T-flex

for Gas

Product Information

DADEX

Dadex is the leading thermoplastic pipes manufacturer in Pakistan. It is the exclusive licensee of Wavin Overseas b.v., of the Netherlands which is one of the largest thermoplastic pipes manufacturer in Europe.

Gas lines require pipe systems that have superior quality, deliver high performance and are maintenance free.

As an ISO 9001 certified and PSQCA (Pakistan Standards Quality Control Authority) accredited company, Dadex is actively involved in drafting and adapting Standards and Codes of Practice for Thermoplastic pipes and fittings, including those related to PE pipes and fittings for the conveyance of gas.

T-flex pipes for gas are manufactured from engineered polyethylene raw material that provides a balance of properties for strength, toughness, flexibility, wear resistance, chemical resistance and durability. T-flex pipes have excellent hydraulics for low resistance to fluid flows even at high flow velocities and resilience for outstanding tolerance to pressure surge. T-flex pipes are manufactured from standard pipe grade, a synthetic polymer produced from the distillation and cracking of crude oil. Fittings used with T-flex pipes are imported from Wavin Overseas.

Raw Material

The Polyethylene compound used for production processes is in the form of small uniform sized granules. It is imported by Dadex from high quality international suppliers. T-flex pipes and fittings are manufactured from Polyethylene (PE 80 or PE100) compound, which is a synthetic Polymer normally produced from the distillation and cracking of crude oil. Polyethylene (PE 80 or PE100) is highly resistant to environmental stress cracking and meets the ISO classification for (PE 80 or PE100) pipe materials. Dadex also has the capability to produce high performance PE 100 pipes for gas.

Colour: PE 80 - Bright Yellow, PE 100 - Bright Orange

General Advantages of Dadex T-flex Pipe System

- Good resistance to corrosion.
- Relatively light weight.
- Flexible & low frictional resistance.
- Comprehensive range of fittings available.
- Suitable for narrow trenching resulting in cost saving.
- Good absorption of impact loads vibration & ground movement.
- Easily identifiable due to their distinctive yellow/orange color.
- Does not require any internal/external coating against corrosion.
- Can withstand substantial deflection during installation.
- Deflection in the system is uniform due to homogeneous pipe/fitting materials.
- Material classification is simple to understand for fusion/welding compatibility like PE 80 and PE 100.
- Available in coiled lengths upto 100 m.

Technical Advantages

Available Lengths

Dadex PE gas pipes are available in the following diameters: 20, 25, 32, 40, 50 and 63 mm in coil of length up to 100 meters. 75 and 90 mm diameter in coils up to 50 meters length. 110, 125, 140, 160, 180, 200, 225 and 250 mm diameter in straight length of 6m/12m.

A complete range of T-flex pipes for gas is available in imperial sizes of ¾”, 1”, 1¼”, 1½”, 2”, 2½”, 3”, 3½”, 4” and 6”.

Trenching

- Open cut narrow trenching

Joint

- Butt Fusion, Socket Fusion, Electro Fusion and Mechanical Joints.

Connections For Off-Takes

- Tapping saddles (Electro Fusion) with cutters available.

Environment Resistance

- Resistant to aggressive and corrsoive ground condition.

Trench Back Filling

- Selected as - dug material free from large stones and sharp objects can be used.

* PE Pipe diameters refer to outer diameters. Internal diameters vary with wall thicknesses.

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Standard Specifications

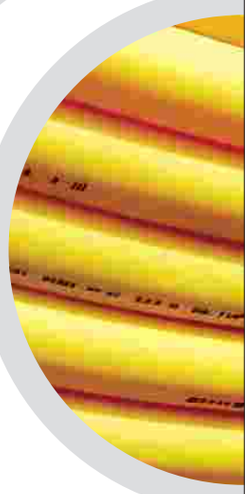
T-flex pipe conforms to the following standards: ISO 4437, DIN 8074, DIN 8075, ASTM D-2513

Product Range*

ISO 4437 Dimensions in Millimetres (mm)

Nominal outside diameter	Minimum wall thickness	
d_e	$e_{min.}$	
	SDR 17.6	SDR 11
20	2.3	3.0
25	2.3	3.0
32	2.3	3.0
40	2.3	3.7
50	2.9	4.6
63	3.6	5.8
75	4.3	6.8
90	5.2	8.2
110	6.3	10.0
125	7.1	11.4
140	8.0	12.7
160	9.1	14.6
180	10.3	16.4
200	11.4	18.2
225	12.8	20.5
250	14.2	22.7

*Note: Special sizes can be manufactured as per ASTM / ISO standards on customer requirement.



