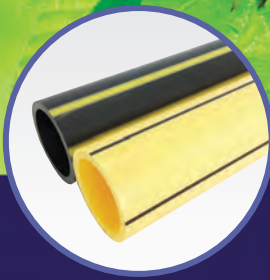


# COSMO I&D



**COSMO I&D PE PIPE Total Solution Prvider**

We will provide One-Stop Service

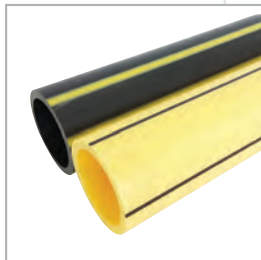


## COSMO I&D PE PIPE Total Solution Prvider

We will provide One-Stop Service

### MAIN PRODUCTS

- PE pipe for water supply
- PE pipe for gas supply
- PE pipe for sewage supply
- PE fittings for heat fusion
- PE fittings for electronic fusion
- PE Ball valve for gas supply
- PE Ball valve for water supply
- Automatic/Manual fusion machine
- Electronic fusion machine
- Mold design and manufacture
- Installation tool



## COMPANY HISTORY

- 1987. 5 Establishment of COSMO I&D. CO., LTD.
- 1994. 8 Screw and fusion type mold design and manufacturing
- 1996. 6 ISO9002 certification
- 1999. 8 KS M 3411 certification of polyethylene coupling pipe for waterworks
- 2003. 1 Production of polyethylene coupling pipe for gas
- 2003.10 KS M 3515 certification of polyethylene coupling pipe for gas
- 2003.10 Development and production of E/F coupling pipe mold for gas
- 2006. 3 Development of e-sewage collection unit, rainwater collection unit, small-sized manhole, and fusion socket
- 2006. 9 Certification for environment new technology in environment part (No.182)
- 2006. 9 KSM 3408-3 certification of polyethylene coupling pipe for waterworks
- 2007. 4 KSM ISO 8085-2 (KSA) certified for polyethylene coupling pipe for gas - part 2. spigot coupling pipe
- 2007. 4 KSM ISO 8085-3 (KSA) certified for polyethylene coupling pipe for gas - part 3. electro fusion coupling pipe
- 2008. 8 Acquisition of venture company certification
- 2010. 8 Acquisition of INNO-BIZ certification
- 2011. 6 Shifted of factory (Jeonui-Myen)
- 2013. 1 Changed a company name(COSMO I&D CO., Ltd)
- 2013. 2 Established Annex research institute of Cosmo I&D Co.,Ltd
- 2014. 4 Acquired ISO 14001
- 2015. 1 Acquired PE valve KS for gas and water supply



## Characteristics of PE PIPE

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### Sanitation

PE water pipes do not contain Fe and toxic substance. PE water pipes are ideal for hygienic water supply.

### Flow characteristics

Smooth inner surface of PE water pipes allows more amounts of fluid to be carried off than other pipes that have same diameter.

### Flexibility

PE water pipes are easy to arrange in rugged terrain and at low temperature.

### Light weight

Light weight makes it easy to deliver, treat and lay pipes.

### Joint characteristics

PE water pipes are easy to arrange quickly and perfectly by using BUTT FUSION.

### Corrosion Resistance

PE water pipes do not erode/corrode.

### Impact Resistance

PE water pipes are designed to bear impacts from outside so that they do not be damaged when the ground subsides

### Cold-weather resistance

There is no deterioration or destruction until the temperature falls below -80°C.

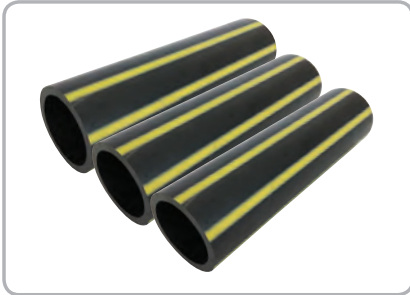
### Abrasion Resistance

PE water pipes remain resistant to abrasion when they carry off various kinds of SLURRY.

### Economical Efficiency

A PE water piping system force main pays for itself quickly because of lower energy costs, pipe longevity and overall reduced maintenance.

## Mechanical & Physical characteristics of PE PIPE for gas



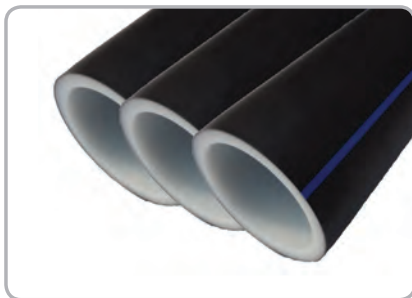
| Test items  | Unit                | Quality standards   | Test Condition                             | Test method(s)                             |
|---|---------------------|---|--|--|
| Hydrostatic strength                                    | hr                  | No failure of any test piece during test period                             | 20°C 100h<br>PE80 10.0MPa<br>PE100 12.4MPa | KS M ISO 1167                              |
|   |                     |   | 80°C 165h<br>PE80 4.5MPa<br>PE100 5.4MPa   |  |
|   |                     |   | 80°C 1000h<br>PE80 4.0MPa<br>PE100 5.0MPa  |  |
| Elongation at break                                     | %                   | ≥ 350   | -  | KS M ISO 6259-1<br>KS M ISO 6259-3         |
| Resistance to weathering (for non-black compounds only) | -                   | Weathering and Thermal stability<br>Hydrostatic strength(165h/80°C)         | E ≥ 3.5 GJ/m                               | ISO 1167<br>ISO 6259-3<br>KS M ISO/TR10837 |
| Rapid Crack Propagation (RCP)                           | Full Scale(FS) Test | Critical Pressure ≥ MOPX1.5   | 0°C  | ISO 13477                                  |
|   | S4 Test             | Critical Pressure ≥ MOPX2.4-0.072   |  |  |
| Slow Crack Growth (SCG) (en≥5mm)                        | hr                  | 165   | 80°C, 8.0MPa<br>80°C, 9.2MPa               | ISO 13479                                  |
| Density   | kg/m <sup>3</sup>   | ≥ 930   | 23°C                                       | KS M ISO 1183<br>KS M ISO 1872-1           |
| Thermal stability                                       | minute              | ≥ 20  | 200°C                                      | KS M ISO 11357-6                           |
| Melt Flow rate  | g/10min             | 1) ≤ 20% in change by processing<br>2) ± 30% of value nominated by producer | 190°C                                      | ISO 4440-1                                 |
| Heat reversion  | %                   | ≤ 3%, no effect on surface  | 110°C                                      | ISO 2505-1, -2                             |

## Polyethylene Pipe for the supply of gaseous fuels

- Usage Gaseous fuels supply
- ISO 4437 specification

| Nominal diameter | O.D (mm) | SDR 11    | SDR 13.6 | SDR 17 | SDR 21 |
|------------------|----------|-----------|----------|--------|--------|
|                  |          | Thickness |          |        |        |
|                  |          | emin      | emin     | emin   | emin   |
| 20               | 20       | 2.3       | -        | -      | -      |
| 25               | 25       | 2.3       | 2.0      | -      | -      |
| 32               | 32       | 3.0       | 2.4      | 2.0    | -      |
| 40               | 40       | 3.7       | 3.0      | 2.4    | 2.0    |
| 50               | 50       | 4.6       | 3.7      | 3.0    | 2.4    |
| 63               | 63       | 5.8       | 4.7      | 3.8    | 3.0    |
| 75               | 75       | 6.8       | 5.6      | 4.5    | 3.6    |
| 90               | 90       | 8.2       | 6.7      | 5.4    | 4.3    |
| 110              | 110      | 10.0      | 8.1      | 6.6    | 5.3    |
| 125              | 125      | 11.4      | 9.2      | 7.4    | 6.0    |
| 140              | 140      | 12.7      | 10.3     | 8.3    | 6.7    |
| 160              | 160      | 14.6      | 11.8     | 9.5    | 7.7    |
| 180              | 180      | 16.4      | 13.3     | 10.7   | 8.6    |
| 200              | 200      | 18.2      | 14.7     | 11.9   | 9.6    |
| 225              | 225      | 20.5      | 16.6     | 13.4   | 10.8   |
| 250              | 250      | 22.7      | 18.4     | 14.8   | 11.9   |
| 280              | 280      | 25.4      | 20.6     | 16.6   | 13.4   |
| 315              | 315      | 28.6      | 23.2     | 18.7   | 15.0   |
| 355              | 355      | 32.2      | 26.1     | 21.1   | 16.9   |
| 400              | 400      | 36.4      | 29.4     | 23.7   | 19.1   |
| 450              | 450      | 40.9      | 33.1     | 26.7   | 21.5   |
| 500              | 500      | 45.5      | 36.8     | 29.7   | 23.9   |
| 560              | 560      | 50.9      | 41.2     | 33.2   | 26.7   |
| 630              | 630      | 57.3      | 46.3     | 37.4   | 30.0   |

## Mechanical & Physical characteristics of PE PIPE for water



| Test items                | Unit   | Quality standards                               | Test Condition                             | Test method(s)                     |
|---------------------------|--------|---|--|------------------------------------|
| Hydrostatic strength      | hr     | No failure of any test piece during test period | 20°C 100h<br>PE80 10.0MPa<br>PE100 12.4MPa | KS M ISO 1167                      |
|                           |        |   | 80°C 165h<br>PE80 4.5MPa<br>PE100 5.4MPa   |                                    |
|                           |        |   | 80°C 1000h<br>PE80 4.0MPa<br>PE100 5.0MPa  |                                    |
| Elongation at break       | %      | ≥ 350   | -  | KS M ISO 6259-1<br>KS M ISO 6259-3 |
| Longitudinal reversion    | %      | ≤ 3   | 110±2°C                                    | KS M ISO 2505-1<br>KS M ISO 2505-2 |
| Melt mass-flow rate (MFR) | %      | Change of MFR by processing ±20                 | 190°C, 5kg                                 | KS M ISO 1133                      |
| Oxidation induction time  | minute | ≥ 20  | 200°C                                      | KS M ISO 11357-6                   |

