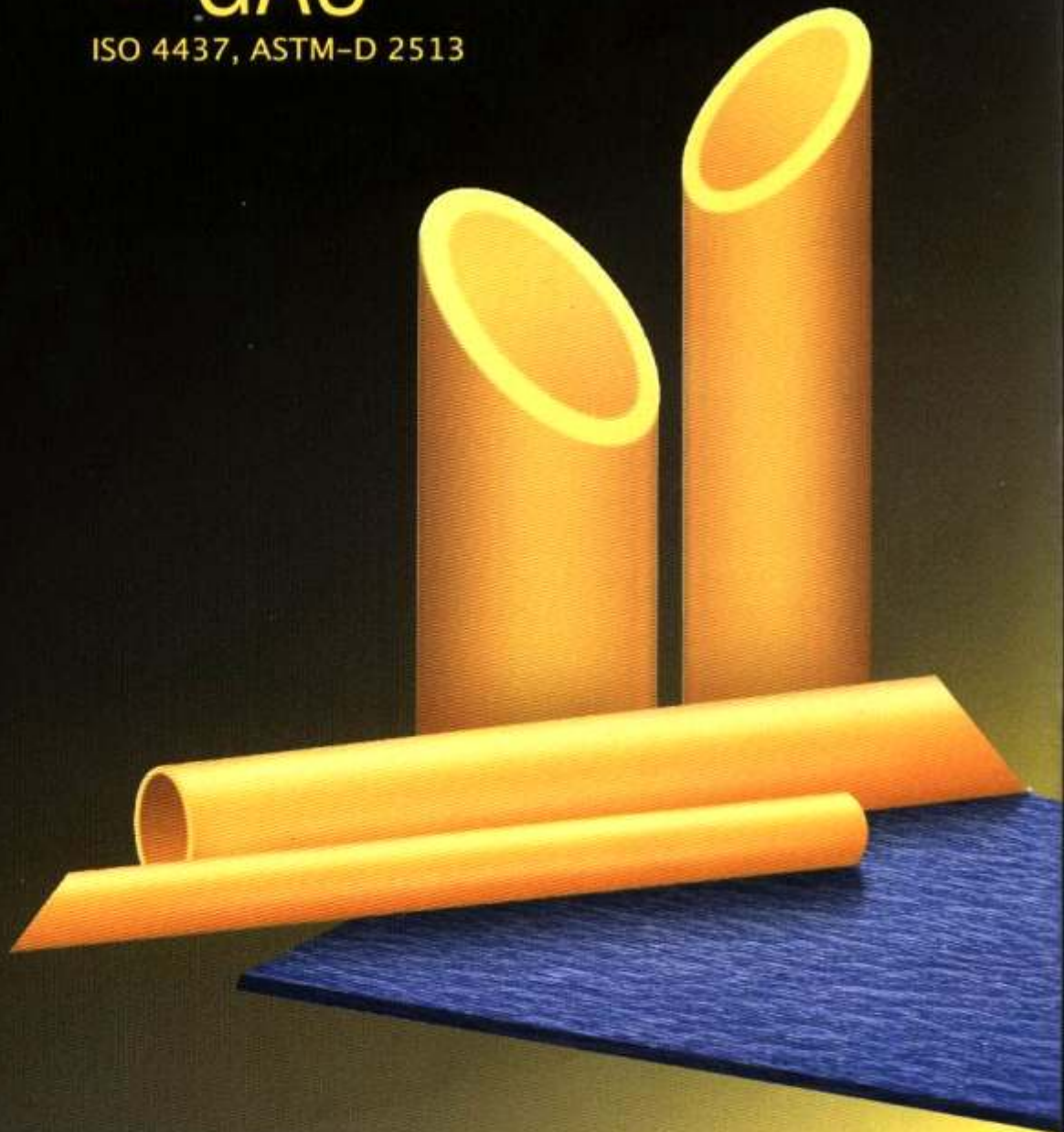


Working for a better tomorrow

# BBJ Polyethylene Pipes

FOR **GAS**  
ISO 4437, ASTM-D 2513



BBJ PIPE INDUSTRIES (PVT) LTD

# INTRODUCTION

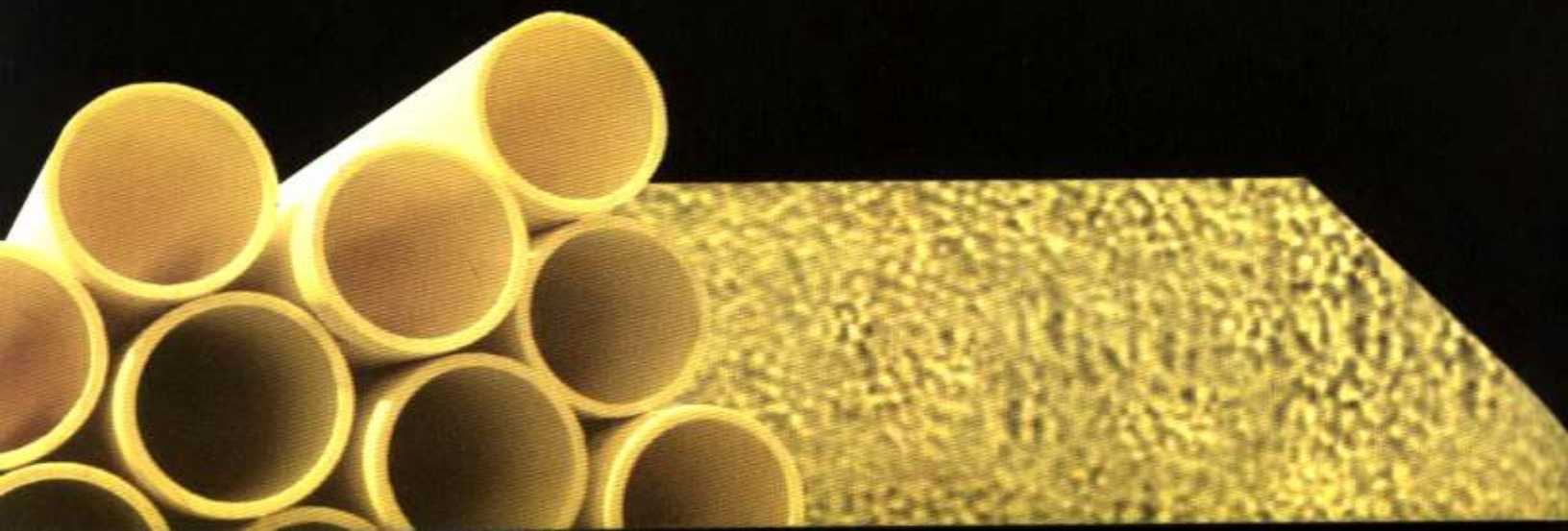
BBJ Pipe Industries is a reputed manufacturer of steel line pipe, galvanized and black, conforming to API-5L, ASTM, BS and other International Standards. BBJ PIPE Industries also manufactures pipe of commercial standards. BBJ Pipe today stands a dynamic name and enjoys prestigious image in the market.

Foreseeing a recess in the field of manufacturing of PE Pipes in the country and in view of increasing trend of their use in Gas Applications, we took initiative to manufacture polyethylene (PE) pipes to meet the country requirements in the name of BBJ Pipe. BBJ Pipe has installed german made state of the art machinery for producing PE pipes for gas and water applications, completely equipped with in-house testing laboratory. BBJ Pipe is proud to be ISO 9001-2008 certified company.

# THE MANAGEMENT

BBJ Management and its members consist of seasoned professionals, highly qualified, skilled and experienced in manufacturing and selling. Our team members are well equipped with the standards and specifications of API, ISO and ASTM.

