



# DP FAMILY SOLUTIONS

FOR ANY CHALLENGE SYSTEM



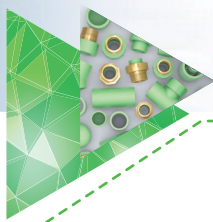
2024



# Content

## Table of content

|    |   |
|----|---|
| 01 | INTRODUCTION                                |
| 02 | VISION AND MISSION                          |
| 04 | DP THERM PROPERTIES                         |
| 07 | DP THERM BENEFITS                           |
| 09 | CHEMICAL AND PHYSICAL BEHAVIORS OF DP THERM |
| 11 | DP THERM PIPES                              |
| 13 | DP THERM FITTINGS                           |
| 15 | QUALITY ASSURANCE - MARKING                 |
| 18 | STANDARDS                                   |
| 19 | LIFESPAN OF DP THERM                        |
| 24 | PRODUCT RANGE                               |
| 74 | STORAGE                                     |
| 75 | HANDLING                                    |
| 76 | INSTALLATION                                |
| 88 | PRESSURE TESTING                            |



# INTRODUCTION

## DP. DUBAI PLAST FAMILY

We, DUBAI PLAST Factory For Plastic Pipes And Fittings, We Are Specialized In Producing All Types Of Plastic Pipes With All Its' Accessories Of Fittings Our Entity Was Established 30 Years Ago DP. Factories Located In:-

**UAE** : - RADIX PLASTIC INDUSTRIES LLC Where The Pressurized UPCV Fittings And Valves Is Being Produced Up To 630 mm With Different Pressure Ratings As One Of The Leading Factories In The Region In Producing Such Big Diameters , Also Both Injected And Fabricated HDPE Fittings Up To 1200 mm

**EGYPT** : - Where UPVC Pipes ,HDPE Pipes And PPH System Is Being Produced , Now In Egypt We Are Launching A new Member Of Our Family, PPR System Pipes, Fittings And Valves, Proudly Made In Egypt With All These Types Of Products, Production Censorship Is Done In Our Laboratories To Be Sure Of Specifications Compatibility. Our Laboratories Has Been Equipped With All Types Of Necessary Systems To Do Those Compatibility Tests.

# OUR VISION



- \* Our vision is to be the leading manufacturer of high-quality polypropylene, PVC, hdpe and pph.
- \* Various industries worldwide. We aim to provide innovative solutions to our customers' needs, offering products that are durable, efficient, and sustainable. We strive to continuously improve our manufacturing processes and technology.
- \* To ensure the highest quality products that meet or exceed industry standards. Our commitment to research and development drives our innovation and allows us to stay ahead of market trends.

# OUR MISSION

- \* A leading manufacturer of high-quality polypropylene, PVC, HDPE and PPH (fitting, valves, and pipes) has established a strong foothold in the domestic market and the company aims to increase its global market share and expand its business operations in key international markets.



# OUR STRENGTHS



Easy and convenient installation of the system



Long service life and operation without complaints



Quality and reliability guarantee



to customer requests

# Why DP. Therm ?

Polypropylene is a synthetic thermoplastic polymer known for its lightweight, durability, and resistance to chemicals.

It is widely used in various applications, such as packaging materials, textiles, automotive components, and plastic parts for household items. Polypropylene is known for its excellent mechanical properties, including strength, toughness, and thermal stability.

The beginning of the use of polypropylene in water supplies can be traced back to the mid-20th century. Polypropylene, a thermoplastic polymer, was discovered in 1951 by the German chemist Karl Rehn.

It gained popularity due to its excellent chemical resistance, low density, and ease of processing. By the 1960s, polypropylene started to be used in various applications, including water supply systems.

Its lightweight, durability, and resistance to harsh chemicals made it an ideal material for manufacturing pipes, tanks, and other water infrastructure components. This shift towards polypropylene-based water systems contributed to improved water quality, reduced corrosion, and enhanced overall efficiency in water supply networks. The rapid acceptance of this material in the world market is attributed to its unique properties. It has a wide range of applications, including central piping for connecting radiators, hot and cold-water piping systems, and floor heating.

The special composition of PP-R (Polypropylene Random Copolymer) makes it suitable not only for pipe extrusion but also for injected fittings. This material's properties enable the creation of a mono-material system, which offers numerous advantages.

In summary, the use of polypropylene in the manufacture of water pipes offers numerous advantages, including chemical resistance, lightweight, corrosion resistance, non-toxicity, ease of fabrication, thermal stability, cost-effectiveness, and recyclability. These factors contribute to the overall efficiency, safety, and sustainability of water supply systems.

## POLYPROPYLENE VS. METAL PIPES:

The composition and smoothness of Polypropylene provide low friction, leading to reduced resistance and pressure drop. It exhibits high resistance against Chemical and enjoys a long lifespan. Conversely, metal pipes face challenges in areas with high salt content in water and elevated oxidation reduction potential. Furthermore, metal piping systems have a higher likelihood of electrolysis occurring.

### AVERAGE SURFACE ROUGHNESS OF DIFFERENT TYPE OF PIPES:

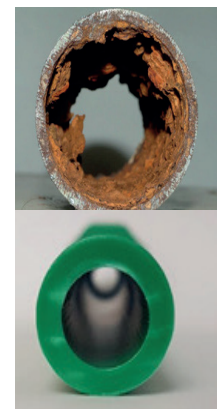
| PIPE MATERIAL               | PIPE ROUGHNESS VALUE (mm) |
|-----------------------------|---------------------------|
| Steel, Commercial or Welded | 0.046                     |
| Cast iron                   | 0.26                      |
| Galvanized iron             | 0.15                      |
| Asphalted cast iron         | 0.12                      |
| Copper, Light metals        | 0.013+0.015               |
| Concrete                    | 0.03+3.0                  |
| Ceramic                     | -0.07                     |
| Plastic                     | 0.006                     |

Corrosion and calcium carbonate deposition can reduce the internal dimension of a metal network by 2-3% per year, reducing efficiency by up to 10%.

Consequently, smaller diameter plastic pipes are employed to transport the same volume of water as their larger counterparts. The comparison between polypropylene, copper, and iron pipes is illustrated in the table provided below.

### DIAMETERS FOR DIFFERENT MATERIALS

| Metal Pipes | Copper Pipes | PP-R Pipes |
|-------------|--------------|------------|
| ½"          | 18×1 mm      | 20 mm      |
| ¾"          | 22×1 mm      | 25 mm      |
| 1"          | 28×1.5 mm    | 32 mm      |
| 1 ¼"        | 32×1.5 mm    | 40 mm      |
| 1 ½"        | 42×1.5 mm    | 50 mm      |
| 2"          | 54×2 mm      | 63 mm      |
| 2 ½"        | 64×2 mm      | 75 mm      |
| 3"          | 76.1×2 mm    | 90 mm      |
| 4"          | 88.9×2 mm    | 110 mm     |
| 5"          | 108×2.5 mm   | 125 mm     |
| 6"          | -            | 160 mm     |





## COMPARISON BETWEEN MATERIALS:

| CHARACTERISTICS                   | PP-R PIPES | METAL PIPES |
|-----------------------------------|------------|-------------|
| CORROSION RESISTANCE              | +          | -           |
| MAINTENANCE                       | +          | -           |
| LIFESPAN                          | +          | -           |
| THERMAL LINEAR EXPANSION          | -          | +           |
| CONDENSATION ISSUES/ PROBLEMS     | +          | -           |
| INSTALLATION COST                 | +          | -           |
| INSTALLATION SET UP TIME          | +          | -           |
| WEIGHT                            | +          | -           |
| FLOW – LOW PRESSURE DROP          | +          | -           |
| DIMENSION AVAILABILITY            | +          | -           |
| ENVIRONMENTALLY FRIENDLY MATERIAL | +          | -           |
| NATURAL SOUND INSULATION          | +          | -           |
| PIPELINE CHEMICAL CLEANING        | +          | -           |

## DP.Therm

**DP.Therm** outlines the production process of random polypropylene pipes and fittings, with dimensions ranging from 20 mm to 160 mm.

**DP.Therm** pipes are available in green pipe for cold water, black color for UV resistance, green pipes with fiber for hot water, black pipes with fiber for hot water and UV resistance. The length of the pipes 4 meters each for dimensions up to 125 mm, and 5.8 meters for dimensions of 160 mm.

**DP.Therm** pipes come with marking that displays crucial information, such as the trade name, outer diameter, wall thickness, operating pressure, pipe manufacturing specifications (like EN, DIN, ISO), certifying institutes, and the code number representing the batch production time.

This information ensures transparency and quality assurance for customers using these pipes.

-Pipes Produced by DP.Therm-

SDR 6

SDR 7.4

SDR 11

| Produced Dimensions |           |
|---------------------|-----------|
| SDR 6               | 20-160 mm |
| SDR 7.4             | 20-160 mm |
| SDR 11              | 20-160 mm |

## DP THERM: BENEFITS

### LIFESPAN

With the right material and solid connections, our systems are made to perform well even decades after installation.

There's a reason they tell you not to throw away plastic. PP-R lasts for decades in piping applications, and keeps going long after other building components have worn out and started to fail. It's important to have a piping system that won't wear out, corrode or scale up, as pipes are costly and difficult to replace. Sustainable building materials, like **DP.Therm's** pipes and fittings, last for the life of the building they're installed in, and then can be easily recycled.

**DP.Therm** hydrophobic, meaning they repel water from its surface. This protects the pipe wall from eroding down and leaking. The smooth, chemically inert material prevents scaling and corrosion build up. so the performance of the pipe never suffers, even without chemical treatment.

Imagine a piping system that performs as well after 50 years as when it was first installed. With **DP.Therm**, you don't have to imagine anymore.

### EXCEPTIONAL HYDRAULIC SHOCK BEHAVIOR

The Dp therm system remains unaffected by high pressures produced by hydraulic shocks, as it is designed to handle pressures exceeding 100 bar at normal temperature.

### SHORTER INSTALLATION TIME

In contrast to traditional systems, Dp therm pipes system offers a 30% decrease in installation time .

### THERMAL CONDUCTIVITY OF DP THERM AND METALS COMMONLY USED IN HEATING AND PLUMBING FIELDS:

The low thermal conductivity leads to significantly fewer condensates forming on the exterior of pipes, an issue that commonly arises in metal pipes under specific temperature and humidity circumstances. Additionally, water takes longer to freeze when external temperatures are extremely low.

|          |                                  |
|----------|----------------------------------|
| Dp therm | $\lambda = 0,17 \text{ W/mk}$    |
| Steel    | $\lambda = 45-60 \text{ W/mk}$   |
| Iron     | $\lambda = 45-60 \text{ W/mk}$   |
| copper   | $\lambda = 300-400 \text{ W/mk}$ |

### CHEMICAL RESISTANCE

The material is resistant to most chemicals, even at high temperatures, which is why it is used in industrial networks.

### MECHANICAL STRENGTH

The **DP.Therm** system showcases outstanding resilience towards mechanical strain. Boasting impressive mechanical robustness and flexibility, even in colder environments, this system is adaptable to various climates.

### CORROSION RESISTANT

The **DP.Therm** system exhibits outstanding resistance to corrosion, even in regions with extremely hard water. Over time, it maintains its integrity without any alterations. Unlike metal pipes, it does not experience electrochemical corrosion. As a result, it can be used in conjunction with construction materials like lime and cement, without necessitating any additional protection. Additionally, high water velocity does not lead to corrosion.

### LOW FRICTIONAL COEFFICIENT

The combination of a well-designed material structure and a smooth surface texture on piping systems plays a crucial role in enhancing their efficiency. This feature allows for reduced friction losses, resulting in lower resistance and pressure drop within the piping. Consequently, this leads to a more economical setup, as smaller-sized pipes and lower-rated pumps with a PN 30 wattage can be employed for the same water flow capacity.

In addition to this, dp therm offers fittings with a significantly lower local resistance coefficient compared to standard PN25 fittings. This improvement in the system's flow is a valuable aspect, as it contributes to an overall better performance and cost-effectiveness.

### NOISE-FREE

The specific material employed in this context notably decreases the amount of noise produced and restricts its propagation within the piping system. As a result, it allows for transporting greater volumes of fluids through narrower pipes, thereby enhancing the flow rate of the network and, in turn, increasing the water capacity.

### CLEAN AND NON-TOXIC

The **DP.Therm** system takes great care in ensuring the safety and quality of the water it provides. It undergoes rigorous sanitary and toxicological analyses to guarantee its suitability for drinking purposes. Regular testing by official institutes further validates the system's effectiveness in maintaining the pleasant taste and odor of the water. Additionally, these tests monitor the growth of microorganisms, the extraction of hazardous substances and metals such as cadmium and arsenic, thus ensuring the overall health and well-being of the public.

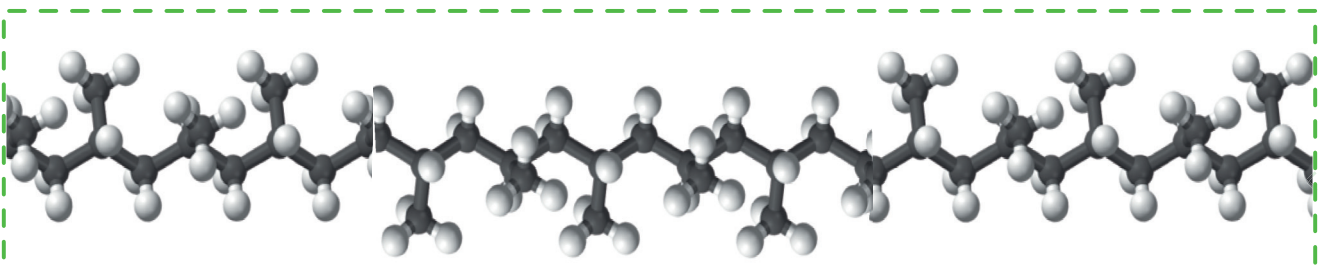
# CHEMICAL ,PHYSICAL MECHANICAL AND ELECTRICAL PROPERTIES OF DP THERM SYSTEM

## POLYPROPYLENE (PP)

It is a thermoplastic polymer with the chemical formula  $C_3H_6$ .

It belongs to the family of polymers called polyolefins, which also includes polyethylene.

The chemical composition of polypropylene pipes consists of repeating units of propylene monomer ( $C_3H_6$ ) in its polymer chain.



## POLYPROPYLENE IS IN THREE DIFFERENT FORMS.

- Type 1 - Polypropylene homopolymer (PP-H)
- Type 2 - Polypropylene block polymer (PP-B)
- Type 3 - Polypropylene random copolymer (PP-R).



## TYPICAL MATERIAL PROPERTIES OF POLYPROPYLENE

| PROPERTIES   | TEST METHOD   | UNITS  | VALUE  |
|--|---|--|--|
| Viscosity Average molecular weight   | ISO 1191<br>Solution viscosity<br>C=0.001 g/cm <sup>3</sup> | cm <sup>3</sup> /g   | 420<br>500.00  |
| Melt Flow index MFI 190/5 MFI 230/5  | ISO/R 1133<br>Condition 18<br>Condition 20<br>Condition 12  | g/10min g/10min<br>g/10min   | 0.5<br>1.5<br>0.25   |
| Density  | ISO/R 1183  | g/cm <sup>3</sup>  | 0.895  |
| Melting zone   | Polarizing microscope                                       | °C   | 140-150  |
| Ultimate strength Resistance to tensile stress Ultimate elongation                             | ISO/R 527<br>Forward speed D Test<br>Specimen fig. 2        | N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>%  | 21<br>40<br>800  |
| Resistance under spherical pressure  | ISO 2039 (H358/30)  | N/mm <sup>2</sup>  | 40   |
| Bending stress at 3,5% Elongation of edge fibers   | ISO 178<br>Specimen 5.1                                     | N/mm <sup>2</sup>  | 20   |
| Modulus of elasticity  | ISO 178   | N/mm <sup>2</sup>  | 800  |
| Shear modulus<br>-10 °C<br>0 °C<br>10 °C<br>20 °C<br>30 °C<br>40 °C<br>50 °C<br>60 °C<br>80 °C | ISO 573<br>Method A   | ISO/R 573<br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup><br>N/mm <sup>2</sup> | 1100<br>770<br>500<br>370<br>300<br>240<br>180<br>140<br>100 |
| Mechanical resistance after the impact bending test  | DIN 8078  |  | No Failure   |
| CHARPY impact strength RT<br>0 °C<br>-10 °C  | ISO/R 179<br>Test Specimen<br>fig.2                         | KJ/mm <sup>2</sup><br>KJ/mm <sup>2</sup><br>KJ/mm <sup>2</sup>   | No Failure No Failure No Failure                             |
| CHARPY impact strength RT<br>0 °C<br>-20 °C  | ISO/R 17 9<br>Test S pecimen                                | KJ/mm <sup>2</sup> :KJ/mm <sup>2</sup><br>KJ/mm <sup>2</sup>   | 25<br>7<br>3   |
| Linear expansion   | VDE 0304 part 1& 4  | K <sup>-1</sup>  | 1.5x10 <sup>-4</sup>   |
| Thermal conductivity at 20 °C  | DIN 52612   | W/mK   | 0.24   |
| Specific heat at 20 °C   | Adiabatic Calorimeter                                       | KJ/KgK   | 2.0  |

# DP THERM PIPES

## DP THERM - GREEN PIPE SDR 6 - 7.4 -11

**DP.Therm** green pipes are versatile and suitable for various applications. To cater to diverse needs, we provide a range of SDR ( 6 - 7.4 -11 ) options and pipe diameters (from 20 mm to 160mm), ensuring their compatibility with multiple uses and tested for their quality according to the EN15874 and DIN 8077 / 8078 standards .

### ADVANTAGES:

- Our pipes are highly resistant to hydraulic shocks, withstanding breaking pressures exceeding 130 bar at room temperature. This ensures their reliability under pressure.
- Long lasting Performance: The **DP.Therm** system offers a lifespan of over 50 years, functioning efficiently in a wide temperature range (20°C to 90°C) and operating pressures (10 to 20 bar).
- High temperature Resistance: Temperature peaks at an operating pressure of 4 bar do not affect the **DP.Therm** system, making it suitable for various environments.
- Corrosion Resistance: Our pipes exhibit excellent resistance to corrosion and perform exceptionally well in areas with very hard water. This ensures their longevity and reliability in different water conditions.

## DP THERM – UV PIPES SDR 6 - 7.4

UV insulated polypropylene pipes are a type of durable and versatile plumbing solution designed for various applications, particularly in outdoor settings. These pipes are made from polypropylene, a thermoplastic material known for its strength, resistance to chemicals, and affordability. The UV insulation serves to protect the pipe's material from degradation caused by exposure to ultraviolet light, ensuring a longer lifespan and maintaining the pipe's structural integrity.

### DP THERM PIPES WITH GLASS FIBER SDR 6 - 7.4 :

DP THERM manufactures three-layered polypropylene pipes, incorporating glass fiber within the central layer. This enhancement provides mechanical reinforcement and improves the overall system's quality. As a result, the support in visible networks can be significantly thinner compared to pipes without glass fibers. When glass fiber pipes are integrated into an underground network.

#### ADVANTAGES:

- \_ Smaller linear expansions
- \_ It is used with water at high temperatures
- \_ Bigger flow due to the smaller wall thickness

#### Note:

- \_ No additional tools needed for the joints
- \_ Production capability of SDR 6 – 7.4 And in dimensions ranging from 25mm to 160 mm

### DP THERM PIPES UV WITH GLASS FIBER SDR 6 - 7.4 :

DP.Therm manufactures four-layered polypropylene pipes, incorporating glass fiber within the central layer and uv layer in the outer surface of the pipe . This enhancement provides mechanical reinforcement and improves the overall system's quality. As a result, the support in visible networks can be significantly and adding a UV layer gives the pipes remarkable resistance to exposure to sunlight .

#### ADVANTAGES:

- \_ Smaller linear expansions
- \_ Thinner support of about 40% compared to pipes that do not contain glass fibers
- \_ Greater stability and service life in temperature changes
- \_ resist the sun's rays
- \_ Bigger flow due to the smaller wall thickness , High stiffness

#### Note:

- \_ The heat sealing of glass fiber pipes with fittings is done with the same ease as with classic pipes
- \_ No additional tools needed for the joints
- \_ Production capability of SDR 6 – 7.4 and in dimensions ranging from 25mm to 160 mm

# DP THERM FITTINGS PN 25

THE FITTINGS ARE CERTIFIED ACCORDING TO THE EUROPEAN STANDARD EN 15874-3

## ADVANTAGES:

- a smooth surface interior within the fitting to enable effortless water flow, minimizing significant friction losses.
- Suitable for all different sdr of pipes
- No need for additional tools in the installation process.
- It is possible to request parts insulated against sunlight for use in areas exposed to the sun with pipes insulated from sunlight (uv)

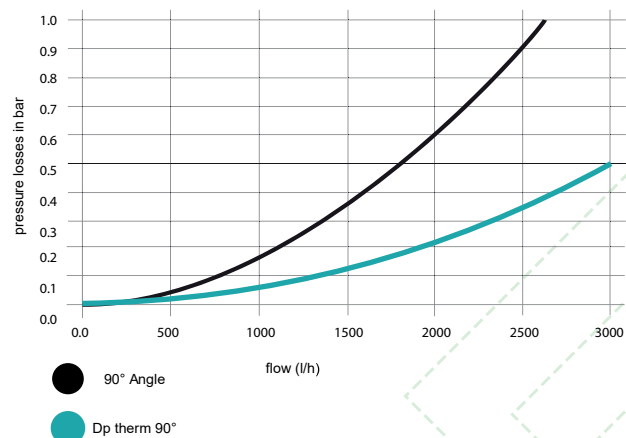
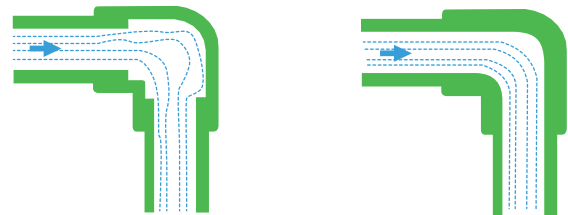
## IMPORTANT NOTE:

In the production of injection fittings up to  $\text{Ø}160\text{mm}$ , the nominal pressure is PN 25, while for prefabricated fittings their strength depends on the wall thickness of the pipe.

## Example of water flow in a 90 degree path diverter .

The flow of water in the vessels with a regulated internal volume and in the smooth surface makes the water flow more like a laminar flow without turning into a complete turbulent flow.

You will observe that having a higher wall thickness enables us to create components with improved geometrical designs. This, in turn, helps in minimizing hydraulic losses, leading to a substantial enhancement in the overall efficiency and flow of the system.





## BRASS FITTINGS:

DP Therm is a comprehensive manufacturer of various components associated with polypropylene systems.

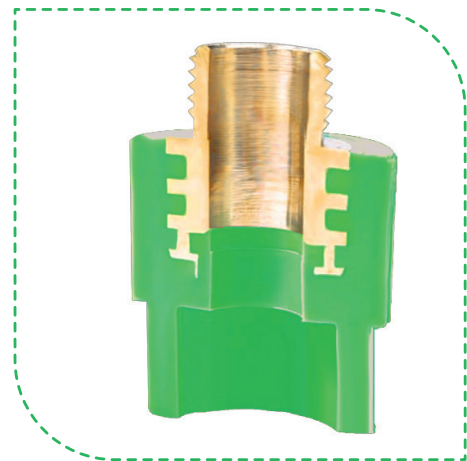
### Parametric channels for holding the fitting.

One side of the channel has a negative slope from outside to inside to hold the PP-R material and prevent the metal part from being pulled out of the plastic in tensile forces.



### Cross-shaped channels

The base of copper inserts undergoes a transformation into cross-shaped channels. This design serves a crucial purpose - it prevents twisting and ensures that the metal and plastic components remain firmly bonded together.



# QUALITY ASSURANCE DURING PRODUCTION

Our top priority and unwavering dedication lie in achieving exceptional quality. We direct a significant portion of our efforts towards this aspect. In the realm of DP Therm pipes and production fittings, we meticulously evaluate the system's quality using advanced mechanical equipment. Alongside the standard mechanical tools needed for pipe manufacturing, DP Therm production lines are equipped with additional equipment. This ensures that our consumers can confidently access top-tier products.

## RAW MATERIAL DEHUMIDIFIER:

By employing this method, we maintain the stability of Extruder data for moisture-absorbing raw materials. Consequently, we prevent the occurrence of dimensional changes that have been observed in numerous pipes.

## AUTOMATIC CORRECTION OF THE WALL THICKNESS OF THE PIPE:

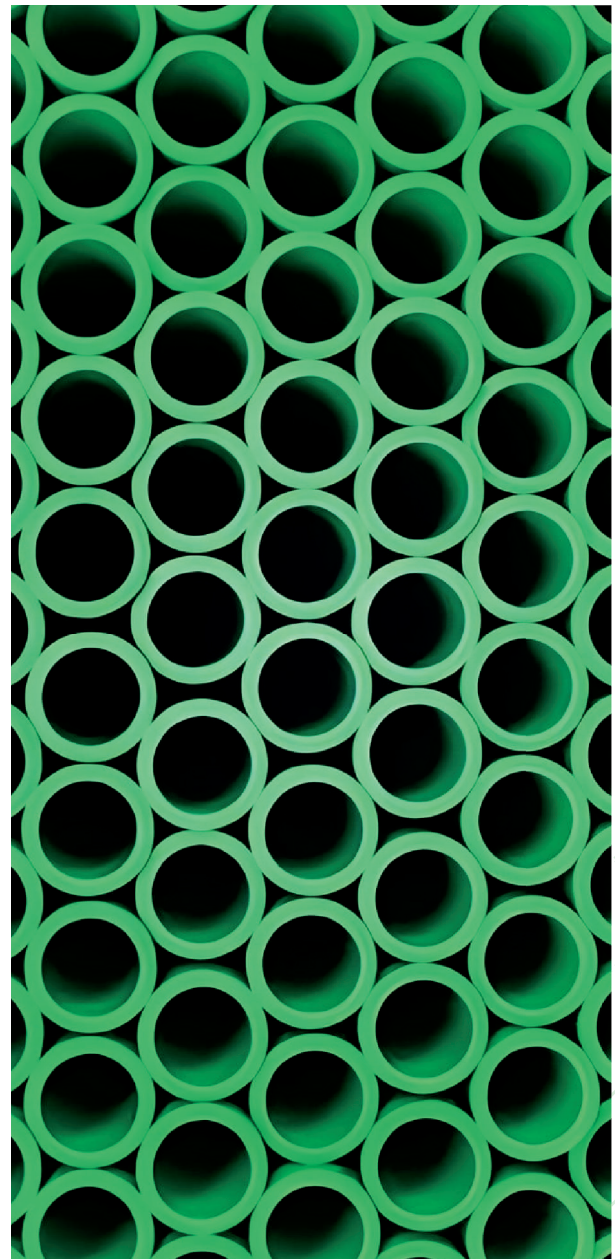
A system allows us to establish the desired wall thickness limits. These limits are then dynamically adjusted based on the production line's operations. This forms aspect of a pipe's dimensional safety assurance.