## Single wall and Double wall PE Pipe for water

- **Usage** Water supply / agricultural water / Plant pipe / industrial water / Sea water supply / Slurry supply / Golf course / swimming pool / fire fighting piping / fishing industry
- **ISO 4427 specification**

|                  |          | Normal Pressure, PN(1)(bar) |      |          |      |        |      |        |      |
|------------------|----------|-----------------------------|------|----------|------|--------|------|--------|------|
| SDR              |          | SDR 11                      |      | SDR 13.6 |      | SDR 17 |      | SDR 21 |      |
| PE80             |          | PN 12.5                     |      | PN 10    |      | PN 8   |      | PN 6   |      |
| PE100            |          | PN16                        |      | PN 12.5  |      | PN 10  |      | PN 8   |      |
| Nominal diameter | O.D (mm) | Thickness                   |      |          |      |        |      |        |      |
|                  |          | emin                        | emax | emin     | emax | emin   | emax | emin   | emax |
| 20               | 20       | 2.0                         | 2.3  | -        | -    | -      | -    | -      | -    |
| 25               | 25       | 2.3                         | 2.7  | 2.0      | 2.3  | -      | -    | -      | -    |
| 32               | 32       | 3.0                         | 3.4  | 2.4      | 2.8  | 2.0    | 2.3  | -      | -    |
| 40               | 40       | 3.7                         | 4.2  | 3.0      | 3.5  | 2.4    | 2.8  | 2.0    | 2.3  |
| 50               | 50       | 4.6                         | 5.2  | 3.7      | 4.2  | 3.0    | 3.4  | 2.4    | 2.8  |
| 63               | 63       | 5.8                         | 6.5  | 4.7      | 5.3  | 3.8    | 4.3  | 3.0    | 3.4  |
| 75               | 75       | 6.8                         | 7.6  | 5.6      | 6.3  | 4.5    | 5.1  | 3.6    | 4.1  |
| 90               | 90       | 8.2                         | 9.2  | 6.7      | 7.5  | 5.4    | 6.1  | 4.3    | 4.9  |
| 110              | 110      | 10.0                        | 11.1 | 8.1      | 9.1  | 6.6    | 7.4  | 5.3    | 6.0  |
| 125              | 125      | 11.4                        | 12.7 | 9.2      | 10.3 | 7.4    | 8.3  | 6.0    | 6.7  |
| 140              | 140      | 12.7                        | 14.1 | 10.3     | 11.5 | 8.3    | 9.3  | 6.7    | 7.5  |
| 160              | 160      | 14.6                        | 16.2 | 11.8     | 13.1 | 9.5    | 10.6 | 7.7    | 8.6  |
| 180              | 180      | 16.4                        | 18.2 | 13.3     | 14.8 | 10.7   | 11.9 | 8.6    | 9.6  |
| 200              | 200      | 18.2                        | 20.2 | 14.7     | 16.3 | 11.9   | 13.2 | 9.6    | 10.7 |
| 225              | 225      | 20.5                        | 22.7 | 16.6     | 18.4 | 13.4   | 14.9 | 10.8   | 12.0 |
| 250              | 250      | 22.7                        | 25.1 | 18.4     | 20.4 | 14.8   | 16.4 | 11.9   | 13.2 |
| 280              | 280      | 25.4                        | 28.1 | 20.6     | 22.8 | 16.6   | 18.4 | 13.4   | 14.9 |
| 315              | 315      | 28.6                        | 31.6 | 23.2     | 25.7 | 18.7   | 20.7 | 15.0   | 16.6 |
| 355              | 355      | 32.2                        | 35.6 | 26.1     | 28.9 | 21.1   | 23.4 | 16.9   | 18.7 |
| 400              | 400      | 36.3                        | 40.1 | 29.4     | 32.5 | 23.7   | 26.2 | 19.1   | 21.2 |
| 450              | 450      | 40.9                        | 45.1 | 33.1     | 36.6 | 26.7   | 29.5 | 21.5   | 23.8 |
| 500              | 500      | 45.4                        | 50.1 | 36.8     | 40.6 | 29.7   | 32.8 | 23.9   | 26.4 |
| 560              | 560      | 50.8                        | 56.0 | 41.2     | 45.5 | 33.2   | 36.7 | 26.7   | 29.5 |
| 630              | 630      | 57.2                        | 63.1 | 46.3     | 51.1 | 37.4   | 41.3 | 30.0   | 33.1 |

(1) PN value is calculated based on design coefficient C=1.25.

## Polyethylene fitting

### PE Heat Fusion Fitting for gas & water supply

PE80/PE100

SDR11, PE100

10bar Gas/16bar water

#### 90° ELBOW (Injection, manufacturing)

| Injection(mm) |     |     | manufacturing fitting |
|---------------|-----|-----|-----------------------|
| 40            | 110 | 225 | 355                   |
| 50            | 125 | 250 | 400                   |
| 63            | 140 | 280 | 450                   |
| 75            | 160 | 315 | 560                   |
| 90            | 200 | 400 | 630                   |



#### 45° ELBOW (Injection, manufacturing)

| Injection(mm) |     | manufacturing fitting |
|---------------|-----|-----------------------|
| 90            | 200 | 355                   |
| 110           | 225 | 400                   |
| 125           | 250 | 450                   |
| 140           | 280 | 560                   |
| 160           | 315 | 630                   |



#### END CAP (Injection)

| Nominal Diameter (mm) |     |     |
|-----------------------|-----|-----|
| 40                    | 110 | 225 |
| 50                    | 125 | 250 |
| 63                    | 140 | 280 |
| 75                    | 160 | 315 |
| 90                    | 200 |     |



## Polyethylene fitting

### TEE

| Injection(mm) |   | manufacturing fitting |              |
|---------------|---|-----------------------|--------------|
| Equal.        | Unequal                                     | Equal.                | Unequal      |
| 50            | 50x40                                       | 355                   | 355x(63~315) |
| 63            | 63x(40, 50)                                 |                       |              |
| 75            | 75x(40, 50, 63)                             |                       |              |
| 90            | 90x(40, 50, 63, 75)                         | 400                   | 400x(63~355) |
| 110           | 110x(40, 50, 63, 75, 90)                    |                       |              |
| 125           | 125x(63, 75, 90, 110)                       |                       |              |
| 140           | 140x(63, 75, 90, 110, 125)                  | 450                   | 450x(63~400) |
| 160           | 160x(50, 63, 75, 90, 110, 125)              |                       |              |
| 200           | 200x(63, 75, 90, 110, 125, 160)             |                       |              |
| 225           | 225x(63, 75, 90, 110, 125, 160)             | 500                   | 500x(63~450) |
| 250           | 250x(63, 75, 90, 110, 125, 160, 180, 225)   |                       |              |
| 280           | 280x(75, 90, 110, 125, 160, 180, 225, 250)  |                       |              |
| 315           | 315x(90, 110, 125, 160, 180, 225, 250, 280) | 630                   | 630x(63~560) |
|               |   |                       |              |



### REDUCER

| Injection(mm)                                      | manufacturing fitting |
|--|-----------------------|
| 63 x 50  | 355x(63~315)          |
| 75 x 63  |                       |
| 90 x (63, 75)                                      | 400x(63~355)          |
| 110 x (63, 75, 90)                                 |                       |
| 125 x (63, 75, 90, 110)                            | 450x(63~400)          |
| 140 x (63, 75, 90, 110, 125)                       |                       |
| 160 x (63, 75, 90, 110, 125, 140)                  |                       |
| 200 x (63, 75, 90, 110, 125, 140, 160)             | 500x(63~450)          |
| 225 x (63, 75, 90, 110, 125, 140, 160, 180)        |                       |
| 250 x (90, 110, 125, 140, 160, 180, 225)           |                       |
| 280 x (90, 110, 125, 140, 160, 180, 225, 250)      | 560x(63~500)          |
| 315 x (90, 110, 125, 140, 160, 180, 225, 250, 280) |                       |
|  | 630x(63~560)          |



### MULTI REDUCER

| Injection(mm)                      |
|------------------------------------|
| 225 x 90, 110, 140, 160            |
| 400 x 160, 225, 280, 315, 355      |
| 630 x 315, 355, 400, 450, 500, 560 |





# Polyethylene fitting

## ○ SADDLE

| Nominal Diameter (mm)                                      |
|--|
| 63 × (75, 90, 110, 125, 140, 160, 200, 225, 250, 280, 315) |
| 90 × (110, 125, 140, 160, 200, 225, 250, 280, 315)         |
| 110 × (125, 140, 160, 200, 225, 250, 280, 315)             |



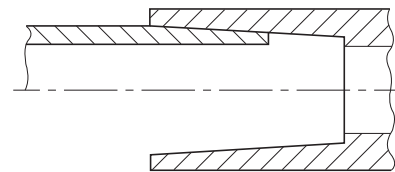
## ○ T/F FITTING

| Injection(mm) |     |     |     |         |
|---------------|-----|-----|-----|---------|
| 63            | 110 | 160 | 250 |         |
| 75            | 125 | 200 | 280 | 90 × 65 |
| 90            | 140 | 225 | 315 |         |



## ○ SOCKET TYPE (Socket fusion fitting)

| Nominal Diameter (mm) |  |
|-----------------------|--|
| 90° ELBOW             | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125   |
| 45° ELBOW             | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125   |
| TEE                   | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125<br>32×25, 40×16, 40×20, 40×25, 40×32, 50×16, 50×20, 50×25,<br>50×32, 50×40, 63×16, 63×20, 63×25, 63×32, 63×40, 63×50,<br>75×50, 75×63                                       |
| END CAP               | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125   |
| COUPLER               | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125   |
| REDUCER               | 20×16, 25×16, 25×20, 32×16, 32×20, 32×25, 40×20, 40×25,<br>40×32, 50×20, 50×25, 50×32, 50×40, 63×25, 63×32, 63×40,<br>63×50, 75×40, 75×50×75×63, 90×50, 90×63, 90×75, 110×63,<br>110×75, 110×90, 125×75, 125×90, 125×110 |
| FLANGE ADAPTER        | 16, 20, 25, 32, 40, 50, 63, 75, 90, 110, 125, 140  |



## ○ FLANGE ADAPTER

| Injection(mm)   |
|---|
| 63, 75, 90, 110, 125, 140, 160, 200, 225, 250, 280, 315, 355, 400, 450, 500, 560, 630 |



## Polyethylene fitting

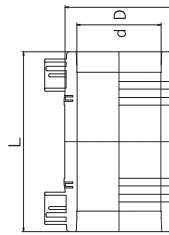
### PE Electrofusion Fitting for gas & water supply

PE80/PE100

SDR11, PE100

10bar Gas/16bar water

#### E/F COUPLER



| ISO Spec[d](mm) | ASTM Spec[d]    | D(mm) | D(mm) |
|-----------------|-----------------|-------|-------|
| 20              | ½" IPS          | 40    | 92    |
| 25              | ¾" IPS          | 40    | 92    |
| 32              | 1" CTS / 1" IPS | 47    | 96    |
| 40              | 1¼" IPS         | 54    | 100   |
| 50              | 1½" IPS         | 66    | 105   |
| 63              | 2" IPS          | 84    | 120   |
| 75              | 2½" IPS         | 98    | 135   |
| 90              | 3" IPS          | 119   | 140   |
| 110             | 3½" IPS         | 143   | 160   |
| 125             | 4" IPS          | 157   | 180   |
| 140             | 5" IPS          | 172   | 190   |
| 160             | 6" IPS          | 207   | 200   |
| 200             | 7" IPS          | 247   | 230   |
| 225             | 8" IPS          | 285   | 230   |
| 250             | -               | 308   | 260   |
| 280             | 10" IPS         | 347   | 265   |
| 315             | 12" IPS         | 391   | 280   |
| 355             | 14" IPS         | 430   | 330   |
| 400             | 16" IPS         | 480   | 360   |

※ ASTM Spec is reference nominal diameter.