A dedicated team of PE engineers, technicians and supporting marketing & sales staff makes the customers aware by providing technical information to our future clients about the benefits of usage of BBJ PE pipe in the system.





# MAIN PRODUCTS

BBJ Pipe offers High and Medium density PE pipe for Gas and Water applications. Our PE pipe is produced from selecting internationally reputed supplier high quality resin, extruded with precision and strict quality control measure taken to ensure high quality of the product in compliance to international standard.

# PRODUCT RANGE

Diameter Range: 20 mm to 450 mm

Coils: 50 m and 100 m standards length upto 90 mm

Length: 6 m and 12 m upto 450 mm

# RAW MATERIAL

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

# PHYSICAL PROPERTIES (Raw Material)

(Tests are performed by raw material manufacturer. Copy of test certificate is provided upon request)

PROPERTY	TYPICAL VALUE	UNITS	TEST METHOD
Melt Flow Rate (190°C, 5Kg)	0.77	g/10 min.	ISO 1133
Density of Compound	940	Kg/m <sup>3</sup>	ISO 1872/1
Tensile Stress at Yield	19	MPa	ISO /R527
Elongation at Break	>600	%	ISO /R527
Flexural Modulus	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 <sup>-4</sup>	°C <sup>-1</sup>	ASTM D 696 (20-60 °C)
Environmental Stress Crack Resistance	>1000	Hrs.	ASTM D 1693 B
Minimum Required Strength (MRS)	8.0	MPa	ISO TR 9080 (97.5 % LCL)

