



**izobor**   
PIPE MANUFACTURING CO.



## PRE- INSULATED BONDEND PIPES

### and FITTINGS

from -200 °C to +315 °C;

- District Heating and Cooling Systems
- Cogeneration Systems
- Transport of Steam Systems (aboveground and underground)
- Geothermal Energy
- Greenhouse
- Marine
- Transport of Cold Gases (LNG, LPG, LEG etc.)
- Frost Protection for Domestic Water Systems and Fire Fighting Sytems
- Solar Energy Systems
- Transport of Liquids and Gases ( transport of all other chemical fluids)

for minimizing the Heat Loss

TS EN 253 Pre-insulated bonded pipes

TS EN 448 Pre-insulated bonded fittings

TS EN 488 Pre-insulated bonded valves

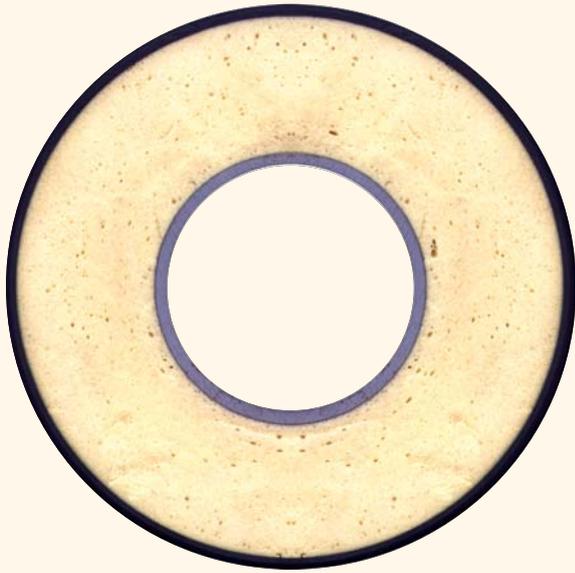
TS EN 489 Joint assembly for pre-insulated bonded pipes

ISO 9001:2000

BS OHSAS 18001:2007

ISO 14001:2004

GOST 30732-2006



### Standart Type

from -200 °C to +120 °C



### Industrail Type

from -120 °C to +315 °C

## STEEL PIPE

ERW, SAW, Seamless	
Density	7850 kg/m <sup>3</sup>
Tensile Strength	> 350 N/mm <sup>2</sup>
Yield Strength	> 235 N/mm <sup>2</sup>
Modulus of Elasticity	2.1 x 10 <sup>5</sup> N/mm <sup>2</sup>
Coefficient of Expansion	1.2 x 10 <sup>-5</sup> K <sup>-1</sup>
Thermal Conductivity	76 W/mK

## HDPE CASING PIPE

Density	> 940 kg/m <sup>3</sup>
Yield Strength	> 19 N/mm <sup>2</sup>
Resistance Against Crack	≥ 2000 hour
Coefficient of Expansion	2.0 x 10 <sup>-4</sup> K <sup>-1</sup>
Thermal Conductivity	0.43 W/mK
Melt Flow Index (MFR)	0.5 gr/10 min.

## POLYURETHANE RIGID FOAM (PUR)

Thermal Conductivity (at 50 °C)	< 0.028 W/mK
Density	≥ 60 kg/m <sup>3</sup>
Average Size of the Cells in Radial Direction	< 0,5 mm
Closed Cell	> % 88
Water Absorption at Elevated Temperature	% 10 < volume
Compressive Strength at 10% Relative Deformation	≥ 0,3 N/mm <sup>2</sup>
Axial Shear Strength	≥ 0,12 N/mm <sup>2</sup>
Tangential Shear Strength	≥ 0,20 N/mm <sup>2</sup>
Thermal Life at Continuous Operating Temperature	
120 °C	at least 30 years
115 °C	at least 50 years
< 115 °C	over 50 years