## CONTROL OF THE OUTER DIMENSION WITH LASER:

By employing this method, we maintain the stability of Extruder data for moisture-absorbing raw materials. Consequently, we prevent the occurrence of dimensional changes that have been observed in numerous pipes.

## DIMENSIONAL INSPECTION IN PIPE MANUFACTURING PROCESSES:

By employing this method, we maintain the stability of Extruder data for moisture-absorbing raw materials. Consequently, we prevent the occurrence of dimensional changes that have been observed in numerous pipes.



# LABORATORY CONTROLS

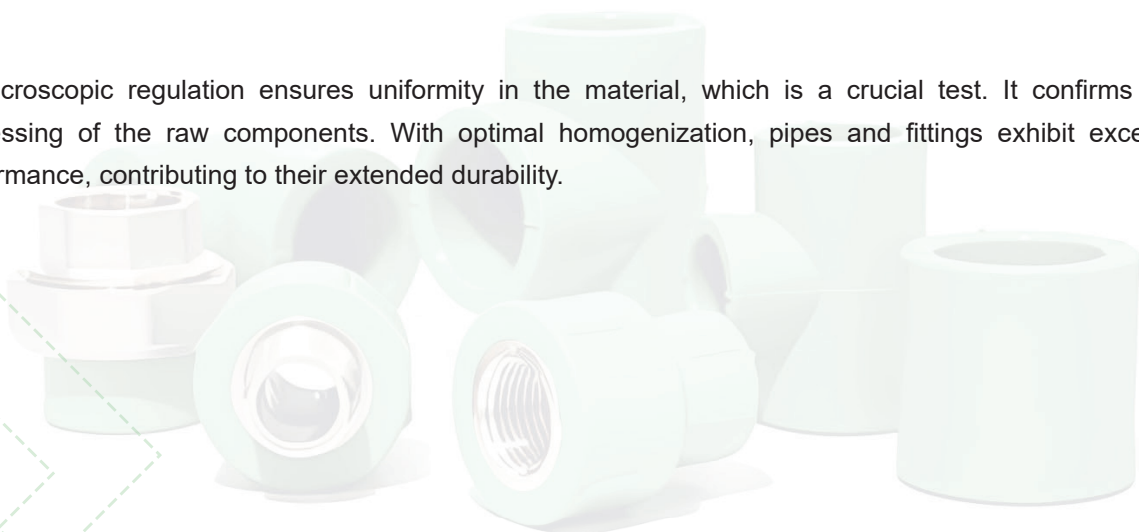
**Dp.Therm** adheres to stringent guidelines during the manufacturing of pipes and fittings. These rigorous standards are validated in cutting-edge laboratories affiliated with government agencies. The testing procedures follow European norms EN ISO 15874-1/2/3 and German standards DIN 8077 / 8078 and 16962. The factory ensures the quality of supplied pipes and fittings through various testing methods.

1- Performing a thorough examination of the pipe's outer surface, we assess the dimensions by determining the external diameter and accurately measuring the wall thickness using calibrated tools. These tests serve as crucial certifications, validating the consistent measurements taken throughout the manufacturing process.

2- Managing the flow index of both raw materials and completed items is crucial. This standard procedure is conducted during the reception of raw materials and production of new products. The flow index of raw materials impacts the extruder's temperature profile and, subsequently, the material's homogeneity. A minimal deviation in the flow index between raw materials and products indicates accurate processing.

3- Assessing durability and dependability of pipes and fittings over time involves subjecting them to a thermal cycle test. This comprehensive evaluation is performed under severe operational circumstances. The water temperature fluctuates every 15 minutes, ranging from 20°C to 95°C, simulating consecutive thermal shocks. Concurrently, the hydraulic pressure remains constant at 6 bar, adhering to the international standards ISO 19893 and EN 12295.

4- Microscopic regulation ensures uniformity in the material, which is a crucial test. It confirms proper processing of the raw components. With optimal homogenization, pipes and fittings exhibit exceptional performance, contributing to their extended durability.

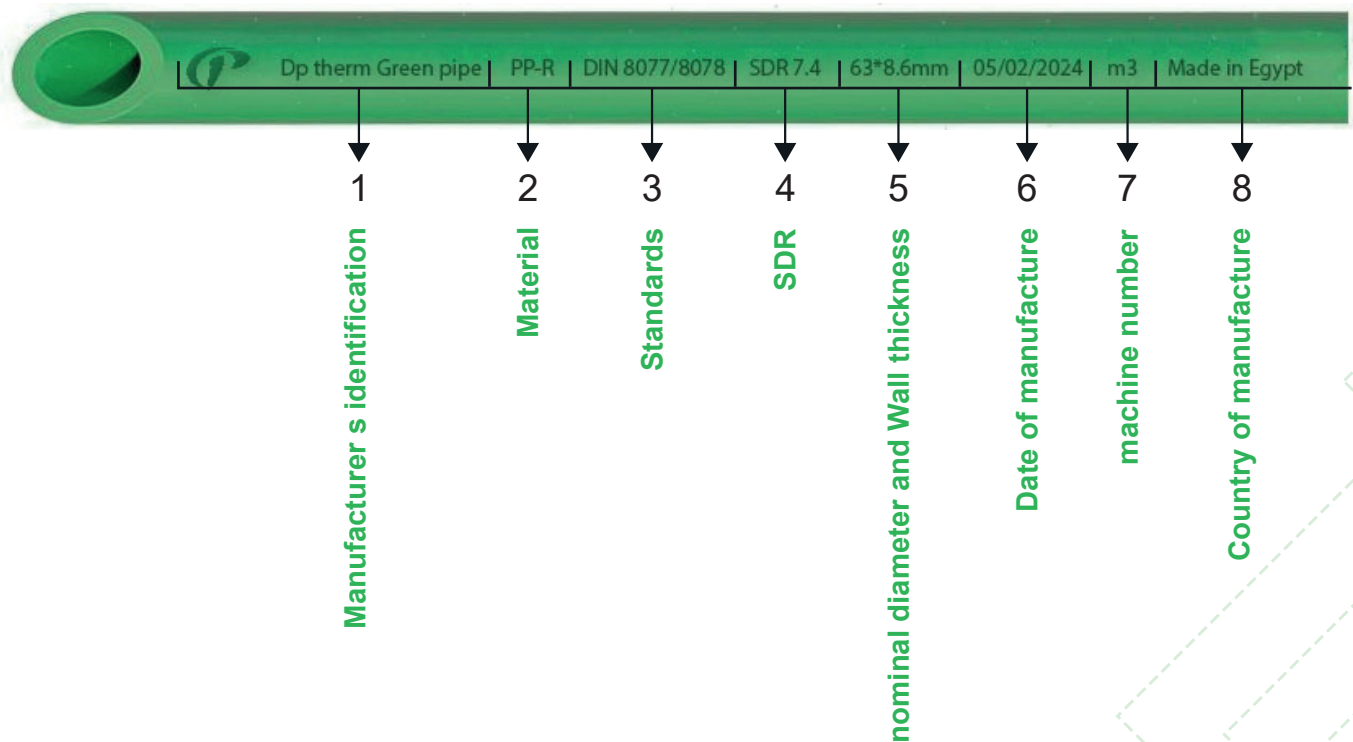


5- Managing the thermal reversal of pipe systems is crucial. In a laboratory, test samples are heated to 135°C for 2 hours. The allowable temperature increase should not surpass 2%, as per DIN and EN ISO standards. The DP Therm readings indicate values of 0.4%, while DP Therm Pipes show 0.2%. This results in exceptionally low thermal linear expansion coefficients during their functioning in heating systems.

6- Ensuring the mechanical strength of pipes and fittings under controlled internal hydrostatic pressure is crucial. This evaluation is conducted at various temperatures and time durations as per European norms and German. At 20°C and 95°C, Additionally, of testing is performed at 110°C. The 1-hour tests are conducted for each batch of the final product.

7- the impact test in accordance with the specifications of DIN 8078, DIN 53453, EN ISO 15874-2, and ISO 9854-1/2, the impact test method is to be followed. It is crucial to assess the durability of PP-R pipes at sub-zero temperatures and under energy shock conditions. The DP Therm pipes, known for their high quality, demonstrate exceptional resilience against breakage. These pipes can withstand temperatures as low as -5°C while enduring 25J energy shocks, which surpasses the standard requirement by an impressive 66%.

## MARKING



# STANDARDS

**DIN 1988** Pipes for drinking water in buildings  
• Technical standards for drinking water installations

**DIN 4726** Plastic pipes for hot water underfloor heating, required Properties .

**DIN 8076** Pressure pipes in thermoplastics  
• Joining to metal Fittings  
• Screw joints for polyethylene pipes

**DIN 8078** Polypropylene pipes, Type 1, 2, & 3: general quality requirements and testing .

**DIN 16960** Welding of thermoplastic materials: principles .

**DVS 2207** Welding thermoplastic materials, Polypropylene Type 1 & 2, pipes and pipe Fittings .

**DVS 2203** Testing welded thermoplastic joints .

**DIN 4725** Underfloor heating with hot water  
• Concepts  
• Thermal testing  
• Heat potential and design

**DIN 4728** Polypropylene pipes for hot water underfloor heating, special

**DIN 8077** Polypropylene pipes: Dimensions

**DIN 16962** Pipe joints and their elements for Polypropylene pipes under pressure: Manufacture and test

**DIN 19560** Flame retardant pipes for sewage applications

**DVS 2208** Tools and equipment for welding thermoplastic materials, welding thermal elements

## LIFESPAN OF DP THERM

Globally, the polypropylene water distribution system has been acknowledged as safe and dependable for over four decades. Engineered to withstand 50 years of usage, it can handle pressures ranging between 6 to 26 bar

The Dp therm system exhibits exceptional resistance to age-related degradation under high temperature and pressure circumstances. The lifespan graph testifies to its outstanding performance when utilized as per the given guidelines and instructions by the manufacturer.

In general, the DP therm system offers durability and reliability in water supply and heating systems. The pipe's lifespan is influenced by factors including pressure, temperature, and external stress.

## THE EQUATION ENCOMPASSING THE MENTIONED FACTORS IS:

$$\rho = \frac{2 \times S_{\min} \times \sigma}{d - S_{\min}}$$

### WHERE:

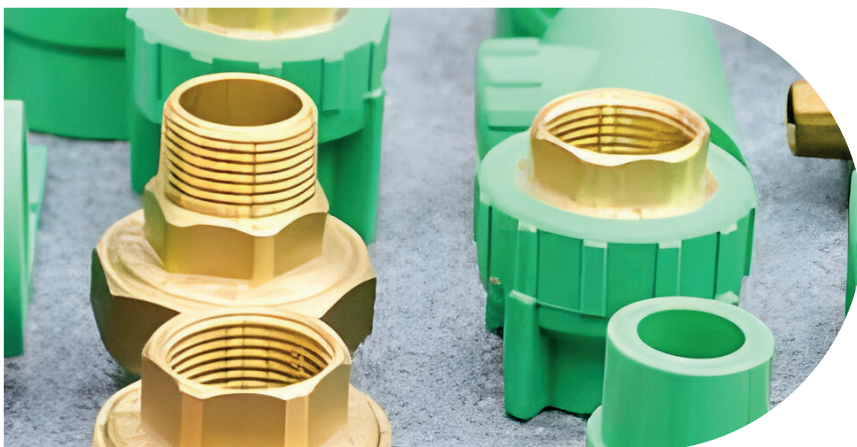
$\rho$ : maximum internal pressure

$d$ : outer dimension

$S_{\min}$ : wall thickness (minimum)

$\sigma$ : peripheral stress in N/mm<sup>2</sup>

In the given table, it is evident that water supply systems can last up to 50 years across various temperature ranges. Conversely, heating systems attain similar durability at high temperatures and pressures.



**ACCOEDING TO EN 15874-75 STANDARD :**

| Accoeding to EN 15874-75 standard :   |                |                                  |                 |               |
|---|----------------|----------------------------------|-----------------|---------------|
| <b>Application class (class)1 :Hot water distribution 60 °C:</b>                        |                |                                  |                 |               |
| Operating Temperature   |                | 49 years at 60°C                 |                 |               |
| Maximum Operating Temperature   |                | 1 years at 80°C                  |                 |               |
| Degradation Temperature   |                | 100 hours at 95°C                |                 |               |
| Maximum Operating pressure  |                | 10 bar                           |                 |               |
| <b>Application class (class)2 :Hot water distribution 70 °C:</b>                        |                |                                  |                 |               |
| Operating Temperature   |                | 49 years at 60°C                 |                 |               |
| Maximum Operating Temperature   |                | 1 years at 80°C                  |                 |               |
| Degradation Temperature   |                | 100 hours at 95°C                |                 |               |
| Maximum Operating pressure  |                | 10 bar                           |                 |               |
| <b>Application class (class)4 :underfloor heating and radiators at low temperatures</b> |                |                                  |                 |               |
| Operating Temperature   |                | 20°C for 2.5 years               |                 |               |
|   |                | 40°C for the subsequent 20 years |                 |               |
|   |                | 60°C for the subsequent 20 years |                 |               |
| Maximum Operating Temperature   |                | 2.5 years at 70°C                |                 |               |
| Degradation Temperature   |                | 100 hours at 100°C               |                 |               |
| Maximum Operating pressure  |                | 10 bar                           |                 |               |
| <b>Application class (class) 5 : High temperatures .</b>                                |                |                                  |                 |               |
| Operating Temperature   |                | 20°C for 14 years                |                 |               |
|   |                | 60°C for the subsequent 25 years |                 |               |
|   |                | 80°C for the subsequent 10 years |                 |               |
| Maximum Operating Temperature   |                | 1 years at 90°C                  |                 |               |
| Degradation Temperature   |                | 100 hours at 100°C               |                 |               |
| Maximum Operating pressure  |                | 10 bar                           |                 |               |
| <b>Standard PP-R Pipes:</b>   |                |                                  |                 |               |
| SDR 11/S5.0(PN10)   | class 1/6 bar  | class 2/4 bar                    |                 |               |
| SDR 7.4/S3.2 (PN16)   | class 1/8 bar  | class 2/6 bar                    | Zclass 4/10 bar | class 5/6 bar |
| SDR 6/S2.5 (PN20)   | class 1/10 bar | class 2/8 bar                    | class 4/10 bar  | class 5/6 bar |
| <b>Glass Fiber Reinliced PP-R Pipes:</b>  |                |                                  |                 |               |
| SDR 7.4/S3.2  | class 1/8 bar  | class 2/6 bar                    | class 4/10 bar  | class 5/6 bar |
| SDR 6/S2.5  | class 1/10 bar | class 2/8 bar                    | class 4/10 bar  | class 5/6 bar |

# WORKING PRESSURE

DP Therm permissible working pressure for potable water installations fluid transported: water acc. to DIN 8077

| Temperature                                  | Service life | DP Therm Pipe SDR 11                          |       | DP Therm Pipe SDR 7.4 |       | DP Therm pipe SDR 6 |       | DP Therm PIPES With glass fiber |       |  |
|--|--------------|---|-------|-----------------------|-------|---------------------|-------|---------------------------------|-------|--|
|  |              | Permissible working pressure in bar and (psi) |       |                       |       |                     |       |                                 |       |  |
|  |              | bar   | (psi) | bar                   | (psi) | bar                 | (psi) | bar                             | (psi) |  |
| 20 °C  | 1            | 15,0  | 218   | 23,8                  | 345   | 30,0                | 435   | 28,6                            | 415   |  |
|  | 5            | 14,1  | 205   | 22,3                  | 324   | 28,1                | 408   | 26,8                            | 389   |  |
|  | 10           | 13,7  | 199   | 21,7                  | 315   | 27,3                | 396   | 26,1                            | 379   |  |
|  | 25           | 13,3  | 193   | 21,1                  | 306   | 26,5                | 385   | 25,3                            | 367   |  |
|  | 50           | 12,9  | 187   | 20,4                  | 296   | 25,7                | 373   | 24,5                            | 356   |  |
| 30 °C  | 1            | 12,8  | 186   | 20,2                  | 293   | 25,5                | 370   | 24,3                            | 353   |  |
|  | 5            | 12,0  | 174   | 19,0                  | 276   | 23,9                | 347   | 22,8                            | 331   |  |
|  | 10           | 11,6  | 168   | 18,3                  | 266   | 23,1                | 335   | 22,0                            | 319   |  |
|  | 25           | 11,2  | 163   | 17,7                  | 257   | 22,3                | 324   | 21,3                            | 309   |  |
|  | 50           | 10,9  | 158   | 17,3                  | 251   | 21,8                | 316   | 20,7                            | 300   |  |
| 40 °C  | 1            | 10,8  | 157   | 17,1                  | 248   | 21,5                | 312   | 20,5                            | 298   |  |
|  | 5            | 10,1  | 147   | 16,0                  | 232   | 20,2                | 293   | 19,2                            | 279   |  |
|  | 10           | 9,8   | 142   | 15,6                  | 226   | 19,6                | 284   | 18,7                            | 271   |  |
|  | 25           | 9,4   | 136   | 15,0                  | 218   | 18,8                | 273   | 18,0                            | 261   |  |
|  | 50           | 9,2   | 134   | 14,5                  | 210   | 18,3                | 266   | 17,5                            | 254   |  |
| 50 °C  | 1            | 9,2   | 134   | 14,5                  | 210   | 18,3                | 266   | 17,5                            | 254   |  |
|  | 5            | 8,5   | 123   | 13,5                  | 196   | 17,0                | 247   | 16,2                            | 235   |  |
|  | 10           | 8,2   | 119   | 13,1                  | 190   | 16,5                | 239   | 15,7                            | 228   |  |
|  | 25           | 8,0   | 116   | 12,6                  | 183   | 15,9                | 231   | 15,2                            | 221   |  |
|  | 50           | 7,7   | 112   | 12,2                  | 177   | 15,4                | 224   | 14,7                            | 213   |  |
| 60 °C  | 1            | 7,7   | 112   | 12,2                  | 177   | 15,4                | 224   | 14,7                            | 213   |  |
|  | 5            | 7,2   | 104   | 11,4                  | 165   | 14,3                | 208   | 13,7                            | 199   |  |
|  | 10           | 6,9   | 100   | 11,0                  | 160   | 13,8                | 200   | 13,2                            | 192   |  |
|  | 25           | 6,7   | 97    | 10,5                  | 152   | 13,3                | 193   | 12,6                            | 183   |  |
|  | 50           | 6,4   | 93    | 10,1                  | 147   | 12,7                | 184   | 12,1                            | 176   |  |
| Potable water (cold)<br>Potable water (warm) | 65 °C        | 1   | 11,6  | 168                   | 14,6  | 212                 | 13,9  | 202                             |       |  |
|  |              | 5   | 10,8  | 157                   | 13,6  | 197                 | 12,9  | 187                             |       |  |
|  |              | 10  | 10,4  | 151                   | 13,1  | 190                 | 12,5  | 181                             |       |  |
|  |              | 25  | 10,0  | 145                   | 12,6  | 183                 | 12,0  | 174                             |       |  |
|  |              | 50  | 8,8   | 128                   | 11,1  | 161                 | 10,6  | 154                             |       |  |
|  | 70 °C        | 1   | 10,3  | 149                   | 13,0  | 189                 | 12,4  | 180                             |       |  |
|  |              | 5   | 9,5   | 138                   | 11,9  | 173                 | 11,4  | 165                             |       |  |
|  |              | 10  | 9,3   | 135                   | 11,7  | 170                 | 11,1  | 161                             |       |  |
|  |              | 25  | 8,0   | 116                   | 10,1  | 147                 | 9,6   | 139                             |       |  |
|  |              | 30  | 7,0   | 102                   | 8,8   | 128                 | 8,3   | 135                             |       |  |
|  | 75 °C        | 50  | 6,7   | 97                    | 8,5   | 123                 | 8,1   | 118                             |       |  |
|  |              | 1   | 9,8   | 142                   | 12,3  | 179                 | 11,7  | 170                             |       |  |
|  |              | 5   | 9,0   | 131                   | 11,4  | 165                 | 10,8  | 157                             |       |  |
|  |              | 10  | 8,3   | 120                   | 10,5  | 152                 | 10,0  | 145                             |       |  |
|  |              | 25  | 6,7   | 97                    | 8,4   | 122                 | 8,0   | 116                             |       |  |

SDR = Standard Dimension Ratio  
(diameter / wall thickness ratio)  
SDR = 2 x S + 1 ≈ d / s

Faser and Stabi composite pipe: high working stress at lower wall thickness and higher flow rate

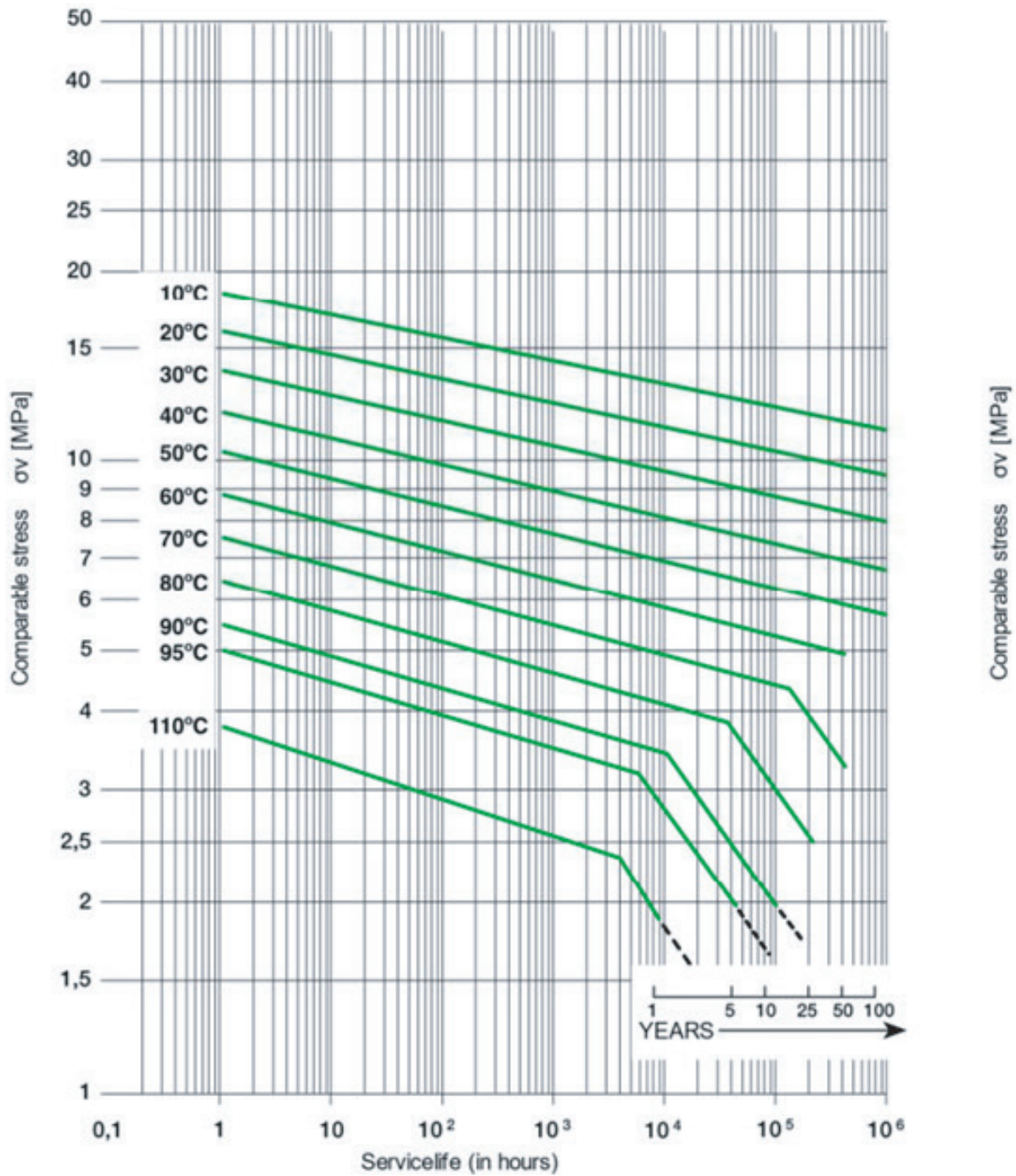


# WORKING PRESSURE

Heating systems or closed systems

| Heating period   | Temperature | Service life | DP.Therm pipes system with glass fiber        |       |
|--|-------------|--------------|---|-------|
|  |             |              | Permissible working pressure in bar and (psi) |       |
|  |             |              | bar   | (psi) |
| constant operating temperature<br>70 °C / 158 °F<br>incl. 30 days per year at          | 75 °C       | 5            | 14,3  | 208   |
|  |             | 10           | 13,8  | 200   |
|  |             | 25           | 11,7  | 170   |
|  |             | 45           | 10,2  | 148   |
|  | 80 °C       | 5            | 13,5  | 196   |
|  |             | 10           | 12,8  | 186   |
|  |             | 25           | 11,1  | 161   |
|  |             | 42,5         | 9,8   | 142   |
|  | 85 °C       | 5            | 12,4  | 180   |
|  |             | 10           | 11,9  | 173   |
|  |             | 25           | 10,1  | 147   |
|  |             | 37,5         | 9,2   | 134   |
|  | 90 °C       | 5            | 11,4  | 165   |
|  |             | 10           | 10,9  | 158   |
|  |             | 25           | 8,9   | 129   |
| 35   |             | 8,2          | 119   |       |
| constant operating temperature<br>70 °C / 158 °F<br>incl. 60 days per year at          | 75 °C       | 5            | 14,1  | 205   |
|  |             | 10           | 13,6  | 197   |
|  |             | 25           | 11,6  | 168   |
|  |             | 45           | 10,1  | 147   |
|  | 80 °C       | 5            | 13,1  | 190   |
|  |             | 10           | 12,5  | 181   |
|  |             | 25           | 10,6  | 154   |
|  |             | 40           | 9,4   | 136   |
|  | 85 °C       | 5            | 12,0  | 174   |
|  |             | 10           | 11,5  | 167   |
|  |             | 25           | 9,2   | 134   |
|  |             | 35           | 8,5   | 123   |
|  | 90 °C       | 5            | 11,0  | 160   |
|  |             | 10           | 9,8   | 142   |
|  |             | 25           | 7,8   | 113   |
| 30   |             | 7,5          | 109   |       |
| constant constant operating temperature<br>70 °C / 158 °F<br>incl. 90 days per year at | 75 °C       | 5            | 14,0  | 203   |
|  |             | 10           | 13,4  | 194   |
|  |             | 25           | 11,3  | 164   |
|  |             | 45           | 9,8   | 142   |
|  | 80 °C       | 5            | 12,9  | 187   |
|  |             | 10           | 12,4  | 180   |
|  |             | 25           | 10,1  | 147   |
|  |             | 37,5         | 9,1   | 132   |
|  | 85 °C       | 5            | 11,8  | 171   |
|  |             | 10           | 10,7  | 155   |
|  |             | 25           | 8,6   | 125   |
|  |             | 32,5         | 8,0   | 116   |
|  | 90 °C       | 5            | 10,6  | 154   |
|  |             | 10           | 9,0   | 131   |
|  |             |              | 25  | 7,2   |

