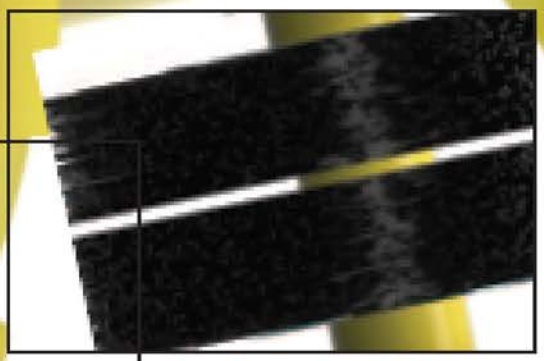
Enduro Pigging Product Guide

UreCast/UreFlex Pigs

Multiple Configurations
Sizes 2" - 24"



Fitted with brush kit

The unique, patented Enduro UreCast is a new concept in conventional pigging, that offers the durability of a metal bodied construction pig and the convenience of a throw-away foam pig. Enduro's UreCast design simplifies pig selection and operation for the pipeline operator.

The Enduro UreCast and UreFlex have been designed to accomplish all pigging tasks relating to cleaning, batching, purging and surveillance tracking. The multi-featured Enduro UreCast incorporates a unique cup and disc combination which provides the optimum sealing and scraping action. It also can be fitted with a brush kit.

The UreFlex features a hollow body for transmitter mounting.

The Enduro UreCast/UreFlex urethane is formulated to the highest quality standards providing the most abrasion resistant qualities possible.

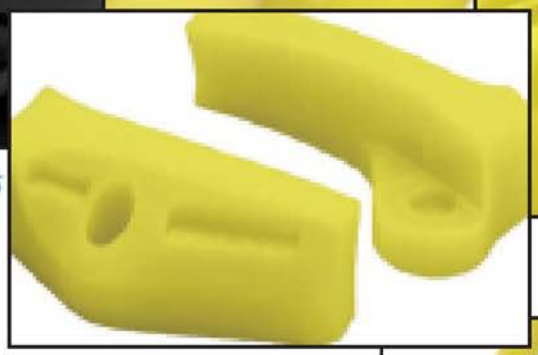
The UreCast construction is completely maintenance free. All cups and discs are formulated from 85 durometer shore A scale urethane. Other hardnesses are available for special applications.

Advantage Cleaning & Batching Pigs

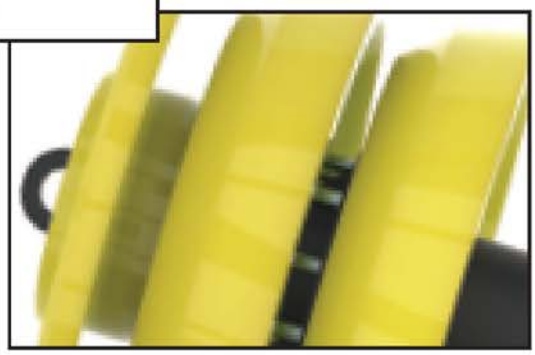
Multiple
Configurations

Sizes 4" - 60"

Optional magnetic cleaners



Choice of blades or brushes



Replaceable cups and discs

The Enduro Advantage Pigs are steel bodied pigs ruggedly constructed to stand up to a wide range of pipeline applications.

The Advantage Cup Pigs; Type ADV-2CC, ADV-3CC and ADV-4CC, are excellent batching pigs; used for condensation removal, purging and light cleaning. The Advantage Type ADV-3D-2CC and ADV-5D-2CC use a combination of cups and discs and are excellent for batching, removal of paraffin, and cleaning common debris found in pipelines.

Cleaning brushes and blades may also be added to enhance the cleaning effectiveness for those tough to clean pipelines. Our Parabolic Scraper "Para-Fin" supplies nine times as much scraper force against the pipeline wall as the conventional scraper plow having three flat bars The Standard Advantage Pigs will traverse pipe reductions up to 25% with no damage to the equipment or the pipeline. Advantage Pigs can easily be fitted with Tracking Equipment when pig location is critical.

