

## **Permanent Connections to Couple Polyethylene Pipes Reinforced with Synthetic Yarns to Steel Pipelines**

(Extract from TU 2248-006-55038886-08)

Permanent connections to couple polyethylene pipes reinforced with synthetic yarns to steel pipelines (hereinafter referred to as permanent connection) are manufactured by means of assembling a connecting piece, made of polyethylene pipe, onto a steel nipple of the insert by mandreling the central hole of the nipple.

Permanent connections are designed to weld reinforced pipes as per TU2248-001-55038886-01 to steel pipelines of cold-water supply systems, process and oil pipeline systems of up to 4 MPa working pressure, and gas distribution networks of up to 1.2 MPa working pressure.

Permanent connections are intended for operation at pipeline wall temperatures ranging from +60°C to -15°C.

The identification mark of the permanent connection includes the following:

- Name of the connection HC (Roman: NS) and the abbreviated name of the reinforced polyethylene pipe:
- TH (Roman: TN): corresponds to pipes intended for oilfield pipelines and utility and drinking water pipelines
- TГ (Roman: TG): corresponds to pipes intended for gas distribution networks
- B (Roman: V) series as per TU2248-001-55038886-01 (polyester yarn reinforcement)
- the pipe's nominal outer diameter
- abbreviated symbol for the steel pipe CT (Roman: ST),
- steel pipe's nominal outer diameter and thickness in mm,
- indication of the engineering specification

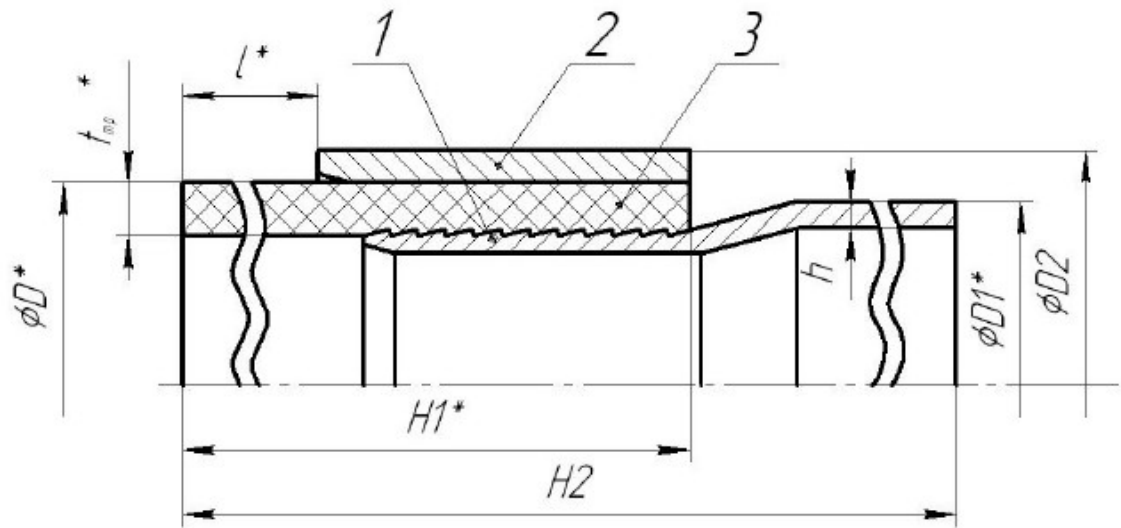
Here is an example of identification of a permanent connection designed to couple a reinforced polyethylene pipe of 110 mm nominal outer diameter to a steel pipe of 95 mm outer diameter and 6 mm thickness:

***HC TH 110B/CT 96x6 TY2248-006-55038886-08 (Roman: NS TN 110V/ST 96x6 TU2248-006-55038886-08)***

### **1 Specification**

Permanent connections are to meet engineering specification requirements and are to be manufactured in conformity with engineering drawings of Tekhnologiya Kompozitov OOO. Permanent connection assembling is to be performed at the facilities of the supplier of the connections.

The design of the permanent connection is to meet Figure 1 and engineering drawings. The dimensions of the permanent connection are to be in conformity with table 1.



\*-dimensions for reference

1- steel pipe insert; 2- holder; 3- connecting piece made of reinforced polyethylene pipe

**Figure 1** – Permanent connection to couple a reinforced polyethylene pipe to a steel pipe

Table 1

D	D <sub>1</sub>	D <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	h	t <sub>tp</sub>	l
63	57*	73	420	790	4*	7,5	440
90	76*	102	420	790	6*	10,5	410
110	95*	121	420	800	6*	13,0	395
125	102*	133	420	814	7*	14,7	385
140	114*	152	420	830	7*	17,0	375
160	133*	168	420	835	7*	19,0	365

\* The dimensions can be changed as agreed by the Customer

### Performance

To manufacture permanent connections, the following steel pipes are used: steel pipes as per GOST 10705 (group B (Roman: group V)), GOST 10704, GOST 8731 (group B and Г (Roman: group V and G)), GOST 8732 with regard to SP42-102 requirements (for gas pipelines) or R51-31323949-58 (for oilfield pipelines).

To manufacture permanent connections, polyethylene pipes reinforced with polyester yarns (series B (Roman: series V)) as per TU2248-001-55038886-01 are used. PE80 or PE100 polyethylene is used. The properties of the material of the pipes intended for gas pipelines are to meet those stated in the appendix L GOST R 50838.

The appearance of connections is to be in conformity with the check samples.

Permanent connections are to meet the performance parameters specified in Table 2.

Table 2

Parameter Name	Parameter Value	Test Method
1 Leak test at 4.0 MPa at 20°C, hours minimum	24	TU2248-006-55038886-08
2 Life at 6.0 MPa continuous internal pressure at 20°C, hours minimum	12	TU2248-006-55038886-08
3 Life at 4.0 MPa continuous internal pressure at 20°C, hours minimum	100	
4 Life at 2.0 MPa continuous internal pressure at 80°C, hours minimum	165	
5 Axial stress strength test at 20°C	The failure is to happen beyond the coupling area	TU2248-006-55038886-08

### **Permanent Connection Assembly**

Permanent connections are welded to reinforced polyethylene pipes by butt-welding with the use of a heated tool and the welded joint is subsequently reinforced by means of an electrofusion sleeve as per process documentation approved in accordance with the established procedure.

Permanent connections are welded to steel pipelines in compliance with GOST 16037.

The temperature of the steel pipe in the point of connection to the reinforced polyethylene pipe is not to exceed 80°C. It is recommended that the permanent connection be welded first to a 1m long piece of a steel pipe in the workshop environment where the thermal conditions at the transition (reducer/increaser) sleeve of the pipe can be assured. In the process of aligning the steel pipes for butt-welding and subsequent reinforcement with an electrofusion sleeve, gas cutting and polishing of the edge should be performed at the steel pipeline end, not at the steel connecting piece end of the permanent connection. The polyethylene connecting piece should be protected from metal splash and dross in the process of joint adjustment and assembling, tick welding, and subsequent electric arc welding.

Steel inserts of permanent connections for oilfield pipelines shall be protected against external corrosion in compliance with PB (ПБ) 08-624 requirements.

In case of underground laying, gas pipelines are to be protected against galvanic attack by means of protective insulating heavy-duty covers in compliance with PB (ПБ) 12-529 requirements.

At crooked elastic parts of pipeline routes, assembling of connections is not permitted.

### **Service Life and Manufacturer's Guarantee**

The service life of permanent connections is taken equal to the service life of the pipeline constructed of steel pipes.

The guaranteed shelf life of permanent connections is two years from that date of manufacture.