RAKESH KUMAR)**  
**CO-INVESTIGATOR**

  
**(Dr. A. ARAVIND KUMAR)**  
**PRINCIPAL INVESTIGATOR**

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ROORKEE-247667 (Uttarakhand)



**FIRE RESEARCH LABORATORY**  
**CSIR - Central Building Research Institute**  
**Roorkee - 247 667 (U.K.) INDIA**



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**Project No. SSP-0521**

## BRIEF EVALUATION REPORT

### BS: 476-PART 6: METHOD OF EVALUATION FOR FIRE PROPAGATION FOR

#### PRODUCTS

**Date of Evaluation** : 28<sup>th</sup>-29<sup>th</sup> December, 2021

**Sponsor** : M/s KPT PIPING SYSTEM PRIVATE LIMITED, KHASRA NO. 122/69, CENTRAL HOPE TOWN, SELAQUI, SAHASPUR, DEHRADUN, UTTARAKHAND-248197.

**Description of Product** : THERMAPLUS FIRE RETARDANT PIPES  
(KPT piping system Thermaplus brand fire retardant pipes of diameter 32mm OD & 22mm ID were tested in bunch.)  
**Thickness:** 5 mm;  
**Nominal Bulk Density:** 949.5 kg/m<sup>3</sup>.  
(Product description has been prepared on the basis of the information provided by the sponsor).

**Specimen dimensions** : 225 mm x 225 mm x 32 mm

#### Results

**Number of specimens evaluated** : Three

**Fire Propagation Index, I** : 25.5

**Sub-indices** :  $i_1 = 9.3$   $i_2 = 10.9$   $i_3 = 5.3$

The evaluation results relate only to the behaviour of the specimens of a product under the particular conditions of the evaluation, they are not intended to be the sole criterion for assessing the potential fire hazard of the materials in use.

*Rakesh Kumar*  
**(MR. RAKESH KUMAR)**

**CO-INVESTIGATOR**

*A. Aravind Kumar*  
**(DR. A. ARAVIND KUMAR)**

**PRINCIPAL INVESTIGATOR**

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वरिष्ठ वैज्ञानिक / Senior Scientist  
अग्नि अनुसंधान समूह / Fire Research Group  
सी.एस.आई.आर. - केन्द्रीय भवन अनुसंधान संस्थान  
CSIR - Central Building Research Institute  
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ROORKEE-247667 (Uttarakhand)



**FIRE RESEARCH LABORATORY**  
**CSIR - Central Building Research Institute**  
**Roorkee - 247 667 (U.K.) INDIA**



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**Project No. SSP-0521**

**BRIEF EVALUATION REPORT**

**BS: 476-PART 7: METHOD FOR CLASSIFICATION OF THE SURFACE SPREAD  
OF FLAME**

**Date of Evaluation : 6th December, 2021.**

**Sponsor : M/s KPT PIPING SYSTEM PRIVATE LIMITED,  
KHASRA NO. 122/69,  
CENTRAL HOPE TOWN, SELAQUI, SAHASPUR,  
DEHRADUN,  
UTTARAKHAND-248197**

**Description of Product : THERMAPLUS FIRE RETARDANT PIPES**  
(KPT piping system Thermaplus brand fire retardant pipes of  
diameter 32mm OD & 22mm ID were tested in bunch.)  
**Thickness: 5 mm;**  
**Nominal Bulk Density: 949.5 kg/m<sup>3</sup>.**  
(Product description has been prepared on the basis of the  
information provided by the sponsor).

**Specimen dimensions : 900 mm x 270 mm x 32 mm**

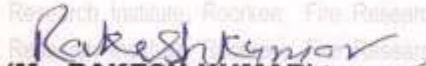
**Observation : Evaluation results**

| Specimen | Spread of Flame at 1.5 min<br>mm | Spread of Flame at<br>Termination/10 min<br>mm |
|----------|----------------------------------|------------------------------------------------|
| 01       | NIL                              | NIL                                            |
| 02       | NIL                              | NIL                                            |
| 03       | NIL                              | NIL                                            |
| 04       | NIL                              | NIL                                            |
| 05       | NIL                              | NIL                                            |
| 06       | NIL                              | NIL                                            |

**Classification : CLASS-1**

**Remark : Melting of the specimen was observed without any flame.**

The evaluation results relate only to the behaviour of the specimens of a product under the particular conditions of the evaluation, they are not intended to be the sole criterion for assessing the potential fire hazard of the materials in use.