## Polyethylene fitting

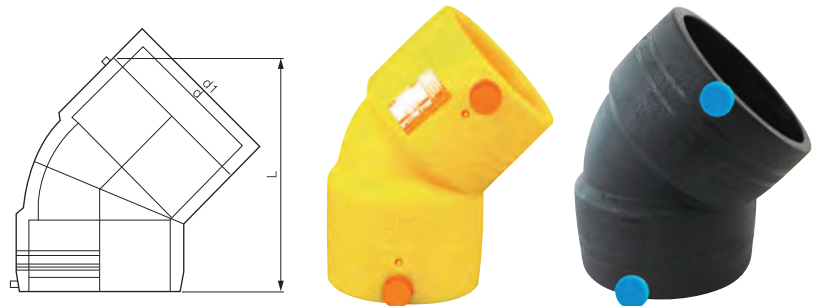
### ● E/F ELBOW 90°



| ISO Spec[d](mm) | ASTM Spec[d] | d1(mm) | L(mm) |
|-----------------|--------------|--------|-------|
| 40              | 1¼" IPS      | 54     | 62    |
| 50              | 1½" IPS      | 66     | 71    |
| 63              | 2" IPS       | 84     | 101   |
| 75              | 2½" IPS      | 98     | 112   |
| 90              | 3" IPS       | 119    | 129   |
| 110             | 3½" IPS      | 143    | 151   |
| 125             | 4" IPS       | 157    | 162   |
| 140             | 5" IPS       | 172    | 182   |
| 160             | 6" IPS       | 207    | 203   |
| 200             | 7" IPS       | 247    | 234   |
| 225             | 8" IPS       | 285    | 274   |
| 315             | 12" IPS      | 387    | 329   |

※ ASTM Spec is reference nominal diameter.

### ● E/F ELBOW 45°



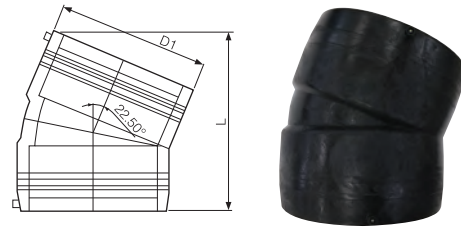
| ISO Spec[d](mm) | ASTM Spec[d] | d1(mm) | L(mm) |
|-----------------|--------------|--------|-------|
| 90              | 3" IPS       | 119    | 218   |
| 110             | 3½" IPS      | 143    | 267   |
| 125             | 4" IPS       | 157    | 270   |
| 140             | 5" IPS       | 172    | 285   |
| 160             | 6" IPS       | 207    | 315   |
| 225             | 8" IPS       | 285    | 420   |
| 315             | 12" IPS      | 387    | 536   |

※ ASTM Spec is reference nominal diameter.

# COSMO I&D

## Polyethylene fitting

### E/F ELBOW 22.5°



| ISO Spec[d](mm) | ASTM Spec[d] | d1(mm) | L(mm) |
|-----------------|--------------|--------|-------|
| 280             | 10" IPS      | 347    | 350   |
| 315             | 12" IPS      | 387    | 454   |

※ ASTM Spec is reference nominal diameter.

### E/F END CAP



| ISO Spec[d](mm) | ASTM Spec[d] | d1(mm) | L(mm) |
|-----------------|--------------|--------|-------|
| 50              | 1½" IPS      | 66     | 90    |
| 63              | 2" IPS       | 84     | 94    |
| 75              | 2½" IPS      | 98     | 98    |
| 90              | 3" IPS       | 119    | 116   |
| 110             | 3½" IPS      | 143    | 116   |
| 125             | 4" IPS       | 157    | 130   |
| 140             | 5" IPS       | 172    | 140   |
| 160             | 6" IPS       | 207    | 150   |
| 200             | 7" IPS       | 247    | 170   |
| 225             | 8" IPS       | 285    | 170   |
| 250             | -            | 308    | 190   |
| 280             | 10" IPS      | 347    | 200   |
| 315             | 12" IPS      | 387    | 260   |

※ ASTM Spec is reference nominal diameter.

### E/F REDUCER

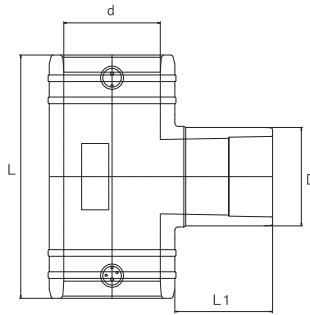


| ISO Spec |          | ASTM Spec |         | D1(mm) | D2(mm) | L(mm) |
|----------|----------|-----------|---------|--------|--------|-------|
| [d](mm)  | [d2](mm) | [d]       | [d2]    |        |        |       |
| 63       | 50       | 2" IPS    | 1½" IPS | 84     | 66     | 165   |
| 75       | 63       | 2½" IPS   | 2" IPS  | 98     | 84     | 165   |
| 90       | 63       | 3" IPS    | 2" IPS  | 119    | 84     | 146   |
| 110      | 90       | 3½" IPS   | 3" IPS  | 143    | 119    | 190   |
| 160      | 110      | 6" IPS    | 4" IPS  | 207    | 347    | 330   |
| 225      | 160      | 8" IPS    | 6" IPS  | 285    | 157    | 200   |
| 315      | 280      | 12" IPS   | 10" IPS | 387    | 207    | 245   |

※ ASTM Spec is reference nominal diameter.

# Polyethylene fitting

## E/F TEE

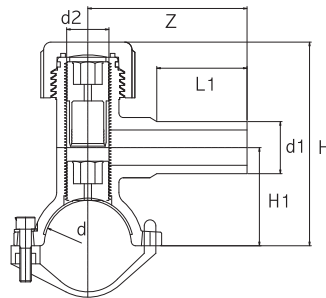


| ISO Spec |         | ASTM Spec |         | L(mm) | L1(mm) | ISO Spec |         | ASTM Spec |         | L(mm) | L1(mm) |
|----------|---------|-----------|---------|-------|--------|----------|---------|-----------|---------|-------|--------|
| [d](mm)  | [D](mm) | [d]       | [D]     |       |        | [d](mm)  | [D](mm) | [d]       | [D]     |       |        |
| 50       | 40      | 1½" IPS   | 1¼" IPS | 135   | 65     | 160      | 50      | 6" IPS    | 1½" IPS | 356   | 65     |
| 50       | 50      | 1½" IPS   | 1½" IPS | 175   | 65     | 160      | 63      | 6" IPS    | 2" IPS  | 356   | 70     |
| 63       | 40      | 2" IPS    | 1¼" IPS | 175   | 65     | 160      | 90      | 6" IPS    | 3" IPS  | 356   | 85     |
| 63       | 50      | 2" IPS    | 1½" IPS | 175   | 65     | 160      | 110     | 6" IPS    | 3½" IPS | 356   | 105    |
| 63       | 63      | 2" IPS    | 2" IPS  | 175   | 65     | 160      | 160     | 6" IPS    | 6" IPS  | 356   | 130    |
| 75       | 50      | 2½" IPS   | 1½" IPS | 200   | 65     | 200      | 63      | 7" IPS    | 2" IPS  | 410   | 70     |
| 75       | 63      | 2½" IPS   | 2" IPS  | 200   | 70     | 200      | 90      | 7" IPS    | 3" IPS  | 410   | 85     |
| 75       | 75      | 2½" IPS   | 2½" IPS | 200   | 70     | 200      | 110     | 7" IPS    | 3½" IPS | 410   | 105    |
| 90       | 50      | 3" IPS    | 1½" IPS | 230   | 65     | 200      | 160     | 7" IPS    | 6" IPS  | 410   | 130    |
| 90       | 63      | 3" IPS    | 2" IPS  | 230   | 70     | 200      | 200     | 7" IPS    | 7" IPS  | 410   | 147    |
| 90       | 90      | 3" IPS    | 3" IPS  | 230   | 70     | 225      | 63      | 8" IPS    | 2" IPS  | 440   | 70     |
| 110      | 50      | 3½" IPS   | 1¼" IPS | 265   | 65     | 225      | 90      | 8" IPS    | 3" IPS  | 440   | 85     |
| 110      | 63      | 3½" IPS   | 2" IPS  | 265   | 70     | 225      | 110     | 8" IPS    | 3½" IPS | 440   | 105    |
| 110      | 90      | 3½" IPS   | 3" IPS  | 265   | 85     | 225      | 160     | 8" IPS    | 6" IPS  | 440   | 130    |
| 110      | 110     | 3½" IPS   | 3½" IPS | 265   | 85     | 225      | 225     | 8" IPS    | 8" IPS  | 440   | 160    |
| 125      | 50      | 4" IPS    | 1½" IPS | 286   | 65     |          |         |           |         |       |        |
| 125      | 63      | 4" IPS    | 2" IPS  | 286   | 70     |          |         |           |         |       |        |
| 125      | 90      | 4" IPS    | 3" IPS  | 286   | 85     |          |         |           |         |       |        |
| 125      | 110     | 4" IPS    | 3½" IPS | 286   | 105    |          |         |           |         |       |        |
| 125      | 125     | 4" IPS    | 4" IPS  | 286   | 105    |          |         |           |         |       |        |
| 140      | 50      | 5" IPS    | 1½" IPS | 320   | 65     |          |         |           |         |       |        |
| 140      | 63      | 5" IPS    | 2" IPS  | 320   | 70     |          |         |           |         |       |        |
| 140      | 90      | 5" IPS    | 3" IPS  | 320   | 85     |          |         |           |         |       |        |
| 140      | 110     | 5" IPS    | 3½" IPS | 320   | 105    |          |         |           |         |       |        |
| 140      | 140     | 5" IPS    | 5" IPS  | 320   | 122    |          |         |           |         |       |        |

※ ASTM Spec is reference nominal diameter.