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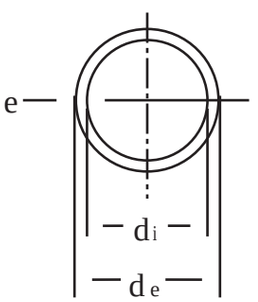
ASTM D 2513 - Dimensions

Nominal Pipe Size	Outside diameter inch (mm)	Tolerance for Max. / Min. out of roundness SDR 17 / SDR 13.5 / SDR 11	Wall Thickness and Tolerance					
			SDR	min. inch (mm)	Tolerance inch (mm)	SDR	min. inch (mm)	Tolerance inch (mm)
3/4”	1.050 (26.7)	±0.010 (±0.254)	11	0.095 (2.41)	+0.011 (+0.279)	-	-	-
1”	1.315 (33.4)	±0.010 (±0.254)	11	0.119 (3.02)	+0.014 (+0.356)	-	-	-
1 1/4”	1.660 (42.1)	±0.012 (±0.305)	11	0.151 (3.84)	+0.018 (+0.457)	17	0.098 (2.49)	+0.012 (+0.305)
1 1/2”	1.900 (48.3)	±0.012 (±0.305)	11	0.173 (4.39)	+0.021 (+0.533)	17	0.112 (2.85)	+0.013 (+0.330)
2”	2.375 (60.3)	±0.012 (±0.305)	11	0.216 (5.49)	+0.026 (+0.660)	17	0.140 (3.56)	+0.017 (+0.432)
2 1/2”	2.875 (73.0)	±0.015 (±0.381)	11	0.261 (6.63)	+0.031 (+0.787)	17	0.169 (4.29)	+0.020 (+0.508)
3”	3.500 (88.9)	±0.015 (±0.381)	11	0.318 (8.08)	+0.038 (+0.965)	17	0.206 (5.23)	+0.025 (+0.635)
3 1/2”	4.000 (101.6)	±0.015 (±0.381)	11	0.363 (9.22)	+0.044 (+1.118)	17	0.236 (5.99)	+0.028 (+0.711)
4”	4.500 (114.3)	±0.015 (±0.381)	11	0.409 (10.39)	+0.049 (+1.246)	17	0.264 (6.71)	+0.032 (+0.813)
6”	6.625 (168.3)	±0.035 (±0.889)	11	0.602(15.29)	+0.072 (+1.829)	17	0.390 (9.91)	+0.047 (+1.194)



e = Wall Thickness

de = Outside Diameter

di = Inside Diameter

Physical Properties (Typical) PE80

Property	Typical	Units	Test Methods
Melt Flow Rate (190°C, 5kg)	0.85	g/10 min	ISO 1133
Density of Colored Compound	940	kg/m^3	ISO 1872/1
Tensile Stress at yield	19	Mpa	ISO / R527
Elongation at Break	>600	%	ISO / R527
Flexural Modules	750	Mpa	ISO 178
Vicat Softening Temperature	116	°C	ISO 306
Thermal Conductivity	0.4	W/m °C	BS 874 (at 23°C)
Linear Thermal Expansion	1.5×10^{-4}	$°C^{-1}$	ASTM D 696 (20-60°C)
Environmental Stress Crack Resist.	>5000	Hrs.	ASTM D 1693 B
Minimum Required Strength (MRS)	8.0	Mpa	ISO TR 9080 (97.5%LCL)

Note: Tests are conducted by manufacturers of Raw Material. Copy of test certificate can be provided on request.