  
**(Mr. RAKESH KUMAR)**  
**CO-INVESTIGATOR**

  
**(Dr. A. ARAVIND KUMAR)**  
**PRINCIPAL INVESTIGATOR**

वरिष्ठ वैज्ञानिक / Senior Scientist  
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**CSIR - Central Building Research Institute**  
**Roorkee - 247 667 (U.K.) INDIA**



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**Project No. SSP-0521**

**BRIEF EVALUATION REPORT**

**IS: 15061-2000: HORIZONTAL FLAMMABILITY EVALUATION OF MATERIALS**

**Date of Evaluation** : 17<sup>th</sup> December, 2021.

**Sponsor** : M/s KPT PIPING SYSTEM PRIVATE LIMITED,  
KHASRA NO. 122/69,  
CENTRAL HOPE TOWN, SELAQUI, SAHASPUR,  
DEHRADUN,  
UTTARAKHAND-248197

**Description of Product** : **THERMAPLUS FIRE RETARDANT PIPES**  
(KPT piping system Thermaplus brand fire retardant pipes of diameter 32mm OD & 22mm ID were tested in bunch.)  
**Thickness: 5 mm;**  
**Nominal Bulk Density: 949.5 kg/m<sup>3</sup>.**  
(Product description has been prepared on the basis of the information provided by the sponsor).

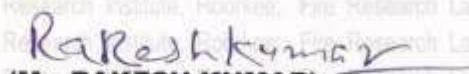
**Specimen dimensions** : **356 mm x 100 mm x 32 mm**

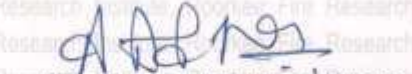
**Test Method** : **Annexure A, Clause 3.2**

**Results:**

| Test No.                                  | Warp Wise         |                 |                                           | Weft Wise         |                 |                      |
|-------------------------------------------|-------------------|-----------------|-------------------------------------------|-------------------|-----------------|----------------------|
|                                           | Burnt Length (mm) | Burning Time(s) | Burning rate(mm/min)                      | Burnt Length (mm) | Burning Time(s) | Burning rate(mm/min) |
| 1                                         | 0                 | 0               | 0                                         | 0                 | 0               | 0                    |
| 2                                         | 0                 | 0               | 0                                         | 0                 | 0               | 0                    |
| 3                                         | 0                 | 0               | 0                                         | 0                 | 0               | 0                    |
| 4                                         | 0                 | 0               | 0                                         | 0                 | 0               | 0                    |
| 5                                         | 0                 | 0               | 0                                         | 0                 | 0               | 0                    |
| Max. Burn rate warp wise: 0 Zero (mm/min) |                   |                 | Max. Burn rate weft wise: 0 Zero (mm/min) |                   |                 |                      |

The evaluation results relate only to the behaviour of the specimens of a product under the particular conditions of the evaluation, they are not intended to be the sole criterion for assessing the potential fire hazard of the materials in use.

  
**(Mr. RAKESH KUMAR)**  
**CO-INVESTIGATOR**

  
**(Dr. A. ARAVIND KUMAR)**  
**PRINCIPAL INVESTIGATOR**  
वरिष्ठ वैज्ञानिक / Senior Scientist  
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**Project No. SSP - 0521**

## BRIEF EVALUATION REPORT

### ASTM D 2863: Determination of Limiting Oxygen Index of Products

**Date of Evaluation** : 13<sup>th</sup> December, 2021

**Sponsor** : M/s KPT PIPING SYSTEM PRIVATE LIMITED, KHASRA NO. 122/69, CENTRAL HOPE TOWN, SELAQUI, SAHASPUR, DEHRADUN, UTTARAKHAND-248197

**Description of Product** : **THERMAPLUS FIRE RETARDANT PIPES**  
(KPT piping system Thermaplus brand fire retardant pipes of diameter 32mm OD & 22mm ID were tested.)  
**Thickness: 5 mm;**  
**Nominal Bulk Density: 949.5 kg/m<sup>3</sup>.**  
(Product description has been prepared on the basis of the information provided by the sponsor).

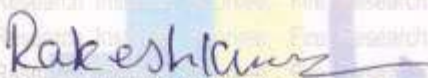
**Specimen dimensions** : **120 mm x 10 mm x 5 mm**

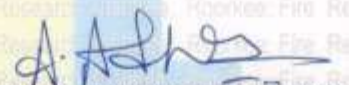
**Results**

**Limiting Oxygen Index** : **24.3**

**Remark** : **Melting of the specimen was observed.**

The evaluation results relate only to the behaviour of the specimens of a product under the particular conditions of the evaluation, they are not intended to be the sole criterion for assessing the potential fire hazard of the materials in use.

