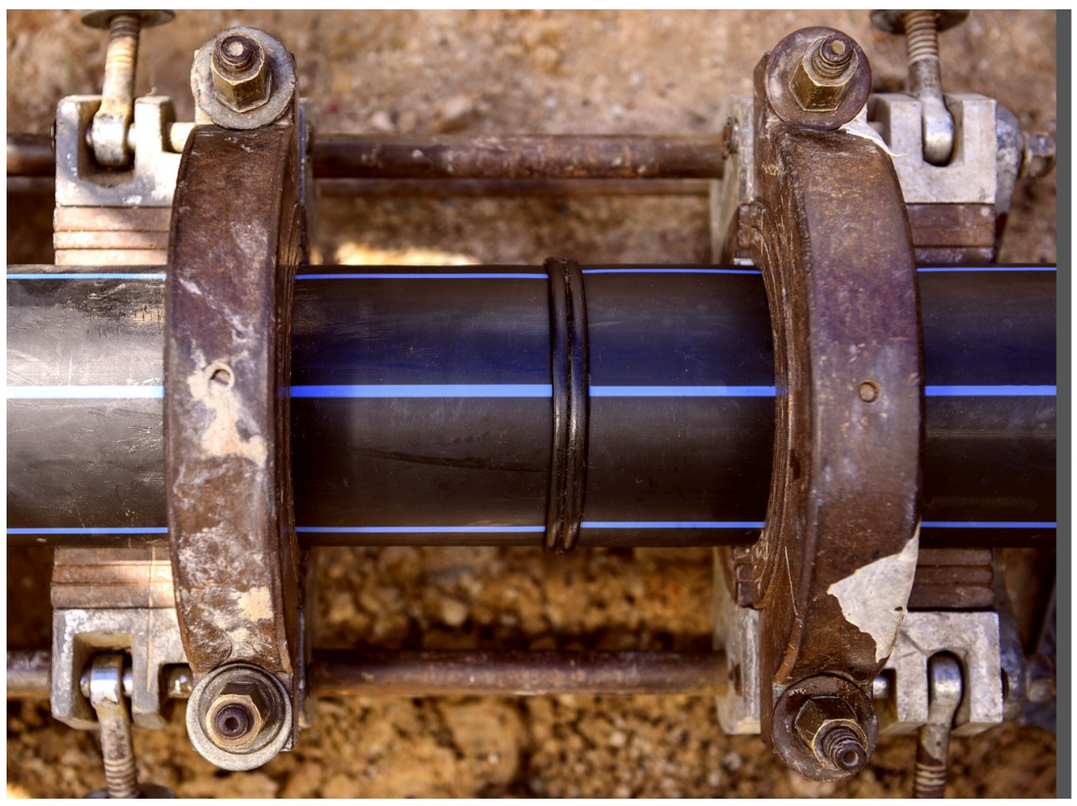
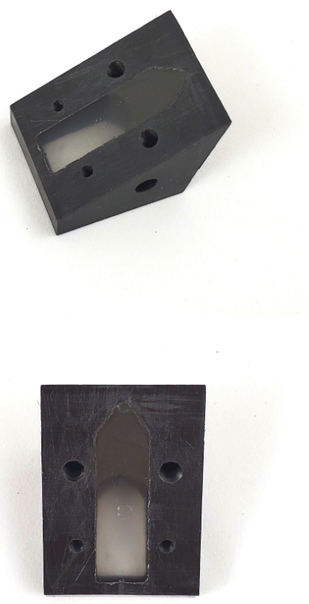
NEW ELASTOMERIC WEDGE DESIGN IMPROVES PHASED ARRAY SECTORIAL SCANNING OF HDPE BUTT FUSION JOINTS

IN A SMALL FOOTPRINT THAT EASILY ADAPTS TO YOUR SCANNING SYSTEM...

High Density Polyethylene (HDPE) pipe is used in applications such as slurry transfer lines, water mains, natural gas mains, sewer mains, and fire system supply lines. In addition, HDPE pipe is used to transport cooling water for both non-safety and safety-related applications in nuclear power plants.