## Polyethylene fitting

### E/F TAPPING TEE



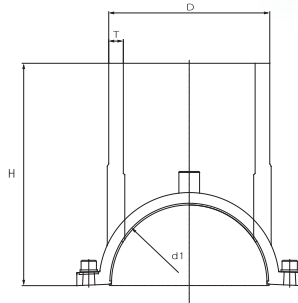
| ISO Spec          |                      | ASTM Spec         |                      | L1(mm) | H(mm) | H1(mm) | Z(mm) |
|-------------------|----------------------|-------------------|----------------------|--------|-------|--------|-------|
| MAIN SIZE [d](mm) | BRANCH SIZE [d1](mm) | MAIN SIZE [d](mm) | BRANCH SIZE [d1](mm) |        |       |        |       |
| 63                | 20~32                | 2" IPS            | ½-1" IPS             | 76     | 186   | 108    | 130   |
| 63                | 40~63                | 2" IPS            | 1¼-2" IPS            | 100    | 134   | 112    | 137   |
| 75                | 20~32                | 2½" IPS           | ½-1" IPS             | 76     | 199   | 121    | 130   |
| 75                | 40~63                | 2½" IPS           | 1¼-2" IPS            | 100    | 248   | 126    | 160   |
| 90                | 20~32                | 3" IPS            | ½-1" IPS             | 76     | 199   | 121    | 130   |
| 90                | 40~63                | 3" IPS            | 1¼-2" IPS            | 100    | 248   | 126    | 160   |
| 110               | 20~32                | 3½" IPS           | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 110               | 40~63                | 3½" IPS           | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 125               | 20~32                | 4" IPS            | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 125               | 40~63                | 4" IPS            | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 140               | 20~32                | 5" IPS            | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 140               | 40~63                | 5" IPS            | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 160               | 20~32                | 6" IPS            | ½-1" IPS             | 76     | 243   | 156    | 130   |
| 160               | 40~63                | 6" IPS            | 1¼-2" IPS            | 100    | 283   | 161    | 160   |
| 200               | 20~32                | 7" IPS            | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 200               | 40~63                | 7" IPS            | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 225               | 20~32                | 8" IPS            | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 225               | 40~63                | 8" IPS            | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 250               | 20~32                | -                 | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 250               | 40~63                | -                 | 1¼-2" IPS            | 100    | 258   | 136    | 160   |
| 280               | 20~32                | 10" IPS           | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 280               | 40~63                | 10" IPS           | 1¼-2" IPS            | 100    | 328   | 206    | 160   |
| 315               | 20~32                | 12" IPS           | ½-1" IPS             | 76     | 209   | 131    | 130   |
| 315               | 40~63                | 12" IPS           | 1¼-2" IPS            | 100    | 328   | 206    | 160   |

※ ASTM Spec is reference nominal diameter.

■ : STANDARD BRANCH    ■ : HIGH VOLUME BRANCH

# Polyethylene fitting

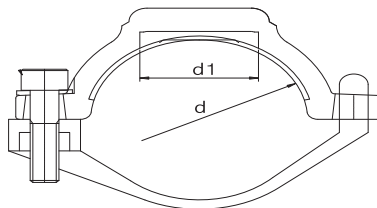
## E/F SADDLE



| ISO Spec[d](m) |            | ASTM Spec |            | t(mm) | H(mm) |
|----------------|------------|-----------|------------|-------|-------|
| Main [d1]      | Branch [D] | Main [d1] | Branch [D] |       |       |
| 110            | 63         | 4" IPS    | 2" IPS     | 5.5   | 170   |
| 110            | 90         | 4" IPS    | 3" IPS     | 8.1   | 180   |
| 160            | 63         | 6" IPS    | 2" IPS     | 5.5   | 196   |
| 160            | 90         | 6" IPS    | 3" IPS     | 8.1   | 206   |
| 160            | 110        | 6" IPS    | 4" IPS     | 10.4  | 212   |
| 225            | 63         | 8" IPS    | 2" IPS     | 5.5   | 182   |
| 225            | 90         | 8" IPS    | 3" IPS     | 8.1   | 192   |
| 225            | 110        | 8" IPS    | 4" IPS     | 10.4  | 214   |
| 225            | 160        | 8" IPS    | 6" IPS     | 15.3  | 261   |

※ ASTM Spec is reference nominal diameter.

## E/F PATCH

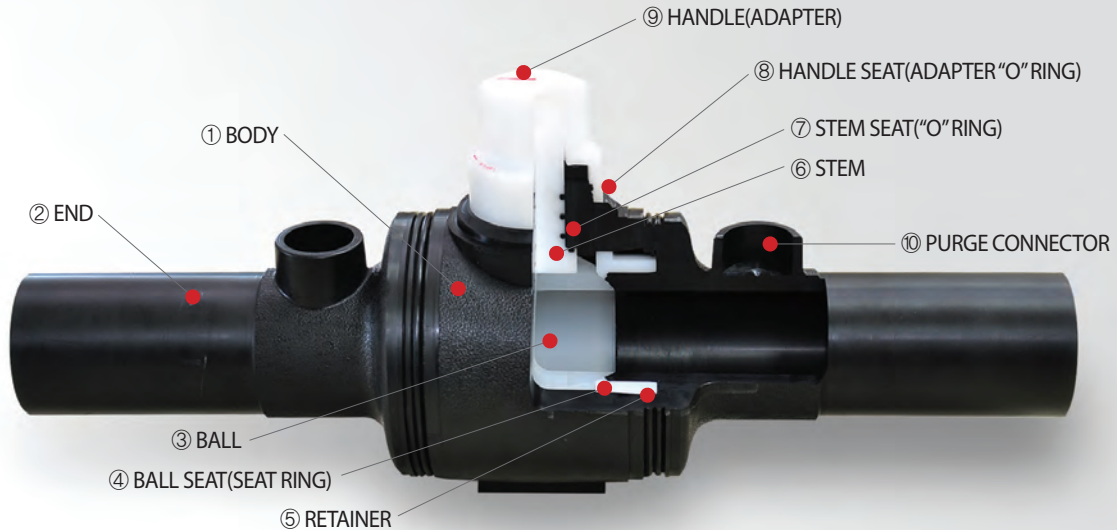


| ISO Spec[d](m) | ASTM Spec[d] | d1(mm) |
|----------------|--------------|--------|
| 160            | 6" IPS       | 80     |
| 200            | 7" IPS       | 80     |
| 225            | 8" IPS       | 80     |
| 250            | -            | 80     |
| 280            | 10" IPS      | 80     |
| 315            | 12" IPS      | 90     |

※ ASTM Spec is reference nominal diameter.

## PE Ball valve

### PE Ball valve structure and specification



#### ■ PE VALVE MAIN PART MATERIALS

| NO | ITEM                          | MATERIAL          | CHARACTERISTIC  |
|----|-------------------------------|-------------------|---|
| 1  | BODY                          | HDPE              | SAME WITH PE PIPE   |
| 2  | END                           | HDPE              | SAME WITH PE PIPE   |
| 3  | BALL                          | Polypropylene(PP) | HIGH STRENGTH AND GOOD AT HEAT RESISTANCE                     |
| 4  | BALL SEAT(SEAT RING)          | NBR(Rubber)       | GOOD AT TIGHTNESS   |
| 5  | RETAINER                      | Polypropylene(PP) | BALL SEAT SUPPORT WITH HIGH STRENGTH AND GOOD HEAT RESISTANCE |
| 6  | STEM                          | ACETAL            | GOOD DURABILITY AND RUGGEDNESS                                |
| 7  | STEM SEAT('O' RING)           | NBR(Rubber)       | GOOD TIGHTNESS BY MULTIPLE SEAT TYPE                          |
| 8  | HANDLE SEAT(ADAPTER 'O' RING) | NBR(Rubber)       | PREVENTION OF WATER AND FOREIGN MATTERS FROM OUTSIDE          |
| 9  | HANDLE(ADAPTER)               | Polypropylene(PP) | SQUARE TYPE FOR CONVENIENT OPERATION                          |
| 10 | PURGE CONNECTOR               | HDPE              | FOR PURGE LINE INSTALLATION                                   |

Note) This valve can be used for water application. And it can be also changed parts

#### ■ PE BALL VALVE SPECIFICATION

| CATEGORY            | SPECIFICATION                                      | CATEGORY              | SPECIFICATION                            |
|---------------------|--|-----------------------|--|
| USE                 | UNDERGROUND GAS PIPE LINE                          | END CONNECTING METHOD | BUTT FUSION(H/F), ELECTRONIC FUSION(E/F) |
| WORKING PRESSURE    | LESS THAN 1.0MPa                                   | PURGE TYPE            | NO PURGE, 1-PURGE, 2-PURGE               |
| MATERIAL            | HIGH DENSITY POLYETHYLENE                          | VALVE TYPE            | LEVER TYPE, GEAR TYPE                    |
| PRODUCTION STANDARD | KS M ISO 10933 EN1555-4, GB 15558, 3, ASME B 16.40 | COLOR                 | Black                                    |
| USE TEMPERAURE      | -29℃~38℃   | INTERNAL FLOW CHANGE  | Full port type (NO CHANGE)               |
| CONSTRUCTION TYPE   | UNDERGROUND BURYING TYPE                           | STEM TYPE             | LONG STEM                                |

Note) This valve can be used for water application. And it can be also changed parts



# PE Ball valve

## Characteristic of COSMO I&D's pe ball valve

- Compact and Light
- Full Port Type
- Satisfy KS M ISO 10933, EN 1555-4, GB 15558.3. ASME B16.40
- Used to subminiature manhole
- Underground burying type
- Semi permanent lifespan
- used with Purge depends on the environment
- Used under high pressure
- Easy to control Open/Close
- Close to Zero defect even for a large size
- The Ball Sheet is flexible and has a long lifespan
- The reduction gear is high speed type
- Corrosion, Impact, Cold-Weather, Abrasion resistance