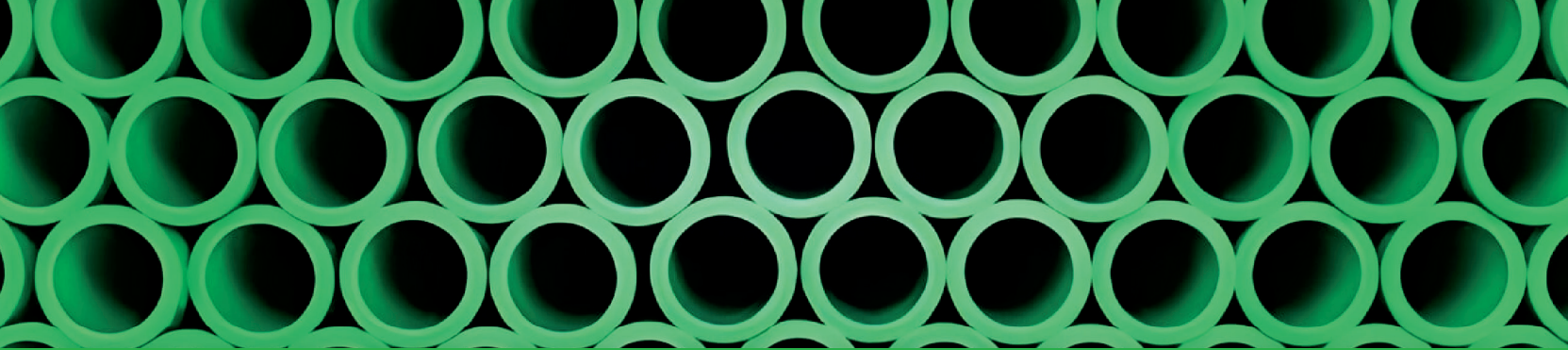
## Isothermal lines for PPR mechanical strength



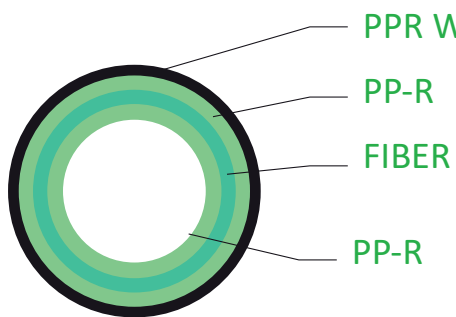
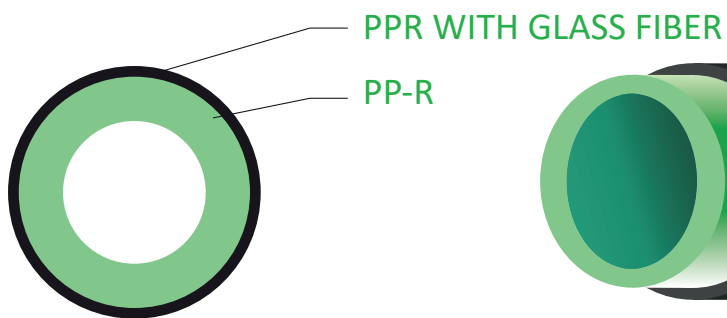
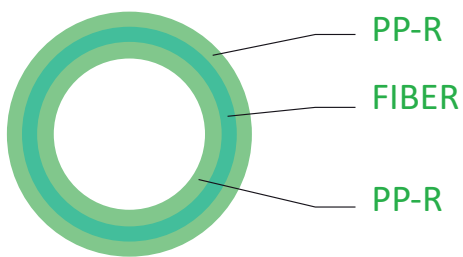
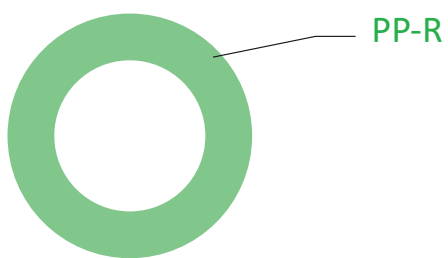


# PPR PIPES





## DP . THERM PIPES



## FIELDS OF APPLICATION



potable water application



swimming-pool technology



heating system construction



chemical transport



connection heating and cooling



irrigation



industrial floor cooling



application in the field of ship building



chilled water technology

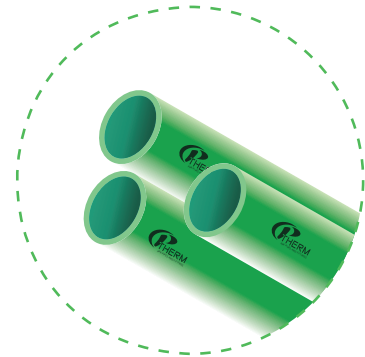
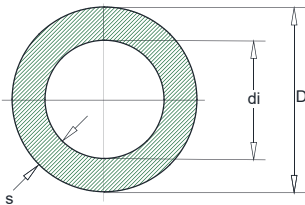


agriculture




Pipes exposed to sun rays

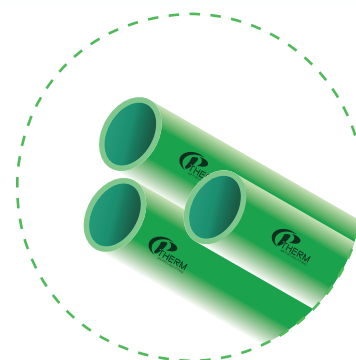
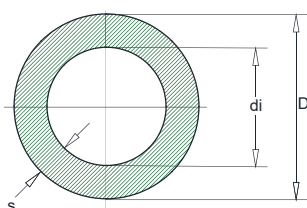





## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm green pipe
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 11 / S 5 - PN10
- **Color:** Green
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

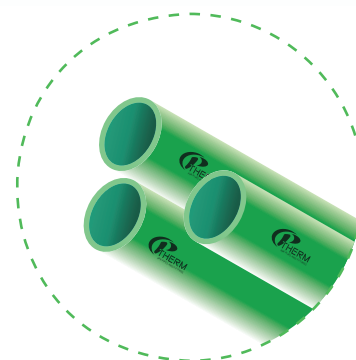
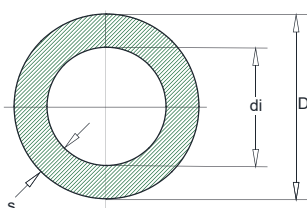
| SDR                    | CODE       | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|------------------------|------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 11<br>S 5<br>PN 10 | B921020101 | 20              | 1.9                   | 16.2                      | 0.206               | 100         |
|                        | B921020102 | 25              | 2.3                   | 20.4                      | 0.327               | 100         |
|                        | B921020103 | 32              | 2.9                   | 26.2                      | 0.539               | 40          |
|                        | B921020104 | 40              | 3.7                   | 32.6                      | 0.834               | 40          |
|                        | B921020105 | 50              | 4.6                   | 40.8                      | 1.307               | 20          |
|                        | B921020106 | 63              | 5.8                   | 51.4                      | 2.074               | 12          |
|                        | B921020107 | 75              | 6.8                   | 61.4                      | 2.959               | 12          |
|                        | B921020108 | 90              | 8.2                   | 73.6                      | 4.252               | 8           |
|                        | B921020109 | 110             | 10                    | 90                        | 6.359               | 8           |
|                        | B921020110 | 125             | 11.4                  | 102.2                     | 8.19                | 4           |
|                        | B921020112 | 160             | 14.6                  | 130.8                     | 13.43               | 5.8         |




## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm green pipe
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 7.4 / S 3.2 - PN16
- **Color:** Green
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

| SDR                       | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|---------------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 7.4<br>S 3.2<br>PN 16 | B92102010201 | 20              | 2.8                   | 14.4                      | 0.163               | 100         |
|                           | B92102010202 | 25              | 3.5                   | 18                        | 0.255               | 100         |
|                           | B92102010203 | 32              | 4.4                   | 23.2                      | 0.423               | 40          |
|                           | B92102010204 | 40              | 5.5                   | 29                        | 0.661               | 40          |
|                           | B92102010205 | 50              | 6.9                   | 36.2                      | 1.03                | 20          |
|                           | B92102010206 | 63              | 8.6                   | 45.8                      | 1.648               | 12          |
|                           | B92102010207 | 75              | 10.3                  | 54.4                      | 2.325               | 12          |
|                           | B92102010208 | 90              | 12.3                  | 65.4                      | 3.361               | 8           |
|                           | B92102010209 | 110             | 15.1                  | 79.8                      | 5.003               | 8           |
|                           | B92102010210 | 125             | 17.1                  | 90.8                      | 6.478               | 4           |
|                           | B92102010312 | 160             | 21.9                  | 116.2                     | 10.609              | 5.8         |

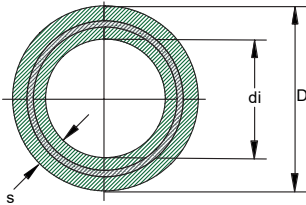


## DP.THERM PIPES


- **Material:** PP-R
- **Type:** DP.Therm green pipe
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR6 / S2.5 - PN20
- **Color:** Green
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

| SDR                     | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|-------------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 6<br>S 2.5<br>PN 20 | B92102010301 | 20              | 3.4                   | 13.2                      | 0.137               | 100         |
|                         | B92102010302 | 25              | 4.2                   | 16.6                      | 0.217               | 100         |
|                         | B92102010303 | 32              | 5.4                   | 21.2                      | 0.353               | 40          |
|                         | B92102010304 | 40              | 6.7                   | 26.6                      | 0.556               | 40          |
|                         | B92102010305 | 50              | 8.3                   | 33.4                      | 0.877               | 20          |
|                         | B92102010306 | 63              | 10.5                  | 42                        | 1.386               | 12          |
|                         | B92102010307 | 75              | 12.5                  | 50                        | 1.964               | 12          |
|                         | B92102010308 | 90              | 15                    | 60                        | 2.829               | 8           |
|                         | B92102010309 | 110             | 18.3                  | 73.4                      | 4.233               | 8           |
|                         | B92102010311 | 125             | 20.8                  | 83.4                      | 5.465               | 4           |
|                         | B92102010313 | 160             | 26.7                  | 106.6                     | 8.929               | 5.8         |

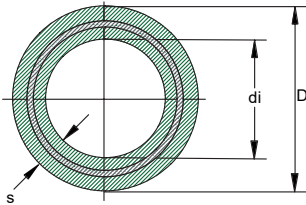





## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm Green Pipes With Glass Fiber
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 7.4 / S 3.2
- **Color:** Green
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

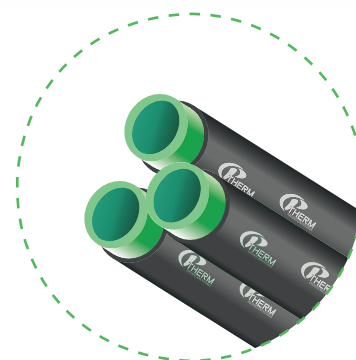
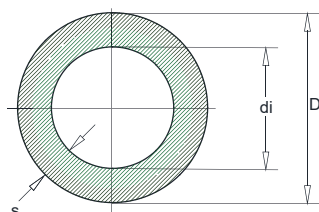
| SDR              | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 7.4<br>S 3.2 | B92102010401 | 20              | 2.8                   | 14.4                      | 0.163               | 100         |
|                  | B92102010402 | 25              | 3.5                   | 18                        | 0.255               | 100         |
|                  | B92102010403 | 32              | 4.4                   | 23.2                      | 0.423               | 40          |
|                  | B92102010404 | 40              | 5.5                   | 29                        | 0.661               | 40          |
|                  | B92102010405 | 50              | 6.9                   | 36.2                      | 1.03                | 20          |
|                  | B92102010406 | 63              | 8.6                   | 45.8                      | 1.648               | 12          |
|                  | B92102010407 | 75              | 10.3                  | 54.4                      | 2.325               | 12          |
|                  | B92102010408 | 90              | 12.3                  | 65.4                      | 3.361               | 8           |
|                  | B92102010409 | 110             | 15.1                  | 79.8                      | 5.003               | 8           |
|                  | B92102010410 | 125             | 17.1                  | 90.8                      | 6.478               | 4           |
|                  | B92102010412 | 160             | 21.9                  | 116.2                     | 10.609              | 5.8         |




## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm Green Pipes With Glass Fiber
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 6 / S 2.5
- **Color:** Green
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

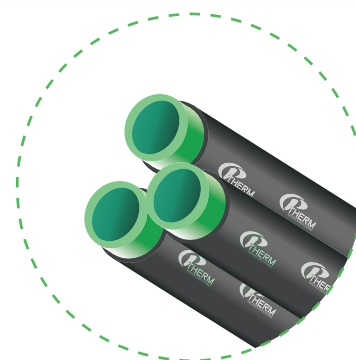
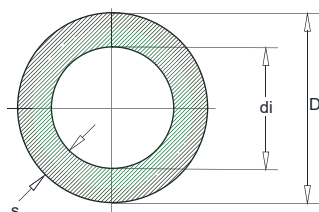
| SDR            | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|----------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 6<br>S 2.5 | B92102010501 | 20              | 3.4                   | 13.2                      | 0.137               | 100         |
|                | B92102010502 | 25              | 4.2                   | 16.6                      | 0.217               | 100         |
|                | B92102010503 | 32              | 5.4                   | 21.2                      | 0.353               | 40          |
|                | B92102010504 | 40              | 6.7                   | 26.6                      | 0.556               | 40          |
|                | B92102010505 | 50              | 8.3                   | 33.4                      | 0.877               | 20          |
|                | B92102010506 | 63              | 10.5                  | 42                        | 1.386               | 12          |
|                | B92102010507 | 75              | 12.5                  | 50                        | 1.964               | 12          |
|                | B92102010508 | 90              | 15                    | 60                        | 2.829               | 8           |
|                | B92102010509 | 110             | 18.3                  | 73.4                      | 4.233               | 8           |
|                | B92102010510 | 125             | 20.8                  | 83.4                      | 5.465               | 4           |
|                | B92102010512 | 160             | 26.7                  | 106.6                     | 8.929               | 5.8         |




## DP.THERM PIPES

- **Material:** PP-R UV
- **Type:** DP.Therm PP-R Pipes With UV
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 7.4 / S 3.2 - PN16
- **Color:** **Black**
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

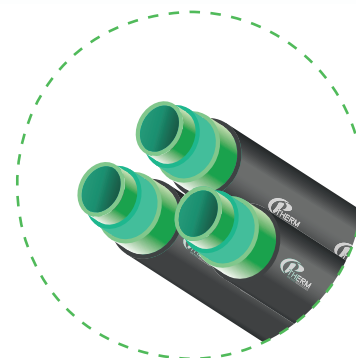
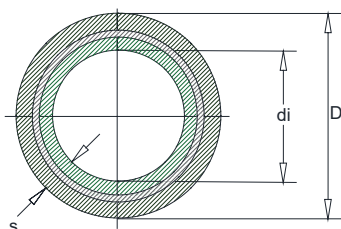
| SDR                       | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|---------------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 7.4<br>S 3.2<br>PN 16 | B92102010601 | 20              | 2.8                   | 14.4                      | 0.163               | 100         |
|                           | B92102010602 | 25              | 3.5                   | 18                        | 0.255               | 100         |
|                           | B92102010603 | 32              | 4.4                   | 23.2                      | 0.423               | 40          |
|                           | B92102010604 | 40              | 5.5                   | 29                        | 0.661               | 40          |
|                           | B92102010605 | 50              | 6.9                   | 36.2                      | 1.03                | 20          |
|                           | B92102010606 | 63              | 8.6                   | 45.8                      | 1.648               | 12          |
|                           | B92102010607 | 75              | 10.3                  | 54.4                      | 2.325               | 12          |
|                           | B92102010608 | 90              | 12.3                  | 65.4                      | 3.361               | 8           |
|                           | B92102010609 | 110             | 15.1                  | 79.8                      | 5.003               | 8           |
|                           | B92102010610 | 125             | 17.1                  | 90.8                      | 6.478               | 4           |
|                           | B92102010612 | 160             | 21.9                  | 116.2                     | 10.609              | 5.8         |




## DP.THERM PIPES

- **Material:** PP-R UV
- **Type:** DP.Therm PP-R Pipes With UV
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 6 / S 2.5 - PN20
- **Color:** **Black**
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

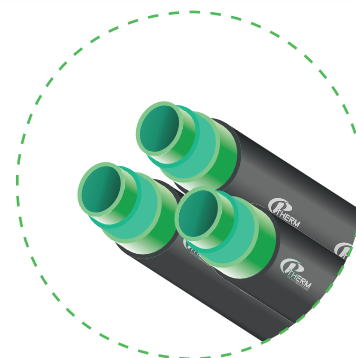
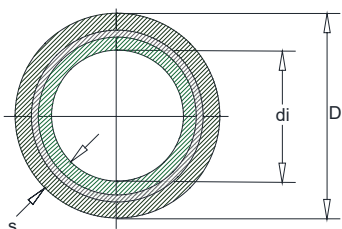
| SDR                     | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|-------------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 6<br>S 2.5<br>PN 20 | B92102010701 | 20              | 3.4                   | 13.2                      | 0.137               | 100         |
|                         | B92102010702 | 25              | 4.2                   | 16.6                      | 0.217               | 100         |
|                         | B92102010703 | 32              | 5.4                   | 21.2                      | 0.353               | 40          |
|                         | B92102010704 | 40              | 6.7                   | 26.6                      | 0.556               | 40          |
|                         | B92102010705 | 50              | 8.3                   | 33.4                      | 0.877               | 20          |
|                         | B92102010706 | 63              | 10.5                  | 42                        | 1.386               | 12          |
|                         | B92102010707 | 75              | 12.5                  | 50                        | 1.964               | 12          |
|                         | B92102010708 | 90              | 15                    | 60                        | 2.829               | 8           |
|                         | B92102010709 | 110             | 18.3                  | 73.4                      | 4.233               | 8           |
|                         | B92102010710 | 125             | 20.8                  | 83.4                      | 5.465               | 4           |
|                         | B92102010712 | 160             | 26.7                  | 106.6                     | 8.929               | 5.8         |




## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm UV Pipes With Glass Fiber
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 7.4 / S 3.2
- **Color:** **Black**
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

| SDR              | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content [l/m] | PU in Meter |
|------------------|--------------|-----------------|-----------------------|---------------------------|---------------------|-------------|
| SDR 7.4<br>S 3.2 | B92102010801 | 20              | 2.8                   | 14.4                      | 0.163               | 100         |
|                  | B92102010802 | 25              | 3.5                   | 18                        | 0.255               | 100         |
|                  | B92102010803 | 32              | 4.4                   | 23.2                      | 0.423               | 40          |
|                  | B92102010804 | 40              | 5.5                   | 29                        | 0.661               | 40          |
|                  | B92102010805 | 50              | 6.9                   | 36.2                      | 1.03                | 20          |
|                  | B92102010806 | 63              | 8.6                   | 45.8                      | 1.648               | 12          |
|                  | B92102010807 | 75              | 10.3                  | 54.4                      | 2.325               | 12          |
|                  | B92102010808 | 90              | 12.3                  | 65.4                      | 3.361               | 8           |
|                  | B92102010809 | 110             | 15.1                  | 79.8                      | 5.003               | 8           |
|                  | B92102010810 | 125             | 17.1                  | 90.8                      | 6.478               | 4           |
|                  | B92102010812 | 160             | 21.9                  | 116.2                     | 10.609              | 5.8         |



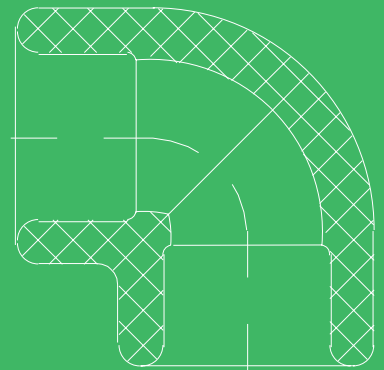
## DP.THERM PIPES

- **Material:** PP-R
- **Type:** DP.Therm UV Pipes With Glass Fiber
- **Standards:** DIN 8077 / 78
- **Pipe series:** SDR 6 / S 2.5
- **Color:** **Black**
- **Packing unit:** 4m straight lengths up to 125 and 5.8 meters for dimensions of 160 mm.
- **Application:** 

| SDR            | CODE         | Dimension D(mm) | Wall thickness s [mm] | Internal diameter di [mm] | Water content | PU in Meter |
|----------------|--------------|-----------------|-----------------------|---------------------------|---------------|-------------|
| SDR 6<br>S 2.5 | B92102010901 | 20              | 3.4                   | 13.2                      | 0.137         | 100         |
|                | B92102010902 | 25              | 4.2                   | 16.6                      | 0.217         | 100         |
|                | B92102010903 | 32              | 5.4                   | 21.2                      | 0.353         | 40          |
|                | B92102010904 | 40              | 6.7                   | 26.6                      | 0.556         | 40          |
|                | B92102010905 | 50              | 8.3                   | 33.4                      | 0.877         | 20          |
|                | B92102010906 | 63              | 10.5                  | 42                        | 1.386         | 12          |
|                | B92102010907 | 75              | 12.5                  | 50                        | 1.964         | 12          |
|                | B92102010908 | 90              | 15                    | 60                        | 2.829         | 8           |
|                | B92102010909 | 110             | 18.3                  | 73.4                      | 4.233         | 8           |
|                | B92102010910 | 125             | 20.8                  | 83.4                      | 5.465         | 4           |
|                | B92102010912 | 160             | 26.7                  | 106.6                     | 8.929         | 5.8         |

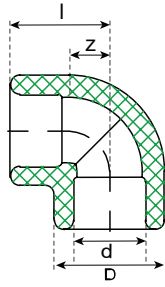


## DP THERM GREEN FITTINGS



## ELBOW 90° PN25

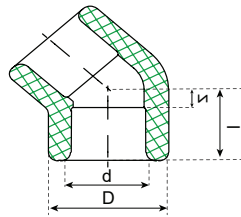
Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN: 25 bar



|                     |              | size                  | code         | D            | d     | l     | z    | pu   |
|---------------------|--------------|-----------------------|--------------|--------------|-------|-------|------|------|
|                     |              | <b>Socket welding</b> | 20           | B92102020101 | 27.4  | 19.2  | 26.6 | 10.6 |
| 25                  | B92102020102 |                       | 32.8         | 24.1         | 31.1  | 13.1  | 10   |      |
| 32                  | B92102020103 |                       | 42.1         | 31           | 36.7  | 16.7  | 5    |      |
| 40                  | B92102020104 |                       | 52.6         | 39           | 42.7  | 21.2  | 5    |      |
| 50                  | B92102020105 |                       | 65.8         | 49           | 50    | 26    | 5    |      |
| 63                  | B92102020106 |                       | 83.2         | 61.9         | 60.5  | 32.5  | 1    |      |
| 75                  | B92102020107 |                       | 98.7         | 73.7         | 70    | 38.5  | 1    |      |
| 90                  | B92102020108 |                       | 118.4        | 88.4         | 82    | 46    | 1    |      |
| 110                 | B92102020109 |                       | 144.7        | 108          | 98    | 56    | 1    |      |
| 125                 | B92102020110 |                       | 167          | 123          | 116.5 | 76.5  | 1    |      |
| <b>Butt Welding</b> | SDR 6        |                       | 160          | B92102020112 | 160   | 106.8 | 145  | 1    |
|                     | SDR 7.4      | 160                   | B92102020113 | 160          | 116.2 | 145   | 1    |      |
|                     | SDR 11       | 160                   | B92102020114 | 160          | 130.8 | 145   | 1    |      |

## ELBOW 45° PN25

Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN : 25 bar

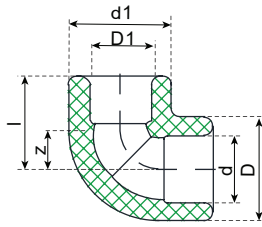


|                     |              | size                  | code         | D            | d     | l     | z  | pu |
|---------------------|--------------|-----------------------|--------------|--------------|-------|-------|----|----|
|                     |              | <b>Socket welding</b> | 20           | B92102020201 | 27.4  | 19.2  | 26 | 5  |
| 25                  | B92102020202 |                       | 32.8         | 24.1         | 28    | 6     | 10 |    |
| 32                  | B92102020203 |                       | 42.1         | 31           | 25    | 7.5   | 5  |    |
| 40                  | B92102020204 |                       | 52.6         | 39           | 26.5  | 9.5   | 5  |    |
| 50                  | B92102020205 |                       | 65.8         | 49           | 29    | 11.5  | 5  |    |
| 63                  | B92102020206 |                       | 83.2         | 61.9         | 29    | 14    | 1  |    |
| 75                  | B92102020207 |                       | 98.7         | 73.7         | 32.5  | 16.5  | 1  |    |
| 90                  | B92102020208 |                       | 118.4        | 88.4         | 37    | 19.5  | 1  |    |
| 110                 | B92102020209 |                       | 144.7        | 108          | 43    | 23.5  | 1  |    |
| 125                 | B92102020210 |                       | 167          | 123          | 67    | 27    | 1  |    |
| <b>Butt Welding</b> | SDR 6        |                       | 160          | B92102020212 | 160   | 106.8 | 95 | 1  |
|                     | SDR 7.4      | 160                   | B92102020213 | 160          | 116.2 | 95    | 1  |    |
|                     | SDR 11       | 160                   | B92102020214 | 160          | 130.8 | 95    | 1  |    |



