

PE PIPE





INTRODUCTION

PE material exhibits a lot of advantages over traditional materials for pressure pipe applications. PE pipe also applicable for sewerage, drainage, sub-duct for electrical & telecommunication cabling

GENERAL SPECIFICATION

Material:
PE100

Certified Standard:

Water Pipe:

MS1058: PART 2: 2005

ISO4427: PART 2: 2019

TNB:

Certified Supplier of Tenaga Nasional

Gas Pipe:

MS1086: PART 2: 2007

ISO4437: PART 2: 2014

Size:

20mm through 630mm availability

Pressure Rating:

PN6, PN8, PN10, PN12.5, PN16, PN20

Colour:

Water Supply:

Black with blue stripes

Electrical (TNB):

Red

Telecommunication:

Black, Black with Orange stripes

Sewer:

Black with Brown stripes

Gas:

Yellow

ADVANTAGE

- Corrosion Resistance : PE pipes are corrosion free
- Flexibility : Allows good conformity to most terrain contour
- Long Length and availability in coil (up to 125mmOD) : Enable jointless laying of longer pipe line
- Resistance to abrasion: Ability to handle many types of slurries and other abrasive elements
- Superior Flow: Smooth interior surface ensures good flow of water and prevent crust formation on the pipe
- Dampen/ Eliminate Water Hammer : Can withstand higher transient pressure than conventional pipes because of greater elasticity
- Tough and Durable: Has higher impact strength
- Lower Overall Cost: Significant cost saving in terms of transportation, cheaper installation and maintenance.
- Light Weight: 6-10 times lighter than conventional pipes
- Fully Welded Leak Free joints

APPLICATION

- Water Supply
- Sewerage
- Drainage
- Sub-duct for electrical and telecommunication cabling
- Gas Supply



DESIGN CONSIDERATION

- PE pipe is produced using an extrusion process, nominal pipe diameters DN refer to the external diameter, OD
- Pipe internal diameter (ID) necessary for the flow capacity required.
- Maximum operation pressure on the pipeline
- **Service temperature :**
 - For water pipe: 20°C as a reference temperature

Note : For application operating at constant temperatures greater than 20°C and up to 40°C a pressure reduction coefficient as given in table below may be applicable:

| Temperature (°C) | Coefficient |
|------------------|-------------|
| 20 | 1.00 |
| 30 | 0.87 |
| 40 | 0.74 |

- For other temperatures between each step, interpolation is permitted
 - For gas pipe: not exceeding 35°C
- Material: PE100
 - Designations PE100 are based on minimum required strength (MRS) which means the long-term strength of the respective materials in accordance to ISO 12162.

| Material Designation | Minimum Required Strength (MRS) MPa |
|----------------------|--|
| PE100 | 10.0 |

- PE100 has higher elastic modulus, yield stress, strain hardening modulus and viscous stress.
- Suggested Manning's n Value
 - For clear water application n = 0.009
 - For sanitary sewer application n = 0.010

STANDARD DETAILS

SPIROLITE PE PIPE WEIGHT CHART (PE100)