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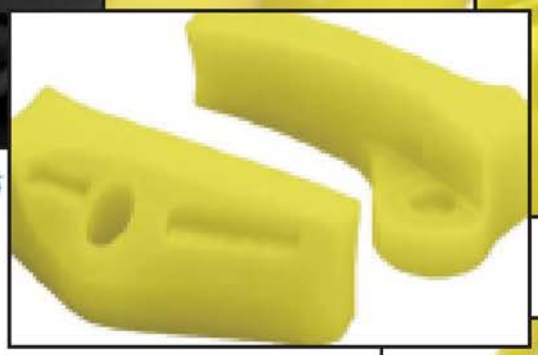
Advantage Cleaning & Batching Pigs

Multiple
Configurations

Sizes 4" - 60"

Optional magnetic cleaners



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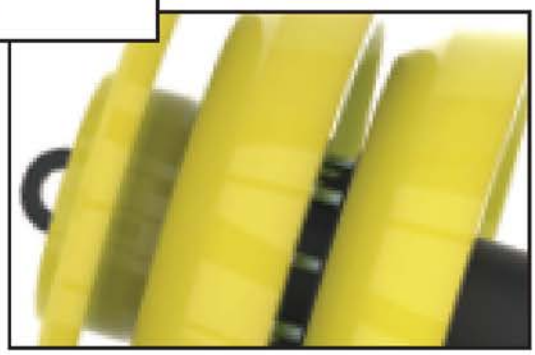

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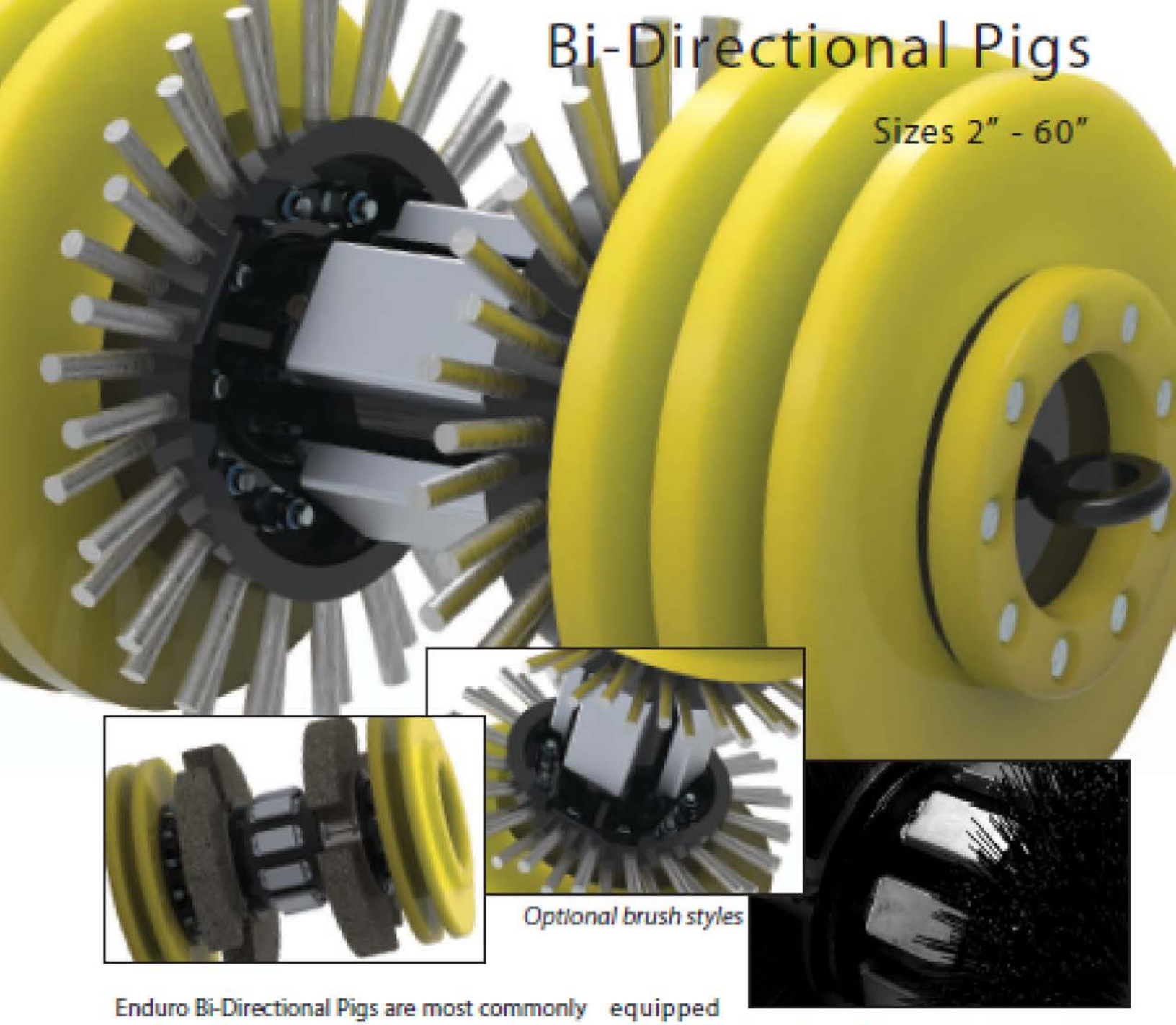
Bi-Directional Pigs