## REDUCER ELBOW

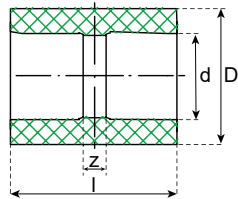
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size  | code         | D    | d    | D1   | d1   | l  | z   | pu |
|----------------|-------|--------------|------|------|------|------|----|-----|----|
|                | 25*20 | B92102020301 | 32.8 | 24.1 | 27.4 | 19.2 | 26 | 5   | 10 |
|                | 32*20 | B92102020302 | 42.1 | 31   | 27.4 | 19.2 | 28 | 6   | 10 |
|                | 32*25 | B92102020303 | 42.1 | 31   | 32.8 | 24.1 | 25 | 7.5 | 5  |

## SOCKET

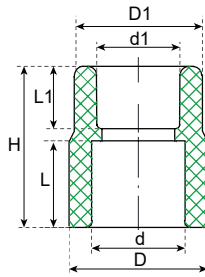
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size         | code         | D     | d    | l    | z   | pu |
|----------------|--------------|--------------|-------|------|------|-----|----|
|                | 20           | B92102020401 | 27.4  | 19.2 | 34   | 2   | 10 |
|                | 25           | B92102020402 | 32.8  | 24.1 | 38.2 | 2.2 | 10 |
|                | 32           | B92102020403 | 42.1  | 31   | 42.5 | 2.5 | 5  |
|                | 40           | B92102020404 | 52.6  | 39   | 45.8 | 2.8 | 5  |
|                | 50           | B92102020405 | 65.8  | 49   | 51.3 | 3.3 | 5  |
|                | 63           | B92102020406 | 83.2  | 61.9 | 59.6 | 3.6 | 1  |
|                | 75           | B92102020407 | 98.7  | 73.7 | 66   | 3   | 1  |
|                | 90           | B92102020408 | 118.4 | 88.4 | 76   | 4   | 1  |
|                | 110          | B92102020409 | 144.7 | 108  | 89   | 5   | 1  |
| 125            | B92102020410 | 167          | 123   | 92   | 5.6  | 1   |    |

## REDUCER

Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN: 25 bar

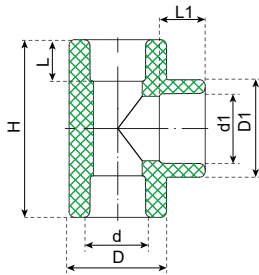


### Socket welding

| size  | code         | D       | d            | L    | D1    | d    | L1    | H    | pu |      |   |
|---|--------------|---------|--------------|------|-------|------|-------|------|----|------|---|
| 25*20   | B92102021101 | 32.4    | 24.1         | 18   | 26.1  | 19.2 | 16    | 34   | 10 |      |   |
| 32*20   | B92102021102 | 42      | 31           | 20   | 26.1  | 19.2 | 16    | 36   | 10 |      |   |
| 32*25   | B92102021103 | 42      | 31           | 20   | 32.4  | 24.1 | 18    | 38   | 10 |      |   |
| 40*20   | B92102021104 | 52.2    | 39           | 21.5 | 26.1  | 19.2 | 16    | 37.5 | 5  |      |   |
| 40*25   | B92102021105 | 52.2    | 39           | 21.5 | 32.4  | 24.1 | 18    | 39.5 | 5  |      |   |
| 40*32   | B92102021106 | 52.2    | 39           | 21.5 | 42    | 31   | 20    | 41.5 | 5  |      |   |
| 50*20   | B92102021107 | 65.5    | 49           | 24   | 26.1  | 19.2 | 16    | 40   | 5  |      |   |
| 50*25   | B92102021108 | 65.5    | 49           | 24   | 32.4  | 24.1 | 18    | 42   | 5  |      |   |
| 50*32   | B92102021109 | 65.5    | 49           | 24   | 42    | 31   | 20    | 44   | 5  |      |   |
| 50*40   | B92102021110 | 65.5    | 49           | 24   | 52.2  | 39   | 21.5  | 45.5 | 5  |      |   |
| 63*20   | B92102021111 | 83      | 61.9         | 28   | 26.1  | 19.2 | 16    | 44   | 1  |      |   |
| 63*25   | B92102021112 | 83      | 61.9         | 28   | 32.4  | 24.1 | 18    | 46   | 1  |      |   |
| 63*32   | B92102021113 | 83      | 61.9         | 28   | 42    | 31   | 20    | 48   | 1  |      |   |
| 63*40   | B92102021114 | 83      | 61.9         | 28   | 52.2  | 39   | 21.5  | 49.5 | 1  |      |   |
| 63*50   | B92102021115 | 83      | 61.9         | 28   | 65.5  | 49   | 24    | 52   | 1  |      |   |
| 75*32   | B92102021116 | 98.7    | 73.9         | 31.5 | 42    | 31   | 20    | 51.5 | 1  |      |   |
| 75*40   | B92102021117 | 98.7    | 73.9         | 31.5 | 52.2  | 39   | 21.5  | 53   | 1  |      |   |
| 75*50   | B92102021118 | 98.7    | 73.9         | 31.5 | 65.5  | 49   | 24    | 55.5 | 1  |      |   |
| 75*63   | B92102021119 | 98.7    | 73.9         | 31.5 | 83    | 61.9 | 28    | 59.5 | 1  |      |   |
| 90*40   | B92102021120 | 118.5   | 88.4         | 36   | 52.2  | 39   | 21.5  | 57.5 | 1  |      |   |
| 90*50   | B92102021121 | 118.5   | 88.4         | 36   | 65.5  | 49   | 24    | 60   | 1  |      |   |
| 90*63   | B92102021122 | 118.5   | 88.4         | 36   | 83    | 61.9 | 28    | 64   | 1  |      |   |
| 90*75   | B92102021123 | 118.5   | 88.4         | 36   | 98.7  | 73.7 | 31.5  | 67.5 | 1  |      |   |
| 110*50  | B92102021124 | 144.5   | 108          | 42   | 65.5  | 49   | 24    | 66   | 1  |      |   |
| 110*63  | B92102021125 | 144.5   | 108          | 42   | 83    | 61.9 | 28    | 70   | 1  |      |   |
| 110*75  | B92102021126 | 144.5   | 108          | 42   | 98.7  | 73.7 | 31.5  | 73.5 | 1  |      |   |
| 110*90  | B92102021127 | 144.5   | 108          | 42   | 118.5 | 88.4 | 36    | 78   | 1  |      |   |
| 125*75  | B92102021128 | 167     | 123          | 45   | 98.7  | 73.7 | 31.5  | 76.5 | 1  |      |   |
| 125*90  | B92102021129 | 167     | 123          | 45   | 118.5 | 88.4 | 36    | 81   | 1  |      |   |
| 125*110   | B92102021130 | 167     | 123          | 45   | 144.5 | 108  | 42    | 87   | 1  |      |   |
| Butt welding for 160 mm Socket welding for other side | SDR 6        | 160*110 | B92102021135 | 160  | 106.8 | 50.5 | 144.5 | 108  | 42 | 92.5 | 1 |
|   |              | 160*125 | B92102021136 | 160  | 106.8 | 50.5 | 167   | 123  | 45 | 95.5 | 1 |
|   | SDR 7.4      | 160*110 | B92102021137 | 160  | 116.2 | 50.5 | 144.5 | 108  | 42 | 92.5 | 1 |
|   |              | 160*125 | B92102021138 | 160  | 116.2 | 50.5 | 167   | 123  | 45 | 95.5 | 1 |
|   | SDR 11       | 160*110 | B92102021139 | 160  | 130.8 | 50.5 | 144.5 | 108  | 42 | 92.5 | 1 |
|   |              | 160*125 | B92102021140 | 160  | 130.8 | 50.5 | 167   | 123  | 45 | 95.5 | 1 |

## REDUCER TEE

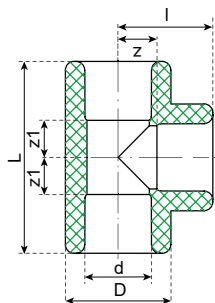
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



|  |         | size         | code         | D     | d     | L    | D1    | d    | L1   | H     | pu |
|--|---------|--------------|--------------|-------|-------|------|-------|------|------|-------|----|
| Socket welding   |         | 25*20        | B92102020601 | 34    | 24.1  | 18   | 27.4  | 19.2 | 16   | 58    | 10 |
|  |         | 32*20        | B92102020602 | 42.1  | 31    | 20   | 27.4  | 19.2 | 16   | 63    | 10 |
|  |         | 32*25        | B92102020603 | 42.1  | 31    | 20   | 32.8  | 24.1 | 18   | 65.8  | 10 |
|  |         | 40*20        | B92102020604 | 52.6  | 39    | 21.5 | 28.2  | 19.2 | 16   | 67    | 5  |
|  |         | 40*25        | B92102020605 | 52.6  | 39    | 21.5 | 34    | 24.1 | 18   | 70.5  | 5  |
|  |         | 40*32        | B92102020606 | 52.6  | 39    | 21.5 | 42.1  | 31   | 20   | 77.4  | 5  |
|  |         | 50*20        | B92102020607 | 65.8  | 49    | 24   | 28.2  | 19.2 | 16   | 71    | 5  |
|  |         | 50*25        | B92102020608 | 65.8  | 49    | 24   | 34    | 24.1 | 18   | 75.5  | 5  |
|  |         | 50*32        | B92102020609 | 65.8  | 49    | 24   | 42.1  | 31   | 20   | 83    | 5  |
|  |         | 50*40        | B92102020610 | 65.8  | 49    | 24   | 52.6  | 39   | 21.5 | 93    | 5  |
|  |         | 63*20        | B92102020611 | 83.2  | 61.9  | 28   | 28.2  | 19.2 | 16   | 80    | 1  |
|  |         | 63*25        | B92102020612 | 83.2  | 61.9  | 28   | 34    | 24.1 | 18   | 86    | 1  |
|  |         | 63*32        | B92102020613 | 83.2  | 61.9  | 28   | 42.1  | 31   | 20   | 91    | 1  |
|  |         | 63*40        | B92102020614 | 83.2  | 61.9  | 28   | 52.6  | 39   | 21.5 | 97    | 1  |
|  |         | 63*50        | B92102020615 | 83.2  | 61.9  | 28   | 65.8  | 49   | 24   | 110   | 1  |
|  |         | 75*32        | B92102020616 | 98.7  | 73.9  | 31.5 | 42.1  | 31   | 20   | 97    | 1  |
|  |         | 75*40        | B92102020617 | 98.7  | 73.9  | 31.5 | 52.6  | 39   | 21.5 | 105   | 1  |
|  |         | 75*50        | B92102020618 | 98.7  | 73.9  | 31.5 | 65.8  | 49   | 24   | 115   | 1  |
|  |         | 75*63        | B92102020619 | 98.7  | 73.9  | 31.5 | 83.2  | 61.9 | 28   | 127   | 1  |
|  |         | 90*40        | B92102020620 | 118.5 | 88.4  | 36   | 52.6  | 39   | 21.5 | 113   | 1  |
|  |         | 90*50        | B92102020621 | 118.5 | 88.4  | 36   | 65.8  | 49   | 24   | 123   | 1  |
|  |         | 90*63        | B92102020622 | 118.5 | 88.4  | 36   | 83.2  | 61.9 | 28   | 137.5 | 1  |
|  |         | 90*75        | B92102020623 | 118.5 | 88.4  | 36   | 98.7  | 73.7 | 31.5 | 148.5 | 1  |
|  |         | 110*50       | B92102020624 | 144.7 | 108   | 42   | 65.8  | 49   | 24   | 136   | 1  |
|  |         | 110*63       | B92102020625 | 144.7 | 108   | 42   | 83.2  | 61.9 | 28   | 148   | 1  |
|  |         | 110*75       | B92102020626 | 144.7 | 108   | 42   | 98.7  | 73.7 | 31.5 | 162.5 | 1  |
|  |         | 110*90       | B92102020627 | 144.7 | 108   | 42   | 118.5 | 88.4 | 36   | 174.5 | 1  |
|  |         | 125*75       | B92102020628 | 167   | 123   | 45   | 98.7  | 73.7 | 31.5 | 233   | 1  |
|  |         | 125*90       | B92102020629 | 167   | 123   | 45   | 118.5 | 88.4 | 36   | 233   | 1  |
|  |         | 125*110      | B92102020630 | 167   | 123   | 45   | 144.5 | 108  | 42   | 233   | 1  |
| Butt welding for 160 mm, Socket welding for other side | SDR 6   | 160*110      | B92102020634 | 160   | 106.8 | 50.5 | 144.5 | 108  | 42   | 290   | 1  |
|  |         | 160*125      | B92102020635 | 160   | 106.8 | 50.5 | 167   | 123  | 45   | 290   | 1  |
|  | SDR 7.4 | 160*110      | B92102020636 | 160   | 116.2 | 50.5 | 144.5 | 108  | 42   | 290   | 1  |
|  |         | 160*125      | B92102021137 | 160   | 116.2 | 50.5 | 167   | 123  | 45   | 290   | 1  |
|  | SDR 11  | 160*110      | B92102021138 | 160   | 130.8 | 50.5 | 144.5 | 108  | 42   | 290   | 1  |
|  | 160*125 | B92102021139 | 160          | 130.8 | 50.5  | 167  | 123   | 45   | 290  | 1     |    |

## TEE

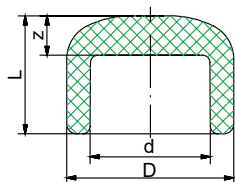
Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN: 25 bar



|                |         | size | code         | D     | d     | L    | l     | Z     | Z1    | pu |
|----------------|---------|------|--------------|-------|-------|------|-------|-------|-------|----|
| Socket welding |         | 20   | B92102020501 | 27.4  | 19.2  | 53.2 | 26.6  | 10.6  | 10.6  | 10 |
|                |         | 25   | B92102020502 | 32.8  | 24.1  | 61   | 30.5  | 12.5  | 12.5  | 10 |
|                |         | 32   | B92102020503 | 42.1  | 31    | 74   | 37    | 17    | 17    | 5  |
|                |         | 40   | B92102020504 | 52.6  | 39    | 84.7 | 42.35 | 20.85 | 20.85 | 5  |
|                |         | 50   | B92102020505 | 65.8  | 49    | 99.9 | 49.95 | 25.95 | 25.95 | 5  |
|                |         | 63   | B92102020506 | 83.2  | 61.9  | 121  | 60.5  | 32.5  | 32.5  | 1  |
|                |         | 75   | B92102020507 | 98.7  | 73.7  | 140  | 70    | 38.5  | 38.5  | 1  |
|                |         | 90   | B92102020508 | 118.4 | 88.4  | 164  | 82    | 46    | 46    | 1  |
|                |         | 110  | B92102020509 | 144.7 | 108   | 195  | 97.5  | 55.5  | 55.5  | 1  |
|                |         | 125  | B92102020510 | 167   | 123   | 186  | 116.5 | 76.5  | 76.5  | 1  |
| Butt Welding   | SDR 6   | 160  | B92102020512 | 160   | 106.8 | 290  | 145   |       |       | 1  |
|                | SDR 7.4 | 160  | B92102020513 | 160   | 116.2 | 290  | 145   |       |       | 1  |
|                | SDR 11  | 160  | B92102020514 | 160   | 130.8 | 290  | 145   |       |       | 1  |

## END CAP

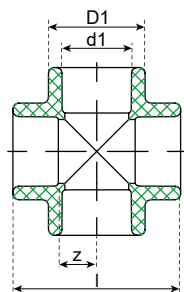
Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN : 25 bar



|                |         | size | code         | D     | d     | l    | z    | pu |
|----------------|---------|------|--------------|-------|-------|------|------|----|
| Socket welding |         | 20   | B92102020801 | 28.4  | 19.2  | 24.5 | 7.3  | 10 |
|                |         | 25   | B92102020802 | 34.3  | 24.1  | 29   | 8.6  | 10 |
|                |         | 32   | B92102020803 | 42.4  | 31    | 32.8 | 9.2  | 5  |
|                |         | 40   | B92102020804 | 52.2  | 39    | 39   | 17.5 | 5  |
|                |         | 50   | B92102020805 | 65.5  | 49    | 47   | 23   | 5  |
|                |         | 63   | B92102020806 | 83    | 61.9  | 58.7 | 30.7 | 1  |
|                |         | 75   | B92102020807 | 98.7  | 73.7  | 59.1 | 27.6 | 1  |
|                |         | 90   | B92102020808 | 118.5 | 88.4  | 68   | 32   | 1  |
|                |         | 110  | B92102020809 | 144.5 | 108   | 74.5 | 32.5 | 1  |
|                |         | 125  | B92102020810 | 167   | 123   | 82   | 42   | 1  |
| Butt Welding   | SDR 6   | 160  | B92102020812 | 160   | 106.8 | 90   | 45   | 1  |
|                | SDR 7.4 | 160  | B92102020513 | 160   | 116.2 | 90   | 45   | 1  |
|                | SDR 11  | 160  | B92102020814 | 160   | 130.8 | 90   | 45   | 1  |

## CROSS

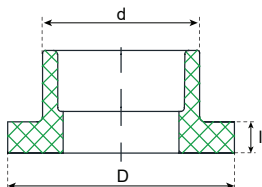
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size | code         | D1   | d1   | l  | z    | pu |
|----------------|------|--------------|------|------|----|------|----|
|                | 20   | B92102020701 | 27.4 | 19.2 | 53 | 11.3 | 10 |
|                | 25   | B92102020702 | 32.8 | 24.1 | 63 | 13.5 | 10 |
|                | 32   | B92102020703 | 42.1 | 31   | 74 | 17   | 5  |
|                | 40   | B92102020704 | 52   | 39   | 83 | 21   | 5  |

## FLANGE ADAPTER

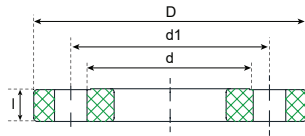
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size         | code         | D     | d            | l    | pu    |    |   |
|----------------|--------------|--------------|-------|--------------|------|-------|----|---|
|                | 32           | B92102020901 | 69    | 41.2         | 9.6  | 5     |    |   |
|                | 40           | B92102020902 | 77.7  | 53.5         | 12.4 | 5     |    |   |
|                | 50           | B92102020903 | 87.7  | 66.7         | 14.6 | 5     |    |   |
|                | 63           | B92102020904 | 101.8 | 84           | 14.6 | 1     |    |   |
|                | 75           | B92102020905 | 122   | 95.3         | 12.6 | 1     |    |   |
|                | 90           | B92102020906 | 138.5 | 114          | 15.2 | 1     |    |   |
|                | 110          | B92102020907 | 157.8 | 138.5        | 18   | 1     |    |   |
|                | 125          | B92102020908 | 190   | 149          | 18   | 1     |    |   |
|                | 160          | B92102020910 | 215   | 198.5        | 18.5 | 1     |    |   |
|                | Butt Welding | SDR 6        | 160   | B92102020911 | 160  | 106.8 | 90 | 1 |
|                |              | SDR 7.4      | 160   | B92102020911 | 160  | 116.2 | 90 | 1 |
|                |              | SDR 11       | 160   | B92102020912 | 160  | 130.8 | 90 | 1 |

## FLANGE

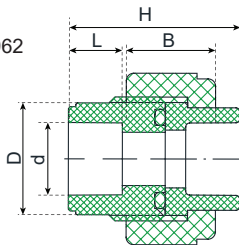
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | sizg | cobg         | D   | d1  | b     | L  | bu |
|----------------|------|--------------|-----|-----|-------|----|----|
|                | 32   | B92102021001 | 115 | 85  | 42.5  | 11 | 5  |
|                | 40   | B92102021002 | 135 | 100 | 56    | 13 | 5  |
|                | 50   | B92102021003 | 145 | 110 | 68    | 13 | 5  |
|                | 63   | B92102021004 | 160 | 125 | 85.5  | 14 | 1  |
|                | 75   | B92102021005 | 180 | 145 | 97    | 14 | 1  |
|                | 90   | B92102021006 | 195 | 160 | 115.5 | 15 | 1  |
|                | 110  | B92102021007 | 215 | 180 | 141   | 16 | 1  |
|                | 125  | B92102021008 | 250 | 210 | 169   | 18 | 1  |
|                | 160  | B92102021010 | 280 | 240 | 199   | 20 | 1  |

## PLASTIC UNION

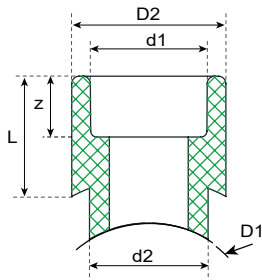
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size | code         | D    | d    | L    | B    | H    | pu |
|----------------|------|--------------|------|------|------|------|------|----|
|                | 20   | B92102021201 | 22   | 19.2 | 22.5 | 23.5 | 49.5 | 10 |
|                | 25   | B92102021202 | 33.5 | 24.1 | 23   | 23.5 | 53   | 10 |
|                | 32   | B92102021203 | 41.5 | 31   | 27.5 | 24.7 | 61   | 5  |

## SADDLE

Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN: 25 bar

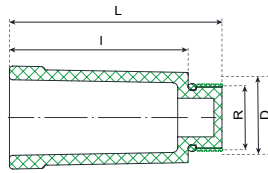


### Socket welding

| size   | code         | D1  | d1 | D2 | d2 | L  | z  | pu |
|--------|--------------|-----|----|----|----|----|----|----|
| 63*32  | B92102023406 | 63  | 32 | 43 | 32 | 30 | 18 | 5  |
| 75*32  | B92102023409 | 75  | 32 | 43 | 32 | 30 | 18 | 5  |
| 90*32  | B92102023412 | 90  | 32 | 43 | 32 | 30 | 18 | 1  |
| 110*32 | B92102023415 | 110 | 32 | 43 | 32 | 30 | 18 | 1  |

## PLUG

Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN : 25 bar

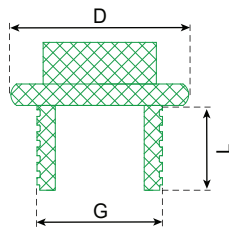


### Socket welding

| size | code         | D  | R    | I    | L  | PU |
|------|--------------|----|------|------|----|----|
| 1/2" | B92102023301 | 28 | 1/2" | 55.5 | 66 | 10 |
| 3/4" | B92102023302 | 34 | 3/4" | 55.5 | 66 | 10 |

## MALE PLUG

Material: PP-R  
Standards: DIN 16962  
Colour: Green  
PN: 25 bar

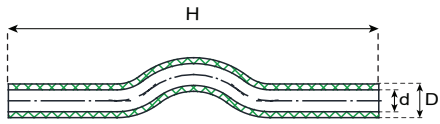


### Socket welding

| size | code         | L  | D  | G    |
|------|--------------|----|----|------|
| 20   | B92102025701 | 13 | 28 | 1/2" |
| 25   | B92102025702 | 15 | 30 | 3/4" |

## LONG-CROSS OVER

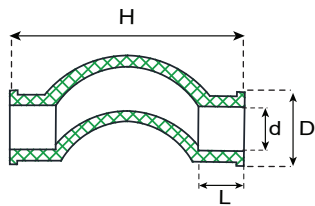
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size | code         | D  | d  | H   | PU |
|----------------|------|--------------|----|----|-----|----|
|                | 20   | B92102021301 | 20 | 13 | 400 | 10 |
|                | 25   | B92102021302 | 25 | 16 | 400 | 10 |
|                | 32   | B92102021303 | 32 | 22 | 400 | 5  |

## SHORT-CROSS OVER

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar

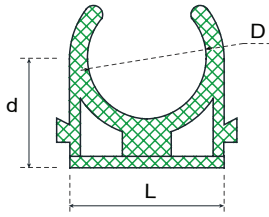


| Socket welding | size | code         | D    | d    | L  | H    | pu |
|----------------|------|--------------|------|------|----|------|----|
|                | 20   | B92102021401 | 28.2 | 19.2 | 16 | 95.5 | 10 |
|                | 25   | B92102021402 | 34   | 24.1 | 18 | 121  | 10 |
|                | 32   | B92102021403 | 42.5 | 31   | 20 | 154  | 5  |



## PLASTIC-CLAMP

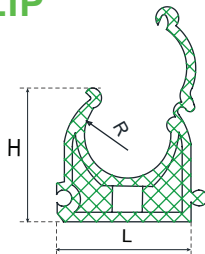
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size | code         | D    | d    | l    |
|----------------|------|--------------|------|------|------|
|                | 20   | B92102023001 | 19.1 | 25.2 | 17.7 |
|                | 25   | B92102023002 | 23.9 | 30.4 | 20   |
|                | 32   | B92102023003 | 30.6 | 37.5 | 23.4 |

## PLASTIC-CLIP

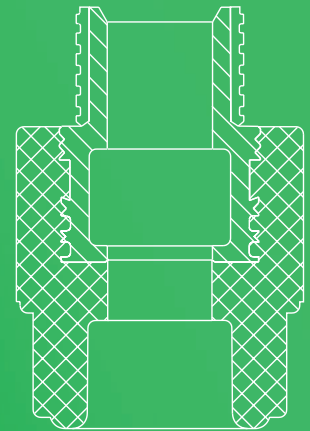
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size | code         | H    | L    | R    |
|----------------|------|--------------|------|------|------|
|                | 20   | B92102023101 | 27.1 | 38.7 | 17.7 |
|                | 25   | B92102023102 | 39.5 | 41.5 | 19.5 |
|                | 32   | B92102023103 | 39.9 | 51.4 | 28.7 |
|                | 40   | B92102023104 | 47.9 | 63.1 | 35.9 |

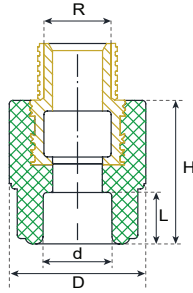


## DP THERM THREADED FITINGE



## MALE THREADED COUPLING

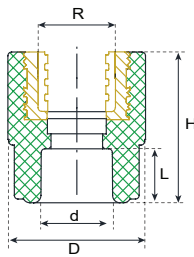
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | L  | H    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|----|
|                | 20*1/2" | B92102021501 | 27.4 | 19.2 | 16 | 39.5 | 1/2" | 10 |
|                | 20*3/4" | B92102021502 | 27.4 | 19.2 | 16 | 40.5 | 3/4" | 10 |
|                | 25*1/2" | B92102021503 | 32.8 | 24.1 | 18 | 41.5 | 1/2" | 10 |
|                | 25*3/4" | B92102021504 | 32.8 | 24.1 | 18 | 42.5 | 3/4" | 10 |
|                | 32*3/4" | B92102021506 | 42.1 | 31   | 20 | 45.5 | 3/4" | 5  |