PE 100

| SDR | 26 | 21 | 17 | 13.6 | 11 | 9 | | | | | | | |
|-----------------------------|------|--------|------|--------|------|--------|------|--------|-------|---------|-------|--------|-------|
| PN | 6 | 8 | 10 | 12.5 | 16 | 20 | | | | | | | |
| MINIMUM WALL THICKNESS (mm) | | | | | | | | | | | | | |
| OD(mm) | mm | kg/m | mm | kg/m | mm | kg/m | mm | kg/m | mm | kg/m | mm | kg/m | |
| 20 | | | | | | | | | 2.0 | 0.117 | 2.3 | 0.133 | |
| 25 | | | | | | | | 2.0 | 0.149 | 2.3 | 0.171 | 3.0 | 0.212 |
| 32 | | | | | 2.0 | 0.194 | 2.4 | 0.231 | 3.0 | 0.279 | 3.6 | 0.328 | |
| 40 | | | 2.0 | 0.246 | 2.4 | 0.295 | 3.0 | 0.362 | 3.7 | 0.431 | 4.5 | 0.512 | |
| 50 | 2.0 | 0.311 | 2.4 | 0.373 | 3.0 | 0.453 | 3.7 | 0.550 | 4.6 | 0.669 | 5.6 | 0.793 | |
| 63 | 2.5 | 0.492 | 3.0 | 0.578 | 3.8 | 0.722 | 4.7 | 0.877 | 5.8 | 1.057 | 7.1 | 1.266 | |
| 75 | 2.9 | 0.674 | 3.6 | 0.828 | 4.5 | 1.019 | 5.6 | 1.242 | 6.8 | 1.476 | 8.4 | 1.779 | |
| 90 | 3.5 | 0.978 | 4.3 | 1.188 | 5.4 | 1.465 | 6.7 | 1.780 | 8.2 | 2.139 | 10.1 | 2.566 | |
| 110 | 4.2 | 1.435 | 5.3 | 1.782 | 6.6 | 2.180 | 8.1 | 2.636 | 10.0 | 3.172 | 12.3 | 3.813 | |
| 125 | 4.8 | 1.848 | 6.0 | 2.278 | 7.4 | 2.780 | 9.2 | 3.397 | 11.4 | 4.115 | 14.0 | 4.932 | |
| 160 | 6.2 | 3.060 | 7.7 | 3.741 | 9.5 | 4.555 | 11.8 | 5.553 | 14.6 | 6.732 | 17.9 | 8.044 | |
| 180 | 6.9 | 3.809 | 8.6 | 4.699 | 10.7 | 5.760 | 13.3 | 7.046 | 16.4 | 8.506 | 20.1 | 10.175 | |
| 200 | 7.7 | 4.726 | 9.6 | 5.825 | 11.9 | 7.111 | 14.7 | 8.645 | 18.2 | 10.495 | 22.4 | 12.587 | |
| 225 | 8.6 | 5.938 | 10.8 | 7.360 | 13.4 | 9.019 | 16.6 | 10.977 | 20.5 | 13.282 | 25.2 | 15.930 | |
| 250 | 9.6 | 7.357 | 11.9 | 9.006 | 14.8 | 11.052 | 18.4 | 13.522 | 22.7 | 16.334 | 27.9 | 19.577 | |
| 280 | 10.7 | 9.177 | 13.4 | 11.370 | 16.6 | 13.885 | 20.6 | 16.943 | 25.4 | 20.478 | 31.3 | 24.609 | |
| 315 | 12.1 | 11.691 | 15.0 | 14.288 | 18.7 | 17.583 | 23.2 | 21.473 | 28.6 | 25.922 | 35.2 | 31.132 | |
| 355 | 13.6 | 14.775 | 16.9 | 18.142 | 21.1 | 22.379 | 26.1 | 27.225 | 32.2 | 32.907 | 39.7 | 39.540 | |
| 400 | 15.3 | 18.735 | 19.1 | 23.133 | 23.7 | 28.282 | 29.4 | 34.524 | 36.3 | 41.777 | 44.7 | 50.155 | |
| 450 | 17.2 | 23.688 | 21.5 | 29.254 | 26.7 | 35.832 | 33.1 | 43.731 | 40.9 | 52.902 | 50.3 | 63.504 | |
| 500 | 19.1 | 29.225 | 23.9 | 36.098 | 29.7 | 44.280 | 36.8 | 53.967 | 45.4 | 65.285 | 55.8 | 78.262 | |
| 560 | 21.4 | 36.634 | 26.7 | 45.180 | 33.2 | 55.472 | 41.2 | 67.708 | 50.8 | 81.787 | | | |
| 630 | 24.1 | 46.418 | 30.0 | 57.073 | 37.4 | 70.258 | 46.3 | 85.580 | 57.2 | 103.625 | | | |

OD : Outer Diameter
SDR : Standard Dimension Ratio
PN : Nominal Pressure

STANDARD LENGTH

Pipes from 20mm to 32mm OD supplied in coils of 100 metres of straight length of 6 or 12 meters.

Pipes from 40mm to 110mm OD supplied in coils of 50 and 100 metres or straight length of 6 or 12 meters.

Pipes from 110mm to 630mm OD supplied in straight length of 6 and 12 meters.

STANDARD DETAILS

PE TNB RED PIPE

**Note:**

- Installation method by Horizontal Directional Drilling (HDD) recommend to refer Table PE 80 Wall thickness Table
- Installation method by Open Trench recommend to refer Table PE 100 Wall thickness Table
- Joining sockets are available upon request.

