

ADS HDPE PIPE SHOWS OUTSTANDING PERFORMANCE UNDER 315,000 POUND RAIL CARS

The Plastics Pipe Institute (PPI) recently completed field testing of Smooth Interior Corrugated High Density Polyethylene (HDPE) pipe under heavy haul track at Transportation Technology Center, Inc. (TTCI). The testing went as expected and the HDPE pipes showed outstanding performance, allowing expanded use for railway projects.

The purpose of this testing was to elevate the Railroad Industry's confidence in HDPE pipe and to field verify calculations using Load Resistance Factor Design (LRFD). Two runs of 48" HDPE pipe manufactured by ADS in accordance with AASHTO M294 and ASTM F2306 standards were installed under track at TTCI's Facility for Accelerated Services Testing (FAST). The FAST Train consisted of three to four locomotives and approximately eighty 315,000-pound gross rail load (GRL) cars. This is considered a rigorous testing environment as normal heavy haul railcars weigh 288,000 pounds. After eight months of testing, the 48" diameter pipes endured 101 Million Gross Ton (MGT) of cumulative load, which simulated what 50% of the track in the United States will experience over a ten year period.



SUMMARIZED TEST RESULTS

- **Deflection**—Deflection was measured in the vertical, horizontal, 45 degree, and 315 degree locations. After construction and train loading, the maximum horizontal and vertical deflections were 1.3% and 1.1% respectively. Deflection in the diagonal directions was negligible, as anticipated. These results are well below the AASHTO allowable limit of 5% deflection.
- **Strain**—The maximum compressive strain from the construction and train loading was 8,800 microstrain or 0.88% strain. This is well below the AASHTO allowable limit of 5% strain.
- **Circumferential Shortening**—This phenomenon is in HDPE pipes that have been installed under very rigorous loading conditions such as deep fills. The maximum circumferential shortening from construction and train loading was 0.4 inch or 0.3%. This is well within expected and acceptable limits.
- **Joint Separation**—The Standard watertight and fabric wrapped split coupler connections used in the TTCI test performed extremely well. Joints were hand-measured throughout the test and there was no significant movement noted.
- **Ride Quality**—Locomotive engineers who operated the FAST train during the test period reported that ride quality over the pipes was satisfactory. No track geometry maintenance was required at the test site after installation.

For more information on ADS HDPE pipe for railroad applications, including specifications, installation and more, please contact your local ADS Regional Engineer.

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