

The Pipeline

News From DIPRA



For Ductile Iron Pipe, Innovations Didn't Start Yesterday

And they won't stop tomorrow.

The Ductile iron pipe of your future is the culmination of ongoing research and innovation... and of the experiences of utilities such as yours that have contributed to the success stories that have become Ductile iron pipe's legacy of long-lasting and reliable water delivery to your customers.

One example of the innovative path of Ductile is shown in the cooperative effort afforded our industry by Lafourche Parish Water District #1 (LAPDW) in Raceland, LA. In 1958, LAPDW agreed to a novel experiment...one that is ongoing today. A 4-inch iron water pipeline that was being installed in an aggressive soil in their system became the first to be encased in polyethylene film as a means of corrosion control. Over the years, DIPRA, in cooperation with LAPDW, has unearthed the pipeline eight times to examine the effectiveness of the system; the latest occurring last summer after 60 years of service. Read the latest report, [here](#).¹

In highly aggressive soils, a dig-up shows no evidence of significant corrosion on 60-year-old polyethylene encased iron pipe.

The results have been impressive. The highly aggressive soils into which this pipeline was installed are the kind that might result in the penetration of a pipe wall in only a few years. This pipeline, however, has had no failures and continues to exhibit no evidence that significant corrosion is taking place after nearly two thirds of a century in challenging soil conditions.

Reminders on Strength and Durability of Ductile

There is no doubt that the strength and durability of Ductile iron pipe is incomparable among water system pipe materials. Its walls are impermeable to the contaminants that can affect plastic materials, its strength is not affected by temperature or exposure to sunlight, cyclic pressures do not shorten its service life, it does not require the extreme installation procedures that plastic pipes need to avoid premature failures, and, perhaps best of all, iron pipe is amazingly resilient. It has a record of performing under unforeseen demands that pipelines have experienced over service lives often exceeding 100 years. When we control the effects of corrosion on Ductile iron pipe, we establish a benchmark of service to which all other materials can only aspire.

The soils in that region of LA are as aggressive as can be found in nature.

The investigations in Lafourche Parish are definitive. The soils in that region of southern Louisiana are as aggressive as can be found in nature. They have very low soil resistivities, test positive for chlorides, exhibit conditions conducive to the activity of

anaerobic bacteria and are consistently saturated with groundwaters ionizing the salts and minerals within the soils that contribute to the extremely low resistivities.

Proper Installation Is Key to Success

Such results do not occur by accident. Polyethylene encasement was a new system of corrosion control in 1958 and the people involved in that installation made the effort to do it right. This was necessary in order to find out how well the system would work. And, it worked very well. The polyethylene was installed snugly against the pipe around its full circumference and along its entire length, isolating the pipe from the soil and impeding the intrusion of groundwaters beneath the encasement. Proper installation is the key to any engineering endeavor and we believe that the efforts made to ensure proper installation provides a return on investment that is difficult to overstate.

What this means to utilities is that they can, with reasonable care and effort, realize the advantages that Ductile iron pipe offers due to its strength and resilience—advantages that no other pipe material can offer: Economy in installation, economy in operation, and value in extended service lives.

 **Ductile offers advantages in economy in installation, in operation, and in value for extended service lives.**

We are always learning, always improving, so we can continue to provide state of the art recommendations to our industry's customers. In 2013, DIPRA introduced V-Bio® enhanced polyethylene, a film infused with a corrosion inhibitor and an anti-microbial component. This innovative improvement to polyethylene encasement was an investment in your future. V-Bio® enhanced polyethylene adds an active component to the demonstrated effectiveness of polyethylene encasement shown in Lafourche Parish.

Two Dimensions of Pipe Protection

In 2018, DIPRA and Corrpro² announced a revision to the Design Decision Model (DDM¹), a two dimensional risk-based corrosion control matrix developed for Ductile iron pipe. In the DDM¹ matrix, the likelihood of corrosion is balanced against the consequences of a corrosion-related problem and appropriate recommendations are made. The matrix is published and available. [Click here³](#) to access the results of the significant research and practical engineering that went into its development.

Learning from the value of the cooperative effort we undertook with LAPWD, DIPRA has additional cooperative studies into the efficacy of the V-Bio® film with several utilities in Colorado, Illinois, Alabama, Tennessee and New England. We learn from these interactions. The 2018 revision to AWWA C105 for polyethylene encasement includes [Modified Method A⁴](#) for installation, an inventive method we learned of in our work with several utilities.

Impressive Return on Investment

This installation in Lafourche Parish exemplifies the value all utilities can realize when properly installed polyethylene encasement becomes a part of their systems. The return on investment that assures proper installation is an aspect of asset management that cannot be minimized for assets that bring potable water to your customers. Sixty years of service in the bayou country soils of Louisiana demonstrates the impressive return on an investment in installation.

When you specify Ductile iron pipe for tomorrow's infrastructure, you can do so with the confidence that your pipeline will be your legacy to the future. And with the confidence that the Ductile iron pipe industry will continue working to improve the performance of Ductile iron pipe. This aspirational goal to make the best pipe even better is a commitment from our industry to you.

It is a future you can believe in.

¹ https://www.dipra.org/phocadownload/new/LaFourche_Parish_Polyethylene_Encasement_Investigation-2018-Final.pdf

² Corrpro® - an Aegion company

³ <https://assets.ctfassets.net/e4roza01bro8/4pc9j5uOSks2d8wGA10jXM/3af1e4bcc15a1ffe7ceb56ee3a3491b5/CorrosionControl-DesignDecisionModel.pdf>

⁴ <https://www.youtube.com/watch?v=agY93k9GRZw&t=2s>

Polyethylene Encasement Dig Up Lafourche Parish, Louisiana

4 -Inch Cast Iron
Installed **1958** – Inspected **2021**

SOIL CONDITIONS

Resistivity	320 ohm-cm
Chlorides	Positive
Moisture Content	Saturated
Groundwater Influence	Positive
pH	6.6
Sulfide Ions	Positive
Redox Potential	-40 mV
Total Points	58

Polyethylene encasement
prior to removal



Polyethylene encasement
has been removed

Note the superficial surface
oxidation which is typical
of most polyethylene
encasement installations



Polyethylene
encasement removed

Pipe cleaned and
inspected with no pitting
or graphitization



Pipe rewrapped with
polyethylene encasement



For more information contact DIPRA or any of its member companies.

Ductile Iron Pipe Research Association

An association of quality producers dedicated to the highest pipe standards through a program of continuing research and service to water and wastewater professionals.

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Visit our website, www.dipra.org and click on the YouTube icon for informational videos on Ductile iron pipe's ease of use, economic benefits, strength and durability, advantages over PVC, and more.