## FEMALE THREADED COUPLING

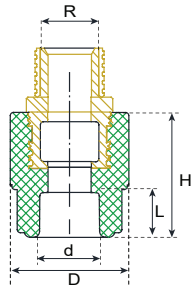
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size    | code         | D    | d    | L  | H    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|----|
|                | 20*1/2" | B92102021601 | 27.4 | 19.2 | 16 | 39.5 | 1/2" | 10 |
|                | 20*3/4" | B92102021602 | 27.4 | 19.2 | 16 | 40.5 | 3/4" | 10 |
|                | 25*1/2" | B92102021603 | 32.8 | 24.1 | 18 | 41.5 | 1/2" | 10 |
|                | 25*3/4" | B92102021604 | 32.8 | 24.1 | 18 | 42.5 | 3/4" | 10 |
|                | 32*3/4" | B92102021606 | 42.1 | 31   | 20 | 45.5 | 3/4" | 5  |

## MALE THREADED COUPLING WITH SPANNER FLAT

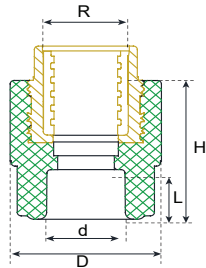
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size      | code         | D     | d    | L    | H    | R      | pu |
|----------------|-----------|--------------|-------|------|------|------|--------|----|
|                | 32*1"     | B92102021702 | 42.1  | 31   | 20   | 46   | 1"     | 5  |
|                | 40*1-1/4" | B92102021704 | 52.6  | 39   | 21.5 | 47.5 | 1-1/4" | 5  |
|                | 50*1-1/2" | B92102021705 | 65.8  | 49   | 24   | 56.2 | 1-1/2" | 5  |
|                | 63*2"     | B92102021706 | 83.2  | 61.9 | 28   | 61   | 2"     | 1  |
|                | 75*2.5"   | B92102021707 | 98.7  | 73.7 | 31.5 | 66.4 | 2-1/2" | 1  |
|                | 90*3"     | B92102021708 | 118.4 | 88.4 | 36.5 | 72   | 3"     | 1  |
|                | 110*4"    | B92102021709 | 144.7 | 108  | 42.5 | 77.5 | 4"     | 1  |

## FEMALE THREADED COUPLING WITH SPANNER FLAT

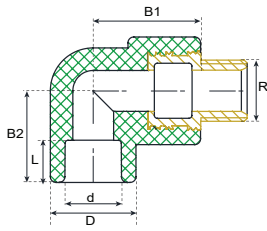
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size      | code         | D     | d    | L    | H    | R      | pu |
|----------------|-----------|--------------|-------|------|------|------|--------|----|
|                | 32*1"     | B92102021801 | 42.1  | 31   | 20   | 46   | 1"     | 5  |
|                | 40*1-1/4" | B92102021803 | 52.6  | 39   | 21.5 | 47.5 | 1-1/4" | 5  |
|                | 50*1-1/2" | B92102021804 | 65.8  | 49   | 24   | 56.2 | 1-1/2" | 5  |
|                | 63*2"     | B92102021805 | 83.2  | 61.9 | 28   | 61   | 2"     | 1  |
|                | 75*2.5"   | B92102021806 | 98.7  | 73.7 | 31.5 | 66.4 | 2-1/2" | 1  |
|                | 90*3"     | B92102021807 | 118.4 | 88.4 | 36.5 | 72   | 3"     | 1  |
|                | 110*4"    | B92102021808 | 144.7 | 108  | 42.5 | 77.5 | 4"     | 1  |

## MALE THREADED ELBOW

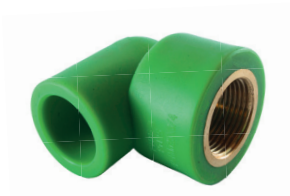
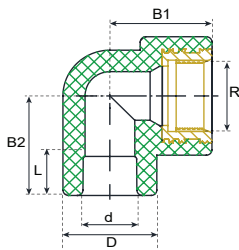
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | L  | B1   | B2   | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102022101 | 27.4 | 19.2 | 16 | 27   | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102022102 | 27.4 | 19.2 | 16 | 30   | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102022103 | 32.8 | 24.1 | 18 | 30   | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102022104 | 32.8 | 24.1 | 18 | 32   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102022105 | 42.1 | 31   | 20 | 34   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102022106 | 42.1 | 31   | 20 | 34   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102022107 | 42.1 | 31   | 20 | 38.5 | 39   | 1"   | 5  |

## FEMALE THREADED ELBOW

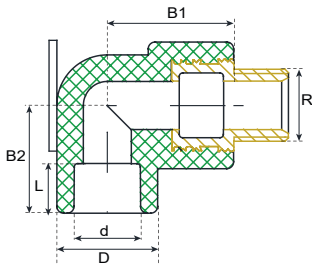
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size    | code         | D    | d    | l  | B1   | B2   | g    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102022201 | 27.4 | 19.2 | 16 | 27   | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102022202 | 27.4 | 19.2 | 16 | 30   | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102022203 | 32.8 | 24.1 | 18 | 30   | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102022204 | 32.8 | 24.1 | 18 | 32   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102022205 | 42.1 | 31   | 20 | 34   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102022206 | 42.1 | 31   | 20 | 34   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102022207 | 42.1 | 31   | 20 | 38.5 | 39   | 1"   | 5  |

## MALE THREADED ELBOW WITH DISK

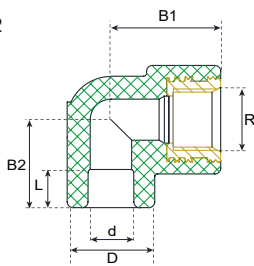
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | L  | B1 | B2   | R    | pu |
|----------------|---------|--------------|------|------|----|----|------|------|----|
|                | 20*1/2" | B92102025601 | 27.4 | 19.2 | 16 | 27 | 33.5 | 1/2" | 10 |
|                | 25*3/4" | B92102025604 | 32.8 | 24.1 | 18 | 32 | 37   | 3/4" | 10 |

## FEMALE THREADED ELBOW WITH DISK

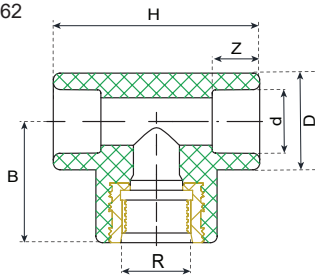
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size    | code         | D1   | d1   | L  | B1 | B2   | R    | pu |
|----------------|---------|--------------|------|------|----|----|------|------|----|
|                | 20*1/2" | B92102022301 | 27.4 | 19.2 | 16 | 27 | 33.5 | 1/2" | 10 |
|                | 25*3/4" | B92102022302 | 32.8 | 24.1 | 18 | 32 | 37   | 3/4" | 10 |

## FEMALE THREADED TEE

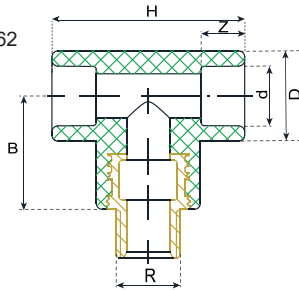
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | z  | H    | B    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102022401 | 27.4 | 19.2 | 16 | 54.5 | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102022402 | 27.4 | 19.2 | 16 | 59.5 | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102022403 | 32.8 | 24.1 | 18 | 58.8 | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102022404 | 32.8 | 24.1 | 18 | 64   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102022405 | 42.1 | 31   | 20 | 65   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102022406 | 42.1 | 31   | 20 | 68   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102022407 | 42.1 | 31   | 20 | 77   | 39   | 1"   | 5  |

## MALE THREADED TEE

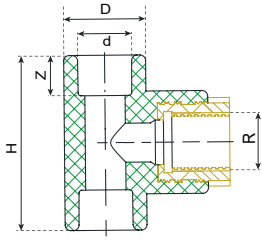
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size    | code         | D    | d    | L  | H    | R    | B    | PU |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102022501 | 27.4 | 19.2 | 16 | 54.5 | 1/2" | 33.5 | 10 |
|                | 20*3/4" | B92102022502 | 27.4 | 19.2 | 16 | 59.5 | 3/4" | 34.5 | 10 |
|                | 25*1/2" | B92102022503 | 32.8 | 24.1 | 18 | 58.8 | 1/2" | 36   | 10 |
|                | 25*3/4" | B92102022504 | 32.8 | 24.1 | 18 | 64   | 3/4" | 37   | 10 |
|                | 32*1/2" | B92102022505 | 42.1 | 31   | 20 | 65   | 1/2" | 40.5 | 5  |
|                | 32*3/4" | B92102022506 | 42.1 | 31   | 20 | 68   | 3/4" | 42   | 5  |
|                | 32*1"   | B92102022507 | 42.1 | 31   | 20 | 77   | 1"   | 39   | 5  |

## FEMALE THREADED TEE WITH SPANNER FLAT

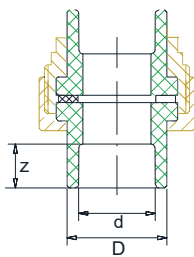
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size  | code         | D    | d  | R  | L  | Z  | pu |
|----------------|-------|--------------|------|----|----|----|----|----|
|                | 32*1" | B92102022901 | 42.1 | 31 | 1" | 77 | 20 | 5  |

## BRASS UNION

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar

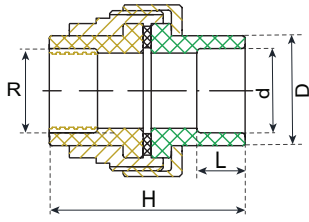


| Socket welding | size | code         | D    | d    | l    | pu |
|----------------|------|--------------|------|------|------|----|
|                | 20   | B92102022801 | 27.4 | 19.2 | 16   | 10 |
|                | 25   | B92102022802 | 32.8 | 24.1 | 18   | 10 |
|                | 32   | B92102022803 | 42.1 | 31   | 20   | 5  |
|                | 40   | B92102022804 | 52.6 | 39   | 21.5 | 5  |
|                | 50   | B92102022805 | 65.8 | 49   | 24   | 5  |
|                | 63   | B92102022806 | 83.2 | 61.9 | 28   | 1  |
|                | 75   | B92102022807 | 98.7 | 73.7 | 31.5 | 1  |



## FEMALE THREADED UNION

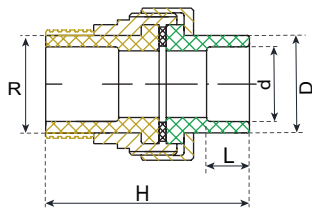
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size      | code         | D    | d    | L    | B1     | B2   | pu |
|----------------|-----------|--------------|------|------|------|--------|------|----|
|                | 20*1/2"   | B92102022001 | 27.4 | 19.2 | 16   | 1/2"   | 36.5 | 10 |
|                | 25*3/4"   | B92102022002 | 32.8 | 24.1 | 18   | 3/4"   | 39   | 10 |
|                | 32*1"     | B92102022003 | 42.1 | 31   | 20   | 1"     | 45   | 5  |
|                | 40*1-1/4" | B92102022004 | 52.6 | 39   | 21.5 | 1-1/4" | 52   | 5  |
|                | 50*1-1/2" | B92102022005 | 65.8 | 49   | 24   | 1-1/2" | 63   | 1  |
|                | 63*2"     | B92102022006 | 83.2 | 61.9 | 28   | 2"     | 69.5 | 1  |

## MALE THREADED UNION

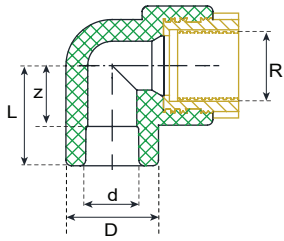
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size      | code         | D    | d    | l    | r      | h    | pu |
|----------------|-----------|--------------|------|------|------|--------|------|----|
|                | 20*1/2"   | B92102021901 | 27.4 | 19.2 | 16   | 1/2"   | 47.5 | 10 |
|                | 25*3/4"   | B92102021902 | 32.8 | 24.1 | 18   | 3/4"   | 51   | 10 |
|                | 32*1"     | B92102021903 | 42.1 | 31   | 20   | 1"     | 59.5 | 5  |
|                | 40*1-1/4" | B92102021904 | 52.6 | 39   | 21.5 | 1-1/4" | 70.5 | 5  |
|                | 50*1-1/2" | B92102021905 | 65.8 | 49   | 24   | 1-1/2" | 84.5 | 1  |
|                | 63*2"     | B92102021906 | 83.2 | 61.9 | 28   | 2"     | 92   | 1  |

## FEMALE THREADED ELBOW WITH SPANNER FLAT

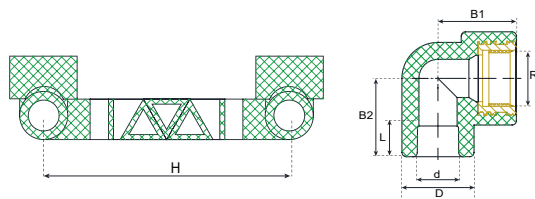
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size  | code         | D    | d  | R  | L    | Z    | pu |
|----------------|-------|--------------|------|----|----|------|------|----|
|                | 32*1" | B92102022701 | 42.1 | 31 | 1" | 38.5 | 18.5 | 5  |

## DOUBLE FEMALE ELBOW WITH TAP CONNECTOR

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | l  | B1 | B2   | R    | H   |
|----------------|---------|--------------|------|------|----|----|------|------|-----|
|                | 20*1/2" | B92102023201 | 27.4 | 19.2 | 16 | 27 | 33.5 | 1/2" | 150 |
|                | 25*1/2" | B92102023202 | 27.4 | 19.2 | 16 | 30 | 34   | 1/2" | 150 |

## TWO-PORT MANIFOLD

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102023501 | 2               | 50            | 3/4"           |
|                | 63*1   | B92102023502 | 2               | 63            | 1"             |
|                | 90*1   | B92102023503 | 2               | 90            | 1"             |

## FOUR-PORTS MANIFOLD

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102023601 | 4               | 50            | 3/4"           |
|                | 63*1   | B92102023602 | 4               | 63            | 1"             |
|                | 90*1   | B92102023603 | 4               | 90            | 1"             |

## FOUR-PORTS MANIFOLD WITH TEE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102023701 | 2               | 50            | 3/4"           |
|                | 63*1   | B92102023702 | 2               | 63            | 1"             |
|                | 90*1   | B92102023703 | 2               | 90            | 1"             |

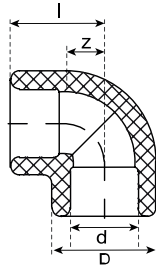


## DP THERM UV FITINGES



## ELBOW 90° (UV)

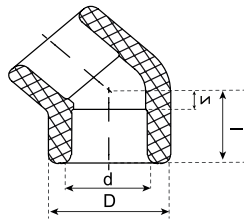
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN: 25 bar



| Socket welding |         | size | code         | D     | d     | l     | z    | pu |
|----------------|---------|------|--------------|-------|-------|-------|------|----|
|                |         | 20   | B92102030101 | 27.4  | 19.2  | 26.6  | 10.6 | 10 |
|                |         | 25   | B92102030102 | 32.8  | 24.1  | 31.1  | 13.1 | 10 |
|                |         | 32   | B92102030103 | 42.1  | 31    | 36.7  | 16.7 | 5  |
|                |         | 40   | B92102030104 | 52.6  | 39    | 42.7  | 21.2 | 5  |
|                |         | 50   | B92102030105 | 65.8  | 49    | 50    | 26   | 5  |
|                |         | 63   | B92102030106 | 83.2  | 61.9  | 60.5  | 32.5 | 1  |
|                |         | 75   | B92102030107 | 98.7  | 73.7  | 70    | 38.5 | 1  |
|                |         | 90   | B92102030108 | 118.4 | 88.4  | 82    | 46   | 1  |
|                |         | 110  | B92102030109 | 144.7 | 108   | 98    | 56   | 1  |
|                |         | 125  | B92102030110 | 167   | 123   | 116.5 | 76.5 | 1  |
| Butt Welding   | SDR 6   | 160  | B92102030112 | 160   | 106.8 | 145   |      | 1  |
|                | SDR 7.4 | 160  | B92102030113 | 160   | 116.2 | 145   |      | 1  |
|                | SDR 11  | 160  | B92102030114 | 160   | 130.8 | 145   |      | 1  |

## ELBOW 45° (UV)

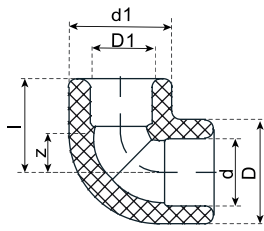
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN : 25 bar



| Socket welding |         | size | code         | D     | d     | l    | z    | pu |
|----------------|---------|------|--------------|-------|-------|------|------|----|
|                |         | 20   | B92102030201 | 27.4  | 19.2  | 26   | 5    | 10 |
|                |         | 25   | B92102030202 | 32.8  | 24.1  | 28   | 6    | 10 |
|                |         | 32   | B92102030203 | 42.1  | 31    | 25   | 7.5  | 5  |
|                |         | 40   | B92102030204 | 52.6  | 39    | 26.5 | 9.5  | 5  |
|                |         | 50   | B92102030205 | 65.8  | 49    | 29   | 11.5 | 5  |
|                |         | 63   | B92102030206 | 83.2  | 61.9  | 29   | 14   | 1  |
|                |         | 75   | B92102030207 | 98.7  | 73.7  | 32.5 | 16.5 | 1  |
|                |         | 90   | B92102030208 | 118.4 | 88.4  | 37   | 19.5 | 1  |
|                |         | 110  | B92102030209 | 144.7 | 108   | 43   | 23.5 | 1  |
|                |         | 125  | B92102030210 | 167   | 123   | 67   | 27   | 1  |
| Butt Welding   | SDR 6   | 160  | B92102030212 | 160   | 106.8 | 95   |      | 1  |
|                | SDR 7.4 | 160  | B92102030213 | 160   | 116.2 | 95   |      | 1  |
|                | SDR 11  | 160  | B92102030214 | 160   | 130.8 | 95   |      | 1  |

## REDUCER ELBOW (UV)

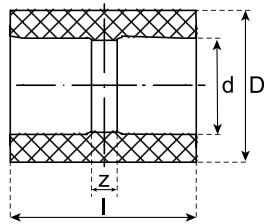
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN: 25 bar



| Socket welding | size  | code         | D    | d    | D1   | d1   | l  | z   | pu |
|----------------|-------|--------------|------|------|------|------|----|-----|----|
|                | 25*20 | B92102030301 | 32.8 | 24.1 | 27.4 | 19.2 | 26 | 5   | 10 |
|                | 32*20 | B92102030302 | 42.1 | 31   | 27.4 | 19.2 | 28 | 6   | 10 |
|                | 32*25 | B92102030303 | 42.1 | 31   | 32.8 | 24.1 | 25 | 7.5 | 5  |

## SOCKET (UV)

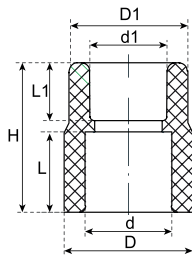
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN : 25 bar



| Socket welding | size | code         | D     | d    | l    | z   | pu |
|----------------|------|--------------|-------|------|------|-----|----|
|                | 20   | B92102030401 | 27.4  | 19.2 | 34   | 2   | 10 |
|                | 25   | B92102030402 | 32.8  | 24.1 | 38.2 | 2.2 | 10 |
|                | 32   | B92102030403 | 42.1  | 31   | 42.5 | 2.5 | 5  |
|                | 40   | B92102030404 | 52.6  | 39   | 45.8 | 2.8 | 5  |
|                | 50   | B92102030405 | 65.8  | 49   | 51.3 | 3.3 | 5  |
|                | 63   | B92102030406 | 83.2  | 61.9 | 59.6 | 3.6 | 1  |
|                | 75   | B92102030407 | 98.7  | 73.7 | 66   | 3   | 1  |
|                | 90   | B92102030408 | 118.4 | 88.4 | 76   | 4   | 1  |
|                | 110  | B92102030409 | 144.7 | 108  | 89   | 5   | 1  |
|                | 125  | B92102030410 | 167   | 123  | 92   | 5.6 | 1  |

## REDUCER (UV)

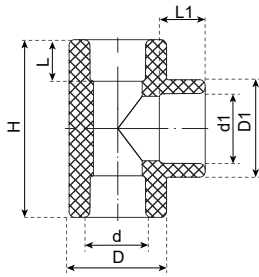
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN: 25 bar



|   |         | size         | code         | D     | d     | L    | D1    | d    | L1   | H    | pu |
|---|---------|--------------|--------------|-------|-------|------|-------|------|------|------|----|
| Socket welding  |         | 25*20        | B92102031101 | 32.4  | 24.1  | 18   | 26.1  | 19.2 | 16   | 34   | 10 |
|   |         | 32*20        | B92102031102 | 42    | 31    | 20   | 26.1  | 19.2 | 16   | 36   | 10 |
|   |         | 32*25        | B92102031103 | 42    | 31    | 20   | 32.4  | 24.1 | 18   | 38   | 10 |
|   |         | 40*20        | B92102031104 | 52.2  | 39    | 21.5 | 26.1  | 19.2 | 16   | 37.5 | 5  |
|   |         | 40*25        | B92102031105 | 52.2  | 39    | 21.5 | 32.4  | 24.1 | 18   | 39.5 | 5  |
|   |         | 40*32        | B92102031106 | 52.2  | 39    | 21.5 | 42    | 31   | 20   | 41.5 | 5  |
|   |         | 50*20        | B92102031107 | 65.5  | 49    | 24   | 26.1  | 19.2 | 16   | 40   | 5  |
|   |         | 50*25        | B92102031108 | 65.5  | 49    | 24   | 32.4  | 24.1 | 18   | 42   | 5  |
|   |         | 50*32        | B92102031109 | 65.5  | 49    | 24   | 42    | 31   | 20   | 44   | 5  |
|   |         | 50*40        | B92102031110 | 65.5  | 49    | 24   | 52.2  | 39   | 21.5 | 45.5 | 5  |
|   |         | 63*20        | B92102031111 | 83    | 61.9  | 28   | 26.1  | 19.2 | 16   | 44   | 1  |
|   |         | 63*25        | B92102031112 | 83    | 61.9  | 28   | 32.4  | 24.1 | 18   | 46   | 1  |
|   |         | 63*32        | B92102031113 | 83    | 61.9  | 28   | 42    | 31   | 20   | 48   | 1  |
|   |         | 63*40        | B92102031114 | 83    | 61.9  | 28   | 52.2  | 39   | 21.5 | 49.5 | 1  |
|   |         | 63*50        | B92102031115 | 83    | 61.9  | 28   | 65.5  | 49   | 24   | 52   | 1  |
|   |         | 75*32        | B92102031116 | 98.7  | 73.9  | 31.5 | 42    | 31   | 20   | 51.5 | 1  |
|   |         | 75*40        | B92102031117 | 98.7  | 73.9  | 31.5 | 52.2  | 39   | 21.5 | 53   | 1  |
|   |         | 75*50        | B92102031118 | 98.7  | 73.9  | 31.5 | 65.5  | 49   | 24   | 55.5 | 1  |
|   |         | 75*63        | B92102031119 | 98.7  | 73.9  | 31.5 | 83    | 61.9 | 28   | 59.5 | 1  |
|   |         | 90*40        | B92102031120 | 118.5 | 88.4  | 36   | 52.2  | 39   | 21.5 | 57.5 | 1  |
|   |         | 90*50        | B92102031121 | 118.5 | 88.4  | 36   | 65.5  | 49   | 24   | 60   | 1  |
|   |         | 90*63        | B92102031122 | 118.5 | 88.4  | 36   | 83    | 61.9 | 28   | 64   | 1  |
|   |         | 90*75        | B92102031123 | 118.5 | 88.4  | 36   | 98.7  | 73.7 | 31.5 | 67.5 | 1  |
|   |         | 110*50       | B92102031124 | 144.5 | 108   | 42   | 65.5  | 49   | 24   | 66   | 1  |
|   |         | 110*63       | B92102031125 | 144.5 | 108   | 42   | 83    | 61.9 | 28   | 70   | 1  |
|   |         | 110*75       | B92102031126 | 144.5 | 108   | 42   | 98.7  | 73.7 | 31.5 | 73.5 | 1  |
|   |         | 110*90       | B92102031127 | 144.5 | 108   | 42   | 118.5 | 88.4 | 36   | 78   | 1  |
|   |         | 125*75       | B92102031128 | 167   | 123   | 45   | 98.7  | 73.7 | 31.5 | 76.5 | 1  |
|   |         | 125*90       | B92102031129 | 167   | 123   | 45   | 118.5 | 88.4 | 36   | 81   | 1  |
|   |         | 125*110      | B92102031130 | 167   | 123   | 45   | 144.5 | 108  | 42   | 87   | 1  |
| Butt welding for 160 mm Socket welding for other side | SDR 6   | 160*110      | B92102031135 | 160   | 106.8 | 50.5 | 144.5 | 108  | 42   | 92.5 | 1  |
|   |         | 160*125      | B92102031136 | 160   | 106.8 | 50.5 | 167   | 123  | 45   | 95.5 | 1  |
|   | SDR 7.4 | 160*110      | B92102031137 | 160   | 116.2 | 50.5 | 144.5 | 108  | 42   | 92.5 | 1  |
|   |         | 160*125      | B92102031138 | 160   | 116.2 | 50.5 | 167   | 123  | 45   | 95.5 | 1  |
|   | SDR 11  | 160*110      | B92102031139 | 160   | 130.8 | 50.5 | 144.5 | 108  | 42   | 92.5 | 1  |
|   | 160*125 | B92102031140 | 160          | 130.8 | 50.5  | 167  | 123   | 45   | 95.5 | 1    |    |