630mm pe ball valve

### ■ PERFORMANCE OF PE BALL VALVE

| INSPECTION ITEM             | TEMPERATURE      | INPUT ITEM               | INSPECTION METHOD   | REMARK                         |                |
|-----------------------------|------------------|--------------------------|---|--------------------------------|----------------|
| TIGHTNESS TEST              | 23±8℃            | 0.028±0.014MPa<br>0.6MPa | Gas pressure test under water   | KS M 3529                      |                |
|                             | 20℃              | 2.5MPa<br>0.6MPa         |   |                                |                |
| OPERATION TEST              | 23±8℃            | 0.4MPa                   | Check standard Torque for each size   | KS M 3529                      |                |
|                             | -20℃             | 0.6MPa                   | Check standard Torque for each size   | KS M ISO 10933                 |                |
|                             | 23℃              |                          |   |                                |                |
|                             | 40℃              |                          |   |                                |                |
| TEMPERATURE RESISTANCE TEST | -29±3℃           | 0.6MPa                   | Tightness test after retaining condition described on the left for 24 hours   | KS M 3529                      |                |
|                             | 38±3℃            |                          |   |                                |                |
| PRESSURE DROP TEST          | 23±2℃            | 2.5KPa                   | Gauge 5 times between 2.5m/s and 7.5m/s   | KS M ISO 10933                 |                |
| TENSILE STRENGTH TEST       | 23±2℃            | 2.5KPa                   | Retain tensile strength until it's yield or break after applying tensile forces of 12MPa tensile stress for 25mm/min and keep tensile strength for a hour and then torque test. | KS M ISO 10933                 |                |
| IMPACT RESISTANCE TEST      | -29±3℃<br>38±3℃  | 0.6MPa                   | Temperature resistance test after drop 9kgs striker vertically to the middle of operation part of the valve from 1m high at less than 31℃                                       | KS M 3529                      |                |
|                             | -20℃             | 0.6MPa                   | tightness torque test after retaining that condition for 2 hours and applying impact at the operation part of valve by dropping 3kgs striker vertically                         | KS M ISO 10933                 |                |
| BURST TEST                  | Room temperature | 4.5MPa                   | It should not burst in the condition of applying pressure by water, gas, nitrogen   | KS M 3529                      |                |
| SUSTAINED PRESSURE TEST     | 23±8℃            | 1.79MPa                  | Tightness test after removing pressure after retaining 1000 hours   | KS M 3529                      |                |
|                             | 38±8℃            | 1.45MPa                  | Tightness test after removing pressure after retaining 1000 hours   |                                |                |
|                             | 80±3℃            | 0.78MPa                  | Tightness test after removing pressure after retaining 170 hours  |                                |                |
|                             | 80℃              | 20℃                      | 2.0MPa  | Retaining more than 100 hours  | KS M ISO 10933 |
|                             |                  |                          | 0.92MPa   | Retaining more than 165 hours  |                |
|                             |                  |                          | 0.8MPa  | Retaining more than 1000 hours |                |
|                             |                  | 1.6MPa                   | Tightness torque striker drop test after retaining 1000 hours   |                                |                |

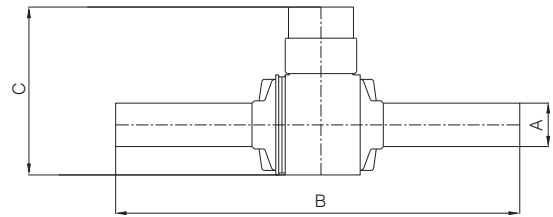
## PE Ball valve

PE80/PE100

SDR11, PE100

10bar Gas/16bar water

### Standard type (small size type)



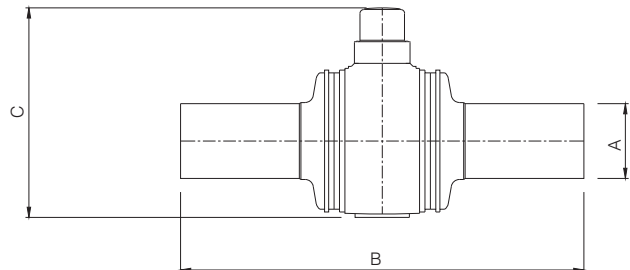
Unit : mm

Unit : mm

| SIZE(dn)<br>ISO | A  | B   | C   |
|-----------------|----|-----|-----|
| 20              | 20 | 298 | 129 |
| 25              | 25 | 303 | 129 |
| 32              | 32 | 311 | 129 |
| 40              | 40 | 300 | 150 |
| 50              | 50 | 320 | 150 |
| 63              | 63 | 345 | 180 |

| SIZE(dn)<br>ASTM | A  |
|------------------|----|
| 1/2"             | 21 |
| 3/4"             | 26 |
| 1"               | 33 |
| 1 1/4"           | 42 |
| 1 1/2"           | 48 |
| 2"               | 60 |

### Standard type



Unit : mm

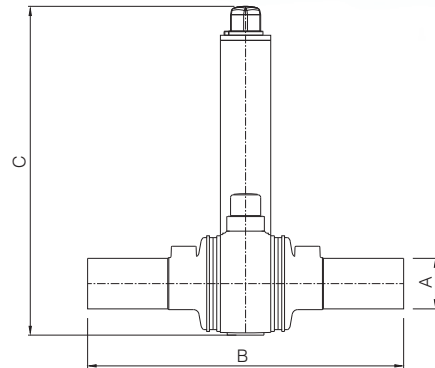
Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C   |
|-----------------|-----|------|-----|
| 63              | 63  | 470  | 180 |
| 75              | 75  | 540  | 275 |
| 90              | 90  | 540  | 275 |
| 110             | 110 | 570  | 308 |
| 125             | 125 | 570  | 300 |
| 160             | 160 | 614  | 387 |
| 200             | 200 | 630  | 493 |
| 225             | 225 | 698  | 525 |
| 250             | 250 | 740  | 563 |
| 280             | 280 | 720  | 609 |
| 315             | 315 | 920  | 690 |
| 355             | 355 | 838  | 753 |
| 400             | 400 | 1010 | 753 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 2"               | 60  |
| 3"               | 88  |
| 4"               | 114 |
| 6"               | 168 |
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

## PE Ball valve

### ○ Lever type No Purge (No gear box)



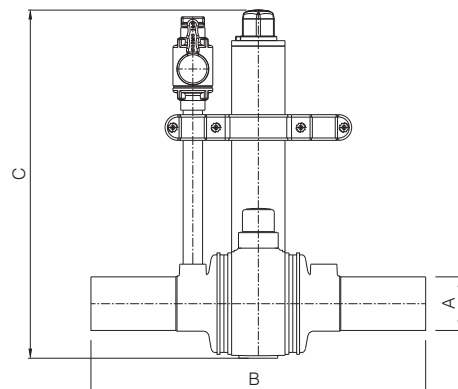
Unit : mm

Unit : mm

| SIZE(dn)<br>ISO | A   | B   | C   |
|-----------------|-----|-----|-----|
| 63              | 63  | 594 | 800 |
| 75              | 75  | 640 | 855 |
| 90              | 90  | 640 | 855 |
| 110             | 110 | 690 | 930 |
| 125             | 125 | 690 | 930 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 2"               | 60  |
| 3"               | 88  |
| 4"               | 114 |

### ○ Lever type 1 Purge (No gear box)



Unit : mm

Unit : mm

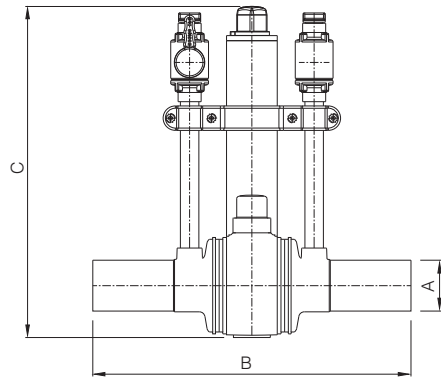
| SIZE(dn)<br>ISO | A   | B   | C   |
|-----------------|-----|-----|-----|
| 63              | 63  | 594 | 800 |
| 75              | 75  | 640 | 855 |
| 90              | 90  | 640 | 855 |
| 110             | 110 | 690 | 930 |
| 125             | 125 | 690 | 930 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 2"               | 60  |
| 3"               | 88  |
| 4"               | 114 |

# COSMO I&D

## PE Ball valve

### ○ Lever type 2 Purge (No gear)



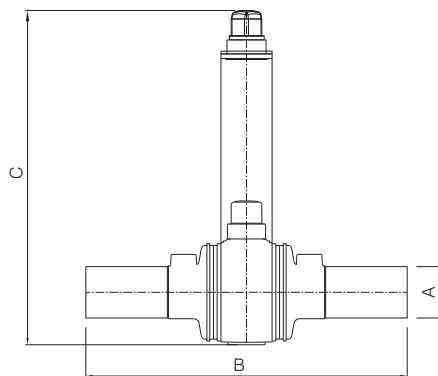
Unit : mm

Unit : mm

| SIZE(dn)<br>ISO | A   | B   | C   |
|-----------------|-----|-----|-----|
| 63              | 63  | 594 | 800 |
| 75              | 75  | 640 | 855 |
| 90              | 90  | 640 | 855 |
| 110             | 110 | 690 | 930 |
| 125             | 125 | 690 | 930 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 2"               | 60  |
| 3"               | 88  |
| 4"               | 114 |

### ○ Lever type No Purge (Separated gear)



Unit : mm

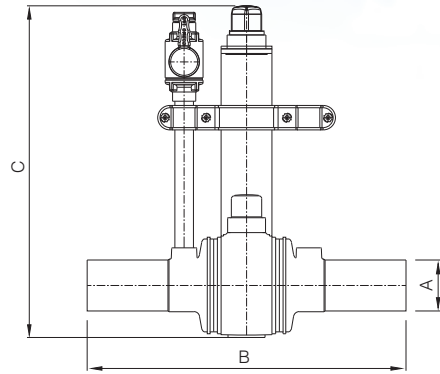
Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C    |
|-----------------|-----|------|------|
| 160             | 160 | 724  | 1060 |
| 200             | 200 | 760  | 1115 |
| 225             | 225 | 798  | 1205 |
| 250             | 250 | 880  | 1205 |
| 280             | 280 | 820  | 1205 |
| 315             | 315 | 960  | 1205 |
| 355             | 355 | 938  | 1364 |
| 400             | 400 | 1110 | 1470 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 6"               | 168 |
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

## PE Ball valve

### ● Lever type 1 Purge (Separated gear)



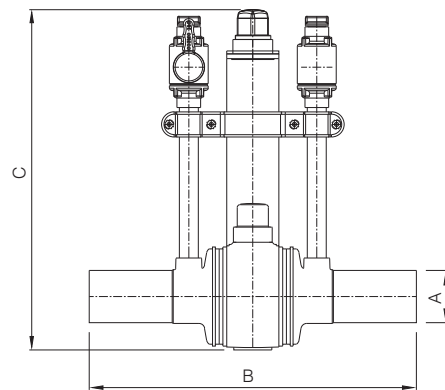
Unit : mm

Unit : mm

| SIZE(dn) | A   | B    | C    |
|----------|-----|------|------|
| ISO      |     |      |      |
| 160      | 160 | 724  | 1060 |
| 200      | 200 | 760  | 1115 |
| 225      | 225 | 798  | 1205 |
| 250      | 250 | 880  | 1205 |
| 280      | 280 | 820  | 1205 |
| 315      | 315 | 960  | 1205 |
| 355      | 355 | 938  | 1364 |
| 400      | 400 | 1110 | 1470 |

| SIZE(dn) | A   |
|----------|-----|
| ASTM     |     |
| 6"       | 168 |
| 8"       | 219 |
| 10"      | 273 |
| 12"      | 323 |
| 14"      | 355 |
| 16"      | 406 |

