Question:

My customer has fiberglass pipe installed on their process. Will SONARtrac meters work on fiberglass? What special information should be gathered when collecting process specification information and filling out the Application Data Sheet? Are there any precautions should be followed?

Answer:

Yes, SONARtrac meters work well on fiberglass pipe. In fact, they are possibly the only clamp-on technology that will work on fiberglass pipe.

There are some considerations for use on fiberglass pipe that must be kept in mind. In particular these are:

- Knowledge of pipe Outside Diameter (OD) – the pipe OD may not be the same as steel pipe depending upon the Type of pipe.
- Pipe surface finish – the surface finish may be very even and smooth or somewhat irregular and not the same constant OD along is length depending upon the Type of pipe.
- Whenever possible, Pipe Manufacturer and the Pipe Specifications should be included on the Application Data Form. These items are extremely helpful to ensure the meter sensor head is properly sized for fiberglass pipe.

Additional information can be found in the following discussion.

Discussion:

Fiberglass pipe (and derivatives of it) is finding its way into many industries due to cost, weight, and performance considerations.

Fiberglass pipes are often used due to their resistance to corrosion and abrasion (either or both) which can create problems for metallic pipes. A chemical resistant layer can be applied to the wetted surface of fiberglass pipe to improve performance in the presence of corrosive fluids. Abrasion resistance of fiberglass pipe is often improved by the addition of fillers such as silica, silica carbide, or ceramic materials.

By definition, fiberglass (or Glass-Fiber-Reinforced Thermosetting Resin) pipe is a tubular product containing glass fiber reinforcements embedded in or surrounded by cured thermosetting resin. The composite structure may contain aggregate, granular, or platelet fillers, thixotropic agents, pigments or dyes. Thermoplastic liners or coatings are sometimes used in fiberglass pipes.

There are three types of fiberglass pipes:

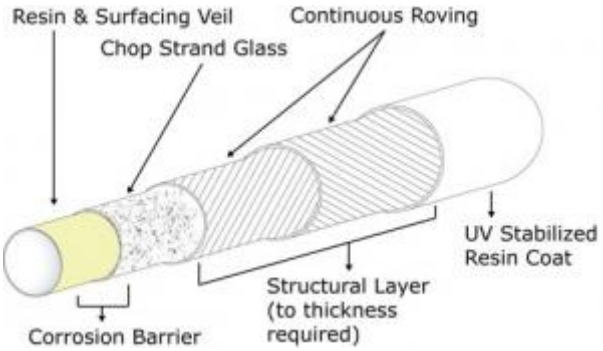
- Type I Filament-wound pipe: Filament wound pipe is typically manufactured by wrapping the pipe materials of construction around a fixed size mandrel. This process results in a pipe with a very exact size inner diameter. The wall thickness is controlled to affect the desired pipe pressure rating and other properties. In

manufacturer specifications for filament-wound pipe, the pipe bore is stated as the Nominal Diameter (ND) and then a minimum wall thickness is specified. **IMPORTANT:** The wall size (thickness) is the **minimum**. Often the actual wall thickness will be thicker than the minimum. With this type of pipe it is very important to know the exact OD of the pipe. The **OD should always be measured** at the proposed SONARtrac meter installation point using a circumferential Vernier wrap tape (Pi Tape). At least three pipe diameter measurements should be made and then averaged.

- Type II Centrifugally cast pipe: Centrifugally cast pipe is manufactured by building up the pipe wall structure from the outside surface of the pipe to the inside surface of the pipe in an externally rotating mold. While the pipe mold is rotating, the pipe wall materials that consist of thermos-setting resin, glass fibers, and sometimes fillers such as aggregate are deposited. This results in a fixed and closely controlled pipe OD. The pipe wall thickness is controlled to affect the desired pressure rating of the pipe.
- Type III Pressure-laminated pipe: No information on this pipe type can be found or referenced.

There are also multiple Grades (1-9) and Classes (A-I) of fiberglass pipe based on whether the pipe is reinforced or resin lined.

The following is an example of Type I pipe.



An example video on the manufacturing of filament-wound pipe is found at:
https://www.youtube.com/watch?v=ZpZrLJYnQiM

An example video on the manufacturing of centrifugally cast pipe is found at:
https://www.youtube.com/watch?v=tO8uKjGYm1Y

Applications for SONARtrac:

SONARtrac clamp-on flow meters have been used with very good results with fiberglass pipes. SONARtrac meters sense the strain in the pipe caused by flow vortical structures. Reportedly ultrasonic flow meters do not perform well on fiberglass pipe due to the makeup of the pipe. Glass fibers, aggregate and the potential for air bubbles can affect performance of ultrasonic flow meters.

Magnetic flow meters are sometimes used on fiberglass pipes. However, this does require stopping the process for installation or maintenance, and flanging of the pipe. Flanging of fiberglass pipes may require outside contractors who specialize in fiberglass piping.

Applications for SONARtrac meters on fiberglass pipe include:

- Coal-fired power plant sulfur dioxide scrubber pipe systems
- Salt-water transport systems
- Fresh water transport systems
- Waste water systems
- Corrosive liquids such as acids or caustics
- Bleach lines in paper production
- Various refinery applications

Key items to be aware of when installing a SONARtrac flow meter on fiberglass pipe are:

1. The **Outside Diameter** (OD) of the pipe must be **measured at the location where the SONARtrac flow meter is to be installed. A Pi tape should be used for accurate measurement**. Information on use of Pi tapes is found at: https://www.youtube.com/watch?v=isj5O7S7uzQ
2. The **surface finish** of the OD should be documented with a photo.
3. **Pipe wall thickness** is typically based on minimum required for a given pressure rating and **may vary**.
4. Get **pipe manufacturer** information and any pipe information the customer can provide.

Please contact Technical Support with questions or comments. The Technical Support phone number is 203-626-3405 and email is techsupport@cidra.com

Revision History

Rev	Date	Changed By	Approved By	Change Description
01	01Jul15	B. Markoja	B. Markoja	Initial Release