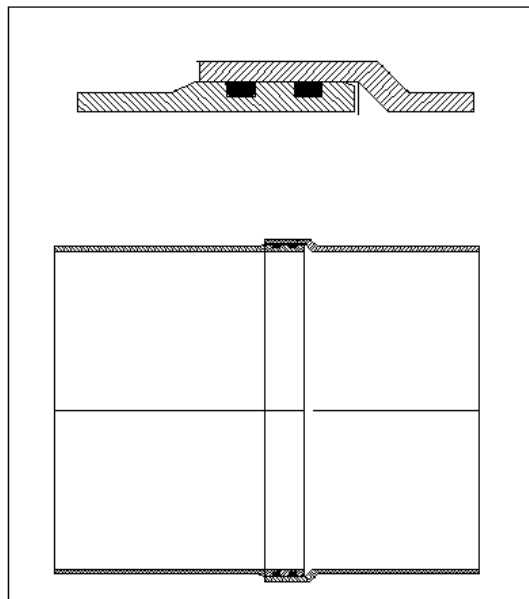


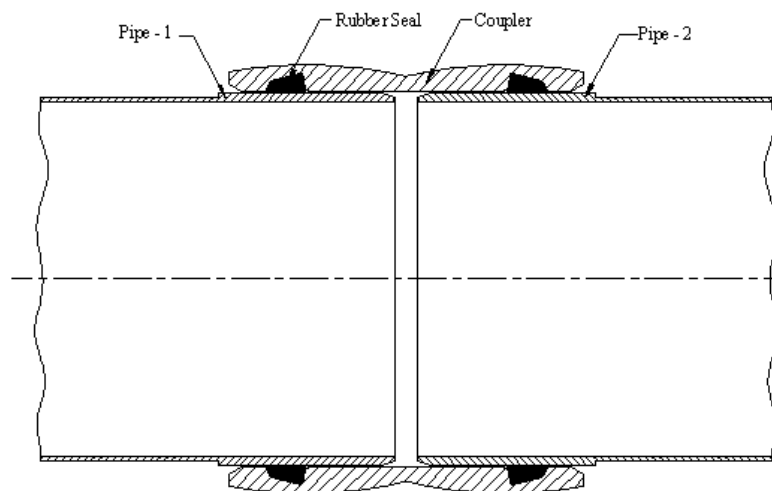
GRP PIPE JOINTS: TECHNICAL SUPERIORITY OF BELL & SPIGOT JOINT OVER COUPLER JOINT

In a typical Bell & Spigot joint, the bell is integrally made with the pipe and the joint is obtained by inserting rubber sealing rings between the bell and spigot which are finished to the required level of tolerances.

In a typical coupler joint, a coupler is separately made and the jointing is achieved by inserting two pipe ends into the coupler and compressing the rubber sealing rings for pressure tightness.



GRP Pipe Bell and Spigot Joint



GRP Pipe Coupler Joint

Compared with a coupler joint, the bell and spigot joint has the following technical advantages.

1. The bell is integrally made with the pipe and this ensures the structural integrity of the bell along with the pipe.
2. In a Bell & Spigot joint there is a single sealing surface per joint, but in a coupler joint there are two sealing surfaces per joint. This means that when coupler joint is adopted, it has two open ends to be sealed per joint. However, in bell & spigot joining method, only one open end to be sealed per joint. Hence, the selection of bell & spigot joint straightaway reduces the chances of leakage from two sections as applicable for coupler to single section.
3. During installation, the Bell & Spigot jointing is done by inserting the spigot end into the bell portion by the usual axial pulling method normally being employed for Steel or any other pipes. In a double bell coupler, the positioning of coupler in relation to pipe ends is critical and the possibility of coupler getting shifted is very high during the field jointing.
4. In our design of Bell & Spigot joint, we use double sealing ring as against the normal single O-Ring Gasket. The salient features of our innovative design is two-fold:
 - a. First is to get enhanced reliability against leak-tightness
 - b. Second is achieving a reliable and faster field hydrotesting of joints by injecting water between two O-Rings(refer the sketch given below) upon joint assembly in the field and thereby ensuring the reliability of every joint during the pipe installation.

Therefore, our bell & spigot joint design with two O –Rings increases the joint reliability by four times (400%) over the coupler joint.

Reliability due to the reduction of sealing surface per joint from two to one = 2

Reliability due to the increase of number of sealing rings per sealing surface from one to two = 2

Overall Reliability of our bell& spigot joint compared to coupler Joint = $2 \times 2 = 4$

Note: The coupler joint is usually adopted for pipes made by advancing mandrel process, since the manufacture of integral bell in the pipe is not possible in the advancing mandrel process.

The field joint testing procedure on the constructed pipeline is as shown in the sketch. Water is filled between the rubber rings through the nipple and subjected to the required pressure. On completion of testing, the nipple is closed with the male adaptor and laminated.