  
(Mr. RAKESH KUMAR)  
CO-INVESTIGATOR

  
(Dr. A. ARAVIND KUMAR)  
PRINCIPAL INVESTIGATOR

वरिष्ठ वैज्ञानिक / Senior Scientist  
आग्नि अनुसंधान समूह / Fire Research Group  
सी.एस.आई.आर - केन्द्रीय भवन अनुसंधान संस्थान  
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An ISO - 9001, 14001 & OHSAS 18001 Certified Institute

Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org

## TEST CERTIFICATE

NO. : C1/0000075377

### Issued To:

Client Code : K0407  
KANHA PLASTICS PVT LTD  
122/69, CENTRAL HOPE TOWN  
SELAQUI, INDUSTRIAL AREA  
DEHRADUN  
UTTARAKHAND-248002  
Kind Attn: MR DHAWAL

Date 08/03/2017

Job No. 1702-1-141-2377

Booking No. RG1617/1/10445

Booking Date 21/02/2017

Customer Ref No. -

Customer Ref Date 17/02/2017

### Sample Description :

ONE SAMPLE DESCRIBED AS PPR-C PIPE AS PER IS 15801:2008, DN 110 MM, SDR - 7.4/PN 16 WAS RECEIVED.

The Sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on declaration by the party.

AS PER UL 94

| S.No | Tests                                                                                                                           | Results Obtained                                                                                                  | Requirements                                                                                      | Conformity |
|------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------|
| I.   | Flammability Test:                                                                                                              |                                                                                                                   |                                                                                                   |            |
|      | 1) For Specimen Conditioned @ 23±2°C & 50±5 % RH for 48 hours                                                                   |                                                                                                                   |                                                                                                   |            |
| a.   | Flaming combustion time of any specimen after either application of the test flame, Sec.                                        |                                                                                                                   | Less than or equal to 30 second for 94 V-2                                                        | Yes        |
|      | i) First Application                                                                                                            | 2, 2, 2, 3, 2                                                                                                     |                                                                                                   |            |
|      | ii) Second Application                                                                                                          | 3, 2, 2, 3, 2                                                                                                     |                                                                                                   |            |
| b.   | Total flaming combustion time after 10 flame applications for each set of five specimens, Sec.                                  | 23                                                                                                                | Less than or equal to 250 second for 94 V-2                                                       | Yes        |
| c.   | Flaming or glowing combustion of any specimen upto the holding clamp                                                            | No specimen burnt with flaming or glowing combustion up to holding clamp                                          | Not have any specimen that burn with flaming or glowing combustion up to holding clamp for 94 V-2 | Yes        |
| d.   | Ignition of dry absorbent surgical cotton located 12 inches (305 mm), below the test specimen by the dripping flaming particles | Dripped flaming particles of all the specimen burnt only briefly which ignites the dry absorbent surgical cotton. | Permitted for 94 V-2                                                                              | Yes        |

*[Signature]*

AUTHORISED SIGNATORY  
EMPLOYEE CODE : 011591

GC-01(Rev-05)

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## TEST CERTIFICATE

NO. : C1/0000075377

- |                                                     |                                                                                                                                 |                                                                                                                  |                                                                                                   |     |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----|
| e.                                                  | Glowing combustion time of any specimen after the second removal of the test flame, Sec                                         | 0, 0, 0, 0, 0                                                                                                    | Less than or equal to 60 second for 94 V-2                                                        | Yes |
| II) For Specimen Conditioned @ 70±1°C for 168 hours |                                                                                                                                 |                                                                                                                  |                                                                                                   |     |
| a.                                                  | Flaming combustion time of any specimen after either application of the test flame, Sec.                                        |                                                                                                                  | Less than or equal to 30 second for 94 V-2                                                        | Yes |
|                                                     | i) First Application                                                                                                            | 3, 3, 2, 3, 4                                                                                                    |                                                                                                   |     |
|                                                     | ii) Second Application                                                                                                          | 4, 3, 4, 4, 3                                                                                                    |                                                                                                   |     |
| b.                                                  | Total flaming combustion time after 10 flame applications for each set of five specimens, Sec.                                  | 33                                                                                                               | Less than or equal to 250 second for 94 V-2                                                       | Yes |
| c.                                                  | Flaming or glowing combustion of any specimen upto the holding clamp                                                            | No specimen burnt with flaming or glowing combustion up to holding clamp                                         | Not have any specimen that burn with flaming or glowing combustion up to holding clamp for 94 V-2 | Yes |
| d.                                                  | Ignition of dry absorbent surgical cotton located 12 inches (305 mm), below the test specimen by the dripping flaming particles | Dripped flaming particles of all the specimen burnt only briefly which ignite the dry absorbent surgical cotton. | Permitted 94 V-2                                                                                  | Yes |
| e.                                                  | Glowing combustion time of any specimen after the second removal of the test flame, Sec                                         | 0, 0, 0, 0, 0                                                                                                    | Less than or equal to 60 second for 94 V-2                                                        | Yes |

Note:- On the basis of the above observations the sample conforms to Grade of UL 94 V-2.