Sizes 2" - 60"



Optional brush styles

Enduro Bi-Directional Pigs are most commonly used as fill and displacement pigs during the hydrostatic phase of pipeline testing. These pigs can also be used for uni-directional applications when required. The Enduro Bi-Directional pigs are available in a steel body design in sizes 2" to 60". The steel bodied Bi-Directional pigs are designed with replaceable components. These pigs are most commonly designed in either a 4 disc configuration or a 6 disc configuration. Enduro tracking equipment may be installed in sizes 6" and larger. Smaller sizes require a special body. The steel bodied pigs may also be equipped with optional gauging plates, ovality disc and magnetic cleaners. Enduro also offers an all urethane Bi-Directional UreFlex pig in sizes 2" to 12". These pigs are designed in a 6 disc configuration. Enduro tracking equipment may be installed in sizes 6" and larger. Wrap around brushes are available for the metal pigs in sizes 2" and above and can be added to the UreFlex pigs in sizes 6" to 12". Both Bi-Directional pig options are designed to safely traverse pipe reductions up to 25% with no damage to the equipment or pipeline.

Pig Links Cleaning Pigs

Customized Length Pig Trains

Enduro introduces a new concept in pipeline pigging. Both flexible and versatile, the Pig Link concept allows many and varied configurations and adaptations of cups, discs, and body links - most any design you may conceive, can be built with Pig Links.

The flexibility of the polyurethane body link allows the pig to pass bend radius as small as one diameter (1D bends are possible) even when attached to additional link sections for added length and design variations.

The model above is a link of three body links connecting a series of nine discs and two conical cups into a tool approximately 48 inches in length.

Excellent for:

- Nitrogen Purges
- Line Cleaning and Scraping
- Batching
- Hydrostatic Fill and Displacement