To address the inspection of butt fusion joints in HDPE using pulse-echo phased-array or TOFD, ASME Boiler and Pressure Vessel Code Section V Article 4 introduced Mandatory Appendix X in 2015. In 2016 ASTM introduced a similar document, Standard Practice 3044/E3044M – 16 Standard Practice for Ultrasonic Testing of Polyethylene Butt Fusion Joints.





Recently, Innovation Polymers in partnership with the Materials Research Institute has developed an innovative design that incorporates a damping material with a low velocity refracting wedge for pulse-echo testing. Until a suitable damping material and processing technique was developed, the advantage of forward refraction from Aqualink™ (a low acoustic velocity and low attenuation elastomer which Innovation Polymers currently supplies for other customized NDT applications) could not be fully optimised.

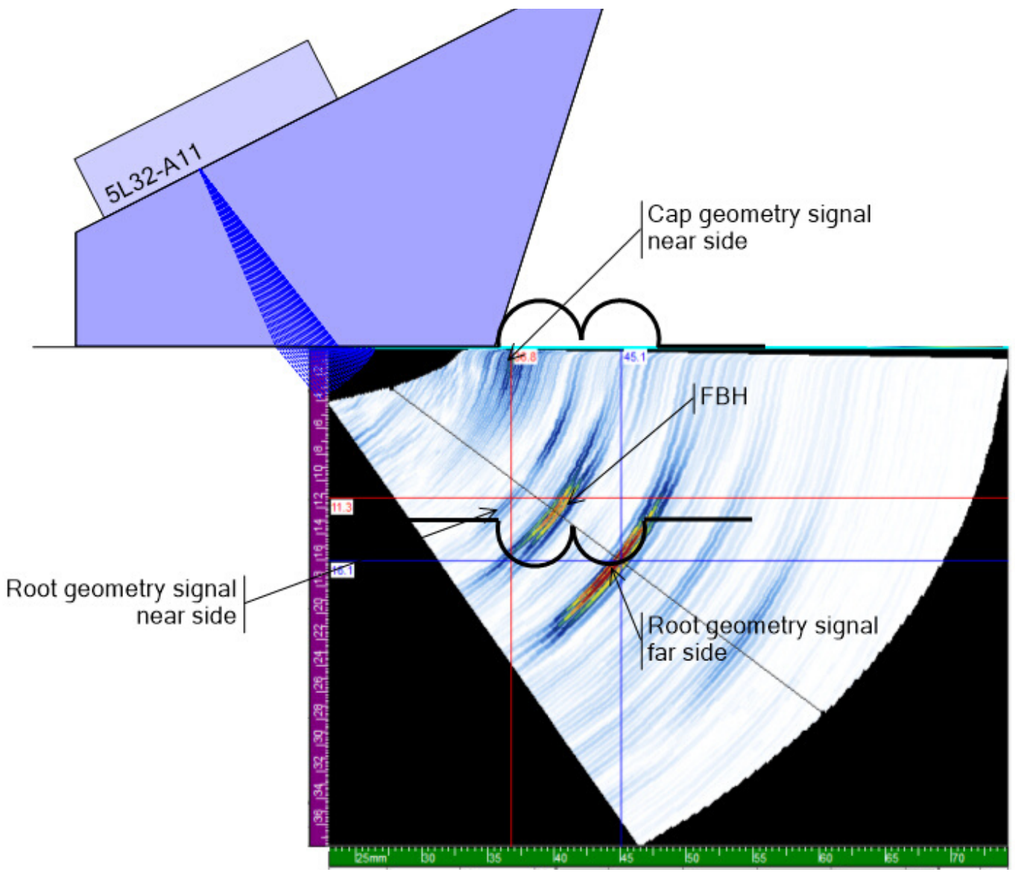
The new design overcomes issues commonly associated with the existing options such as negative refraction when using hard plastics such as Rexolite and large footprints limiting close approach when using water membrane designs.

