

CONSTRUCTIVE AND TECHNOLOGICAL POSSIBILITIES OF BLENDING THE POLYETHYLENE PIPES

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Key words: pipes, polyethylene, reticulated

Abstract:

The polyethylene pipes play a role more and more important in the industry of supplying with water, gas, but also the ventilation network system.

In the present paper are presented the majority of the known constructive and technological possibilities of the ordinary polyethylene pipe-lines, as well as the actual possibilities of coupling of the reticulated polyethylene pipe-lines (PE-X), at the end followed by the conclusions regarding these connection methods.

I. INTRODUCTION AND GENERALITIES

The polyethylene pipes play a role more and more important in the industry of supplying with water, gas, but also the ventilation network system.

The polyethylene pipes present multiple hydraulic properties, mechanical, thermal, positive chemical, so as their utility domain became wider buying more and more field in front of the metallic ones.

The principal properties that characterize the polyethylene pipes are the following: the absence of corrosion, the resistance at low temperatures, chemical high resistance, great flexibility, low weight, high resistance at mechanical shocks, etc.

Further on this paper are presented the majority of known constructive and technological possibilities of blending the pipes made from usual polyethylene, and also the possibilities of blending the more actual reticulated polyethylene.

II. METHODS AND BLENDING TECHNOLOGIES FOR USUAL POLYETHYLENE PIPES

The polyethylene pipes can be blended in many ways with multiple technologies.

After the way they are blended they are:

- dissembling;
- no dissembling.

The dissembling assemblies can be realized by linkage under compression or flange linkage. In the case of the flange linkage the screws with nuts are elements that assure the degree of clenching.

The no dissembling assemblies are realized in our days by:

- **Welding by electro fusion** (this method are present in the next chapter);
- **Welding by poly fusion**

This method applies to the pipes with the a diameter between 16 and 110mm; so as this way of welding can be realized it is necessary to obey some technical conditions, conditions that can be found in specialty books.

- **The head on head welding**

It is realized with the help of some special devices; the behinds of the pipes are clenched with torques with the help of some hydraulic or mechanic devices, that move the surfaces that will be welded one to another.

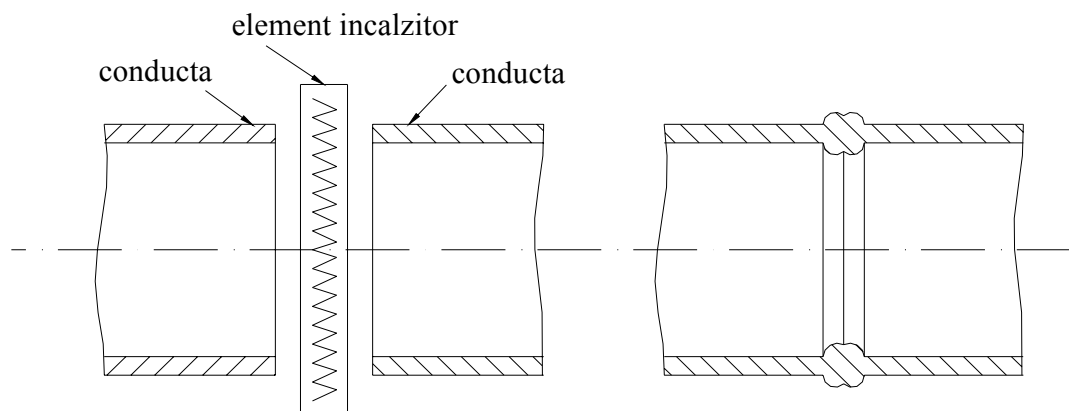


Figure 1. The head on head welding

III. METHODS OF BLENDING THE PIPE MADE OF RETICULATED POLYETHYLENE

The raw material for the reticulated polyethylene pipes is the polyethylene (PE). The polyethylene is an organic link between the molecules of carbon and hydrogen. In the case of reticulated polyethylene (X), the hydrogen atoms are distanced from the molecular chain. In this way a network of molecules irreversible in cross is obtained between the carbon atoms, and in the process of extrusion the polyethylene, peroxide is added, so the oxygen links the hydrogen atoms. After this process the reticulated polyethylene (PE-X) is obtained and it is resistant to big demands.

Methods of blending the reticulated polyethylene pipes:

- Method of blending with connections and ramifications with sliding muff

These connections can be made of steel, copper, bronze, etc. The tightness of the blend is obtained by pressuring; the pressing effect is obtained in a mechanic way, with special working devices. The disadvantage of this method is that once the diameter of the ramification grows, the price of the piece grows proportionally with it.



Figure 2. Blending with connections and ramifications with sliding muff

- Method of blending with electro fusion muffs

These muffs can be easily installed because of the free space assured since projecting them. They have an electrical resistance that can be found on the interior of the muff. The electrical resistance is connected to a source of alimentation with electrical power.

This type of blending must be done by special qualified personnel.

The disadvantage of this method is the same as the blending with ramifications, the sliding muff. Another disadvantage is that only materials of the same type can be blended.



Figure 3. Blending with electro fusion muffs

- Method of blending with elastic bracelet

This method is based on the friction forces resulted after clenching on the cylindrical surface of the pipe with an elastic bracelet. This is made with the help of some screws and nuts. The advantage of this method is the easy way of assembling and disassembling.

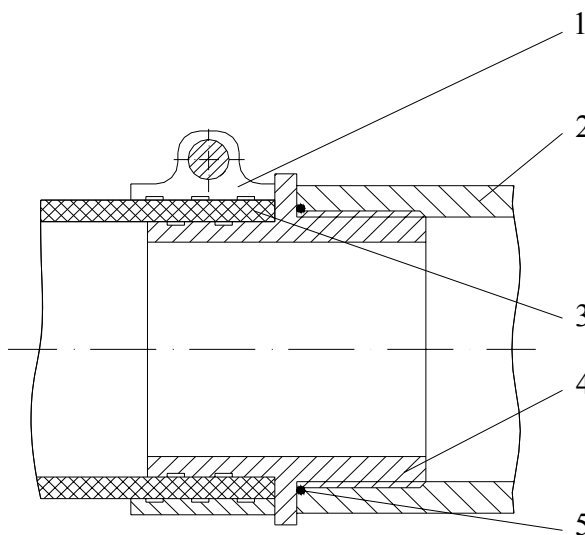


Figure 4. Blending with elastical bracelet
1-bracelet; 2-elbow; 3- polyethylene pipes; 4-interlinkage; 5- joint

Unconventional technological methods applied to the usually polyethylene pipes can not be applied to the reticulated pipes (PE-X), because of their different properties. The actual solutions of blending them are aforementioned.

IV. CONCLUSIONS

After the foregoing presentations we can notice that every method of blending the reticulated polyethylene pipe (PE-X) involves a linking piece in comparison to the usual polyethylene pipes that can be blended between these ones through other unconventional technological processes.

The existence of a procedure of blending the reticulated polyethylene pipe (PE-X), through a unconventional technological way would lead to the elimination of the metal or plastic ramifications and connectors, the electro fusion muffs, that are used in the present for blending. In consequence the existence of a method like this would lead to networks of reticulated polyethylene much more cheaper, because nowadays a network like that of thermal agents has a big price, price that is due to these blending procedures.

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