## REDUCER TEE (UV)

Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN: 25 bar

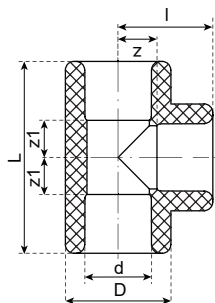


|  |              | size                  | code         | D       | d            | L    | D1    | d    | L1    | H    | pu |      |    |
|--|--------------|-----------------------|--------------|---------|--------------|------|-------|------|-------|------|----|------|----|
|  |              | <b>Socket welding</b> |              | 25*20   | B92102030601 | 32.4 | 24.1  | 18   | 26.1  | 19.2 | 16 | 34   | 10 |
| 32*20  | B92102030602 |                       |              | 42      | 31           | 20   | 26.1  | 19.2 | 16    | 36   | 10 |      |    |
| 32*25  | B92102030603 |                       |              | 42      | 31           | 20   | 32.4  | 24.1 | 18    | 38   | 10 |      |    |
| 40*20  | B92102030604 |                       |              | 52.2    | 39           | 21.5 | 26.1  | 19.2 | 16    | 37.5 | 5  |      |    |
| 40*25  | B92102030605 |                       |              | 52.2    | 39           | 21.5 | 32.4  | 24.1 | 18    | 39.5 | 5  |      |    |
| 40*32  | B92102030606 |                       |              | 52.2    | 39           | 21.5 | 42    | 31   | 20    | 41.5 | 5  |      |    |
| 50*20  | B92102030607 |                       |              | 65.5    | 49           | 24   | 26.1  | 19.2 | 16    | 40   | 5  |      |    |
| 50*25  | B92102030608 |                       |              | 65.5    | 49           | 24   | 32.4  | 24.1 | 18    | 42   | 5  |      |    |
| 50*32  | B92102030609 |                       |              | 65.5    | 49           | 24   | 42    | 31   | 20    | 44   | 5  |      |    |
| 50*40  | B92102030610 |                       |              | 65.5    | 49           | 24   | 52.2  | 39   | 21.5  | 45.5 | 5  |      |    |
| 63*20  | B92102030611 |                       |              | 83      | 61.9         | 28   | 26.1  | 19.2 | 16    | 44   | 1  |      |    |
| 63*25  | B92102030612 |                       |              | 83      | 61.9         | 28   | 32.4  | 24.1 | 18    | 46   | 1  |      |    |
| 63*32  | B92102030613 |                       |              | 83      | 61.9         | 28   | 42    | 31   | 20    | 48   | 1  |      |    |
| 63*40  | B92102030614 |                       |              | 83      | 61.9         | 28   | 52.2  | 39   | 21.5  | 49.5 | 1  |      |    |
| 63*50  | B92102030615 |                       |              | 83      | 61.9         | 28   | 65.5  | 49   | 24    | 52   | 1  |      |    |
| 75*32  | B92102030616 |                       |              | 98.7    | 73.9         | 31.5 | 42    | 31   | 20    | 51.5 | 1  |      |    |
| 75*40  | B92102030617 |                       |              | 98.7    | 73.9         | 31.5 | 52.2  | 39   | 21.5  | 53   | 1  |      |    |
| 75*50  | B92102030618 |                       |              | 98.7    | 73.9         | 31.5 | 65.5  | 49   | 24    | 55.5 | 1  |      |    |
| 75*63  | B92102030619 |                       |              | 98.7    | 73.9         | 31.5 | 83    | 61.9 | 28    | 59.5 | 1  |      |    |
| 90*40  | B92102030620 |                       |              | 118.5   | 88.4         | 36   | 52.2  | 39   | 21.5  | 57.5 | 1  |      |    |
| 90*50  | B92102030621 |                       |              | 118.5   | 88.4         | 36   | 65.5  | 49   | 24    | 60   | 1  |      |    |
| 90*63  | B92102030622 |                       |              | 118.5   | 88.4         | 36   | 83    | 61.9 | 28    | 64   | 1  |      |    |
| 90*75  | B92102030623 |                       |              | 118.5   | 88.4         | 36   | 98.7  | 73.7 | 31.5  | 67.5 | 1  |      |    |
| 110*50   | B92102030624 |                       |              | 144.5   | 108          | 42   | 65.5  | 49   | 24    | 66   | 1  |      |    |
| 110*63   | B92102030625 |                       |              | 144.5   | 108          | 42   | 83    | 61.9 | 28    | 70   | 1  |      |    |
| 110*75   | B92102030626 |                       |              | 144.5   | 108          | 42   | 98.7  | 73.7 | 31.5  | 73.5 | 1  |      |    |
| 110*90   | B92102030627 |                       |              | 144.5   | 108          | 42   | 118.5 | 88.4 | 36    | 78   | 1  |      |    |
| 125*75   | B92102030628 |                       |              | 167     | 123          | 45   | 98.7  | 73.7 | 31.5  | 76.5 | 1  |      |    |
| 125*90   | B92102030629 |                       |              | 167     | 123          | 45   | 118.5 | 88.4 | 36    | 81   | 1  |      |    |
| 125*110  | B92102030630 |                       |              | 167     | 123          | 45   | 144.5 | 108  | 42    | 87   | 1  |      |    |
| <b>Butt welding for 160 mm Socket welding for other side</b> | SDR 6        |                       |              | 160*110 | B92102030636 | 160  | 106.8 | 50.5 | 144.5 | 108  | 42 | 92.5 | 1  |
|  |              |                       |              | 160*125 | B92102030637 | 160  | 106.8 | 50.5 | 167   | 123  | 45 | 95.5 | 1  |
|  | SDR 7.4      |                       |              | 160*110 | B92102030638 | 160  | 116.2 | 50.5 | 144.5 | 108  | 42 | 92.5 | 1  |
|  |              | 160*125               | B92102030639 | 160     | 116.2        | 50.5 | 167   | 123  | 45    | 95.5 | 1  |      |    |
|  | SDR 11       | 160*110               | B92102030640 | 160     | 130.8        | 50.5 | 144.5 | 108  | 42    | 92.5 | 1  |      |    |
|  |              | 160*125               | B92102030641 | 160     | 130.8        | 50.5 | 167   | 123  | 45    | 95.5 | 1  |      |    |



## TEE ( UV )

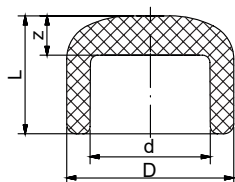
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN: 25 bar



| Socket welding |              | size  | code         | D    | d     | L     | l     | Z    | Z1   | pu |
|----------------|--------------|-------|--------------|------|-------|-------|-------|------|------|----|
|                |              | 20    | B92102030501 | 27.4 | 19.2  | 53.2  | 26.6  | 10.6 | 10.6 | 10 |
| 25             | B92102030502 | 32.8  | 24.1         | 61   | 30.5  | 12.5  | 12.5  | 10   |      |    |
| 32             | B92102030503 | 42.1  | 31           | 74   | 37    | 17    | 17    | 5    |      |    |
| 40             | B92102030504 | 52.6  | 39           | 84.7 | 42.35 | 20.85 | 20.85 | 5    |      |    |
| 50             | B92102030505 | 65.8  | 49           | 99.9 | 49.95 | 25.95 | 25.95 | 5    |      |    |
| 63             | B92102030506 | 83.2  | 61.9         | 121  | 60.5  | 32.5  | 32.5  | 1    |      |    |
| 75             | B92102030507 | 98.7  | 73.7         | 140  | 70    | 38.5  | 38.5  | 1    |      |    |
| 90             | B92102030508 | 118.4 | 88.4         | 164  | 82    | 46    | 46    | 1    |      |    |
| 110            | B92102030509 | 144.7 | 108          | 195  | 97.5  | 55.5  | 55.5  | 1    |      |    |
| 125            | B92102030510 | 167   | 123          | 186  | 116.5 | 76.5  | 76.5  | 1    |      |    |
| Butt Welding   | SDR 6        | 160   | B92102030512 | 160  | 106.8 | 290   | 145   |      | 1    |    |
|                | SDR 7.4      | 160   | B92102030513 | 160  | 116.2 | 290   | 145   |      | 1    |    |
|                | SDR 11       | 160   | B92102030514 | 160  | 130.8 | 290   | 145   |      | 1    |    |

## END CAP ( UV )

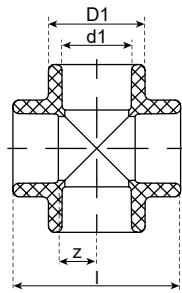
Material: PP-R  
Standards: DIN 16962  
Colour: **Black**  
PN : 25 bar



| Socket welding |              | size  | code         | D    | d     | l    | z   | pu |
|----------------|--------------|-------|--------------|------|-------|------|-----|----|
|                |              | 20    | B92102030801 | 28.4 | 19.2  | 24.5 | 7.3 | 10 |
| 25             | B92102030802 | 34.3  | 24.1         | 29   | 8.6   | 10   |     |    |
| 32             | B92102030803 | 42.4  | 31           | 32.8 | 9.2   | 5    |     |    |
| 40             | B92102030804 | 52.2  | 39           | 39   | 17.5  | 5    |     |    |
| 50             | B92102030805 | 65.5  | 49           | 47   | 23    | 5    |     |    |
| 63             | B92102030806 | 83    | 61.9         | 58.7 | 30.7  | 1    |     |    |
| 75             | B92102030807 | 98.7  | 73.7         | 59.1 | 27.6  | 1    |     |    |
| 90             | B92102030808 | 118.5 | 88.4         | 68   | 32    | 1    |     |    |
| 110            | B92102030809 | 144.5 | 108          | 74.5 | 32.5  | 1    |     |    |
| 125            | B92102030810 | 167   | 123          | 82   | 42    | 1    |     |    |
| Butt Welding   | SDR 6        | 160   | B92102030812 | 160  | 106.8 | 90   | 45  | 1  |
|                | SDR 7.4      | 160   | B92102030813 | 160  | 116.2 | 90   | 45  | 1  |
|                | SDR 11       | 160   | B92102030814 | 160  | 130.8 | 90   | 45  | 1  |

## CROSS (UV)

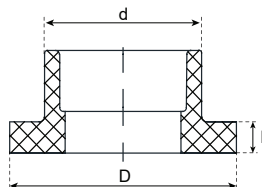
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size | code         | D    | d    | l  | z    | pu |
|----------------|------|--------------|------|------|----|------|----|
|                | 20   | B92102030701 | 27.4 | 19.2 | 53 | 11.3 | 10 |
|                | 25   | B92102030702 | 32.8 | 24.1 | 63 | 13.5 | 10 |
|                | 32   | B92102030703 | 42.1 | 31   | 74 | 17   | 5  |
|                | 40   | B92102030704 | 52   | 39   | 83 | 21   | 5  |

## FLANGE ADAPTER (UV)

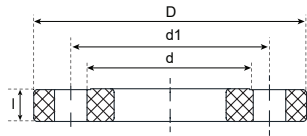
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size         | code         | D     | d            | l    | pu    |    |   |
|----------------|--------------|--------------|-------|--------------|------|-------|----|---|
|                | 32           | B92102030901 | 69    | 41.2         | 9.6  | 5     |    |   |
|                | 40           | B92102030902 | 77.7  | 53.5         | 12.4 | 5     |    |   |
|                | 50           | B92102030903 | 87.7  | 66.7         | 14.6 | 5     |    |   |
|                | 63           | B92102030904 | 101.8 | 84           | 14.6 | 1     |    |   |
|                | 75           | B92102030905 | 122   | 95.3         | 12.6 | 1     |    |   |
|                | 90           | B92102030906 | 138.5 | 114          | 15.2 | 1     |    |   |
|                | 110          | B92102030907 | 157.8 | 138.5        | 18   | 1     |    |   |
|                | 125          | B92102030908 | 190   | 149          | 18   | 1     |    |   |
|                | 160          | B92102030910 | 215   | 198.5        | 18.5 | 1     |    |   |
|                | Butt Welding | SDR 6        | 160   | B92102020812 | 160  | 106.8 | 90 | 1 |
|                |              | SDR 7.4      | 160   | B92102020513 | 160  | 116.2 | 90 | 1 |
|                |              | SDR 11       | 160   | B92102020814 | 160  | 130.8 | 90 | 1 |

## FLANGE (UV)

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar

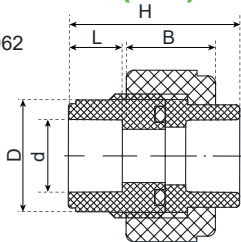


Socket welding

| size | code         | D   | d1  | d     | l  | pu |
|------|--------------|-----|-----|-------|----|----|
| 32   | B92102031001 | 115 | 85  | 42.5  | 11 | 5  |
| 40   | B92102031002 | 135 | 100 | 56    | 13 | 5  |
| 50   | B92102031003 | 145 | 110 | 68    | 13 | 5  |
| 63   | B92102031004 | 160 | 125 | 85.5  | 14 | 1  |
| 75   | B92102031005 | 180 | 145 | 97    | 14 | 1  |
| 90   | B92102031006 | 195 | 160 | 115.5 | 15 | 1  |
| 110  | B92102031007 | 215 | 180 | 141   | 16 | 1  |
| 125  | B92102031008 | 250 | 210 | 169   | 18 | 1  |
| 160  | B92102031010 | 280 | 240 | 199   | 20 | 1  |

## PLASTIC UNION (UV)

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar

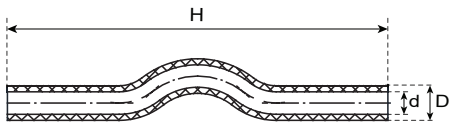


Socket welding

| size | code         | D  | d    | l  | l1 | z1  | z  | pu |
|------|--------------|----|------|----|----|-----|----|----|
| 20   | B92102031201 | 46 | 19.2 | 26 | 20 | 5.5 | 12 | 10 |
| 25   | B92102031202 | 56 | 24.1 | 28 | 21 | 5   | 12 | 10 |
| 32   | B92102031203 | 66 | 31   | 30 | 23 | 5   | 12 | 5  |

## LONG CROSS OVER (UV)

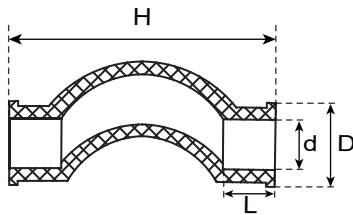
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size | code         | D  | d  | H   | PU |
|----------------|------|--------------|----|----|-----|----|
|                | 20   | B92102031301 | 20 | 13 | 400 | 10 |
|                | 25   | B92102031302 | 25 | 16 | 400 | 10 |
|                | 32   | B92102031303 | 32 | 22 | 400 | 5  |

## SHORT CROSS OVER (UV)

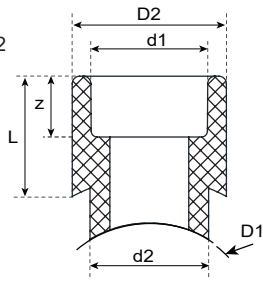
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size | code         | D    | d    | l  | H    | pu |
|----------------|------|--------------|------|------|----|------|----|
|                | 20   | B92102031401 | 28.2 | 19.2 | 16 | 95.5 | 10 |
|                | 25   | B92102031402 | 34   | 24.1 | 18 | 121  | 10 |
|                | 32   | B92102031403 | 42.5 | 31   | 20 | 154  | 5  |

## SADEL ( UV )

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar

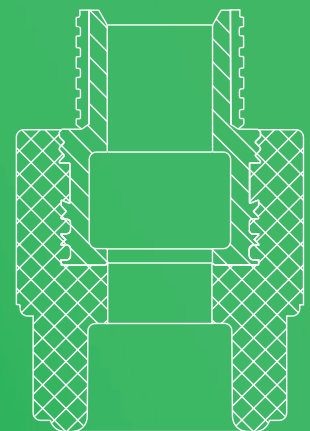


| Socket welding | size   | code         | D1  | d1 | D2 | d2 | L  | z  | pu |
|----------------|--------|--------------|-----|----|----|----|----|----|----|
|                | 63*32  | B92102033006 | 63  | 32 | 43 | 32 | 30 | 18 | 5  |
|                | 75*32  | B92102033007 | 75  | 32 | 43 | 32 | 30 | 18 | 5  |
|                | 90*32  | B92102033008 | 90  | 32 | 43 | 32 | 30 | 18 | 1  |
|                | 110*32 | B92102033009 | 110 | 32 | 43 | 32 | 30 | 18 | 1  |



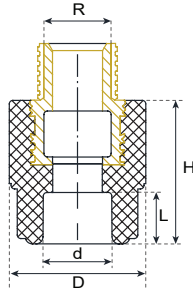


## DP THERM UV THREADED FITINGE



## MALE THREADED COUPLING (UV)

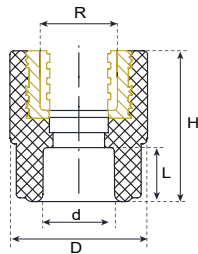
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | L  | H    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|----|
|                | 20*1/2" | B92102031501 | 27.4 | 19.2 | 16 | 39.5 | 1/2" | 10 |
|                | 20*3/4" | B92102031502 | 27.4 | 19.2 | 16 | 40.5 | 3/4" | 10 |
|                | 25*1/2" | B92102031503 | 32.8 | 24.1 | 18 | 41.5 | 1/2" | 10 |
|                | 25*3/4" | B92102031504 | 32.8 | 24.1 | 18 | 42.5 | 3/4" | 10 |
|                | 32*3/4" | B92102031506 | 42.1 | 31   | 20 | 45.5 | 3/4" | 5  |

## FEMALE THREADED COUPLING (UV)

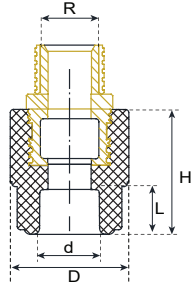
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size    | code         | D    | d    | L  | H    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|----|
|                | 20*1/2" | B92102031601 | 27.4 | 19.2 | 16 | 39.5 | 1/2" | 10 |
|                | 20*3/4" | B92102031602 | 27.4 | 19.2 | 16 | 40.5 | 3/4" | 10 |
|                | 25*1/2" | B92102031603 | 32.8 | 24.1 | 18 | 41.5 | 1/2" | 10 |
|                | 25*3/4" | B92102031604 | 32.8 | 24.1 | 18 | 42.5 | 3/4" | 10 |
|                | 32*3/4" | B92102031606 | 42.1 | 31   | 20 | 45.5 | 3/4" | 5  |

## FEMALE THREADED COUPLING WITH SPANNER FLAT (UV)

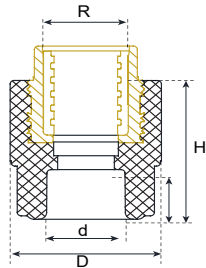
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size      | code         | D     | d    | L    | H    | R      | pu |
|----------------|-----------|--------------|-------|------|------|------|--------|----|
|                | 32*1"     | B92102031801 | 42.1  | 31   | 20   | 46   | 1"     | 5  |
|                | 40*1-1/4" | B92102031803 | 52.6  | 39   | 21.5 | 47.5 | 1-1/4" | 5  |
|                | 50*1-1/2" | B92102031804 | 65.8  | 49   | 24   | 56.2 | 1-1/2" | 5  |
|                | 63*2"     | B92102031805 | 83.2  | 61.9 | 28   | 61   | 2"     | 1  |
|                | 75*2.5"   | B92102031806 | 98.7  | 73.7 | 31.5 | 66.4 | 2-1/2" | 1  |
|                | 90*3"     | B92102031807 | 118.4 | 88.4 | 36.5 | 72   | 3"     | 1  |
|                | 110*4"    | B92102031808 | 144.7 | 108  | 42.5 | 77.5 | 4"     | 1  |

## MALE THREADED COUPLING WITH SPANNER FLAT (UV)

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar

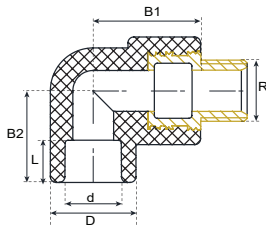


| Socket welding | size      | code         | D     | d    | L    | H    | R      | pu |
|----------------|-----------|--------------|-------|------|------|------|--------|----|
|                | 32*1"     | B92102031701 | 42.1  | 31   | 20   | 46   | 1"     | 5  |
|                | 40*1-1/4" | B92102031704 | 52.6  | 39   | 21.5 | 47.5 | 1-1/4" | 5  |
|                | 50*1-1/2" | B92102031705 | 65.8  | 49   | 24   | 56.2 | 1-1/2" | 5  |
|                | 63*2"     | B92102031706 | 83.2  | 61.9 | 28   | 61   | 2"     | 1  |
|                | 75*2.5"   | B92102031707 | 98.7  | 73.7 | 31.5 | 66.4 | 2-1/2" | 1  |
|                | 90*3"     | B92102031708 | 118.4 | 88.4 | 36.5 | 72   | 3"     | 1  |
|                | 110*4"    | B92102031709 | 144.7 | 108  | 42.5 | 77.5 | 4"     | 1  |



## MALE THREADED ELBOW (UV)

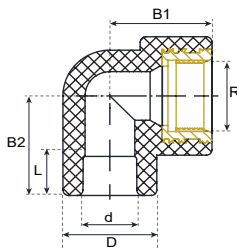
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | l  | B1   | B2   | g    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102032101 | 27.4 | 19.2 | 16 | 27   | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102032102 | 27.4 | 19.2 | 16 | 30   | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102032103 | 32.8 | 24.1 | 18 | 30   | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102032104 | 32.8 | 24.1 | 18 | 32   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102032105 | 42.1 | 31   | 20 | 34   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102032106 | 42.1 | 31   | 20 | 34   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102032107 | 42.1 | 31   | 20 | 38.5 | 39   | 1"   | 5  |

## FEMALE THREADED ELBOW (UV)

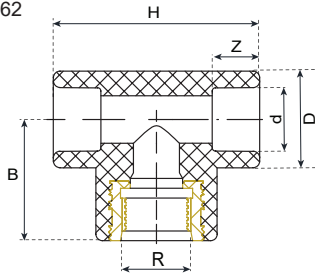
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size    | code         | D    | d    | l  | B1   | B2   | g    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102032201 | 27.4 | 19.2 | 16 | 27   | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102032202 | 27.4 | 19.2 | 16 | 30   | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102032203 | 32.8 | 24.1 | 18 | 30   | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102032204 | 32.8 | 24.1 | 18 | 32   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102032205 | 42.1 | 31   | 20 | 34   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102032206 | 42.1 | 31   | 20 | 34   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102032207 | 42.1 | 31   | 20 | 38.5 | 39   | 1"   | 5  |

## FEMALE THREADED TEE (UV)

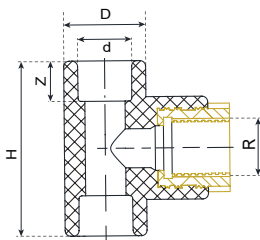
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | z  | H    | B    | R    | pu |
|----------------|---------|--------------|------|------|----|------|------|------|----|
|                | 20*1/2" | B92102032401 | 27.4 | 19.2 | 16 | 54.5 | 33.5 | 1/2" | 10 |
|                | 20*3/4" | B92102032402 | 27.4 | 19.2 | 16 | 59.5 | 34.5 | 3/4" | 10 |
|                | 25*1/2" | B92102032403 | 32.8 | 24.1 | 18 | 58.8 | 36   | 1/2" | 10 |
|                | 25*3/4" | B92102032404 | 32.8 | 24.1 | 18 | 64   | 37   | 3/4" | 10 |
|                | 32*1/2" | B92102032405 | 42.1 | 31   | 20 | 65   | 40   | 1/2" | 5  |
|                | 32*3/4" | B92102032406 | 42.1 | 31   | 20 | 68   | 42   | 3/4" | 5  |
|                | 32*1"   | B92102032407 | 42.1 | 31   | 20 | 77   | 39   | 1"   | 5  |

## FEMALE THREADED TEE WITH SPANNER FIAT (UV)

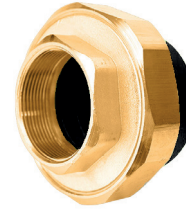
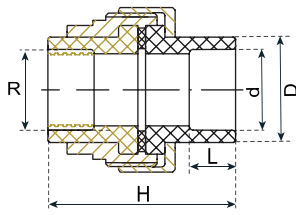
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size  | code         | D    | d  | R  | L  | Z  | pu |
|----------------|-------|--------------|------|----|----|----|----|----|
|                | 32*1" | B92102032901 | 42.1 | 31 | 1" | 77 | 20 | 5  |

## FEMALE THREADED UNION (UV)

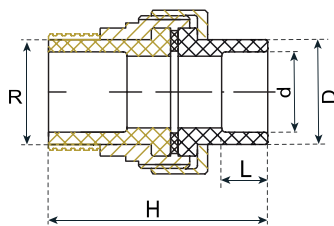
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size     | code         | D    | d    | l    | B1     | B2   | pu |
|----------------|----------|--------------|------|------|------|--------|------|----|
|                | 20*12"   | B92102032001 | 27.4 | 19.2 | 16   | 1/2"   | 36.5 | 10 |
|                | 25*34"   | B92102032002 | 32.8 | 24.1 | 18   | 3/4"   | 39   | 10 |
|                | 32*1"    | B92102032003 | 42.1 | 31   | 20   | 1"     | 45   | 5  |
|                | 40*1-14" | B92102032004 | 52.6 | 39   | 21.5 | 1-1/4" | 52   | 5  |
|                | 50*1-12" | B92102032005 | 65.8 | 49   | 24   | 1-1/2" | 63   | 1  |
|                | 63*2"    | B92102032006 | 83.2 | 61.9 | 28   | 2"     | 69.5 | 1  |

## MALE THREADED UNION (UV)

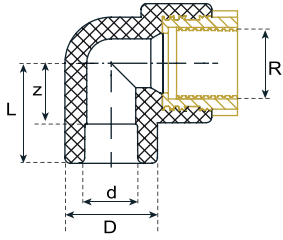
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size     | code         | D    | d    | l    | r      | h    | pu |
|----------------|----------|--------------|------|------|------|--------|------|----|
|                | 20*12"   | B92102031901 | 27.4 | 19.2 | 16   | 1/2"   | 47.5 | 10 |
|                | 25*34"   | B92102031902 | 32.8 | 24.1 | 18   | 3/4"   | 51   | 10 |
|                | 32*1"    | B92102031903 | 42.1 | 31   | 20   | 1"     | 59.5 | 5  |
|                | 40*1-14" | B92102031904 | 52.6 | 39   | 21.5 | 1-1/4" | 70.5 | 5  |
|                | 50*1-12" | B92102031905 | 65.8 | 49   | 24   | 1-1/2" | 84.5 | 1  |
|                | 63*2"    | B92102031906 | 83.2 | 61.9 | 28   | 2"     | 92   | 1  |

## FEMALE THREADED ELBOW WITH SPANNER FLAT (UV)

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size  | code         | D    | d  | R  | L    | Z    | pu |
|----------------|-------|--------------|------|----|----|------|------|----|
|                | 32*1" | B92102032701 | 42.1 | 31 | 1" | 38.5 | 18.5 | 5  |

## TWO-PORT MANIFOLD

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102033101 | 2               | 50            | 3/4"           |
|                | 63*1   | B92102033102 | 2               | 63            | 1"             |
|                | 90*1   | B92102033103 | 2               | 90            | 1"             |

## FOUR-PORT MANIFOLD

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN: 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102033201 | 4               | 50            | 3/4"           |
|                | 63*1   | B92102033202 | 4               | 63            | 1"             |
|                | 90*1   | B92102033203 | 4               | 90            | 1"             |