# ADVANTAGES OF BBJ PE PIPE

## Versus Metal and Concrete

- Flexible pipes so coiling is easy
- Non-corrosive nature
- Have various jointing techniques
- Have low coefficient of friction  
i.e. good flow properties
- Light weight
- Low installation cost
- Low maintenance and operational cost
- Durable & impact resistant
- Long life (More than 50 years)
- Cost effective pipeline network
- Suitable for narrow trenching
- Can withstand substantial deflection during installation
- Material classification is simple to understand for fusion/welding compatibility like PE 80 and PE 100

## Versus Other Plastic Material

- Heat fusion
- Ductile
- Low temperature toughness
- High flexible
- Fast and easy installation





# TECHNICAL ADVANTAGES

## INCREASED SERVICE PRESSURE

- ISO specify maximum working pressure of 4 bar for PE pipes for gas application

## EASY JOINTING

- Butt Fusion
- Socket Fusion
- Electro Fusion
- Mechanical Joints Methods

## REDUCED PIPE WALL THICKNESS

## INCREASED RESISTANCE TO

- Aggressive ground condition
- Corrosive ground conditions & chemicals

## POSSIBILITY TO PRODUCE LARGER PIPES

- From 20 mm to 450 mm in diameter

## LOW PRESSURE LOSS TRENCHING

- Open cut narrow trenching

## ENVIRONMENT RESISTANCE

- Resistant to aggressive and corrosive ground condition

## TRENCH BACKING FILLING

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



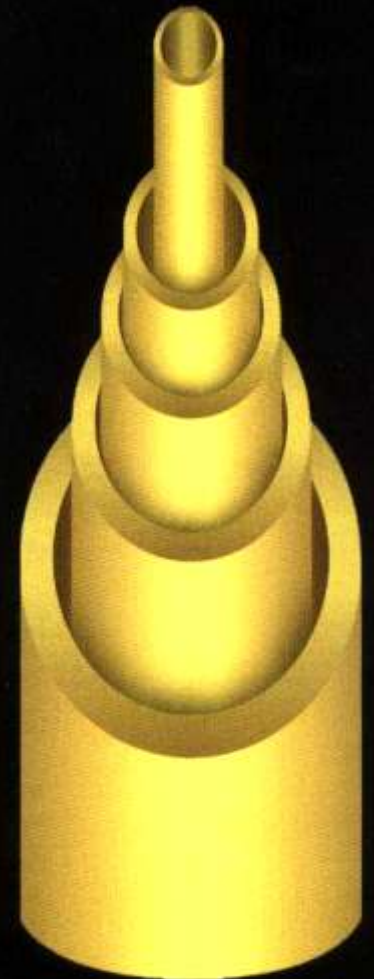
# PE PIPES STANDARD SPECIFICATIONS

BBJ Pipe offers PE pipes produced in accordance to International standards ISO 4437, ASTM D 2513 for Gas Applications.

ISO 4437:2007

Gas (Dimensions in millimeters)

* DN	SDR 26	SDR 21	SDR 17	SDR 13.6	SDR 11	SDR 9
* O.D (mm)	e (mm)	e (mm)	e (mm)	e (mm)	e (mm)	e (mm)
20	-	-	-	-	2.3	3.0
25	-	-	-	2.0	2.3	3.0
32	-	-	2.0	2.4	3.0	3.6
40	-	2.0	2.4	3.0	3.7	4.5
50	2.0	2.4	3.0	3.7	4.6	5.6
63	2.5	3.0	3.8	4.7	5.8	7.1
75	2.9	3.6	4.5	5.6	6.8	8.4
90	3.5	4.3	5.4	6.7	8.2	10.1
110	4.2	5.3	6.6	8.1	10.0	12.3
125	4.8	6.0	7.4	9.2	11.4	14.0
140	5.4	6.7	8.3	10.3	12.7	15.7
160	6.2	7.7	9.5	11.8	14.6	17.0
180	6.9	8.6	10.7	13.3	16.4	20.1
200	7.7	9.6	11.9	14.7	18.2	22.4
225	8.6	10.8	13.4	16.6	20.5	25.2
250	9.6	11.9	14.8	18.4	22.7	27.9
280	10.7	13.4	16.6	20.6	25.4	31.9
315	12.1	15.0	18.7	23.2	28.6	35.2
355	13.6	16.9	21.1	26.1	32.2	39.7
400	15.3	19.1	23.7	29.4	36.4	44.7
450	17.2	21.5	26.7	33.1	40.9	50.3