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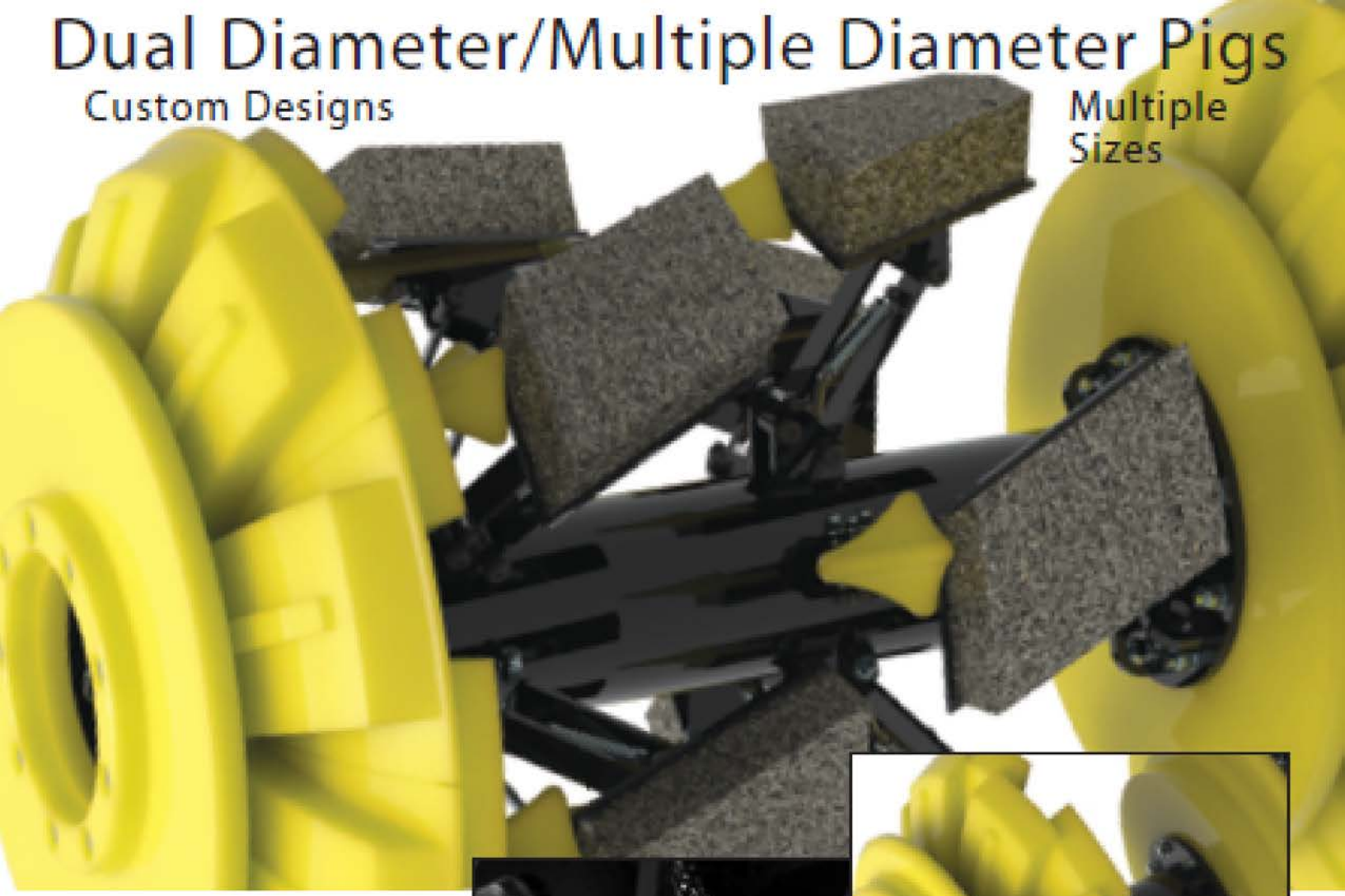
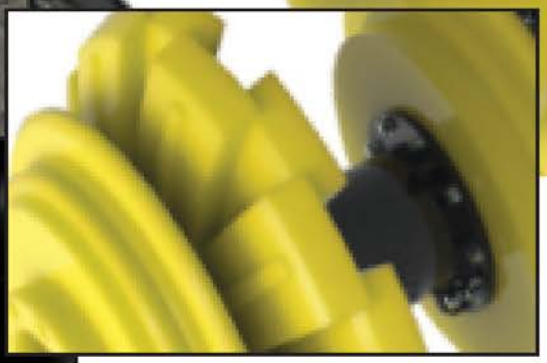
Dual Diameter/Multiple Diameter Pigs

