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Issue 53

In This Issue

Hobas Pipe USA Installs Giant Custom-Built Instron Frame

HOBAS® Pipe USA, a producer and supplier of fiberglass-reinforced polymer mortar pipe systems, produces pipe and pipe-coupling products in a wide range of sizes. Worldwide population growth has increased the demand for bigger water supply and sewage pipes. Consequently, the pipe diameter range was set to increase beyond the size capability of their current testing equipment. They needed a system that could test their full range of products and they turned to Instron for the solution. The resulting testing system was so big that it was installed out in the open and the test building was constructed around the frame.

HOBAS pipes are centrifugally cast, glass-fiber-reinforced, polymer mortar (CCFRPM) construction. A feeder arm places materials in multiple layers, building up the wall cross-section. A computer controls and monitors the layer formation and thus the formation of the varying layers of the pipe.

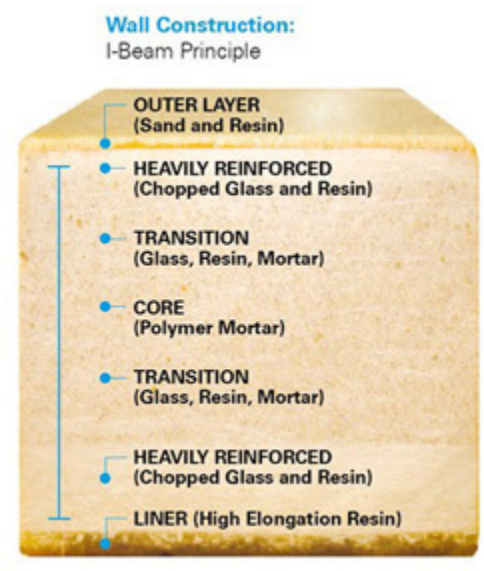


Illustration of a typical HOBAS pipe wall composition

The resulting product has multiple layers including reinforced outer and inner glass layers. The actual cross-section is of a highly engineered composition with transition layers to optimize pipe performance. Other centrifugal casting processes exist, but the HOBAS process is truly unique. By adjusting the quantity, placement, and orientation of the glass-fiber reinforcements, HOBAS can specifically tailor their products for a wide range of environmental demands and service requirements.

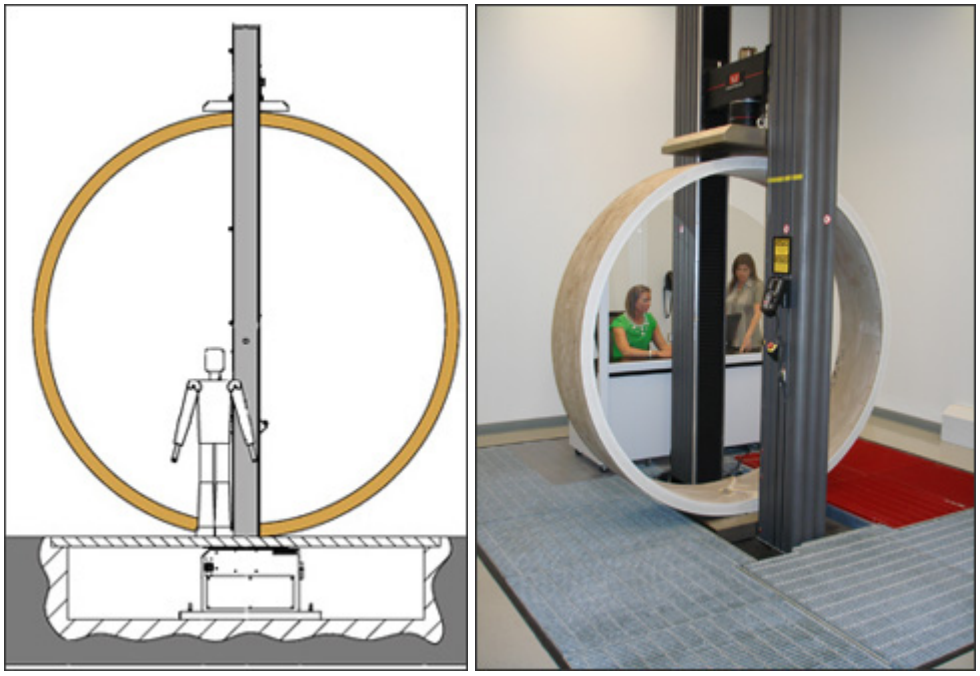
HOBAS has stringent quality-control testing requirements for their products and this type of construction presents complex testing challenges. Many different tests are performed such as pipe stiffness, compression and tension testing, and corrosion resistance. The main flexural, tensile, and compressive testing is performed to the following ASTM standards:

- D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D638 - Standard Test Method for Tensile Properties of Plastics
- D695 - Standard Test Method for Compressive Properties of Rigid Plastics

HOBAS Pipe's current testing equipment had become limited by size. The maximum pipe diameter that they could test was 110 inches. They were planning to manufacture 120-inch diameter pipe for a major new sewage replacement project in Houston and knew that the future demand for larger pipes would grow. They needed a new tensile/compressive testing system.

For their new system, they specified a test height requirement of 160 inches to allow for future, even larger pipe dimensions. Working with Instron sales engineers, HOBAS determined that a custom-built Model 5989 load frame with Bluehill® Software suited their purpose perfectly.

The sheer size of the new system allowed for two alternative installations; either lower the equipment through the roof of the existing building or install the load frame in the open and then construct a new building around it. Both schemes had advantages and disadvantages, but in the end the HOBAS project team decided to take the latter route. The new building incorporates a sub-floor that is so deep the frame table is level with the main floor and the pipe sections are rolled into position for testing.



Left: Scale drawing of Instron 5989 extra-tall load frame. Right: The new system in operation.

Construction was recently completed and the load frame was tested and commissioned into service.

When asked why HOBAS decided to purchase an Instron system, Kimberly Paggioli, Vice President of Marketing and Quality Control for HOBAS Pipe USA, responded, "Two main reasons. Familiarity; a sister company already has experience with Instron equipment, and locality; you have field service engineers close at hand."

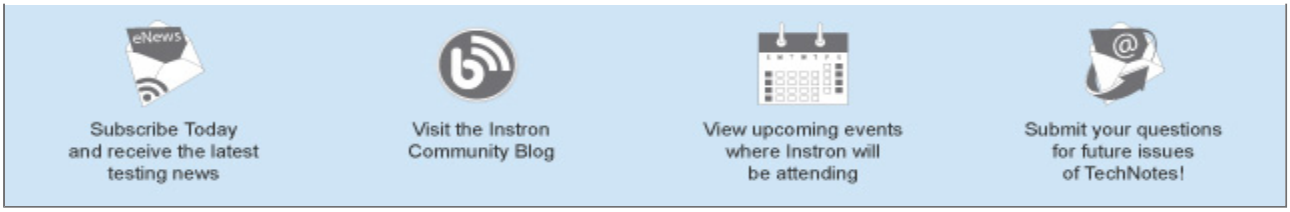
Selecting a Pressure Transducer for Your Capillary Rheometer

It is common to refer to pressure transducers by their full-scale range in megapascals (1 MPa is 145 psi). The accuracy is 0.25% of the full scale of the pressure transducer. To obtain the highest quality data, the recommended minimum pressure is about 10 times the accuracy and the recommended maximum pressure is about 90% of the full-scale range. For example, If you select a 1,000 bar transducer, referred to as a 100 MPa transducer, the recommended minimum is 2.5 MPa (362 psi) (ten times the accuracy) and the recommended maximum is 90 MPa (13,050 psi) (90% of full-scale range).

Individual capillary rheometer pressure transducers have a limited range. For example, a 15 mm diameter barrel can only apply about 35.5 kN before it reaches the maximum of 200 MPa. Multiple transducers are often used to cover a wide variety of samples and tests.

Q. What is the resolution and accuracy of your Smart Rheo load cell?

A. The CEAST Smart Rheo load cells resolution is 0.05% of full-scale and the accuracy is 0.5% of full-scale. For example, the 20 kN load cell has a resolution of 10 N and an accuracy of 100 N.



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