### ● Lever type 2 Purge (Separated gear)



Unit : mm

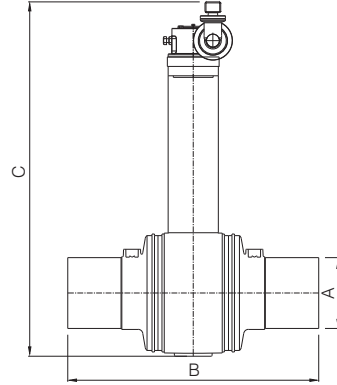
Unit : mm

| SIZE(dn) | A   | B    | C    |
|----------|-----|------|------|
| ISO      |     |      |      |
| 160      | 160 | 724  | 1060 |
| 200      | 200 | 760  | 1115 |
| 225      | 225 | 798  | 1205 |
| 250      | 250 | 880  | 1205 |
| 280      | 280 | 820  | 1205 |
| 315      | 315 | 960  | 1205 |
| 355      | 355 | 938  | 1364 |
| 400      | 400 | 1110 | 1470 |

| SIZE(dn) | A   |
|----------|-----|
| ASTM     |     |
| 6"       | 168 |
| 8"       | 219 |
| 10"      | 273 |
| 12"      | 323 |
| 14"      | 355 |
| 16"      | 406 |

## PE Ball valve

### ⦿ Gear type No Purge



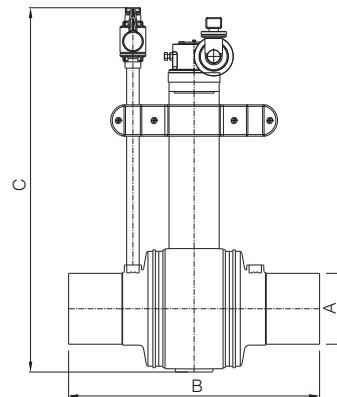
Unit : mm

Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C    |
|-----------------|-----|------|------|
| 200             | 200 | 760  | 1115 |
| 225             | 225 | 798  | 1205 |
| 250             | 250 | 880  | 1205 |
| 280             | 280 | 820  | 1205 |
| 315             | 315 | 960  | 1205 |
| 355             | 355 | 938  | 1364 |
| 400             | 400 | 1110 | 1470 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

### ⦿ Gear type 1 Purge



Unit : mm

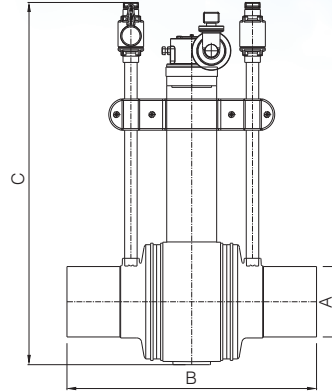
Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C    |
|-----------------|-----|------|------|
| 200             | 200 | 760  | 1115 |
| 225             | 225 | 798  | 1205 |
| 250             | 250 | 880  | 1205 |
| 280             | 280 | 820  | 1205 |
| 315             | 315 | 960  | 1205 |
| 355             | 355 | 938  | 1364 |
| 400             | 400 | 1110 | 1470 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

# PE Ball valve

## ● Gear type 2 Purge



Unit : mm

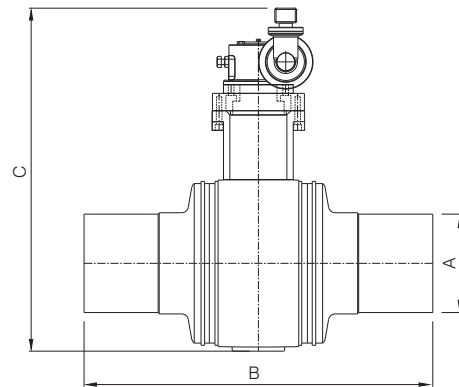
Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C    |
|-----------------|-----|------|------|
| 200             | 200 | 760  | 1115 |
| 225             | 225 | 798  | 1205 |
| 250             | 250 | 880  | 1205 |
| 280             | 280 | 820  | 1205 |
| 315             | 315 | 960  | 1205 |
| 355             | 355 | 938  | 1364 |
| 400             | 400 | 1110 | 1470 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

Note) This picture can be changed by manufacturer or customer's demand.

## ● Short type gear No Purge (On demand)



Unit : mm

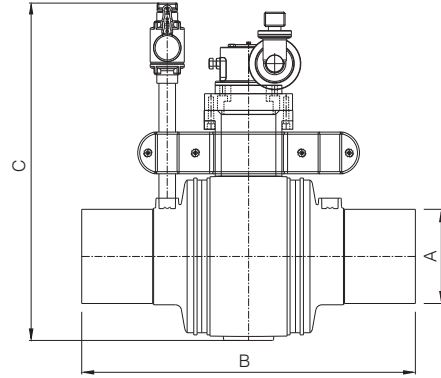
Unit : mm

| SIZE(dn)<br>ISO | A   | B    | C   |
|-----------------|-----|------|-----|
| 200             | 200 | 760  | 738 |
| 225             | 225 | 798  | 767 |
| 250             | 250 | 880  | 808 |
| 280             | 280 | 820  | 843 |
| 315             | 315 | 960  | 923 |
| 355             | 355 | 938  | 987 |
| 400             | 400 | 1110 | 998 |

| SIZE(dn)<br>ASTM | A   |
|------------------|-----|
| 8"               | 219 |
| 10"              | 273 |
| 12"              | 323 |
| 14"              | 355 |
| 16"              | 406 |

## PE Ball valve

### Short type gear 1 Purge (On demand)



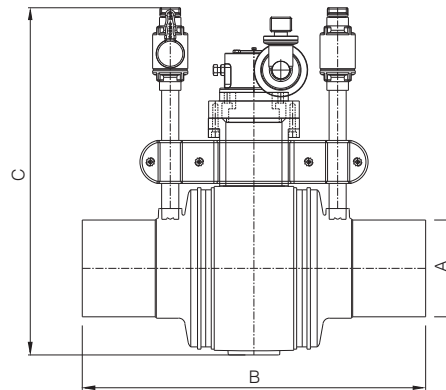
Unit : mm

Unit : mm

| SIZE(dn) | A   | B    | C   |
|----------|-----|------|-----|
| ISO      |     |      |     |
| 200      | 200 | 760  | 738 |
| 225      | 225 | 798  | 767 |
| 250      | 250 | 880  | 808 |
| 280      | 280 | 820  | 843 |
| 315      | 315 | 960  | 923 |
| 355      | 355 | 938  | 987 |
| 400      | 400 | 1110 | 998 |

| SIZE(dn) | A   |
|----------|-----|
| ASTM     |     |
| 8"       | 219 |
| 10"      | 273 |
| 12"      | 323 |
| 14"      | 355 |
| 16"      | 406 |

### Short type gear 2 Purge (On demand)



Unit : mm

Unit : mm

| SIZE(dn) | A   | B    | C   |
|----------|-----|------|-----|
| ISO      |     |      |     |
| 200      | 200 | 760  | 738 |
| 225      | 225 | 798  | 767 |
| 250      | 250 | 880  | 808 |
| 280      | 280 | 820  | 843 |
| 315      | 315 | 960  | 923 |
| 355      | 355 | 938  | 987 |
| 400      | 400 | 1110 | 998 |

| SIZE(dn) | A   |
|----------|-----|
| ASTM     |     |
| 8"       | 219 |
| 10"      | 273 |
| 12"      | 323 |
| 14"      | 355 |
| 16"      | 406 |

Note) This picture can be changed by manufacturer or customer's demand.



## Operation instrument and accessory

### Universal scraper (D315)

- Applicable dn : 200~315mm
- easy scraping with simple rotational works
- easy working at narrow trench
- excellent scraping compared with manual scraping



### Universal scraper (D160)

- Applicable dn : 63~160mm
- easy scraping with simple rotational works
- easy working at narrow trench
- excellent scraping compared with manual scraping



### Chain socket clamp

- Applicable dn : 160~315mm
- Fixing of pipe movement during fusion
- Modulate pipe arrangement change



### Tapping tool (T type, 7 type)

- hall cutting tool after fixing tapping tee
- for re-cutting after first cutting failed
- compatible with other product
- easy working at narrow trench



### Tapping tool (ratchet handle, I type)

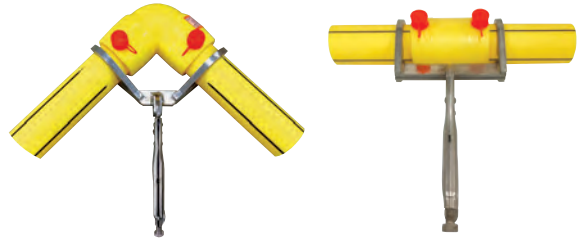
- hall cutting tool after fixing tapping tee
- for re-cutting after first cutting failed
- compatible with other product
- easy working at narrow trench
- convenience using ratchet



## Operation instrument and accessory

### ● Econoclamp (socket, elbow type)

- Applicable dn : 63~110mm
- Type : Coupler, Tee, Elbow, Reducer
- Minimizing electrofusion error fixing pipe



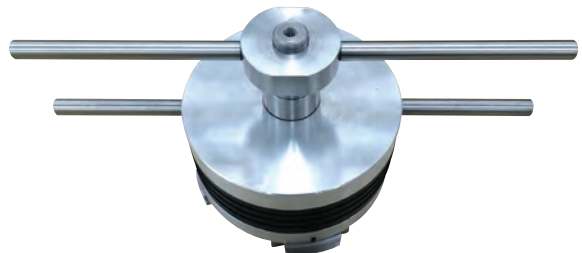
### ● Portable one-touch leaktightness cap

- Applicable dn : 63mm
- easy check of good welding after tapping tee fusion
- easy leaktightness test using one-touch



### ● Portable leaktightness cap

- easy check of leaktightness during installation without ball valve
- Applicable pressure : 0~0.3MPa



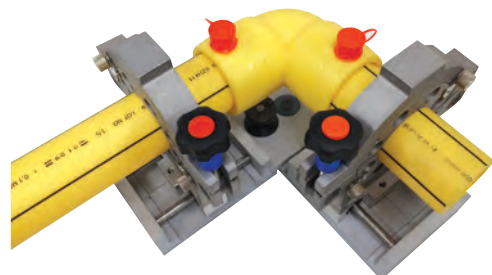
### ● Bending Supporter

- Product size : 300mm, 500mm
- easy bending and supporting of pipe within trench



### ● Multi-clamp

- Applicable dn : 63~110mm
- fixing type : coupler, 90°/45°elbow
- applicable fusion adapter(40~110mm)



## Operation instrument and accessory

### ○ POLYTAPP VALVE

- SDR 11 / PE80
- Applicable size : 63 ~ 160mm
- Pressure for use : 0.4MPa (for Gas supply)



### ○ POLYTAPP PE ADAPTER

- SDR 11 / PE80
- Applicable size : 63 ~ 160mm
- used for branching out pipes in use by combining Polytapp and tapping machine