Custom Designs

Multiple Sizes

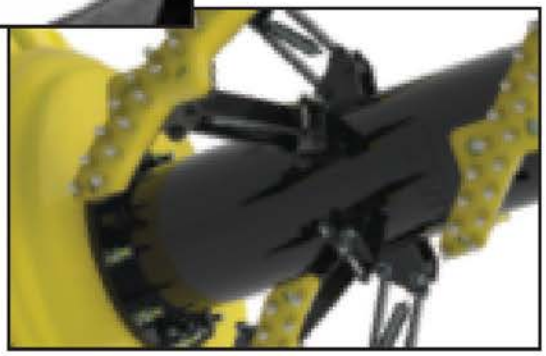




Replaceable disks

Magnetic cleaners

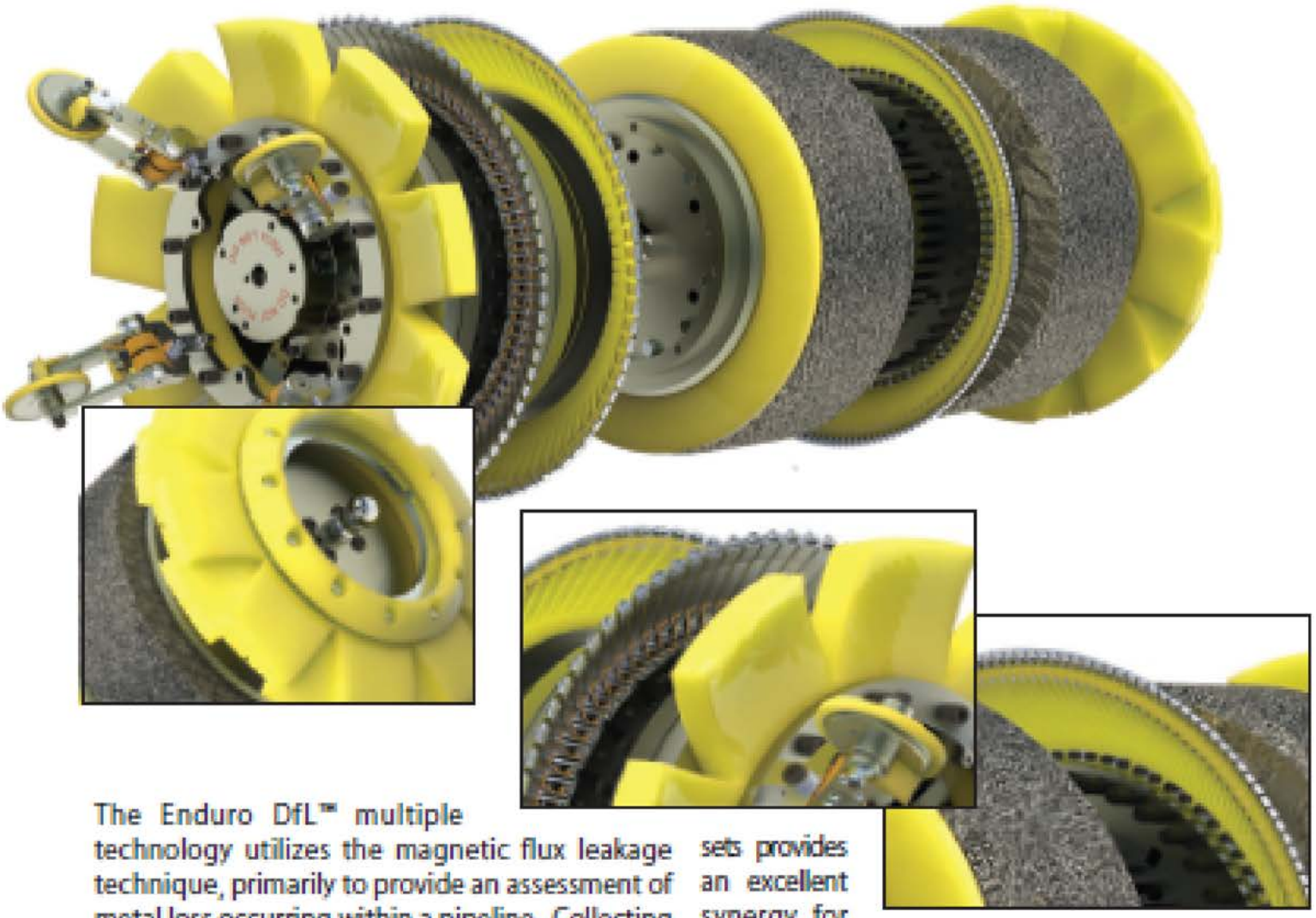
Enduro has developed a new slotted cup and slotted disc designed for pigging dual diameter and multiple diameter pipelines. The special sized cups and disc have proven to minimize by-pass and provide a near constant seal in dual diameter and multiple diameter pipelines. Specially designed pigs can be manufactured to accommodate brushes and/or magnets for pipelines as small as 3" X 4" with 1.5D bends.



Optional brush configuration

Enduro Digitel Flux Logger™

Multiple Technology Tool



The Enduro DfL™ multiple technology utilizes the magnetic flux leakage technique, primarily to provide an assessment of metal loss occurring within a pipeline. Collecting metal loss, deformation, inertial, internal/external discrimination and residual field data sets concurrently greatly simplifies the process of identifying features and anomaly types. Processing and analyzing the closely coupled data allows the software users and analysts to more readily recognize pipeline features and assess conditions. Any areas indicating geometry and/or metal loss features may be simultaneously evaluated for deformation, strain, profile, and permeability variations.

While the combination of magnetic flux leakage, deformation, inertial and internal/external data sets provides an excellent synergy for classification, these features are enhanced by the addition of the residual magnetic field data set.

The extreme sensitivity of the residual field component provides a means to identify and locate any areas possessing minimal deformation which would otherwise not be identified by conventional techniques.

Enduro's multi tools utilize some of the most advanced design, data storage and packaging techniques available, as evidenced by the diverse data sets being taken and limited physical size and weight of the tools, typically less in length and weight than most presently being offered.