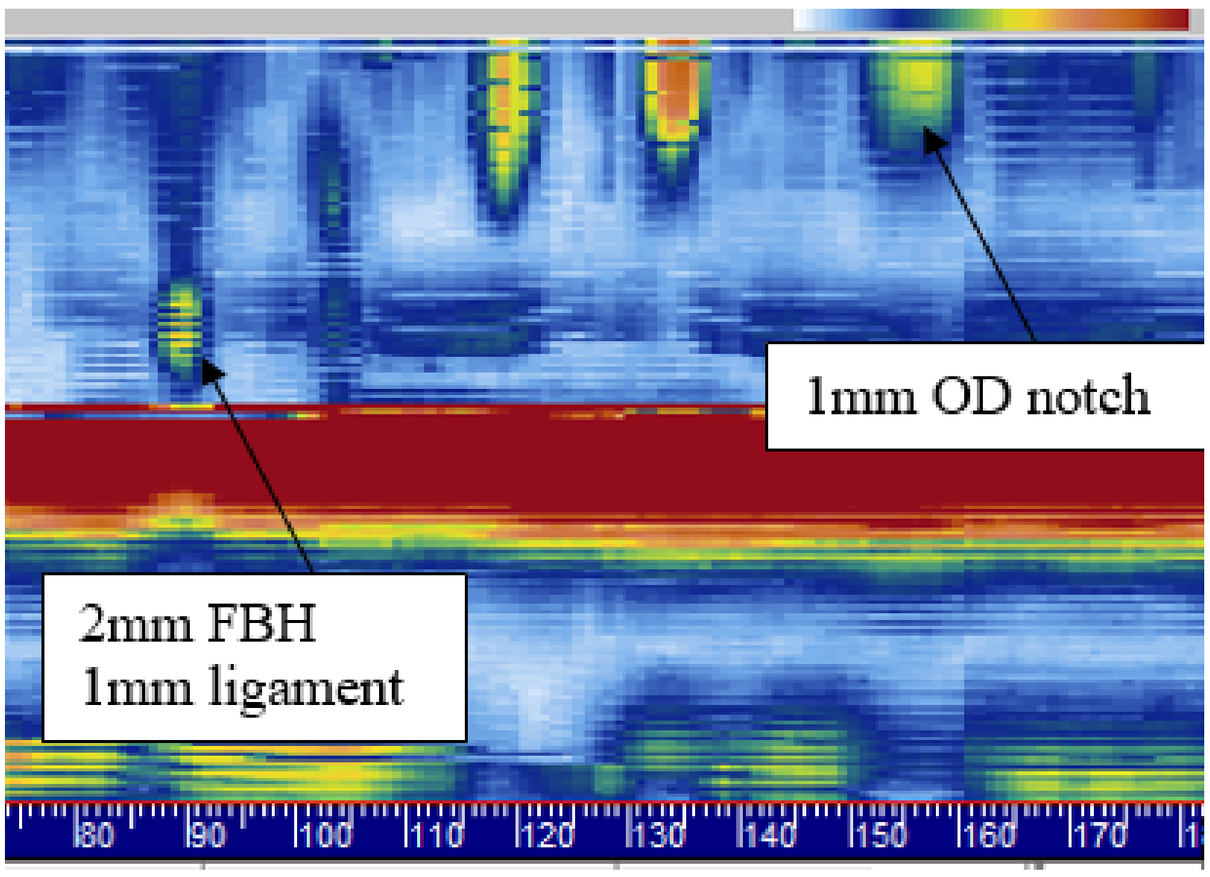
A new ASTM International practice provides a standardized way for manufacturers and construction professionals to examine plastic pipe joints using sound waves. The new standard (E044/E3044M, Practice for Ultrasonic Testing of Polyethylene Butt Fusion Joints) provides a non-destructive way to identify flaws inside the pipe's butt-fusion joints and to assess the joint's overall quality.
- e-Journal of Nondestructive Testing (NDT) ISSN 1435-4934 (NDT.net Journal)

