

Pronto-Lock® II

heavy-duty mechanical coupling system
for fiberglass pipe

Introduction

Recognizing the need for a simple, reliable coupling system in the 8 to 16-inch nominal pipe sizes, Ameron Fiberglass Pipe Division designed Pronto-Lock II* so that only the male threaded portion of the coupling has to turn in order to lock the joint. This feature allows for limited axial movement and also permits the incorporation of a 2° angular deflection capability that is unavailable in steel and conventional adhesive-bonded fiberglass piping systems. The angular deflection capability allows the pipeline to conform much more readily to changes in terrain and minimizes the number of elbows required. The deflection capabilities of the Pronto-Lock II coupling do not affect the integrity of the O-ring seal. Pronto-Lock II employs a tapered male end which, after being lubricated, is inserted into the female end, compressing the O-ring, thus providing a leakproof connection. The locking sleeve is then spun into place, positively locking the joint into position.

The female end of Pronto-Lock II is fiberglass-reinforced epoxy and is filament wound onto the pipe in the factory. The male end is machined and attached in the factory by adhesive bonding. The male end and the locking sleeve are made of centrifugally cast chopped fiberglass reinforcement and epoxy resins. The resilient bearing ring is Buna-N. The O-ring material is selected to be compatible with the system fluid. Buna-N is standard, but other materials such as EPR and Viton A are available. Consult BONDSTRAND CORROSION GUIDE, FP132, or Ameron Fiberglass Pipe Division for selection of the proper O-ring material.

* U.S. Patent No. 4,014,568

User benefits

Lower, more predictable installation costs because the pipe is installed quickly under all weather conditions.

Specially trained crews are unnecessary since no special techniques or tools are required.

Immediate usability permits handling, testing and backfilling without waiting for adhesives to cure.

Reusability of the mechanical coupling permits use on temporary lines.

Operation

Fig. 1. The Pronto-Lock II coupling prior to insertion of the male end into the female end.

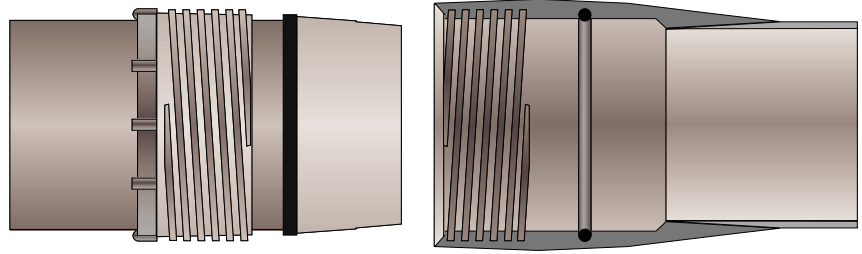


Fig. 2. After insertion, an effective seal is made. The two ends are joined in a leak-tight assembly, but are free to separate as long as the piping remains axially unrestrained.

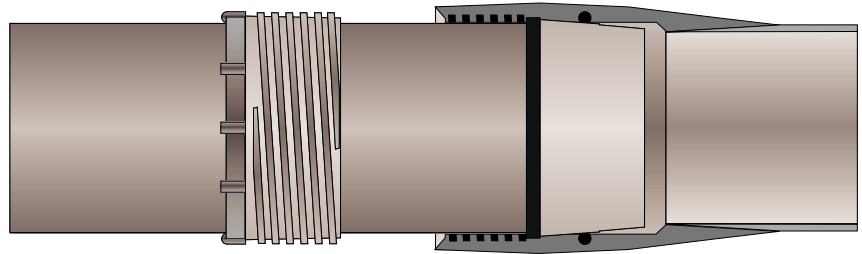
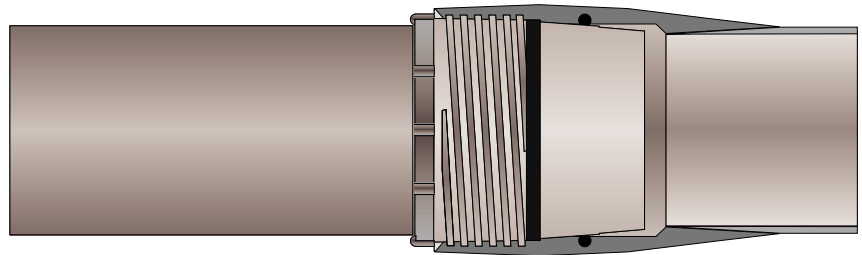


Fig. 3. The Pronto-Lock II coupling completely made up: axial restraint of the joint by the threaded locking sleeve assures that the pipe ends cannot pull apart.



Angular deflection

The Pronto-Lock II coupling can accommodate up to 2° angular deflection off the centerline when properly made up.

Fig. 4. The positions of the mating surfaces in the straight run (nondeflected) configuration.