## LEGEND:

- \* SDR: Standard Diameter Ratio
- \* O.D: Outside Diameter
- \* I.D: Inside Diameter



## ASTM D 2513 - DIMENSIONS

Nominal Pipe Size	Outside Diameter Inch (mm)	Tolerance for Max./Min. out of roundness SDR 17/13.6/11/10/9	Wall Thickness								
			SDR	Min. Inch (mm)	Tolerance Inch (mm)	SDR	Min. Inch (mm)	Tolerance Inch (mm)	SDR	Min. Inch (mm)	Tolerance Inch (mm)
3/4"	10.050 (26.67)	± 0.010 (± 0.254)	9			11	0.095 (2.41)	+0.011 (+0.279)	17		
1"	1.315 (33.4)	± 0.010 (± 0.254)	9	0.140 (3.56)	+0.017 (+0.432)	11	0.120 (3.05)	+0.014 (+0.356)	17		
1-1/4"	1.660 (42.1)	± 0.012 (± 0.305)	9	0.178 (4.62)	+0.021 (+0.533)	11	0.151 (3.84)	+0.018 (+0.457)	17	0.098 (2.49)	+0.012 (+0.279)
1-1/2"	1.900 (48.3)	± 0.012 (± 0.305)	9			11	0.173 (4.39)	0.021 (0.533)	17	0.112 (2.85)	+0.013 (+0.33)
2"	2.375 (60.3)	± 0.015 (± 0.381)	9	0.255 (6.48)	+0.231 (+0.79)	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)	9			11	0.216 (6.63)	+0.031 (+0.787)	17	0.169 (4.29)	+0.020 (+0.508)
3"	3.500 (88.9)	± 0.015 (± 0.381)	9	0.375 (9.53)	+0.045 (+1.14)	11	0.313 (8.08)	+0.038 (+0.965)	17	0.206 (5.23)	+0.025 (+0.508)
3-1/2"	4.000 (101.6)	± 0.015 (± 0.381)	9	0.482 (12.24)	+0.058 (+1.473)	11	0.636 (9.22)	+0.044 (+1.118)	17	0.236 (5.99)	+0.028 (+0.711)
4"	4.500 (114.3)	± 0.015 (± 0.381)	9			11	0.409 (10.39)	+0.049 (+1.246)	17	0.265 (6.73)	+0.032 (+0.813)
5"	5.563 (141.30)	± 0.010 (± 0.25)	9			11	0.506 (12.85)	+0.061 (+1.549)	17	0.327 (8.31)	+0.039 (+0.991)
6"	6.625 (168.3)	± 0.035 (± 0.889)	9			11	0.602 (11.239)	+0.072 (+1.829)	17	0.390 (9.91)	+0.047 (+1.94)
8"	8.625 (219.08)	± 0.015 (± 0.83)	9			11	0.784 (19.91)	+0.094 (+2.388)	17	0.507 (12.90)	+0.061 (+1.549)
10"	10.750 (273.05)	± 0.015 (± 0.83)	9			11	0.977 (24.82)	+0.117 (+2.972)	17	0.632 (16.05)	+0.076 (+1.39)
12"	12.750 (323.85)	± 0.017 (± 0.43)	9			11	1.159 (29.44)	+0.139 (+3.531)	17	0.750 (19.05)	+0.090 (+2.286)





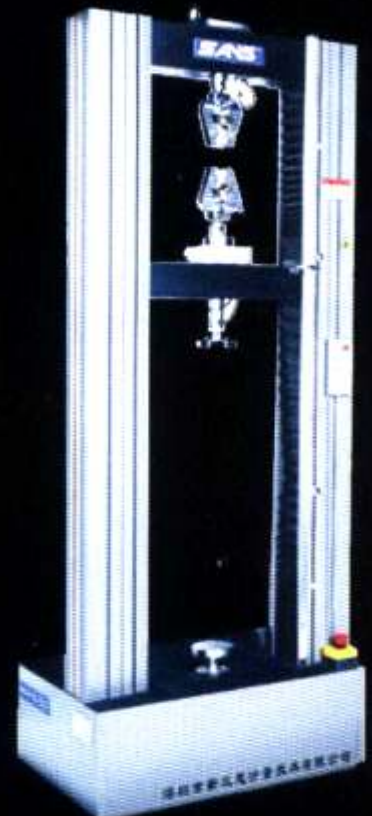
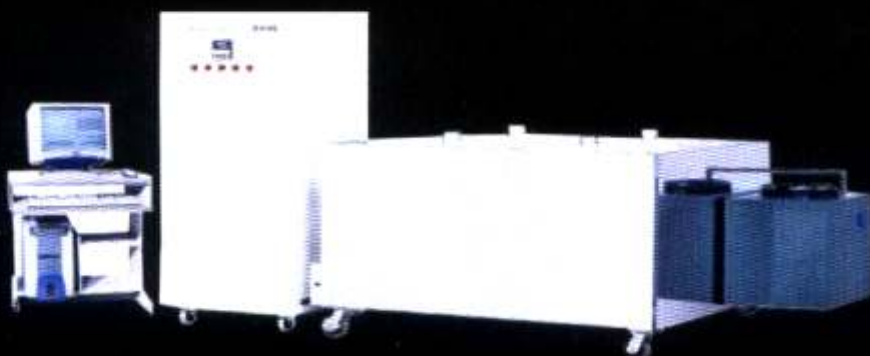
# QUALITY ASSURANCE