## FOUR-PORT MANIFOLD WITH TEE

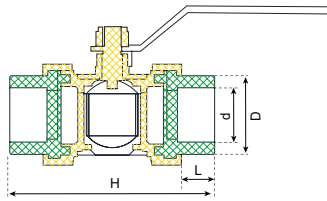
Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar



| Socket welding | size   | code         | Number of Ports | Main Diameter | Ports Diameter |
|----------------|--------|--------------|-----------------|---------------|----------------|
|                | 50*3/4 | B92102033301 | 4               | 50            | 3/4"           |
|                | 63*1   | B92102033302 | 4               | 63            | 1"             |
|                | 90*1   | B92102033303 | 4               | 90            | 1"             |

## DOUBLE UNION BALL VALVE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar

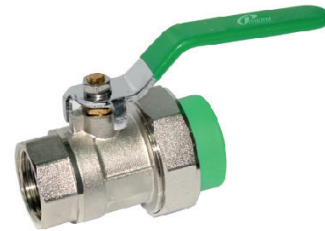
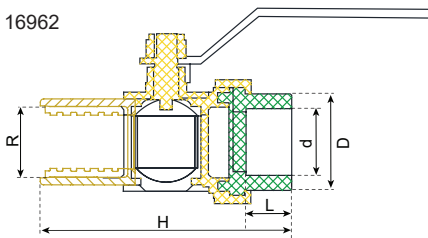


### Socket welding

| size | code         | D    | d    | L    | H     | pu |
|------|--------------|------|------|------|-------|----|
| 20   | B92102024001 | 27.4 | 19.2 | 16   | 78.5  | 1  |
| 25   | B92102024002 | 32.8 | 24.1 | 18   | 85    | 1  |
| 32   | B92102024003 | 42.1 | 31   | 20   | 102   | 1  |
| 40   | B92102024004 | 52.6 | 39   | 21.5 | 117   | 1  |
| 50   | B92102024005 | 65.8 | 49   | 24   | 146.5 | 1  |
| 63   | B92102024006 | 83.2 | 61.9 | 28   | 165.5 | 1  |

## FEMALE SINGLE UNION BALL VALVE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar

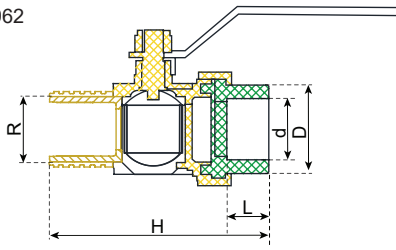


### Socket welding

| size    | code         | D    | d    | l  | R    | H    | pu |
|---------|--------------|------|------|----|------|------|----|
| 20*1/2" | B92102024201 | 27.4 | 19.2 | 16 | 1/2" | 67   | 1  |
| 25*3/4" | B92102024202 | 32.8 | 24.1 | 18 | 3/4" | 73   | 1  |
| 32*1"   | B92102024203 | 42.1 | 31   | 20 | 1"   | 82.5 | 1  |

## MALE SINGLE UNION BALL VALVE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar

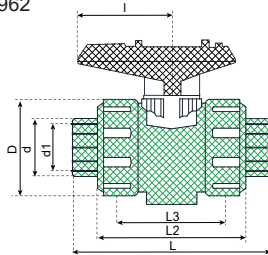


### Socket welding

| size    | code         | D    | d    | l  | R    | H    | pu |
|---------|--------------|------|------|----|------|------|----|
| 20*1/2" | B92102024301 | 27.4 | 19.2 | 16 | 1/2" | 70   | 1  |
| 25*3/4" | B92102024302 | 32.8 | 24.1 | 18 | 3/4" | 76.5 | 1  |
| 32*1"   | B92102024303 | 42.1 | 31   | 20 | 1"   | 86   | 1  |

## DOUBLE UNION BALL VALVE WITH PP-R BODY

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar

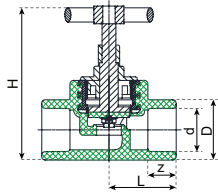


### Socket welding

| sizeg | cobg         | D     | b     | d1   | L     | l   | L2   | L3    | bu |
|-------|--------------|-------|-------|------|-------|-----|------|-------|----|
| 20    | B92102024101 | 50.3  | 27.4  | 19.2 | 97    | 48  | 56.5 | 68    | 1  |
| 25    | B92102024102 | 59    | 32.8  | 24.1 | 110   | 59  | 65.5 | 78    | 1  |
| 32    | B92102024103 | 70.3  | 42.1  | 31   | 120.5 | 59  | 72   | 84.5  | 1  |
| 40    | B92102024104 | 85.9  | 52.6  | 39   | 141   | 64  | 85   | 100   | 1  |
| 50    | B92102024105 | 99.5  | 65.8  | 49   | 154   | 64  | 89   | 107   | 1  |
| 63    | B92102024106 | 125.5 | 83.2  | 61.9 | 173   | 108 | 101  | 118   | 1  |
| 75    | B92102024107 | 147   | 98.7  | 73.7 | 185.8 | 108 | 109  | 128.5 | 1  |
| 90    | B92102024108 | 162   | 118.4 | 88.4 | 201   | 136 | 118  | 147   | 1  |
| 110   | B92102024109 | 189   | 144.7 | 108  | 216.3 | 155 | 128  | 172   | 1  |

## GLOBE VALVE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



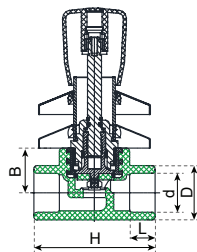
| Socket welding | size | code         | D    | b    | L  | z    | h    | bu |
|----------------|------|--------------|------|------|----|------|------|----|
|                | 20   | B92102024601 | 27.4 | 19.2 | 35 | 20.5 | 75.3 | 1  |
|                | 25   | B92102024602 | 32.8 | 24.1 | 38 | 22   | 75   | 1  |
|                | 32   | B92102024603 | 42.1 | 31   | 49 | 31   | 97   | 1  |

| SIZE | CODE         |
|------|--------------|
| 20   | B92102024901 |
| 25   | B92102024902 |
| 32   | B92102024903 |



## CONCEALED VALVE

Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size | code         | D    | d    | l  | B    | H    | pu |
|----------------|------|--------------|------|------|----|------|------|----|
|                | 20   | B92102024501 | 27.4 | 19.2 | 16 | 26   | 67.3 | 1  |
|                | 25   | B92102024502 | 32.8 | 24.1 | 18 | 31   | 78   | 1  |
|                | 32   | B92102024503 | 42.1 | 31   | 20 | 33.7 | 79.6 | 1  |

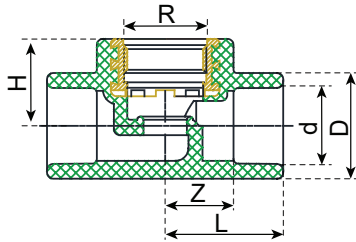
| SIZE | CODE         |
|------|--------------|
| 20   | B92102024801 |
| 25   | B92102024802 |
| 32   | B92102024803 |





## CONCEALED VALVE BODY

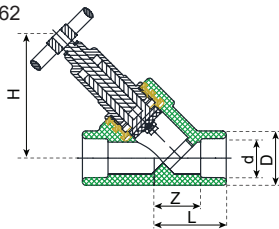
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| Socket welding | size    | code         | D    | d    | L  | z  | h  | R    | pu |
|----------------|---------|--------------|------|------|----|----|----|------|----|
|                | 20*3/4" | B92102025101 | 27.4 | 19.2 | 35 | 20 | 28 | 3/4" | 1  |
|                | 25*3/4" | B92102025102 | 32.8 | 24.1 | 38 | 22 | 28 | 3/4" | 1  |
|                | 32*1    | B92102025103 | 42.1 | 31   | 49 | 31 | 34 | 1"   | 1  |

## INCLINED VALVE

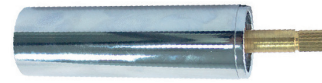
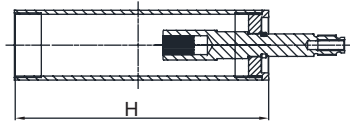
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN : 25 bar



| Socket welding | size | code         | D    | d    | L  | z    | h     | pu |
|----------------|------|--------------|------|------|----|------|-------|----|
|                | 20   | B92102024701 | 27.4 | 19.2 | 45 | 30.5 | 95.5  | 1  |
|                | 25   | B92102024702 | 32.8 | 24.1 | 45 | 29   | 95.5  | 1  |
|                | 32   | B92102024703 | 42.1 | 31   | 56 | 38   | 111.5 | 1  |

## EXTENSION FOR CONCEALED VALVE

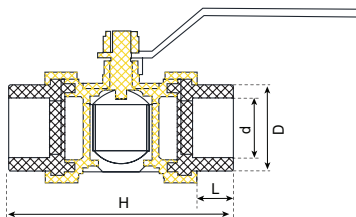
Material: PP-R  
 Standards: DIN 16962  
 Colour: Green  
 PN: 25 bar



| size | code         | H   | PU |
|------|--------------|-----|----|
| 109  | B92102025001 | 109 | 1  |

## DOUBLE UNION BALL VALVE ( UV )

Material: PP-R  
 Standards: DIN 16962  
 Colour: **Black**  
 PN : 25 bar

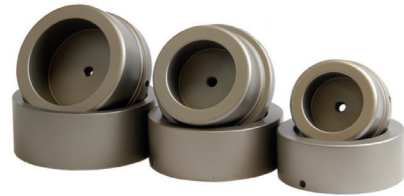


| Socket welding | size | code         | D    | d    | L    | H     | pu |
|----------------|------|--------------|------|------|------|-------|----|
|                | 20   | B92102033601 | 27.4 | 19.2 | 16   | 78.5  | 1  |
|                | 25   | B92102033602 | 32.8 | 24.1 | 18   | 85    | 1  |
|                | 32   | B92102033603 | 42.1 | 31   | 20   | 102   | 1  |
|                | 40   | B92102033604 | 52.6 | 39   | 21.5 | 117   | 1  |
|                | 50   | B92102033605 | 65.8 | 49   | 24   | 146.5 | 1  |
|                | 63   | B92102033606 | 83.2 | 61.9 | 28   | 165.5 | 1  |



### PIPE CUTTER

| CODE         | SIZE  |
|--------------|-------|
| B92102025301 | 20-32 |
| B92102025302 | 20-40 |
| B92102025303 | 20-63 |



### SOCKET FUSION

| CODE         | SIZE |
|--------------|------|
| B92102025201 | 20   |
| B92102025202 | 25   |
| B92102025203 | 32   |
| B92102025204 | 40   |
| B92102025205 | 50   |
| B92102025206 | 63   |
| B92102025207 | 75   |
| B92102025208 | 90   |
| B92102025209 | 110  |
| B92102025210 | 125  |
| B92102025212 | 160  |



### WELDING MACHINE

| CODE         | SIZE   |
|--------------|--------|
| B92102025301 | 20-32  |
| B92102025302 | 20-40  |
| B92102025303 | 20-63  |
| B92102025304 | 50-110 |
| B92102025305 | 75-110 |



### HOLE REPAIR

| CODE  | SIZE         |
|-------|--------------|
| 20-32 | B92102025501 |

# STORAGE

1- It is crucial to focus on the pipe's terminations, as they necessitate particular care. In the event of compromised components, it is advisable to eliminate them prior to the installation process.

2- Wall surface imperfections, such as dents or scratches, that exceed a depth of 5% of the wall's thickness, are regarded as damage.

3- To properly store a pipe on storage racks, it is crucial to maintain a specific support arrangement. Ensure that you have at least three supports, each measuring less than 4 meters in length, and four supports with lengths not exceeding 5.8 meters.

4- It is essential to note that pipes should always be placed only on a flat and immaculate surface for proper storage.

5- be cautious not to take the pipes out of their protective packaging, particularly when storing them outdoors. The packaging serves to safeguard the pipes from scratches, dust, exposure to sunlight, and harsh weather conditions.

6- The warranty does not encompass pipes left uncovered in open-air settings for over three months. If your pipes have UV protection and are installed outdoors, kindly reach out to the company's Technical Support Department for assistance.

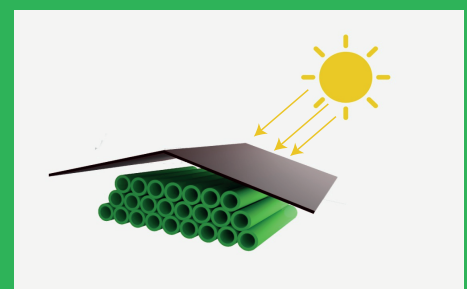
7- To safeguard the pipe with a protective coating, opt for a lighter hue, such as white, to prevent potential thermal harm. Abstain from applying darker colors, like black, for this purpose.

8- During the transportation of a pipe, ensure it rests on a level and clean surface, or is provided with consistent support.

9- It is essential to keep fittings stored inside cardboard boxes for an extended period, as required.

10- In pipes with substantial cross-sections, it is prohibited

\* Ultraviolet (UV) radiation can damage polypropylene materials. Consequently, extended sunlight exposure may negatively impact the functionality of a system, particularly when items are placed outdoors, in courtyards, or unprotected on external walls. To mitigate this issue, it's crucial to store pipes and fittings in enclosed storage areas or cover them with appropriate insulation. Nevertheless, UV doesn't impact on the Dptherm when using insulated pipes systems Therefore polypropylene is stored in covered warehouses.



# HANDLING

PPR (Polypropylene Random) pipes have gained significant popularity in recent years due to their durability, flexibility, and resistance to various environmental factors. These pipes are widely used in plumbing, heating, and cooling systems. Loading PPR pipes correctly is crucial to maintain their structural integrity and prevent any damage during transportation. In this article, we will discuss some essential loading techniques to ensure safe and efficient handling of PPR pipes.

## 1. Proper Packaging

Before loading PPR pipes, it is essential to package them correctly. Use high-quality packaging materials such as plastic wraps protect the pipes from scratches, dents, and other potential damages. Proper packaging also helps in maintaining the pipes' original shape and prevents them from getting tangled during transportation.

## 2. Secure Palletizing

Palletize the PPR pipes in a way that ensures stability and uniform distribution of weight. Arrange the pipes in a crisscross pattern, alternating their lengths and orientations to create a stable structure. This method minimizes the risk of pipe movement during transit and prevents any damage to the pipes or the pallet itself.

## 3. Loading onto vehicles

When loading PPR pipes onto vehicles, follow the vehicle's weight distribution guidelines. Ensure that the weight is evenly distributed across the axles to prevent any imbalance that could lead to accidents. It is also crucial to secure the pallets properly using straps or chains to prevent them from shifting during transit.

## 4. Stack Pipes Carefully

If you need to stack PPR pipes in a confined space or on a vehicle with limited height, be cautious while stacking. Stack the pipes alternately, with shorter pipes on top of longer ones, to maintain stability and avoid any damage. Additionally, ensure there is enough space between the stacks to allow for proper ventilation and prevent any potential heat buildup.

## 5. Handle with care

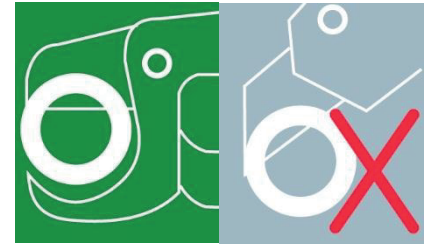
Throughout the loading process, handle the PPR pipes with care to avoid any unnecessary stress or impact. Use appropriate equipment, such as forklifts or pallet jacks, to lift and move the pallets. This step will help maintain the structural integrity of the pipes and reduce the risk of damage.

### IMPORTANT NOTE:

\*\*Loading PPR pipes requires attention to detail and proper handling techniques to ensure their safety and efficiency during transportation. By following these guidelines, you can minimize the risk of damage and maintain the quality of your PPR pipes, ultimately benefiting both the supplier and the end-user.

## USE INSTRUCTIONS

- To achieve accurate cuts, we employ specialized plastic pipe shears. These tools ensure a perpendicular cut relative to the pipes' longitudinal axis. It is essential to avoid using knives, bevels, or hacksaws for cutting purposes. When working with multi-layered pipes it is crucial to meticulously clean the pipe ends using scrapers.



- To maintain the safety and integrity of plastic pipes, it is crucial not to use an open flame for heating. Instead, when localized heating is necessary, opt for hot air at a controlled temperature of 130°C. After the heating process, allow the pipe to cool down and return to its original ambient temperature naturally.



- It is essential to avoid using excessive amounts of thread sealing cord and overly tightening screw connections in plastic-brass and brass fittings. These components feature high-precision threads, designed to achieve adequate tightness with minimal effort.

- To join a metal pipe and an Aqua-Plus pipe, it is suggested to utilize a socket (F/F) and attach the Aqua-Plus fittings featuring a male thread onto this socket.



## TOOLS

In the dp therm system, pipes and fittings are joined through fusion welding. This technique entails melting the outer surface of the pipe and the inner surface of the fitting, both heated to 260-280°C. Successfully welded connections exhibit no gaps between the components when cut perpendicular to the pipe's longitudinal axis.

For the welding of the pipes and the fittings, we use the following tools:

- Pipe cutting tools, which are available in two types:

- 1- Cutting tools, used for pipes with an outer dimension between 20 to 40mm.
- 2- Cutting tools, used for pipes with an outer dimension between 50 to 63mm.

- Pipes with dimensions between of 75 to 160mm are cut with:

- 1- Rotary pipe cutting tools.
2. Mechanical circular saws.

**After cutting with a circular saw, you should remove the protrusions from the inner end of the cut pipe**

### IMPORTANT NOTE:

- Any cutting residues (metal scraps) should be removed from the end of the pipe.
- In sections from 75 to 125mm, a bench-type welding machine should be used for thermal welding rather than a racket.

## ASSEMBLY GUIDELINES

- To begin the fusion welding process, it is essential to select dies that correspond with the diameter of the elements to be joined. These dies are attached to the heating plate using the provided tool set. Ensuring proper die selection and tool usage guarantees a successful and seamless welding operation.

- Make sure the dies are in perfect contact with the heating surface.

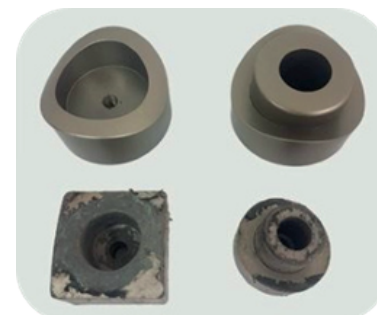
- To maintain optimal performance, the dies must be securely fastened onto the heating plate. This is crucial because it guarantees that the entire surface area of the die and plate come into direct contact with one another.



- To guarantee successful welding, it's crucial that the thermal fusion welding apparatus operates efficiently. It must consistently maintain a temperature of at least 260°C. Failing to do so may result in cold welding, which is a welding failure.

- The welding dies should be in excellent condition, without the slightest scratch or bump.

The Teflon layer on their surface ensures proper welding, as there are no remains of molten plastic inside and outside the dies after welding. The opposite would result in a decrease in the surface temperature of the dies and the formation of a gasket in the next welding, which would make the welding (cold welding) particularly difficult .



## HEATING

Heat the tube and the fitting by pressing simultaneously into the welding die .

**The heating time starts when the pipe and fitting are placed in the welding die.**

Once they are warmed up for the right amount of time, slowly remove the components in a Horizontal position from the appliance At ambient temperatures below 5°C ( should be avoided) the heating time is extended by 50%.

**Welding should not occur at temperatures below 0°C.**

Concurrent heating of pipes and fittings is necessary, with only one round permitted. A second heating is prohibited. It's crucial to maintain uninterrupted heating and welding procedures. The table below displays the necessary time durations.



| Pipe Dimension (mm) | Heating Time (sec) |
|---------------------|--------------------|
| 20                  | 5                  |
| 25                  | 7                  |
| 32                  | 8                  |
| 40                  | 12                 |
| 50                  | 18                 |
| 63                  | 24                 |
| 75                  | 30                 |
| 90                  | 40                 |
| 110                 | 50                 |
| 125                 | 60                 |

### • IMPORTANT NOTE

If the pipe or fitting remain for less time inside the die, this will result in cold welding and a higher risk of detachment. More time will result in excessive melting of the material which can lead to a reduction in its cross-section.



## WELDING

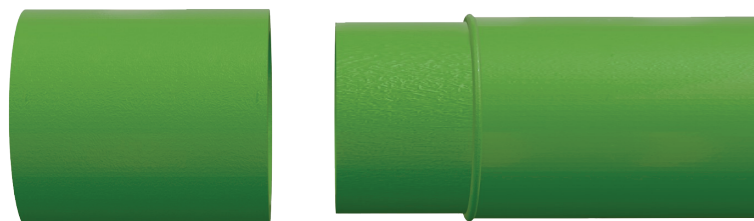
To connect a pipe and fitting, first, look for the markings. Match the embossed line on the fitting with the dashed line on the tube. This ensures proper alignment and a secure connection.

### IMPORTANT NOTE

- In the welding process, it is crucial not to rotate the welded components around their axes. However, adjusting the elements' axes within a range of +/- 3 degrees is permissible.
- During the welding inspection, it is crucial to maintain continuity in the outer seam surrounding the pipe. In situations involving a double seam, both seams must be aligned in a tangential manner.
- Avoid having the welding touch water or any other liquids.
- The pipe should never directly touch the fitting at any given moment.

The required time for welding is listed in the table below

| Pipe Dimension (mm) | Welding Time (sec) |
|---------------------|--------------------|
| 20                  | 4                  |
| 25                  | 4                  |
| 32                  | 6                  |
| 40                  | 6                  |
| 50                  | 6                  |
| 63                  | 8                  |
| 75                  | 10                 |
| 90                  | 10                 |
| 110                 | 10                 |
| 125                 | 15                 |



## COOLING

The welded elements must remain stationary until they cool down, at a time specified in the table below.

| Pipe Dimension (mm) | Cooling Time (sec) |
|---------------------|--------------------|
| 20                  | 2                  |
| 25                  | 2                  |
| 32                  | 4                  |
| 40                  | 4                  |
| 50                  | 4                  |
| 63                  | 6                  |
| 75                  | 8                  |
| 90                  | 8                  |
| 110                 | 8                  |
| 125                 | 10                 |

## PP-R WELDING

Inside the pipe, a peripheral narrowing occurs due to:

- a) the constant pressure on the pipe when its end has reached the die and
- b) the violation of the heating time limits



## INSTRUCTIONS OF INSTALLATION OF BUTT WELDING MACHINE FOR PP-R

### General

Butt welding is a technique that combines heat and pressure to seamlessly unite the two edges (profiles) of pipes, eliminating the requirement for fittings, while preserving the structural integrity of the joints.

#### Welding machine components:

1. Device for unit control and oil compression
2. Pipe clamps
3. Hydraulic pressure pipes
4. Hydraulic cylinder with base
5. Sharpening device
6. Heating device

## SUCCESSFUL WELDING STEPS

### Alignment:

-Arrange and secure the pipes using clamping elements. The gap measurement can reach 315mm, and the outer dimension should be 0.5mm (as shown in Image 1).

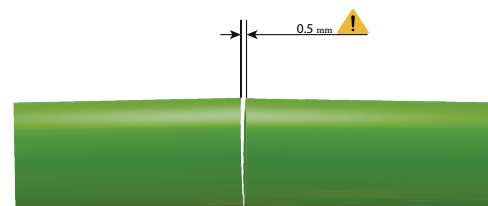


Image 1

-The maximum alignment deviation should not exceed 10% of the wall thickness or 2mm (image 2)

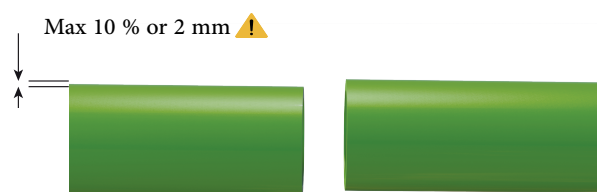


Image 2

### Surface parallelism (Frontal placement):

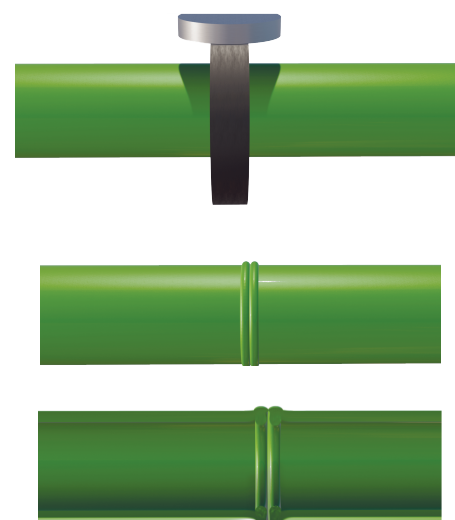
Arrange the pipes such that both surfaces maintain adequate parallelism, and eliminate any residual oxides.

### Heating:

As the pipe heats up, the PP-R molecular chains are activated for fusion.

### Fusion:

Applying pressure to the mentioned surfaces of the two pipelines allows for a secure connection. This pressure causes the chains to fill any existing gaps, reducing the likelihood of leakage.



## BUTT WELDING PRESSURES:

Each stage of frontal welding requires a certain pressure. The four pressures you will need to know are the Drag Pressure [P1], the Interfacial Pressure [P2], the Preheating Pressure [P3] and the Welding Pressure [P4]. Calculate the reported pressures before starting the welding procedure.

### Drag pressure [P1]:

The minimal hydraulic pressure needed to shift the pipes within hydraulic clamps can be identified by gradually increasing the pressure control until the pipe begins to move. This drag pressure is subject to change based on the machine's design, its orientation, and the dimensions of the pipe.

### Interfacial pressure [P2]:

The force needed at the fusion point in welding is known as the required pressure. To achieve this, apply the pressure consistently until the desired fusion ring is formed. The specific pressure value (P2) can be found in Table 1, located on the following page.

The interface pressure is calculated using the pressure gauge provided on the welding machine.

### Preheating pressure [P3]:

The necessary force for a machine to attain the appropriate pressure between its surfaces depends on factors such as the machine's cylinder size and pipe dimensions.

Manufacturers provide welding pressures in their manuals, while preheating pressures are calculated using the machine's pressure gauge.

### Welding pressure [P4]:

The necessary force for a machine to attain the appropriate pressure between its surfaces depends on factors such as the machine's cylinder size and pipe dimensions.

Manufacturers provide welding pressures in their manuals, while preheating pressures are calculated using the machine's pressure gauge.

# STEPS FOR BUTT WELDING

## Surface parallelism phase:

The requirement for surface alignment adjusts based on:

1. The pipe's dimensions.
2. The initial circumstances at the drag pressure.

Over time, the pressure between the pipe and the machinery progressively rises, ensuring that two uninterrupted 360-degree washers are removed from both sides of the pipe.