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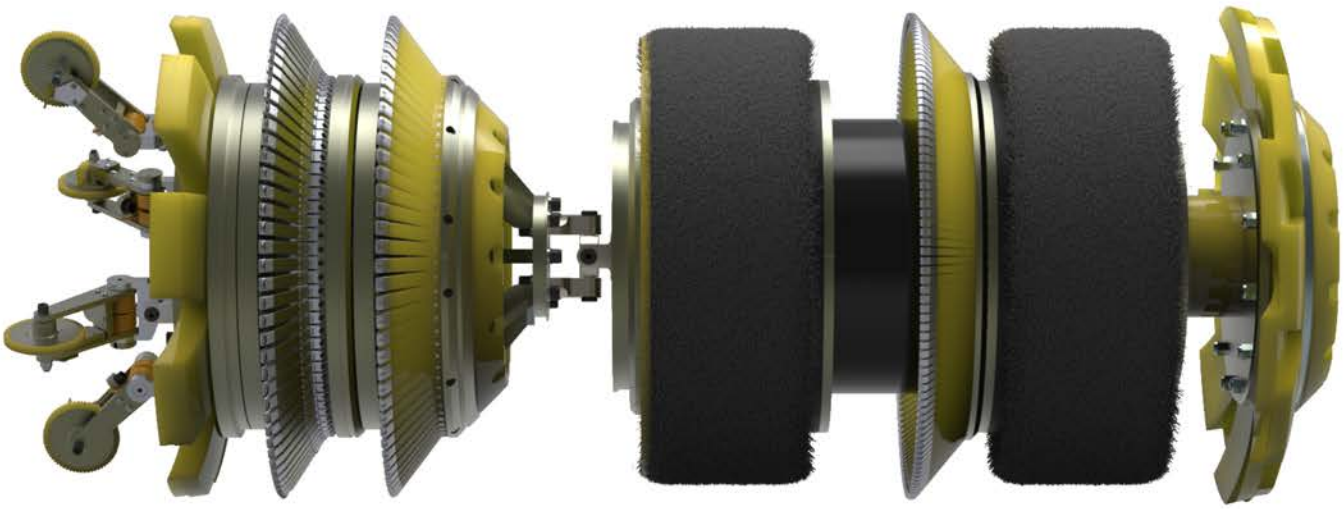
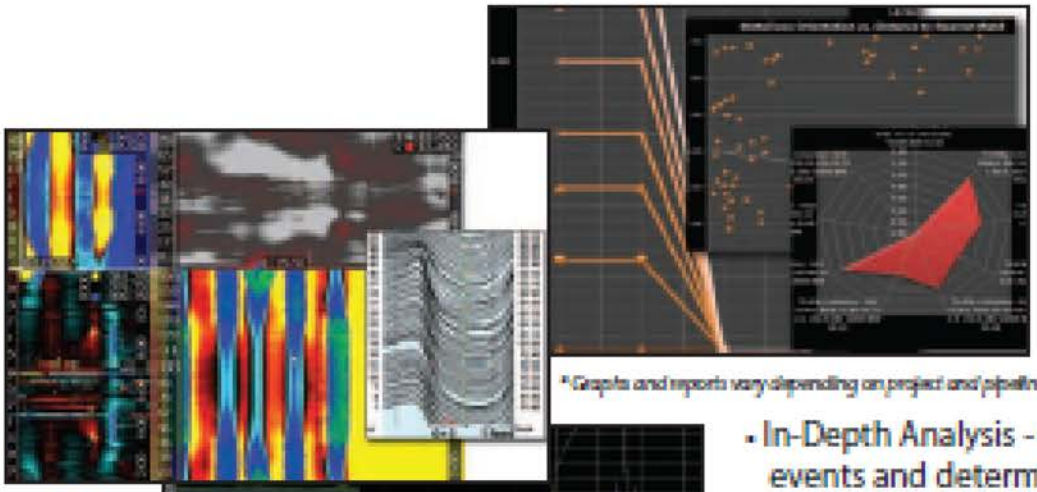
Pig Prog Presenter™

Data Analysis





*Graphs and reports vary depending on project and pipeline conditions.

Enduro Pig Prog II Presenter™ is an advanced data analysis software tool engineered on breakthrough technology that lets you visualize and analyze your pipeline data. You can connect and interact with your pipeline integrity data in seconds, then analyze and create interactive views that give you optimal information. The result is instantaneous cross-analysis from a true combination of data sets working interactively. PigProg also connects to a geospatial system utilizing ArcGIS to produce deliverables the client can integrate into their GIS database with ease.

- In-Depth Analysis - View events and determine integrity issues.
- Multiple Data Views - Display data in several different views simultaneously.
- Interactive Displays - Update all views easily by simply moving to a new event.
- 3D Pipeline Analysis - View a three-dimensional sectional view of your pipeline.
- Customize Reporting* - Create reports tailored to your company needs.
- Historical Data Comparisons - Project future trends, view growth analysis and determine potential integrity risk areas.