\*\*\*\*\*

D.O.R 21-02-2017

D.O.C 08-03-2017

*(Signature)*

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Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org

## TEST CERTIFICATE

NO.: C1/0000075378

### Issued To:

Client Code : K0407  
KANHA PLASTICS PVT LTD  
122/69, CENTRAL HOPE TOWN  
SELAQUI, INDUSTRIAL AREA  
DEHRADUN  
UTTARAKHAND-248002  
Kind Attn: MR DHAWAL

Date 08/03/2017

Job No. 1702-I-141-2378

Booking No. RG1617/1/10445

Booking Date 21/02/2017

Customer Ref No. -

Customer Ref Date 17/02/2017

### Sample Description :

ONE SAMPLE DESCRIBED AS PPR-C PIPE COUPLING 110, WAS RECEIVED.

The Sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on declaration by the party.

AS PER UL 94

| S.No | Tests                                                                                                                                               | Results Obtained                                                                                                           | Requirements                                                                                               | Conformity |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------|
| 1.   | Flammability Test:<br>1) For Specimen<br>Conditioned @ $23 \pm 2^\circ\text{C}$ &<br>$50 \pm 5\%$ RH for 48 hours                                   |                                                                                                                            |                                                                                                            |            |
| a.   | Flaming combustion time<br>of any specimen after<br>either application of the<br>test flame, Sec.<br>i) First Application<br>ii) Second Application | 2, 3, 3, 2, 2<br>3, 2, 3, 3, 3                                                                                             | Less than or equal to 30<br>second for 94 V-2                                                              | Yes        |
| b.   | Total flaming combustion<br>time after 10 flame<br>applications for each set of<br>five specimens, Sec.                                             | 26                                                                                                                         | Less than or equal to 250<br>second for 94 V-2                                                             | Yes        |
| c.   | Flaming or glowing<br>combustion of any<br>specimen upto the<br>holding clamp                                                                       | No specimen burnt with<br>flaming or glowing<br>combustion up to holding<br>clamp                                          | Not have any specimen<br>that burn with flaming or<br>glowing combustion up to<br>holding clamp for 94 V-2 | Yes        |
| d.   | Ignition of dry absorbent<br>surgical cotton located 12<br>inches (305 mm), below<br>the test specimen by the<br>dripping flaming particles         | Dripped flaming particles of<br>all the specimen burnt only<br>briefly which ignites the dry<br>absorbent surgical cotton. | Permitted for 94 V-2                                                                                       | Yes        |

*[Signature]*

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EMPLOYEE CODE : (d119)

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## TEST CERTIFICATE

NO. : C1/0000075378

- |                                                     |                                                                                                                                 |                                                                                                                  |                                                                                                   |     |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----|
| e.                                                  | Glowing combustion time of any specimen after the second removal of the test flame, Sec                                         | 0, 0, 0, 0, 0                                                                                                    | Less than or equal to 60 second for 94 V-2                                                        | Yes |
| II) For Specimen Conditioned @ 70±1°C for 168 hours |                                                                                                                                 |                                                                                                                  |                                                                                                   |     |
| a.                                                  | Flaming combustion time of any specimen after either application of the test flame, Sec.                                        |                                                                                                                  | Less than or equal to 30 second for 94 V-2                                                        | Yes |
|                                                     | i) First Application                                                                                                            | 3, 4, 3, 4, 3                                                                                                    |                                                                                                   |     |
|                                                     | ii) Second Application                                                                                                          | 4, 3, 4, 4, 4                                                                                                    |                                                                                                   |     |
| b.                                                  | Total flaming combustion time after 10 flame applications for each set of five specimens, Sec.                                  | 36                                                                                                               | Less than or equal to 250 second for 94 V-2                                                       | Yes |
| c.                                                  | Flaming or glowing combustion of any specimen upto the holding clamp                                                            | No specimen burnt with flaming or glowing combustion up to holding clamp                                         | Not have any specimen that burn with flaming or glowing combustion up to holding clamp for 94 V-2 | Yes |
| d.                                                  | Ignition of dry absorbent surgical cotton located 12 inches (305 mm), below the test specimen by the dripping flaming particles | Dripped flaming particles of all the specimen burnt only briefly which ignite the dry absorbent surgical cotton. | Permitted 94 V-2                                                                                  | Yes |
| e.                                                  | Glowing combustion time of any specimen after the second removal of the test flame, Sec                                         | 0, 0, 0, 0, 0                                                                                                    | Less than or equal to 60 second for 94 V-2                                                        | Yes |

Note:- On the basis of the above observations the sample conforms to Grade of UL 94 V-2.

\*\*\*\*\*

D.O.R 21-02-2017

D.O.C 08-03-2017

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