# PRE-INSULATED BONDED PIPE DIMENSIONS ACCORDING TO TS EN 253



STEEL PIPE NOMINAL DIAMETER		STEEL PIPE				CASING PIPE (HDPE)			INSULATION THICKNESS mm	BONDED PIPE WEIGHT kg / m	JOINT SET		HEAT LOSS**		L Max***		
DN*	inch	Outer Dia. mm	Thickness mm	Inner Dia. mm	kg / m	Outer Dia. mm	Thickness mm	Inner Dia. mm			POLYOL gr	ISOCYANATE gr	W/mK	MWh/m	0,5 m	0,75 m	1,0 m
15	1/2"	21,3	2,0	17,3	0,95	75	2,2	70,6	24,65	1,79	64	102	15	2,8	32	22	17
20	3/4"	26,9	2,0	22,9	1,23	90	2,2	85,6	29,35	2,32	93	149	17	3,2	36	25	19
25	1"	33,7	2,3	29,1	1,78	90	2,2	85,6	25,95	2,85	91	146	20	3,9	40	27	21
32	1 1/4"	42,4	2,6	37,2	2,55	110	2,5	105,0	31,30	4,06	114	182	21	3,9	47	32	25
40	1 1/2"	48,3	2,6	43,1	2,93	110	2,5	105,0	28,35	4,40	110	176	24	4,5	54	37	28
50	2"	60,3	2,9	54,5	4,10	125	2,5	120,0	29,85	5,83	130	208	27	5,0	66	46	35
65	2 1/2"	76,1	2,9	70,3	5,23	140	3,0	134,0	28,95	7,41	162	259	32	5,9	74	51	39
80	3"	88,9	3,2	82,5	6,76	160	3,0	154,0	32,55	9,37	202	323	33	6,1	82	57	44
100	4"	114,3	3,6	107,1	9,83	200	3,2	193,6	39,65	13,55	311	498	34	6,3	92	65	50
125	5"	139,7	3,6	132,5	12,08	225	3,5	218,0	39,15	16,53	355	568	40	7,2	99	70	54
150	6"	168,3	4,0	160,3	16,21	250	3,9	242,2	36,95	21,42	410	656	47	8,6	117	83	65
200	8"	219,1	4,5	210,1	23,81	315	4,9	305,2	43,05	31,85	635	1.016	52	9,4	130	94	74
250	10"	273,0	5,0	263,0	33,04	400	6,3	387,4	57,20	46,28	1.044	1.670	50	9,0	133	98	78
300	12"	323,9	5,6	312,7	43,96	450	7,0	436,0	56,05	59,93	1.173	1.877	58	10,3	152	113	90
350	14"	355,6	5,6	344,4	48,33	500	7,8	484,4	64,40	68,24	1.497	2.395	56	10,0	145	109	87
400	16"	406,4	6,3	393,8	62,16	560	8,8	542,4	68,00	86,87	1.876	3.002	60	10,6	160	121	98

\* Steel pipes and fittings in dimensions up to DN 1200 can be supplied to order.  
 \*\* The calculations are done according to 90°C as fluid temperature and 10°C as soil temperature.  
 \*\*\* Maximum fitting length of pipe.



**Straight Pipe**

Standard pipe length is 6m but, it can be supplied 8m and 12 m length.



**Elbow 45° - 90°**

Elbows with other angles and lengths are supplied to order.



**T-fitting**

Parallel and straight T-fittings are supplied to order.



**Anchor**

Anchors are supplied in fixed 2m length.



**Compensator**

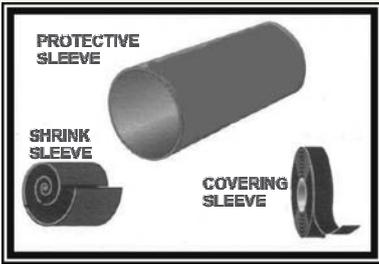
Compensators are supplied as 30-60-90-120 mm expansion.



**Reduction**

Reduction fittings are supplied to order concentric or eccentric.

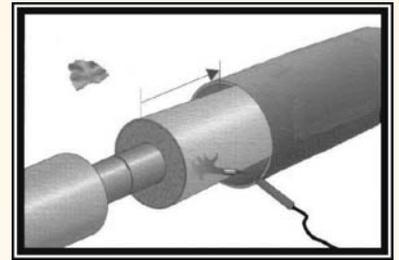
# JOINT SET INSTALLATION GUIDE



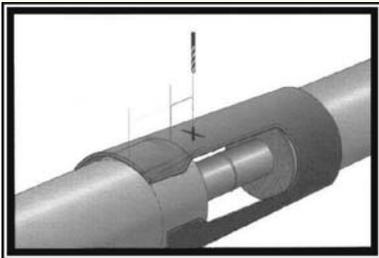
Suitable joint sets should be provided for every diameter of pre-insulated pipe. (These joint sets to be sent by IZOBOR.)



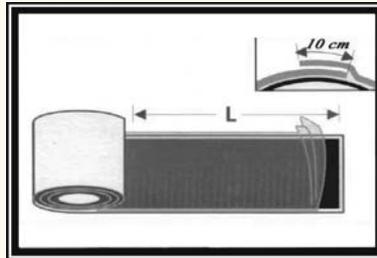
Required equipment should be provided. These are, propane tank, hose, torch and regulator, tools for surface abrasion, gloves, goggles, etc.



