SOCKETS OF CORRUGATED PIPES – RELIABILITY IS THE PRIORITY

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The socket-and-spigot joint is the most common type of pipe connection in gravity systems. They can be made of reinforced concrete, ceramic, cast iron or plastic. Socket-and-spigot joints are common with corrugated plastic pipes as well.

The requirements for pipe joints are very strict since corrugated pipes are used in different conditions; quite often in high static (great depth, deep fill) and dynamic (ground movement, heavy vehicles) loads. Pipe joints must ensure integrity in any operating conditions even in cases of pipe bending and deformation.

There are two ways to produce pipe joints: 1) in-line molding (simultaneously with the pipe) and 2) welding of pipe joints made separately. The first method is very easy and far less labour- intensive. That's why these pipes are cheaper than pipes with welded joints. There are two completely different ways of molding: the single layer method with the inner part cut-out (e.g. Drossbach lines) and the double-layer method patented by Corma, manufacturer of equipment for corrugated pipe production and used by other manufacturing companies. It is obvious that a single-layer pipe joint is significantly thinner and cannot guarantee the required stiffness and integrity. That's why the application of such joints in many countries is only approved for use with storm water sewers where leakage is not critical.

However, as practice has shown, molded double-layer joints have their disadvantages. First, molded joints have lower mechanical strength due to molding with the pipe. They cannot have greater wall thickness than the wall thickness of the pipe. And that is why it can't guarantee the required stiffness at bends and deformation

In-line socket molding, obvious disadvantages

of the pipelines – when the pipe joint will be bearing most of the load.

A thin walled joint can also loosen contact with the sealing ring during relaxation and cause leakage. There are technologies that "slow" the line during joint socket molding but they don't always ensure a consistently high level of synchronisation and repeatability. But the most important thing is that in-line socket molding technology / vacuum molding can't ensure fine inner diameter tolerance. Bigger tolerance can lead to seal failure. Welded sockets are manufactured by injection molding providing much finer tolerance.

Lower stiffness of molded sockets often leads to deformation, developing an oval or even square shape during improper transportation and storage on-site (which is quite common in Russia). In the best case scenario, it will make installation more difficult. In the worst case, it will reduce seal reliability and integrity.

Uneven cooling of a thinner socket and corrugated pipe will lead to stresses that make in-line sockets more fragile. This increases the risk of integrity failure during transportation, loading and installation at low temperatures. This problem is especially true of PP pipes which can crack at low temperatures, as a result of minor impacts during loading and installation.

A welded socket gives a better safety margin compared with a molded socket and it is the more popular option for Russia and CIS countries.

The world's leading producers of plastic pipes like Pipelife (Austria), Wavin (Holland), the POLYPLASTIC Group (Russia) use welded pipe joint technology. The POLYPLASTIC Group uses Corma equipment and has a license for molding joints but refuses to use this technology, preferring the more difficult, more labour-intensive option of socket welding. Welding is done in-house using an automatic mode which ensures total compliance with technology, reduces the operator's chance of failure to zero and ensures optimum quality and reliability of the pipe joints.

Molded joints often get deformation during improper transportation and storage

Many years of production and use of corrugated plastic pipes of different designs show that the POLYPLASTIC Group made the right decision.

Leaking in-line molded pipe joint during leak testing according to EN 13476-3