BBJ Pipe philosophy is customer focused and believes in customer delightness. All products are supplied to the customers after adhering stringent quality measures. In order to supply best quality products to the client, a separate quality control department has been established to ensure implementation of client specifications and compliance to applicable international standards from raw material to delivery of the products. Quality control staff consists of energetic and self motivated professional engineers. BBJ Pipe has in house laboratory facility, fully equipped with latest and state of the art testing equipments capable to test PE products & PE materials in accordance with all applicable International Standards including furnished below:-

API 15 LE, ISO 4437, ASTM D 2513, ISO 11830  
ISO 1133, 6259 & 9080 etc

BBJ Pipe is quality conscious and leaves no stone unturned to ensure quality of the pipe during production process and finish product. All tests (raw material to finish product) of international standards are carried out in high standard testing facility within manufacturing concern. Quality department ensures that materials used in the manufacturing process are in strict compliance with the end users' requirements and the end product is in conformity with the applicable international standards. Following tests are carried out to ensure conformity of raw materials and finish products to match the specifications laid down by the client:-

- Melt Flow Rate
- Density
- International Hydrostatic Pressure Resistance (ICPR)
- Longitudinal Reversion
- Tensile Strength
- Elongation at Break
- Thermal Stability (Oxidation Induction Test)
- Environmental Stress Crack Resistance (ESCR)





# JOINTING SYSTEMS

There are two jointing system used world wide:

1. Butt Fusion
2. Electro Fusion

## 1.0 BUTT FUSION

A method of joining PE 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 and SDR rating should be used.

$$\text{SDR} = \frac{\text{Average Specified Outside Diameter}}{\text{Minimum Specified Wall Thickness}}$$

### Do's

- Check that diameters, SDR, Pipe (MRS) are same.
- Check all equipment is clean and in good working condition.
- 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

- Ensure that the pipes to be joined are of same diameter and SDR,
- If necessary pipe and fittings should be washed with clean water and wiped with paper before clamping in machine.
- The pipe ends must be reasonably square cut. If not, re-cut pipe ends and pipe ends should be cleaned with moist cloth and dried.
- At the start of each working day (welding session) the cold heater plate should be cleaned with moist cloth and dried
- Check to ensure that the butt fusion equipment is clean and in working order, the correct size clamp insert are available and heater plate is up to working temperature.
- To avoid any risk of contamination at site, place butt fusion machine on a clean base board or tarpauline.
- If the weather is windy or wet, jointing should be carried out inside a protective shelter.
- To prevent cooling of heater plate air drafts, the pipe ends should be plugged or covered before welding commences.
- 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.
- Check that the generator has sufficient fuel to last for the jointing cycle.

## 2.0 ELECTRO FUSION

The jointing technique is based on a sleeve coupler with an integrated coil. The pipe ends that are to be joined are placed in the coupler and electrical current passes 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 V and rephrase unless adequate protection is provided.
- Stop the fusion cycle mid way.
- Touch the fusion indicator until the fitting 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 from the pipe ends.

## . Scrape:

Using an approved mechanical or handheld scrapper, 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:

Use the molded depth of entry mark on the fitting as a guide. Clearly mark the depth of the entry on the pipe.

## . Align:

Remove the fitting from the bag and assemble on the pipes up to the central stop. At this point as 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:

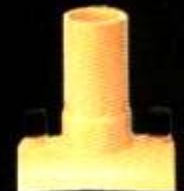
Position the pipe and fittings into the clamp. Check that the pipes are in line and fully tighten both retraining clamps.

## . Fuse:

Connect the fusion box electrical wires to the fitting terminals. Press start and ensure the joint complete its 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.





BBJ PIPE - PE GAS



API-5L  
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