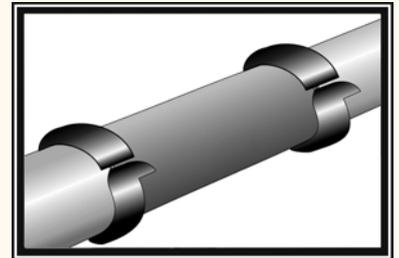
Clean exposed steel and protective sleeve and pre-heat the exposed steel and protective sleeve.



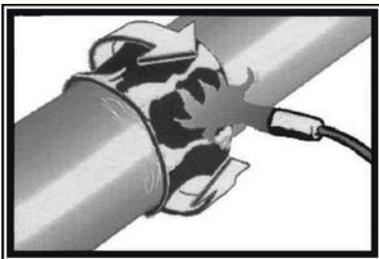
Fix the protective sleeve over casing pipe. Hole on the protective sleeve should be placed upwards.



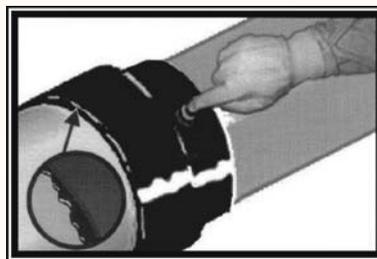
Wrap the shrink sleeve around the casing pipe, ensuring the appropriate overlap. (between the 10 and 2 o'clock position – 10cm)



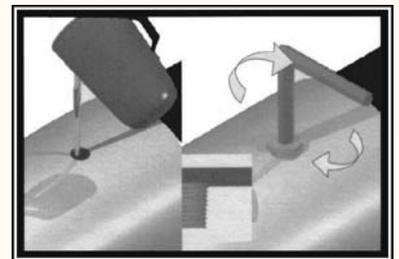
Fix the shrink sleeves. (the half of shrink sleeve should be on casing pipe, the other half should be on protective sleeve.)



Using the appropriate torch, begin at the centre of the sleeve and heat circumferentially around the pipe.

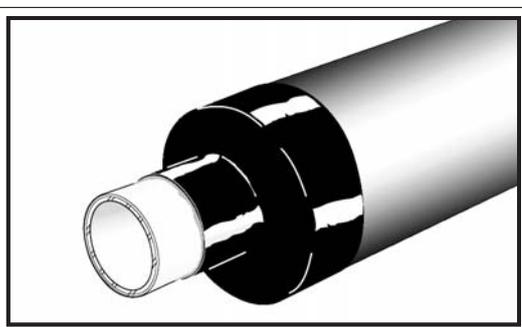


Shrinking has been completed when the adhesive begins to ooze at the sleeve edges all around the circumference. Finish shrinking the sleeve with long horizontal strokes over the entire surface to ensure a uniform bond.



The PUR foam used to insulate seams is a Polyurethane substance made from two chemicals that are supplied in liquid form in jars or bags. The amount used varies according to the size of the seam. These amounts are given in the table Page 3.

## END CAP



Pipe Diameter PE 90 - PE 500



Operation Temp. Max 130°C

# WHY SHOULD WE USE PRE INSULATED BONDED PIPES IN OUR SYSTEMS?

- The pipe system has long thermal life time. (According to TS EN 253 minimum 30 years)
- The pipe system reduces heat losses. (The pipe system includes the best insulation material in the world. PUR : 0.028 W/mK)
- The pipe system reduces the cost of construction. (As pipe system can be directly buried in the ground there is no need to construct reinforced concrete pipe gallery.)
- The pipe system reduces using compensators. (The expansion in the pipe system reduces because of soil load and friction between casing pipe and soil.)
- The pipe system has homogenous insulation thickness in all along the line.
- The pipe system has 40% energy saving compare with the pipes insulated traditionally.
- The pipe system has no operational cost. ( The thermal properties of insulation material remain same for lifetime period)
- The pipe system is water proof. (The properties of casing pipe remain safe for lifetime period and there is no external corrosion of steel pipe.
- The pipe system does not need cathodic protection.
- The pipe system does not occur any thermal bridge.
- The pipe system has resistance to chemicals and direct sun light.
- Pre insulated bonded fittings are fully compatible with pipe system.
- The pre insulated pipe and fittings are produced according to EN 253 and EN 448 respectively.

## OUR SERVICES

### PRE-SALE SERVICE

IZOBOR offers to customers the most preferred systems having less investment and operational cost by its experience and knowledge in pipe sector.

### AFTER-SALE SUPPORT

Full support is provided by the company's team of Customer Services personnel whose primary function is to provide any planning and technical requirement and technical training service of our customers.

### ENGINEERING – CONSULTING – PROJECT DESIGN

IZOBOR offers engineering and consulting services to describe and design the system according to customer requirement. Our highly qualified experts have an in-depth knowledge of the needs as well as best practices in project design and testing and commissioning the systems.



**YOUR BUSINESS**

**PARTNER**

**FACTORY**

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