### ○ TAPPING MACHINE

- 32" movement length
- 1.72MPa pressure at 46°C
- weight 19.5 kgW
- Ratchet crank or Air drive motor option
- Applicable size : 63~400mm



### ○ PUNCHING CUTTER

- Applicable size : 63 ~ 160mm
- Used with tapping machine



### ○ TIGHTNESS TESTER

- Applicable size : 25 ~ 63mm
- For saddle part fusion condition test before punching
- Tightness test is possible without damage at branch



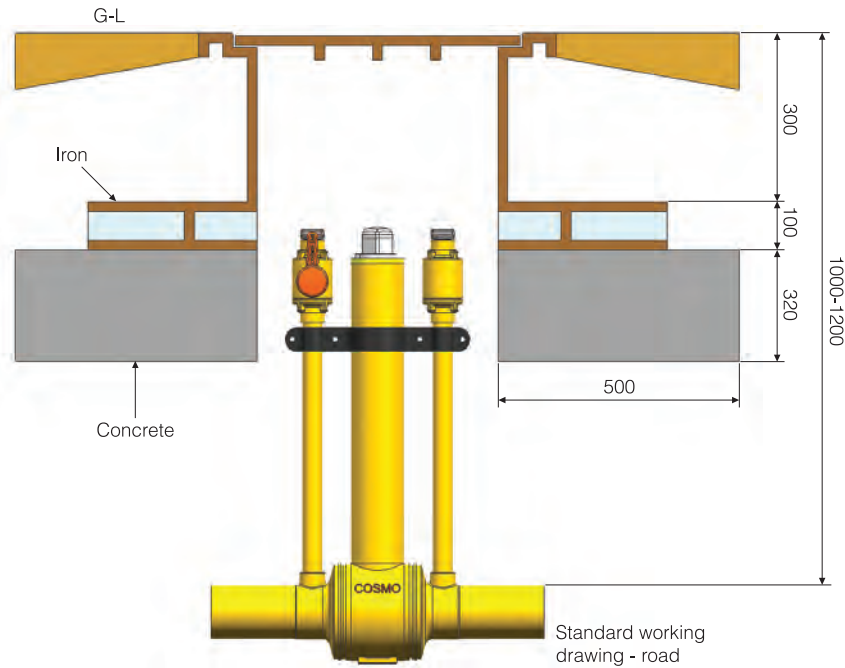
### ○ BIG SIZE TAPPING TEE PUNCHING TOOL

- Punching is possible to branch to 90mm, 110mm
- Punching is possible to branch to 160mm
- Easy to use, light weight
- Able to make a hole without leaking gases



## PE Valve Handling and matters that require attention in operation

- Be careful at impact during unload and transportation
- Fusion of valves or pipes should follow construction method
- Protect the products by covering plastic bag or protect cap before the fusion
- Valve construction method should follow working drawing or specification on the site



## PE Valve Operation Method

- Handle : 50mm Square type and usable for all size
- Connection : after putting liner stick to handle, then put the handle to Top adapter
- Open/Close method for Lever type
  - In order to close, turn clockwise 90° from 'Open' location
  - In order to open, turn counterclockwise 90° from 'Close' location
- Open/Close method for Gear type
  - in order to close, turn clockwise from 'Open' location until it makes 'tac' sound
  - in order to open, turn counterclockwise from 'Close' location until it makes 'tac' sound



Gear type Door operator



Lever type door operator

# Polyethylene fitting

## Installation Specifications

### 1. Excavation

As the PE PIPE is used to perform Butt Fusion in long length on the ground, installation costs can be saved. In addition, narrow the excavation width to the minimum after you consider a given condition and state in the field.

#### 1) Excavation Width

Secure the excavation width so that soil can be filled around the pipe, in which case the pipe shall reach 30cm wider than its designated external diameter. In general, the excavated materials do not include stones and rocks and if they are broken, they are used as a basic material.

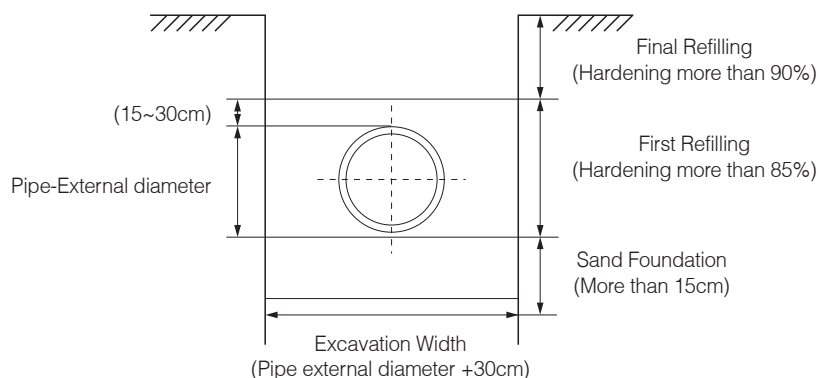
#### 2) Excavation Bottom

Make sure the excavation bottom is not hard and do not have stones and rocks. Remove the rocks that may lay a load the pipe and its joints and fill basic materials like sand over, underneath, around the pipe and its joints.

### 2. Pipe Foundation

The PE PIPE is very flexible, so there is no concern about being broken or separated as it elastically reacts even if installing it on the weak stratum with differential settlement in comparison with a rigid pipe. However, in case of soft ground, replace the material with sand or rubble and install it.

In general, the pipe foundation shall be constructed as follows.



### 3. Refilling and Hardening

As the transform of the pipe depends on the hardening seen on the side view above, completely perform the hardening of the pipe side. The purpose of hardening is to provide the hard and conservative bearing capacity around a pipe, so it is efficient to use the soil dug out again to the maximum as hardening soil. If possible, use sand as a material for 1st hardening. When hardening, keep the middle height of the pipe or elevated higher. During 2nd refilling, perform hardening to 15~30cm over the pipe. For the area where traffic is frequent, perform hardening of 90~95%, and for the other areas, more than 85%.







## Polyethylene fitting

### Installation Specifications

#### 4. The Connection of Pipes

Polyethylene can be united with its basic materials kept, so the installation is simple and the performance is excellent, compared to other general pipes. The PE water pipes can be united in a variety of connection ways such as heat fusion, socket fusion, electro-fusion joint, screw tightening joint according to operation conditions.

##### ■ Butt Fusion - Working Process

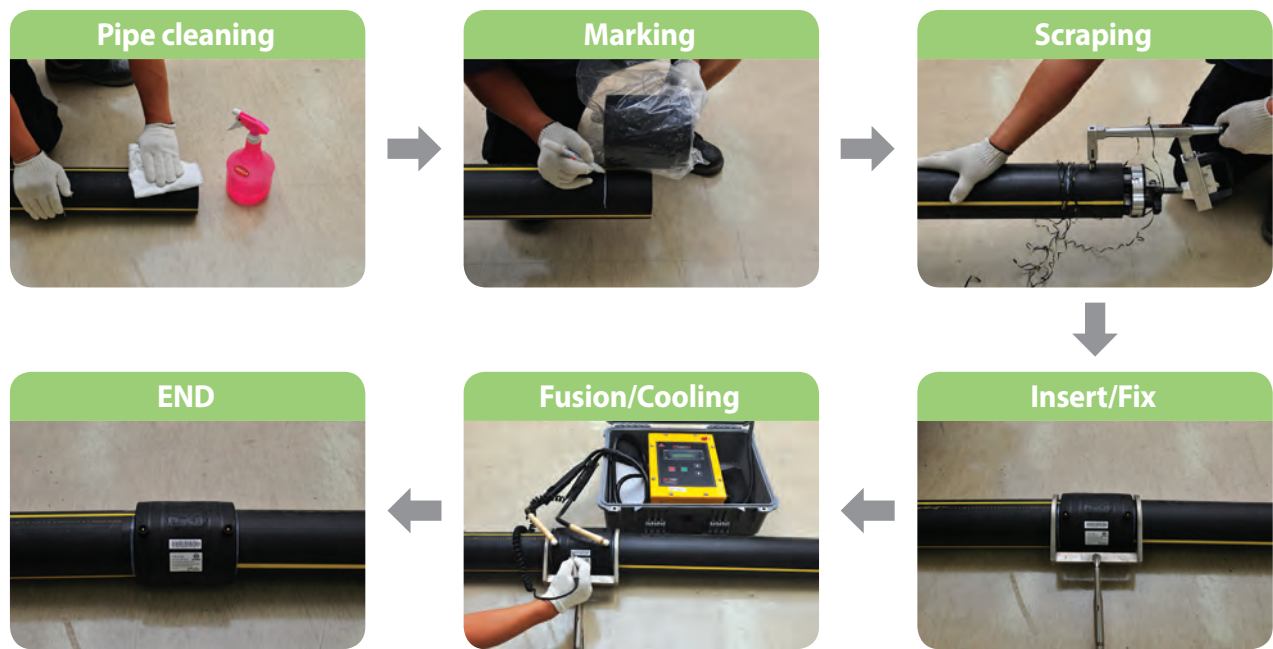
| Working Process            | Working Order   |   |
|----------------------------|---|---|
| Working Preparation        | 1. Master how to use the equipment. Check out the state of the equipment operation. Remove the foreign objects. Investigate whether the pipe has been damaged or not. Prepare the liner set   |   |
|                            | 2. The Operation of the Heater Power<br>Check out the state of temperature maintenance ( $210 \pm 10^\circ\text{C}$ ). Remove the foreign objects on the internal and external sides of the pipe  |   |
| Pipe Alignment             | 3. Check out the alignment after inserting the pipe and the trimming tool. Fix the clamp  |  |
| Joining surface Processing | 4. Process the trimming on the joining surface.<br>Perform trimming till a regular shavings comes out   |  |
|                            | 5. Remove the trimming machine and chips  |   |
| Pipe Alignment             | 6. Check out the horizontality, perpendicularity, alignment, and gab of the pipe Make the clamp move forward and check out the alignment state. Process trimming again if necessary. (Allow the alignment error less than 10 % of the pipe thickness) |  |
| Fusion                     | 7. Install the heater. Make the clamp move forward and melt the end of the pipe at regular pressure   |  |
|                            | 8. When the regular bead is formed, maintain heating under no pressure  |   |
|                            | 9. Make the clamp move backward, remove the heater quickly, and compress the melting side at proper pressure  |   |
| Fusion                     | 10. Cool off the pipe in natural state under pressured condition and remove the clamp   |  |
|                            | 11. Investigation on the joining status of pipe Investigate the bead width, and check out if fusion has been performed exactly and any error has been made in the data of the fusion report   |   |

# Polyethylene fitting

## Benefit of Electrofusion

### Advantages of E/F (Electro Fusion Fitting)

- E/F for the use in gas is connected to the automatic fusion fitting machine so that the fitting time is automatically set up and it is easy to operate the machine.
- As the fittings, specified per KS M ISO 8085-2, 3 and KS M 3408-3, are identical in dimension to the main pipes and the coupling pipes, it is convenient to install.
- It is efficient to install as the fittings are lighter in weight than other products.
- The product lifetime is semi-permanent due to excellent resistance to corrosion, chemicals and cold temperature characteristic of the product raw material, PE.
- Because the automatic fusion machine is small and light, it is convenient to operate in the limited space or in the site of difficult construction.
- Fusion processes are simpler and easier than for the butt welding.