Digitel Data Logger™

Sizes
4" - 48"

Twin gyro Inputs

The Enduro Digitel Data Logger™ (the DdL™) offers both radius point readings and diametrical cross-sectional analysis; multiple channels are provided offering the ability to log pipeline anomalies in clock orientation. Gyro inputs provide the ability to determine bend radii and bend direction (up from down – left from right); the angle of the bend is also determined.

Global Position System (GPS) equipment works very well with the DdL™; excavations may be determined from logged GPS readings and given in GPS excavation points.

With the reference points established, calculations are then made to determine the GPS coordinates and station at the anomaly location to be excavated.

The Enduro Above Ground Marker (AGM) is required on all DdL™ surveys. Enduro's traditional AGM equipment provides a reference location at specific points along the pipeline; these locations are logged directly to the DdL™ recorded data; the signal and location is then stored in the DdL™ for future reference and location assistance.

With the use of twin gyros on the DdL™, profiling and mapping of the pipeline is possible, as direction and angle readings are made on all bends. Bends are easily seen and may be used as reference locations when locating anomalies. Enduro's DdL™ equipment is capable of traversing and recording bend radii of normal radius of 1.5 times pipe diameter.

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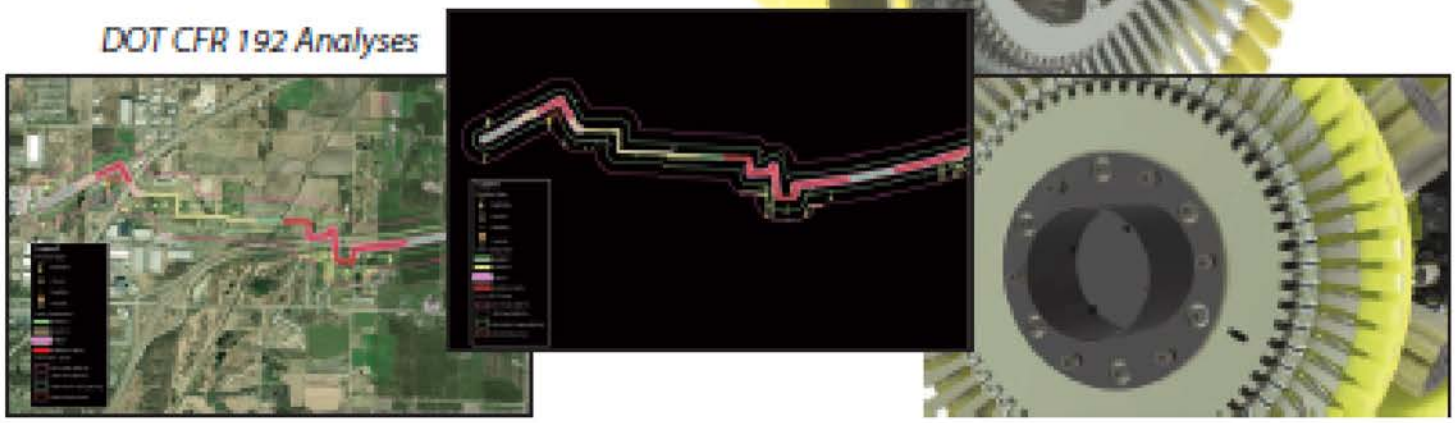
Enduro's NEW DdL DW2™

Sizes 4" - 48"

DOT CFR 192 Analyses



Our newly developed Digitel Data Logger DW2™ ILI (the DdL DW2™) pig features advanced IMU navigation equipment that complements our PigProg software containing GIS tools connecting to a system utilizing ArcGIS.

As the industry evolves, so do the regulations. Pipeline Operators are becoming very familiar with new regulations pertaining to CFR 192 and 195 compliance. Pipelines affected by these new regulations will need accurate mapping along with moderate consequence area (MCA) determination. Similarly, as the "Mega Rule" applies to natural gas gathering and transmission pipelines already under regulation, these lines also need to be updated. Moreover, urban sprawl and growing suburban neighborhoods are increasingly putting people and businesses into the 100-yard, 220-yard, and potential impact radius (PIR) extents of active pipelines. With Enduro's advancements in GIS, Class location, HCA, and MCA determination for Natural Gas pipelines is now a service we are offering. We are not leaving out liquid lines, Enduro has the expertise and the tools to work with the pipeline operators for HCA determination using the Unusual Sensitive Area (USA) licensed datasets. As part of HCA determination for liquid pipelines, Enduro will provide overland spill analysis. With accurate up-to-date HCA, MCA, and Class location analysis we can better support our client's Integrity management plans (IMP). Regulatory analysis will be provided in the final report, and we are equipped to provide the Spatial deliverables for GIS Integration.