## Adjustment phase:

This step moves the outermost layer of the surface farther from the connection, by applying force on the pipe's shape to distance it from the heated area under high pressure. The process is considered complete when the dislodged material forms a noticeable ring.

## Heating phase:

While undergoing the heating process, the pipe maintains contact with the heated surface at low pressure. This enables the heat to permeate into the pipe's molecular structure without causing the PP-R material to shift. The table below provides information on heating hours (and any other reported time).

## Welding phase:

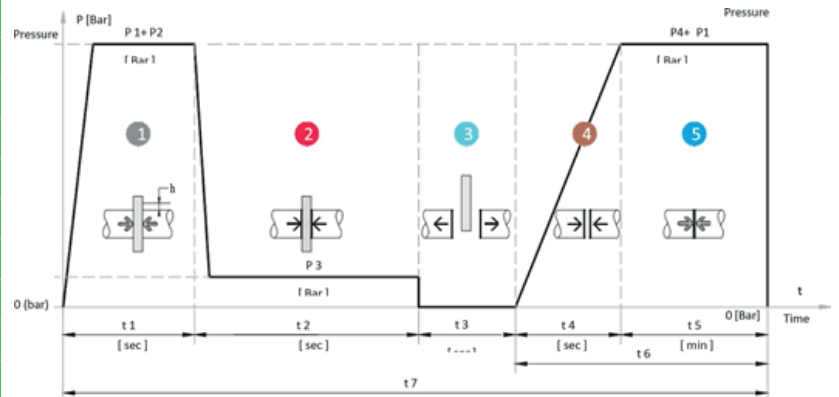
Upon removing the iron, the two heated pipes are connected at their highest pressure point. It is crucial to join these pipes within the designated transition period and maintain the combined pressure ( $P1 + P4$ ) during the welding process.

## Cooling phase:

During the fusion process, maintain the connection at the combined pressure of  $P1$  and  $P4$  for at least half the cooling duration. Afterward, the merged tubes can be taken out of the jaws; however, they must be sustained until the end of the cooling period. If a pipe cannot be properly supported, it must endure full pressure throughout the entire cooling phase.

## PP-R BUTT WELDING DESIGN AND TABLE

|         |                              |
|---------|------------------------------|
| SDR     | STANDER DIMENSIONAL RATIO    |
| D       | OUTER PIPE DIMENSION         |
| s       | PIPE WALL THICKNESS          |
| T       | TEMPERATURE OF WELDING PLATE |
| P1      | Drag pressure                |
| P2      | Interfacial pressure         |
| P3      | Preheating pressure          |
| P4      | Welding and cooling pressure |
| 45296   | Welding phases               |
| t1...t5 | Welding times (sec/min)      |



| SDR | D   | s   | T       | P1  |     | k   | P2  |     | t2  | t3  | t4  | P3 | t5  |
|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|
|     |     |     |         | MPa | Bar |     | MPa | Bar | sec | sec | sec |    | Bar |
| 7.4 | 160 | 21  | 200-220 | 1.4 | 14  | 1.5 | 0.1 | 1   | 233 | 10  | 19  | 14 | 21  |
|     | 200 | 27  |         | 2.2 | 22  | 2   | 0.2 | 2   | 283 | 11  | 23  | 22 | 25  |
| 9   | 160 | 17  |         | 1.2 | 12  | 1   | 0.1 | 1   | 194 | 9   | 16  | 12 | 17  |
|     | 200 | 22  |         | 1.9 | 19  | 1.5 | 0.2 | 2   | 236 | 10  | 19  | 19 | 21  |
| 11  | 160 | 14  |         | 1   | 10  | 1   | 0.1 | 1   | 161 | 8   | 13  | 10 | 14  |
|     | 200 | 18  |         | 1.6 | 16  | 1   | 0.2 | 2   | 198 | 9   | 16  | 16 | 17  |
|     | 250 | 22  |         | 2.4 | 24  | 1.5 | 0.2 | 2   | 240 | 10  | 20  | 24 | 21  |
|     | 315 | 28  |         | 3.9 | 39  | 2   | 0.4 | 4   | 239 | 12  | 24  | 39 | 26  |
| 17  | 160 | 9.5 |         | 0.7 | 7   | 1   | 0.1 | 1   | 108 | 6   | 9   | 7  | 9   |
|     | 200 | 11  |         | 1.1 | 11  | 1   | 0.1 | 1   | 134 | 7   | 11  | 11 | 12  |
|     | 250 | 14  |         | 1.6 | 16  | 1   | 0.2 | 2   | 163 | 8   | 13  | 16 | 14  |
|     | 315 | 18  |         | 2.6 | 26  | 1   | 0.3 | 3   | 203 | 9   | 17  | 26 | 18  |

### THERMAL EXPANSION

In accordance with the fundamental principles of physics, all piping materials undergo dimensional changes when exposed to varying temperatures. This inherent behavior, irrespective of the piping material, should be considered during the installation of the DpTherm polypropylene system.

The alteration in the longitudinal dimension (linear expansion/contraction) predominantly occurs due to the disparity between the operating temperature of the fluid (water) and the surrounding environment's temperature. Length variations can also result from internal pressure, albeit to a lesser extent.

Length change due to heat: The change in length due to heat (linear expansion/contraction) is calculated by the equation :

$$\Delta L = a \cdot L \cdot \Delta T$$

$\Delta L$  = Length variation due to heat (mm)

$a$  = Linear expansion coefficient of the pipe materials (mm/m • K)

$L$  = Calculated pipe length (m)

$T_1$  = Operating temperature of the fluid inside the pipe (K)

$T_2$  = Ambient temperature at the exterior of the pipe (K)

$\Delta T$  = temperature difference ( $\Delta T = T_1 - T_2$ ) (K)

**THE LINEAR EXPANSION COEFFICIENT (A) IS DIFFERENT FOR EACH PIPE TYPE AND STRUCTURE.**

| DP Therm Green Pipes PP-R a=0,07mm/m·k |                            |    |     |     |     |     |     |     |
|--|----------------------------|----|-----|-----|-----|-----|-----|-----|
| Length [m]                             | ( $\Delta T = T_1 - T_2$ ) |    |     |     |     |     |     |     |
|  | 10                         | 20 | 30  | 40  | 50  | 60  | 70  | 80  |
| Linear expansion $\Delta L$ [mm]       |                            |    |     |     |     |     |     |     |
| 5                                      | 4                          | 7  | 11  | 14  | 18  | 21  | 25  | 28  |
| 10                                     | 7                          | 14 | 21  | 21  | 28  | 35  | 42  | 56  |
| 15                                     | 11                         | 21 | 32  | 32  | 42  | 53  | 63  | 84  |
| 20                                     | 14                         | 28 | 42  | 42  | 56  | 70  | 84  | 112 |
| 25                                     | 18                         | 35 | 53  | 53  | 70  | 88  | 105 | 140 |
| 30                                     | 21                         | 42 | 63  | 63  | 84  | 105 | 126 | 168 |
| 35                                     | 25                         | 49 | 74  | 74  | 98  | 123 | 147 | 196 |
| 40                                     | 28                         | 56 | 84  | 84  | 112 | 140 | 168 | 224 |
| 45                                     | 32                         | 63 | 95  | 95  | 126 | 158 | 189 | 252 |
| 50                                     | 35                         | 70 | 105 | 140 | 175 | 210 | 245 | 280 |

| Multi-layer pipe with fiberglass / a=0,030mm/m·k |                            |    |     |     |     |     |     |     |
|--|----------------------------|----|-----|-----|-----|-----|-----|-----|
| Length [m]                                       | ( $\Delta T = T_1 - T_2$ ) |    |     |     |     |     |     |     |
|  | 10                         | 20 | 30  | 40  | 50  | 60  | 70  | 80  |
| Linear expansion $\Delta L$ [mm]                 |                            |    |     |     |     |     |     |     |
| 5  | 4                          | 7  | 11  | 14  | 18  | 21  | 25  | 28  |
| 10   | 7                          | 14 | 21  | 21  | 28  | 35  | 42  | 56  |
| 15   | 11                         | 21 | 32  | 32  | 42  | 53  | 63  | 84  |
| 20   | 14                         | 28 | 42  | 42  | 56  | 70  | 84  | 112 |
| 25   | 18                         | 35 | 53  | 53  | 70  | 88  | 105 | 140 |
| 30   | 21                         | 42 | 63  | 63  | 84  | 105 | 126 | 168 |
| 35   | 25                         | 49 | 74  | 74  | 98  | 123 | 147 | 196 |
| 40   | 28                         | 56 | 84  | 84  | 112 | 140 | 168 | 224 |
| 45   | 32                         | 63 | 95  | 95  | 126 | 158 | 189 | 252 |
| 50   | 35                         | 70 | 105 | 140 | 175 | 210 | 245 | 280 |
| 60   | 18                         | 36 | 54  | 72  | 90  | 108 | 126 | 144 |
| 70   | 21                         | 42 | 63  | 84  | 105 | 126 | 147 | 168 |
| 80   | 24                         | 48 | 72  | 96  | 120 | 144 | 168 | 192 |
| 90   | 27                         | 54 | 81  | 108 | 135 | 162 | 189 | 216 |
| 100  | 30                         | 60 | 90  | 120 | 150 | 180 | 210 | 240 |

## CLASSIFICATION OF INSTALLATIONS.

Considering the thermal expansion caused by temperature variations, we propose several methods to mitigate the impacts of linear expansion across various installation types. We categorize these installations into the following groups:

1. Embedded installations: These include fixtures set within floors or walls, which may require special considerations to manage the effects of thermal expansion.
2. External Visible Installations: These refer to installations that are installed vertically or horizontally on the exterior surfaces of structures. Proper planning and techniques should be applied to address the challenges posed by thermal expansion in these cases.

### EXTERNAL INSTALLATION

In situations where pipes are installed externally, such as in vertical mechanical wells or horizontally on rooftops, it is essential to implement compensatory measures. These measures should allow or restrict movement depending on the specific situation. Proper installation should ensure stability and maintain an aesthetically pleasing appearance. To achieve optimal control, the linear expansion or contraction length should not exceed 50mm between two fixed points (FP)

### IN LONG STRAIGHT LINES, IT IS RECOMMENDED TO APPLY EXPANSION ARRANGEMENTS PER:

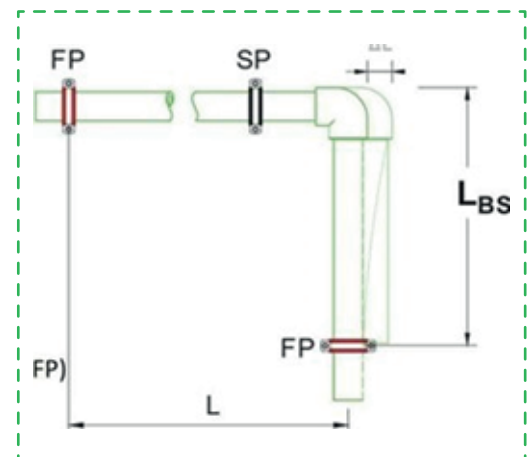
- 10m for Green Pipes
- 40m for Pipe with glass fiber

Flexible arm arrangement.

In many instances, the flexible arm arrangement serves as a means to accommodate thermal expansion in straight sections. This adaptable design is crucial for maintaining structural integrity. To determine the length of the flexible arm (LBS), refer to the provided calculation tables on the subsequent pages. Alternatively, the equation can be used to calculate LBS, ensuring optimal performance.

$$L = \sqrt{(de \cdot \Delta L)}$$

Where:





L = Required length of flexible arm (mm)

C = Dp therm polypropylene material constant (15,0)

de = Outer pipe dimension (mm)

$\Delta L$  = Length variation due to heat (mm)

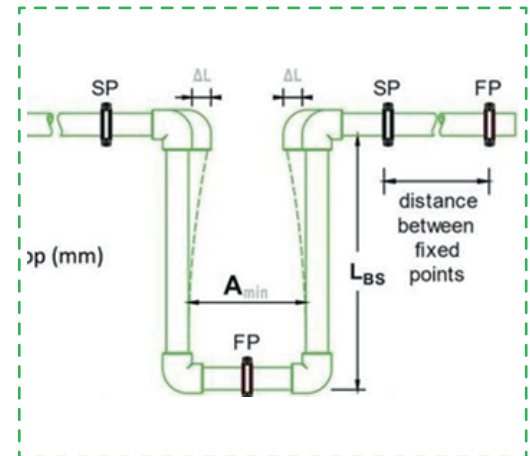
SP = Slippery fixing point

L = Length of straight section extending between the (FP) and the change of direction

### OMEGA LOOP EXPANSION

If the linear expansion cannot be compensated by the changes in direction, it is necessary to install an omega loop, using straight pipe sections and four 90° elbows.

In this arrangement, the required length of the flexible arm 18 should be calculated, as well as the minimum bending width (A).



The minimum bending width (A) is calculated by the equation:

$$A_{min} = 2 \cdot \Delta L + SG$$

Where:

A<sub>min</sub> = Minimum bending width of omega loop (mm)

$\Delta L$  = Length variation due to heat

SG = Safety distance 150 (mm)

L = Length of straight section extending between two fixed points (FP)

### LENGTH OF FLEXIBLE ARM LBS

The flexible arm length LBS is obtained from the following table for each pipe dimension and predetermined linear expansion value.

| Pipe Dim | Linear Expansion $\Delta L$ [mm] |     |      |      |      |      |      |      |      |      |      |      |
|----------|----------------------------------|-----|------|------|------|------|------|------|------|------|------|------|
|          | 10                               | 20  | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  |
|          | Bending side length LBS          |     |      |      |      |      |      |      |      |      |      |      |
| 20       | 212                              | 300 | 367  | 424  | 474  | 520  | 561  | 600  | 636  | 671  | 704  | 735  |
| 25       | 237                              | 335 | 411  | 474  | 530  | 581  | 627  | 671  | 712  | 750  | 787  | 822  |
| 32       | 268                              | 379 | 465  | 537  | 600  | 657  | 710  | 759  | 805  | 849  | 890  | 930  |
| 40       | 300                              | 424 | 520  | 600  | 671  | 735  | 794  | 849  | 900  | 949  | 995  | 1039 |
| 50       | 335                              | 474 | 581  | 671  | 750  | 822  | 887  | 949  | 1006 | 1061 | 1112 | 1162 |
| 63       | 376                              | 532 | 652  | 753  | 842  | 922  | 996  | 1065 | 1129 | 1191 | 1249 | 1304 |
| 75       | 411                              | 581 | 712  | 822  | 919  | 1006 | 1087 | 1162 | 1232 | 1299 | 1362 | 1423 |
| 90       | 450                              | 636 | 779  | 900  | 1006 | 1102 | 1191 | 1273 | 1350 | 1423 | 1492 | 1559 |
| 110      | 497                              | 704 | 862  | 995  | 1112 | 1219 | 1316 | 1407 | 1492 | 1573 | 1650 | 1723 |
| 125      | 530                              | 750 | 919  | 1061 | 1186 | 1299 | 1403 | 1500 | 1591 | 1677 | 1759 | 1837 |
| 160      | 600                              | 849 | 1039 | 1200 | 1342 | 1470 | 1587 | 1697 | 1800 | 1897 | 1990 | 2078 |

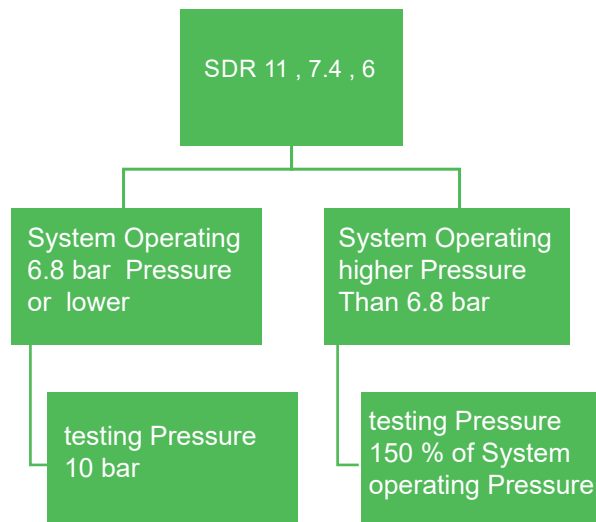
## STANDARD PRESSURE TESTING PROCEDURE

Dp therm provides an extensive warranty to safeguard against damages resulting from manufacturing defects. Dp therm mandates that all installations undergo pressure testing in accordance with the following guidelines, and proof of the pressure test must be submitted to Dp therm prior to the warranty’s activation. Warranty coverage commences only after the pressure test is properly executed and submitted. Dp therm’s warranty does not encompass failures attributed to incorrect installation, operation beyond recommended parameters, freeze damage, or mishandling post-manufacturing. Additionally, the Dp therm warranty does not cover elastomeric components (seals, gaskets, O-rings), components produced by other manufacturers, or connections to non-Dp therm systems or components.

### STEP 1: DETERMINE YOUR TESTING PRESSURE.

To maintain the integrity of heat fusion connections, it is essential to conduct a pressure test on the fully assembled system. The pressure level employed should correspond with the pipe type and the intended application pressure.

- If the piping system has a mixture of SDR pipe, you should test to the higher SDR’s (thinner walled pipe’s) testing requirements. For example, if the piping system contains SDR 11 pipe and SDR 7.4 piping, you should test to the requirements of the SDR 11 piping.
- If the system contains only SDR 11 or heavier-walled pipe (lower SDR) and has an intended operating pressure of 6.8 bar or less, the system must be tested at 10 bar.
- If the system contains only SDR 11 or heavier-walled pipe (lower SDR) and has an intended operating pressure higher than 6.8 bar, the system must be tested at 150% of the intended operating pressure.



The following are maximum testing pressures for high-rise buildings or high-pressure systems. The maximum testing pressures should not exceed the following:

| Dp therm Pipe | Maximum Test Pressure Allowed |
|---------------|-------------------------------|
| PP-R SDR 6    | 32.5 bar                      |
| PP-R SDR 7.4  | 25 bar                        |
| PP-R SDR 11   | 18.5 bar                      |

### STEP 2: DETERMINE YOUR TESTING MEDIUM

Water is the primary medium for testing, as it is incompressible. This makes it ideal for various applications. However, under specific circumstances, low pressure (1 bar or less) air testing can be employed to detect leaks and open-end pipes. It is crucial to avoid using compressed air alone on any piping system unless it is specifically designed for such use and properly safeguarded and contained to prevent severe ruptures, injuries, or damage to nearby equipment and structures.

- If the system is intended for compressed air service, only compressed air may be used for the pressure test, regardless of the following restrictions.

- If the testing pressure is equal to or less than 10 bar, you may test with water only, or with an air-over-water combination system (water-filled piping, with air as pressure source and air separated from water).

If the testing pressure exceeds 10 bar, the test must be performed using water only. Compressed air alone is not approved for systems with a testing pressure higher than a 1 bar leak test, unless those systems are intended for compressed air service.

### STEP 3: OBSERVE SAFETY PROTOCOLS

The DP Therm warranty becomes effective only after the pressure test is concluded and submitted, before the system is operational. Consequently, it is crucial for the tester to adhere to all safety guidelines provided by DP Therm until the testing process is fully accomplished.

For all systems:

- Examine the DP Therm connections for indications of correct fusion, adhering to the instructions provided in the DP Therm Installer Manual. Socket connections should display two even rings of melted plastic, along with a visible depth mark.

Meanwhile, butt welded connections should have a single bead with a rounded top. This inspection is most efficiently conducted during the fusion process. The absence of these features might suggest an improper fusion.

- Remove all fusion equipment from the system before starting the pressure test.
- Set your pressure gauge near the lowest point<sup>3</sup> of the system, where the pressure will be highest. This reduces the risk of over pressurizing the system.
- Observe the system during the test for any indications of leaks. If a leak is found, relieve all test pressure and repair the leak before continuing.

#### **Additionally, when using compressed air as the pressure source:**

- Stand clear of the pipe during testing and warn others nearby to do the same. Take measures to secure all<sup>3</sup> sections of the pipe in case a rupture does occur.
- Should any transition joints leak during testing, check the joints for proper assembly and repeat the test using water before replacing any of the fittings.
- Always take precautions to eliminate hazards to persons near lines being tested. For the entire duration of the procedure and any subsequent retesting, only authorized persons that are conducting the test or inspecting the piping section being tested should be allowed in the proximity of the section under test. Caution all personnel to stay well clear of the pipe unless checking for leaks.
- For the entire duration of the procedure, the test section and the work area around the test section and equipment shall be supervised or secured with barricades and warnings so that unauthorized persons are kept at a safe distance away.
- A failure in the piping system or mechanical components and connections may result in a sudden, violent, uncontrolled, and dangerous movement of the system piping, or components, or parts of components.

#### **STEP 4: PERFORM THE TEST.**

Follow the steps in the order indicated below. Use a pressure test gauge that is accurate to within 0.5 psi. (Record the results on the pressure test form)

## CYCLIC PRESSURE TEST:

1. Release any existing pressure from the system.
2. Bring the system up to test pressure for two minutes.
3. Reduce the system pressure to 15 psi for two minutes.
4. Release the pressure from the system.
5. Bring the system up to test pressure for two minutes.
6. Reduce the system pressure to 15 psi for two minutes.
7. Release the pressure from the system.
8. Bring the system up to test pressure for two minutes.
9. Reduce the system pressure to 15 psi for two minutes.
10. Release the pressure from the system.
11. Bring the system up to test pressure for five minutes.
12. Reduce the system pressure to 15 psi for five minutes.
13. Release the pressure from the system.

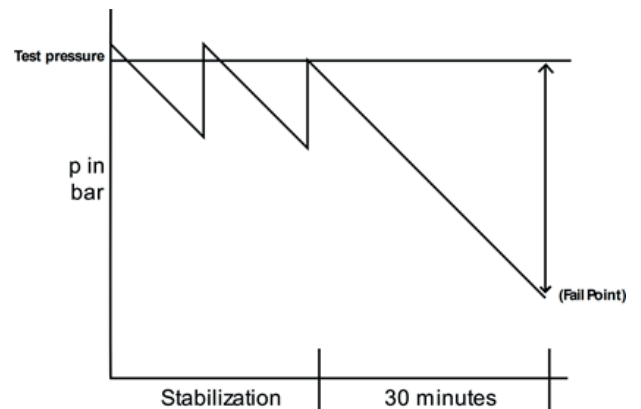
• A successful version of this test must be completed before proceeding. This test is intended to expand and stress the system and joints, so additional pump pressure may be necessary to maintain the test pressure initially. Any significant loss of pressure or inability to maintain the test pressure should be investigated for leaks, damage, entrapped air or equipment malfunction.



### 30-MINUTES TEST:

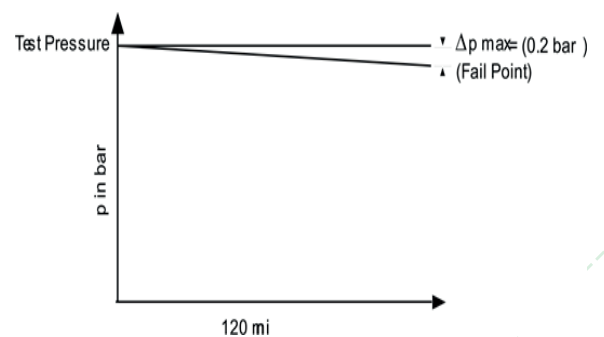
Bring the system up to the test pressure.

- The system will expand slightly once it is up to pressure, so additional pressure may be required to help it stabilize.
- Once the system stabilizes, observe it for 30 minutes. The system should be able to hold the test pressure during that time.
- The loss of more than 0.5 bar or steadily decreasing pressure during this test is indicative of a leak. If a leak occurs, identify the leak and repair the system then repeat this test.
- If the system does not stabilize properly, but no leak is found, then there is likely entrapped air in the piping. Inspect the system for high points or other locations where filling may have entrapped air and ensure all air is removed from the piping system.
- A successful version of this test must be completed before proceeding.



### 2-HOURS TEST:

- In case the system experiences a pressure drop within a 30-minute timeframe, restore it to the designated test pressure level.
- Monitor the system for 120 minutes. It must maintain the maximum test pressure throughout this period .
- A pressure drop exceeding 0.2 bar or a continuous decrease during the test suggests a leak. To proceed, locate and fix the leak, ensuring the system is leak-free. The test should demonstrate less than 0.2 bar pressure loss and maintain stability at this level.



## STEP 5: COMPLETE AND SUBMIT THE PRESSURE TEST RECORD

# TEST RECORD

Description of the installation

Place: \_\_\_\_\_

Object: \_\_\_\_\_

Pipe-lengths:

Ø 16 mm \_\_\_\_\_ m  
 Ø 20 mm \_\_\_\_\_ m  
 Ø 25 mm \_\_\_\_\_ m  
 Ø 32 mm \_\_\_\_\_ m  
 Ø 40 mm \_\_\_\_\_ m  
 Ø 50 mm \_\_\_\_\_ m  
 Ø 63 mm \_\_\_\_\_ m  
 Ø 75 mm \_\_\_\_\_ m  
 Ø 90 mm \_\_\_\_\_ m  
 Ø 110 mm \_\_\_\_\_ m  
 Ø 125 mm \_\_\_\_\_ m

Highest point:

\_\_\_\_\_ m  
(over manometer)

Start of the test: \_\_\_\_\_

End of the test: \_\_\_\_\_

Test period: \_\_\_\_\_

Contractor: \_\_\_\_\_

Client: \_\_\_\_\_

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Stamp/Signature \_\_\_\_\_

Preliminary test

max. working pressure x 1.5 \_\_\_\_\_ bar

Pressure drop after 30 minutes: \_\_\_\_\_ bar  
(max.0,6 bar)

Result preliminary test: \_\_\_\_\_

Principal test

Working pressure: \_\_\_\_\_ bar  
(Ergebnis Vorprüfung)

Pressure after 2 hours: \_\_\_\_\_ bar  
(max.0,2 bar)

Result principal test: \_\_\_\_\_

Final test\*

1. Working pressure 10 bar: \_\_\_\_\_ bar  
at least 2 minutes, then  
Working pressure 1 bar: \_\_\_\_\_ bar  
at least 2 minutes

2. Working pressure 10 bar: \_\_\_\_\_ bar  
at least 2 minutes, then  
Working pressure 1 bar: \_\_\_\_\_ bar  
at least 2 minutes

3. Working pressure 10 bar: \_\_\_\_\_ bar  
at least 2 minutes, then  
Working pressure 1 bar: \_\_\_\_\_ bar  
at least 2 minutes

4. Working pressure 10 bar: \_\_\_\_\_ bar  
at least 5 minutes, then  
Working pressure 1 bar: \_\_\_\_\_ bar  
at least 5 minutes

\* Unpressurize the pipe between each cycle.







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