

Technical Sales Bulletin 8-523

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UGSI QA/QC Protocol: Full Traceability

The purpose of this bulletin is to outline the various analytical tests and data retention methods that are used by UGSI to ensure that conforming pipe is sold to clients with full traceability from fusion joint back to materials testing.

UGSI breaks the quality process into four layers that help ensure high quality outcomes in the field – and provide clients with the most rigorously tested and controlled plastic pipe in the world. (*Table 1.0 summarizes the QA/QC tests and methods at each level*)

- 1) UGSI Vendor Qualification Testing – UGSI requires that our pipe extruders submit pipe samples that have been made to our proprietary formulation for testing of material properties as well as the strength of the butt-fusion joint. Once these samples meet acceptable criteria – the vendor is approved to manufacture pipe for UGSI. (*Please see UGSI Technical Sales Bulletin 8-528 for a description of the relevant tests and methods*)
- 2) UGSI Vendor Testing – UGSI requires that the pipe extruder certify that pipe manufactured for UGSI meets relevant AWWA standards and tests. In addition to AWWA requirements, UGSI asks that vendors certify to passing several additional tests such as Heat Reversion and Loss on Ignition to further ensure that high quality pipe is shipped to UGSI customers.
- 3) UGSI Independent Laboratory Testing Lot Acceptance – Before UGSI accepts a lot of pipe from a pipe extruder, the lot must pass a number of tests conducted by a UGSI hired independent laboratory (AWWA Flattening, Heat Reversion, AWWA Acetone Immersion).
- 4) Fusion Quality Control and Traceability – Each fusion joint accomplished in the field has data recorded from a bluetooth data-logging device and operator direct input to allow for review of critical fusion parameters such as temperature, pressure, ambient conditions etc. – on each fusion joint. This data is linked with the certified technician identifier and most importantly to the pipe lot and all of the material and quality testing on that particular lot (#2, #3 above). See Figure #1.0 below.

Figure 1.0: Sample Fusion Data Sheet with Unique Joint Identifier

Fusion Joint Data Sheet - Joint #214

Fusion Date	Dec. 13, 2006	Project No.	30013
Project Name	Collier Co.		
Jobsite Location	Naples, FL	Pull No.	2
Project Engineer			
Fusion Technician	Eric Kerner		

PIPE DETAILS					
Joint No.	Pipe Dia. (in)	Pipe DR	Color	Extruder	Pipe Description
214	30	DR 25	White	NAPCO	C-905

EQUIPMENT IDENTIFICATION				
Fusion Machine Identification	Piston Area (in ²)	Heat Plate Serial ID	Data Logger Serial No.	IR Pyrometer Serial No.
C17867	15.32	3602923	MDL3-0149	2667269202-0111

A. Pressures (psi)

Heat	247
Fusion	1199
Drag	70

B. Ambient Conditions / Start Time

Temp. (°F)	65
Weather	cloudy
Start Time	7:32 AM
End Time	7:43 AM

C. Heating Plate Temperature & Extrusion Marking

Left Face Temperature - °F

Right Face Temperature - °F

Joint Number

214

Nov 15-06 13:29	Nov 15-06 10:33
560	600

Record extruder pipe marking (near fusion joint) and pipe length above.

Table 1.0: UGSI QA/QC Tests and Methods

Test	Vendor Qualification	Required Vendor Testing	UGSI Lot Acceptance Testing	Fusion Joint QC Data
Fusion Tensile	ASTM D638			
Pipe Tensile	ASTM D638			
Pipe Dimensions	Per AWWA C-900/C-905	Per AWWA C-900/C-905		
Pipe Burst	Per AWWA C-900	Per AWWA C-900		
Flattening	Per AWWA C-900/C-905	Per AWWA C-900/C-905	Per AWWA C-900/C-905	
Acetone Immersion	ASTM D2152	ASTM D2152	ASTM D2152	
Hydrostatic Pressure Test	Per AWWA C-900/C-905	Per AWWA C-900/C-905		
Impact Test	ASTM D2241; ASTM D2444	ASTM D2241; ASTM D2444		
Heat Reversion	ASTM F1057	ASTM F1057	ASTM F1057	
Ash/Inert Content (LOI)	ASTM D2584	ASTM D2584 Per UGSI Request		
Joint Fusion Parameters				Temperature Pressure, Location, Other
Licensed Operator				Unique Operator ID

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Underground Solutions (UGSI) provides infrastructure technologies for water/wastewater applications, and conduit for applications ranging from electrical to fiber optics. UGSI's **Fusible C-900®**, **Fusible C-905®** and **FPVC™** products contain a proprietary PVC formulation that, when combined with UGSI's patented fusion process, results in a monolithic, fully restrained, gasket-free, leak-free piping system. **Duraliner™** is a patented, close-fit pipeline renewal system creating a stand-alone structural liner.