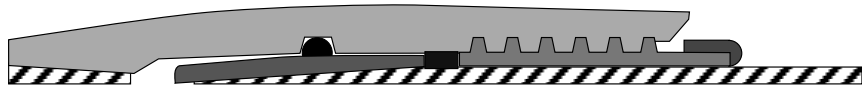
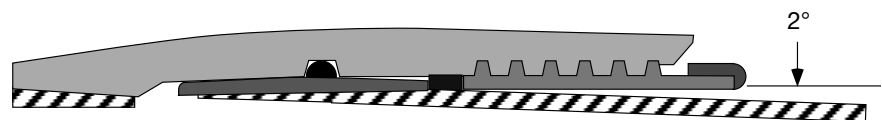


Fig. 5. The mating surfaces in the maximum 2° angular deflection condition.



Expansion/contraction

The Pronto-Lock II coupling can accommodate both tensile and compressive axial loads. When the joint is made, the O-ring is compressed against the male end and maintains leak-tight integrity of the coupling under tensile, neutral and compressive axial load conditions. Although the no-load position cannot be determined exactly in an assembled coupling, the total capacity for axial movement is about $\frac{3}{8}$ inch.

Fig.6. The joint with no axial loading.



Fig.7. The joint under tensile axial load: movement is limited such that the free space between the bearing ring and the locking sleeve is taken up and the bearing ring is compressed. The joint is restrained from pulling apart by the locking sleeve.

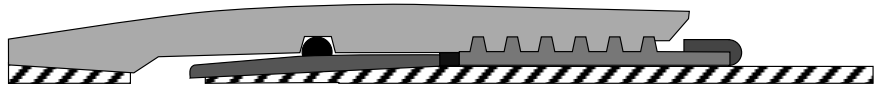


Fig.8. The joint under compressive axial load: the coupling slides together until the male end wedges inside the female end.



Only a light torque is needed to make up the locking sleeve. Owing to the limited thread make-up of the sleeve into the female end, excess torque will not advance the threads to compress the bearing ring on a properly inserted joint.

Since there is a mechanical interference at both ends of the axial travel, axial travel cannot accumulate and cause the joint to separate. No tightening is necessary after the joint has been put into operation. The coupling can be disassembled, if necessary. However, about 10 inches of axial clearance is required to separate a disassembled Pronto-Lock II joint.

Fittings

Ameron manufactures a complete line of fittings in the 8 to 16-inch nominal pipe size range. All are available with the Pronto-Lock II coupling system that provides a union-type connection at every joint. The concept can be applied to all fittings, providing a totally mechanical, all-fiberglass system that forgives the minor angular or dimensional variations that occur in all complex piping arrangements. The standard fitting comes equipped with Pronto-Lock II female ends. Pronto-Lock II male ends are also available.

Prefabrication

Special layouts and fittings can be factory prefabricated from shop drawings by Ameron and then shipped to the job ready for assembly. Where piping must be tailored to special alignments for a specific job, the pipe can be cut and tapered and the Pronto-Lock male ends bonded onto the pipe under controlled factory conditions. Thus, field assembly and installation can be carried out regardless of weather conditions.

Reusability

The mechanical joining of Pronto-Lock II also enables the user to recover and reuse pipe and fittings. Piping systems can be modified and relocated without having to scrap usable fittings.

Ease of installation

Since make-up of the Pronto-Lock II joint does not depend on curing adhesives, welding metals or favorable weather conditions, significant reductions in labor and installation time are realized. The following table gives typical installation rates for welded-steel pipelines and for fiberglass pipelines employing adhesive-bonded bell and spigot joints and the Pronto-Lock II coupling system, respectively. Large pipe sizes require larger crews and additional equipment.

With lightweight fiberglass pipe these needs range from 25 to 50% less than steel pipe.

Nominal Pipe Size		40-ft Steel Pipe Welded Joint 4-man Crew	30-ft Fiberglass Pipe Bell and Spigot Adhesive Joint 3-man Crew	40-ft Fiberglass Pipe Pronto-Lock II Mechanical Joint 3-man Crew
(in)	(mm)	(ft/8 hr shift)	(ft/8 hr shift)	(ft/8 hr shift)
8	200	1000	2400	6600
10	250	800	2100	6000
12	300	600	1800	5400
14	350	420	1500	4200
16	400	300	1200	3600

Individual system components may not have the same ratings as the pipe. Refer to the detailed product information for the specific components to determine the pressure rating for the system as a whole.

Important notice

This literature and the information and recommendations it contains are based on data reasonably believed to be reliable. However, such factors as variations in environment, application or installation, changes in operating procedures, or extrapolation of data may cause different results. Ameron makes no representation or warranty, express or implied, including warranties of merchantability or fitness for purpose, as to the accuracy, adequacy or completeness of the recommendations or information contained herein. Ameron assumes no liability whatsoever in connection with this literature or the information or recommendations it contains.

Written comments regarding this document are invited. Please write Engineering Manager, Ameron Fiberglass Pipe Division.



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Manufacturing plants: Burkburnett, Texas; Spartanburg, South Carolina; Geldermalsen, The Netherlands and Singapore. Bondstrand pipe is also manufactured in Japan and Saudi Arabia.