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Butt Fusion Fittings - Shapes and Size (ISO System)

PRODUCT		SIZE (mm)
END CAP		20 25 32 63 90 125 180 250
EQUAL TEE		63 90 125 180 250
REDUCER		63 x 32 90 x 63 125 x 63 125 x 90 180 x 125 250 x 180
90° ELBOW		25 32 63 90 125 180 250
45° ELBOW		63 90 125 180 250
STUB FLANGE		63 (50) 90 (80) 125 (100) 180 (150) 250 (250)

Note: All fittings are imported from Wavin Overseas on need basis.

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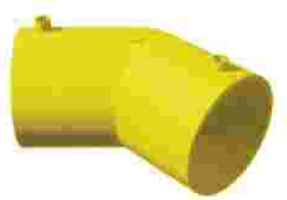
Electrofusion Fittings - Shapes and Size (ISO System)

PRODUCT		SIZE (mm)
COUPLER		20 25 32 63 90 110 125 160 180 200 225 250
REDUCER		25 x 20 32 x 20 32 x 25 90 x 63 110 x 90 125 x 90 180 x 125
EQUAL TEE		*20 *25 32 63 90 110 125 160 180
90° ELBOW		25 32 63 90 110 125 160 180
45° ELBOW		63 90 110 125 160 180

Note: All fittings are imported from Wavin Overseas on need basis.

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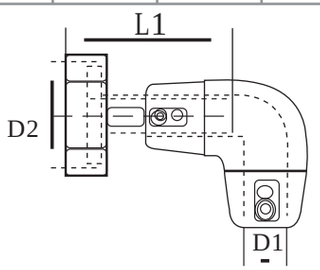
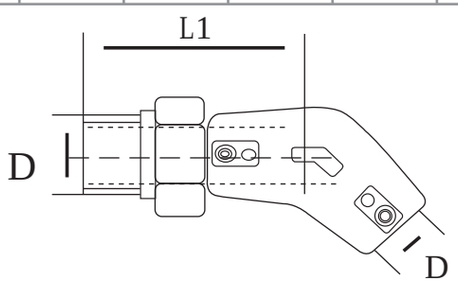
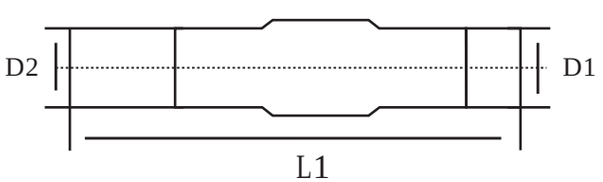
Transition Fittings - Travelling Nut - 90° Elbow							
D1	D2	PN 6	PN 10	PN 12.5	PN 16	L 1	Material
20	3/4”	-	X	X	X	54	Brass
25	3/4”	-	X	X	X	55	Brass
25	1”	-	X	X	X	56.5	Brass
32	1”	-	X	X	X	59.5	Brass



Transition Fittings - Travelling Nut - 90° Elbow							
D1	D2	PN 6	PN 10	PN 12.5	PN 16	L 1	Material
20	3/4”	-	X	X	X	54	Brass
25	3/4”	-	X	X	X	55	Brass
25	1”	-	X	X	X	56.5	Brass
32	1”	-	X	X	X	59.5	Brass



PE/Steel Transition Fittings							
D1	D2	PN 6	PN 10	PN 12.5	PN 16	L 1	Material
32	1”		x	x		280	Steel
40	1 1/4”		x	x		310	Steel
50	1 1/2”		x	x		320	Steel
63	2”		x	x		340	Steel
90	3”	x	x	x		430	Steel
110	4”	x	x	x		460	Steel
125	4”	x	x	x		480	Steel
160	6”	x	x	x		660	Steel
180	6”	x	x	x		720	Steel
200	8”	x	x	x		800	Steel
225	8”	x	x	x		870	Steel
250	8”	x	x	x		940	Steel
315	10”	x	x	x		1050	Steel



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Note: All fittings are imported from Wavin Overseas on need basis.