## Comparison of E/F's for Gas, Water Supply and Sewer

| E/F Use          | Material            | Color  | Terminal Type | Fusion Machine | Standard          |
|------------------|---------------------|--------|---------------|----------------|-------------------|
| for Gas          | Mid Density (MDPE)  | Yellow | 1PIN/1PIN     | Automatic      | KS, ISO, ASTM, GB |
| for Gas          | High Density (HDPE) | Black  | 1PIN/1PIN     | Automatic      | KS, ISO, ASTM, GB |
| for Water Supply | High Density (HDPE) | Black  | 1PIN/1PIN     | Automatic      | KS, ISO, ASTM, GB |
| for Sewer        | High Density (HDPE) | Black  | 1PIN/1PIN     | Automatic      | KWWA M 203        |

# COSMO I&D

## Polyethylene fitting

### Installation Pictures & Fish cage products



Spigot fitting for Gas and water supply



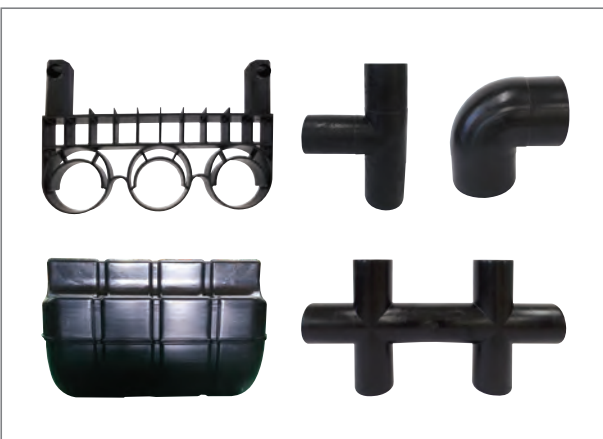
Electrofusion fitting for Gas and water supply



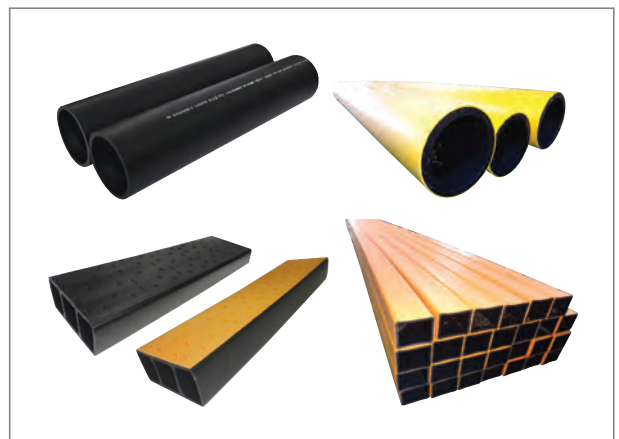
Tourist Leisure Facilities



Marine Facilities



Pipe fixtures for fishing



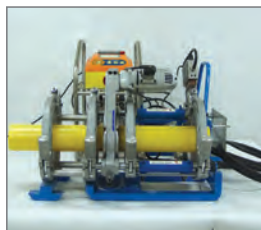
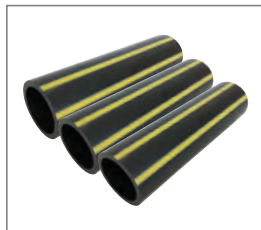
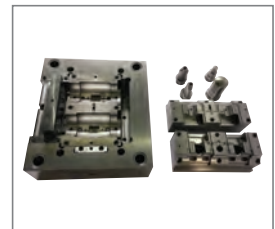
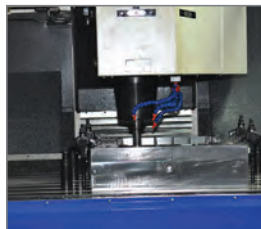
Pipe for handrail, scaffold



## Polyethylene fitting

### Polyethylene pipe line Total solution provider

We supply total solution service from mold design to pipe, fitting, welding machine.  
We are prepared to give our best products and service solution.

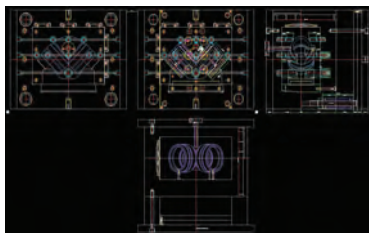


## Polyethylene fitting

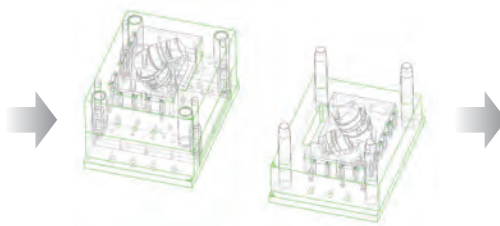
### Mold design and manufacture for Polyethylene pipe and fitting

We can design and manufacture mold of twenty set using of CNC machining center etc.

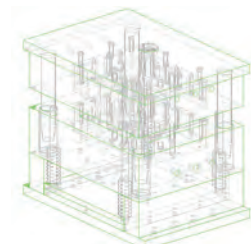
#### Mold Design



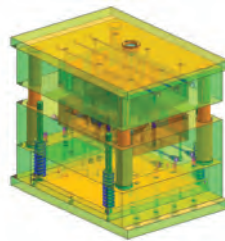
Mold Design(3D)



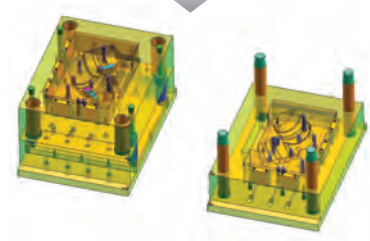
Medeling(3D)



Mold assembly

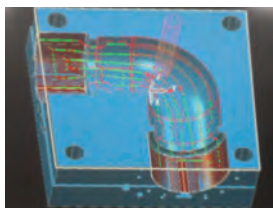


Sumulation(assembly)

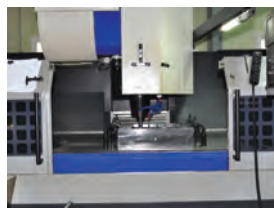


Sumulation

#### Mold manufacturing



Tooling  
(CNC transformation)



Outer-mold manufacturing



Mold assembly



Completion

# Polyethylene fitting

## Machine setting and Transfer of technical know-how for Polyethylene pipe and fitting

We can mount the production machine and supply our technical know-how

### Machine setting



Injection molding machine



Extrusion machine

### Transfer of technical know-how



A covered wire



Winding on the core



Preparing



Injection molding



Packaging



Product Inspection



Separate out the core



Cooling

# COSMO I&D

## Polyethylene fitting

### Quality Certification

All products of COSMO I & D has been maintaining KS(Korea Industrial Standards) Certification and ISO 9001 Quality management system through inspection and examination every year by Korea Standard Association which is authorized from government. Through this, We try to produce and supply high quality products to meet our customer's requirements on product design, development, material purchase, production, shipment, and after service.

Also, We keep trying research and develop to provide valuable new products for our customers.



21 Items of patent



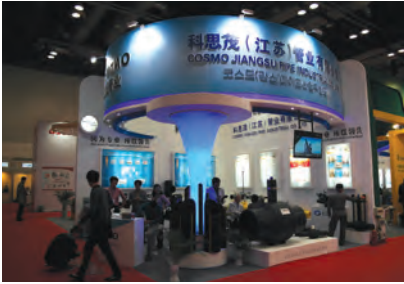
6 Items of utility model

### MAIN PRODUCTS

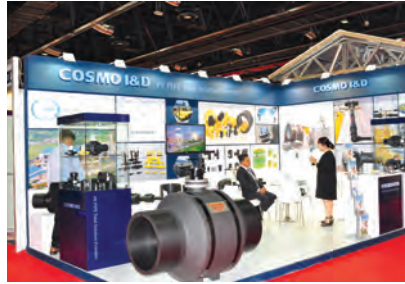
- PE pipe for water supply
- PE pipe for gas supply
- PE pipe for sewage supply
- PE fittings for heat fusion
- PE fittings for electronic fusion
- PE Ball valve for gas supply
- PE Ball valve for water supply
- Automatic/Manual fusion machine
- Electronic fusion machine
- Mold design and manufacture
- Installation tool



## Overseas Exhibition



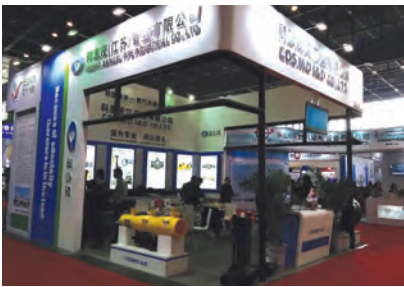
GAS & HEATING 2014 (China)



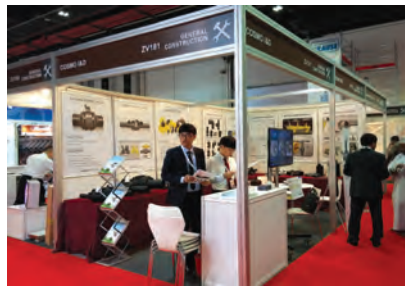
The big5 show 2014 (UAE)



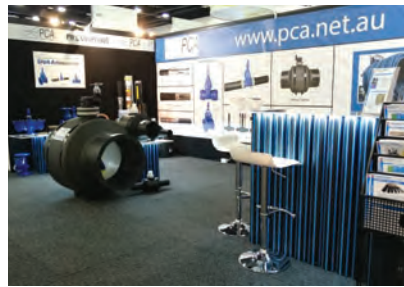
4th International Exhibition (Oman)



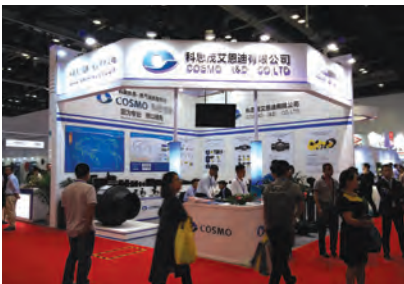
GAS & HEATING 2015 (China)



The big5 show 2015 (UAE)



OZWATER 2015 (Australia)



GAS & HEATING 2016 (China)



The big5 show 2016 (UAE)



ACE 2016 (USA)



OZWATER 2016 (Australia)









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