PE 80

| SDR | 13.6 | | 11 | | | |
|---------------------|----------|----------|---------------|----------|----------|---------------|
| PN | 10 | | 12.5 | | | |
| WALL THICKNESS (mm) | | | | | | |
| OUTER DIAMETER (mm) | Min (mm) | Max (mm) | Weight (kg/m) | Min (mm) | Max (mm) | Weight (kg/m) |
| 110 | 8.1 | 9.1 | 2.617 | 10.0 | 11.1 | 3.149 |
| 160 | 11.8 | 13.1 | 5.513 | 14.6 | 16.2 | 6.683 |
| 180 | 13.3 | 14.8 | 6.994 | 16.4 | 18.2 | 8.444 |
| 200 | 14.7 | 16.3 | 8.582 | 18.2 | 20.2 | 10.418 |
| 315 | 23.2 | 25.7 | 21.316 | 28.6 | 31.6 | 25.733 |

PE 100

| SDR | 17 | | 13.6 | | | |
|---------------------|----------|----------|---------------|----------|----------|---------------|
| PN | 10 | | 12.5 | | | |
| WALL THICKNESS (mm) | | | | | | |
| OUTER DIAMETER (mm) | Min (mm) | Max (mm) | Weight (kg/m) | Min (mm) | Max (mm) | Weight (kg/m) |
| 110 | 6.6 | 7.4 | 2.180 | 8.1 | 9.1 | 2.636 |
| 160 | 9.5 | 10.6 | 4.555 | 11.8 | 13.1 | 5.553 |
| 180 | 10.7 | 11.9 | 5.760 | 13.3 | 14.8 | 7.046 |
| 200 | 11.9 | 13.2 | 7.111 | 14.7 | 16.3 | 8.645 |
| 315 | 18.7 | 20.7 | 17.583 | 23.2 | 25.7 | 21.473 |

STANDARD DETAILS

PE TELEKOM BLACK PIPE

**Note:**

- Installation method by Horizontal Directional Drilling (HDD) recommend to refer Table PE 80 Wall thickness Table
- Installation method by Open Trench recommend to refer Table PE 100 Wall thickness Table
- Joining sockets are available upon request.

PE 80

| | | | | | | |
|----------------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|
| SDR | 13.6 | | | 11 | | |
| PN | 10 | | | 12.5 | | |
| WALL THICKNESS (mm) | | | | | | |
| OUTER DIAMETER (mm) | Min (mm) | Max (mm) | Weight (kg/m) | Min (mm) | Max (mm) | Weight (kg/m) |
| 110 | 8.1 | 9.1 | 2.617 | 10.0 | 11.1 | 3.149 |
| 160 | 11.8 | 13.1 | 5.513 | 14.6 | 16.2 | 6.683 |
| 180 | 13.3 | 14.8 | 6.994 | 16.4 | 18.2 | 8.444 |

PE 100

| | | | | | | |
|----------------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|
| SDR | 17 | | | 13.6 | | |
| PN | 10 | | | 12.5 | | |
| WALL THICKNESS (mm) | | | | | | |
| OUTER DIAMETER (mm) | Min (mm) | Max (mm) | Weight (kg/m) | Min (mm) | Max (mm) | Weight (kg/m) |
| 110 | 6.6 | 7.4 | 2.180 | 8.1 | 9.1 | 2.636 |
| 160 | 9.5 | 10.6 | 4.555 | 11.8 | 13.1 | 5.553 |
| 180 | 10.7 | 11.9 | 5.760 | 13.3 | 14.8 | 7.046 |

JOINTING

1) Mechanical Joint by Compression Fitting

Mechanical joint is using compression fitting type to perform the jointing. Compression fitting designed with many mechanical small parts which can hold the pipe tightly by using the compression force. This fitting maximum can go up to 4 inch (110mm) diameter only. Usually this will use for indoor purpose. supply upon request.

2) Butt Fusion Joint by Butt Fusion Fittings



The most widely used method for joining individual lengths of PE pipe and pipe to PE fittings is by heat fusion of the pipe butt ends. Lesso brand is available to supply upon request.

3) Butt Fusion Joint by Fabricated Fittings



Fabricated fittings usually will be use for larger diameter of PE pipe and pipe to PE fittings is by heat fusion of the pipe butt ends. Lesso brand is available to supply upon request.

4) Electrofusion



Electrofusion is a method of joining PE pipe using electrofusion fittings that have built-in electric heating elements which are used to weld and join the pipes and fittings together. Lesso brand is available to supply upon request.



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