Jointing Methods

Two most commonly used jointing methods are:

1. Butt Fusion
2. Electro Fusion

1. Butt Fusion

A method of joining T-flex pipes where two pipe ends are heated to a molten state, and brought together to form a homogeneous bond. For long lasting and reliable fusion, only pipes and fittings of same size, MRS and SDR* rating should be used.

$$\text{* Standard Dimension Ratio} = \frac{\text{Average Outside Diameter}}{\text{Mimimum Wall Thickness}}$$

Preparation for Butt Fusion Joints

Do's

- Check that diameter, SDR, Polymer (MRS) are same.
- Check all equipment is clean and in good working conditon.
- Ensure that the pipe is undamaged.
- Check fuel for generator (where applicable).
- Check fusion condition for pipe to be welded.
- Use pipe support rollers.
- Carry out dummy fusion to clean heating plate (where needed).

Don'ts

- Weld in wet or windy condition without protection of welding equipments.
- Remove pipe from clamp before cooling period is complete.
- Use dirty or contaminated pipe.
- Use Butt Fusion equipment unless fully trained to do so.

General Butt Fusion Installation Procedure

1. Ensure that the pipes to be joined are of same diameter, SDR and polymer.
2. If necessary pipe and fittings should be washed with clean water and wiped with paper before clamping in machine.
3. The pipe ends must be reasonably square cut. If not, re-cut pipe ends with pipe cleaned with moist cloth and dried.
4. At the start of each working day (welding session) the cold heater plate should be cleaned with moist cloth and dried.
5. Check to ensure that the butt fusion equipment is clean and in working order, the correct size clamp inserts are available and heater plate is upto working temperature.
6. To avoid any risk of contamination at site, place butt fusion machine on a clean base board or tarpaulin.
7. If the weather is windy or wet, jointing should be carried out inside a protective shelter.
8. To prevent cooling of heater plates from air drafts, the pipe ends should be plugged or covered before welding commences.
9. Before jointing commences the fusion pressure and fusion time should be established for the pipes being jointed. The information should be attached to the fusion machine, or contact our Technical Department to obtain fusion data.
10. Check that the generator has sufficient fuel to last for the joining cycle.

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2. Electro Fusion Method

The jointing technique is based on sleeve coupler with an integrated coil. The pipe ends that are to be joined are placed in the coupler and electrical current is passed through the coil. As resistance of wire generates temperature, the material of coupler and pipe melts to fuse with each other.

Preparation for Electro Fusion Joints

Do's

- Cut pipe ends square and deburr.
- Scrape pipe ends.
- Use correct restraining clamps.
- Set correct fusion and cooling times.
- Check fuel for generator (where applicable).

Don'ts

- Use sandpaper, emery cloth etc. for cleaning pipe ends.
- Touch scraped pipe ends or inside of fittings.
- Make joints in wet and rephrase unless adequate protection is provided.
- Stop the fusion cycle mid way.
- Touch the fusion indicator until the fitting has cooled.
- Move joints before fully cooled.
- Remove the fitting from the plastic bag till the time it is actually required.

General Electro Fusion Installation Procedure

• Clean

Use a clean, dry, lint free cloth or paper towel and wipe loose dirt off the pipe ends.

• Scrape

Using an approved mechanical or handheld scraper, scrape each pipe in excess of half a socket length. Ensure the entire surface layer is removed. Do not touch pipe ends after scraping.

• Mark

Using the molded depth of entry mark on the fitting as a guide. Clearly mark the depth of the entry on the pipes.

• Align

Remove the fitting from the bag and assemble on the pipes upto the central stop. At this point an approved disposable wipe may be used to clean the pipe ends and bore of the fitting. Otherwise do not touch the inside of the fitting.

• Clamp

Position the pipes and fittings into the clamp. Check that the pipes are in line. Fully tighten both restraining clamps.

• Fuse

Connect the fusion box electrical wires to the fitting terminals. Press start and ensure the joint complete it's full fusion cycle (indicated by movement of the fusion indicator.)

• Cool

Leave the joint in the clamp for cooling till the required time as marked on each fitting. Check that the fusion indicator has moved.

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