Enduro N.I.P.S.

Non-Intrusive Pig Sensor

Enduro has designed the Non-Intrusive Pig Sensor to detect a change in the magnetic field as a pig runs through a pipeline and under the unit. Each NIPS is equipped with a strong rare earth magnet on the base that attaches directly to the pipe. It is a simple, lightweight, portable and cost-effective unit destined to be your next piece of standard tracking equipment.

N.I.P.S. Unit Includes:

- Enduro N.I.P.S. Unit
- (2) Sets of Lithium CR123 Batteries
- Instruction Card
- High impact, O-Ring sealed watertight carrying case

The purpose of the N.I.P.S. is to be able to get an indication when the pig passes a particular point inside the line. Generally used at launchers, receivers and valve sites where the pipe is exposed. The pig will require magnets to trigger the N.I. P.S. Mfl tools would be easily seen, as they already have very strong magnets. For other types of tools, a signaling magnet (provided by Enduro or others) would be installed in the pig.

Battery Life

Batteries should last 36 hours. There is a low battery indicator that lets you know when there are 2-3 hours of remaining battery life.

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Enduro Wireless GeoPhone

Model EWG-1

Enduro Wireless GeoPhone™ is sensitive to ground vibration and detects pig movement by amplifying the sound of the pig cups striking weld joints and scraping along in the pipeline. The unit can be placed on the ground or attached to exposed piping such as valve settings, vent pipes, etc.

Features include:

- EWG-1 amplifier
- Blutooth headset
- Bluetooth speaker
- 2 sets of 4 "AA" batteries
- High impact, O-ring sealed watertight carry case

Ground Probe Power

The ground probe is powered by four (4) AA cell batteries capable of up to 30 hours of operation.

Bluetooth Headset Power

The headset is rechargeable via the included USB cable. Each charge provides up to 24 hours of operation. The functional range of the headset to probe is 40 feet.

Bluetooth Speaker

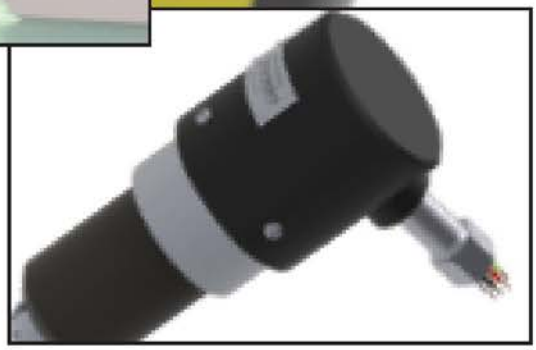
Our portable Bluetooth speaker will wirelessly stream high-quality sound from our GeoPhone, your smartphone or tablet. Waterproof design with a built-in, rechargeable Li-ion battery that supports up to 5 hours of playtime.

Pig Popper™ Signals

Multiple Configurations

6 inch extensions

Our Enduro Pig Popper is an intrusive pig signal that is manually reset once it has been tripped by a pig. The Enduro Pig Popper is available in several different options - Manual Visual alert, Electrical alert, and Electrical/Manual Visual alert. Extensions are available in six inch increments for buried pipe locations. All units are also available in a lighted version. The Pig Popper is designed to be fitted on most existing 2" fittings.



Electrical Alert Version

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Enduro Pig Locating & Tracking

Above Ground Markers, Transmitters, and Receivers

The Enduro AGM2™ Above Ground Marker constantly monitors the surrounding magnetic field. As a change occurs in the magnetic field, or as a pig with a magnetic field passes, the AGM2 indicates and records the pig data in the internal storage – ready for download at your convenience – simplicity at its best and featuring:

- Real time pig pass detection
- 16 days of continuous magnetic field/GPS logging
- Adjustable pig detection parameters
- USB 2.0
- 4 second GPS sampling rate
- GPS fix acquired in 40 seconds from cold start

380-12-AT-111

380-12-SSC-110

Pig tracking services & AGM site documentation

- Pre-run site visits
- Consultation/Recommendations
- AGM site selection
- Survey location documentation
- GPS survey of AGM locations*
- Pig Tracking and AGM placement
- Dig site staking and documentation

We're Cleaning, Data Logging, Pigging, Gauging, Tracking, Data Storage, Purging, ILI, Monitoring, GIS, Batching, and Data Analysis.

We're

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