INNOVATION POLYMERS

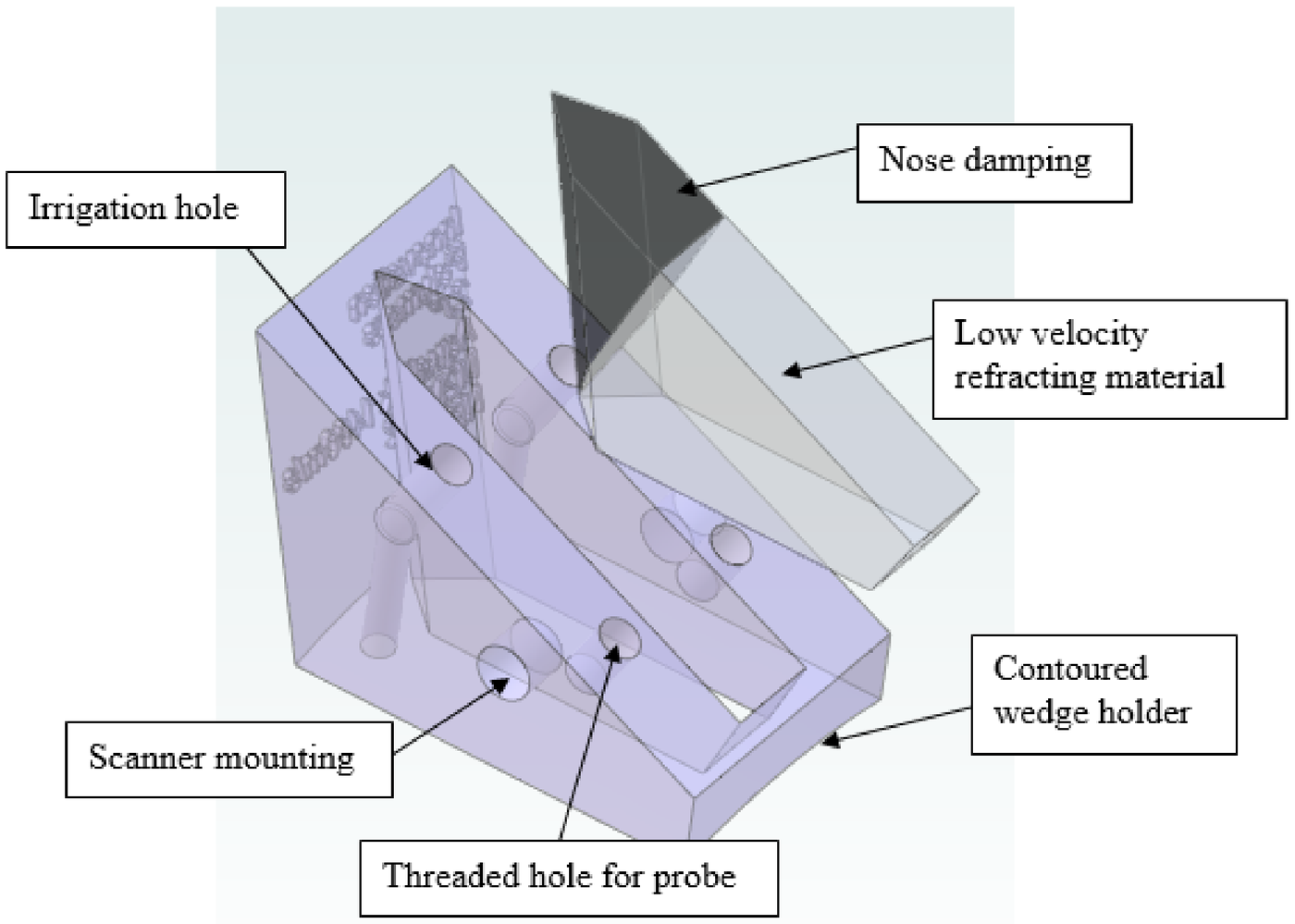
INNOVATIONPOLYMERS.CA

With Aqualink™ we have a great advantage because we can use the upper most refracted angles at around 85° - 89°. Being able to steer to such high angles allows us to detect flaws near the top of the weld. In steel, we would have to rely on a reflection from the opposite surface to have the beam bounce up to the top again. But with HDPE being so attenuative, this would result in very weak signals.
- Ed Ginzel, Materials Research Institute





Using this design technique, Innovation Polymers has been able to produce wedges that integrate with a number of widely used phased-array probes within the ultrasonic nondestructive testing industry.



For more information on these and other custom moulded polymer dry coupling solutions, please call Innovation Polymers at

+1 226 749 3035

or email Rick MacNeil at

rmacneil@innovationpolymers.ca