

COMPONENT FOAMS

Infrastructure Solutions

Infrastructure is all around us in our daily lives. It makes up the basic fundamental systems that support the sustainable functionality of our society and economy. Infrastructure projects are key to a civilization's growth, health, and financial development. Across the U.S., the public sector manages transportation infrastructure and these advanced systems demand efficient installation and integration, while maintaining conservative costs. Helping support this essential need, Armacell provides five PennDOT Bulletin 15 qualified sealing and joint material solutions that construction projects can rely on to support a growing society.

// Our fast-responding technical experts will help you navigate our vast product line for any application or develop innovative solutions to meet market requirements.

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 **armacell**[®]
ArmaComp[™]

Infrastructure Innovation

Investing in Our Future

America's infrastructure connects our communities as a modern nation. It is represented in many forms such as highways, roads, bridges, water conveyance, sewers, ports, mass transit, aviation, telecommunications, and railway systems. In order to grow with the times, our infrastructure must be expanded and maintained constantly. In 2019, the federal government spent \$29 billion on infrastructure and transferred an additional \$67 billion in infrastructure spending to state and local public governments.¹ Included in this public sector spending are six types of transportation and water infrastructure:

- // Highways
- // Mass transit and rail
- // Aviation
- // Water transportation
- // Water resources
- // Water utilities

¹ <https://usafacts.org/state-of-the-union/transportation-infrastructure/>

Did You Know?

More than
25%
of bridges in the United States need significant repairs or are handling more traffic than they were designed to carry. This translates to a whopping 150,000 bridges that aren't up to snuff!

(source: <https://www.carinsurance.org/15-startling-facts-about-americas-infrastructure/>)

More than half of the federal transportation spending is actually used for much-needed highway projects. Since roads and highways make up such a large part of budgeted infrastructure activity, it is especially important that the construction process is cost-efficient and timely. Due to the seasonal nature of infrastructure construction (starting after the last freeze and completing before the next) there will always be aggressive timelines. Knowing this, contractors, engineers and architects need to find simple, effective, and approved solutions to meet these strict requirements. Road and highway projects can be completed faster with the use of precast concrete box culverts instead of site-pouring concrete. Water conveyance jobs can also benefit from the use of precast culverts to ensure speedy completion. On both of these types of construction projects, culverts need to be properly secured and sealed between the structures.

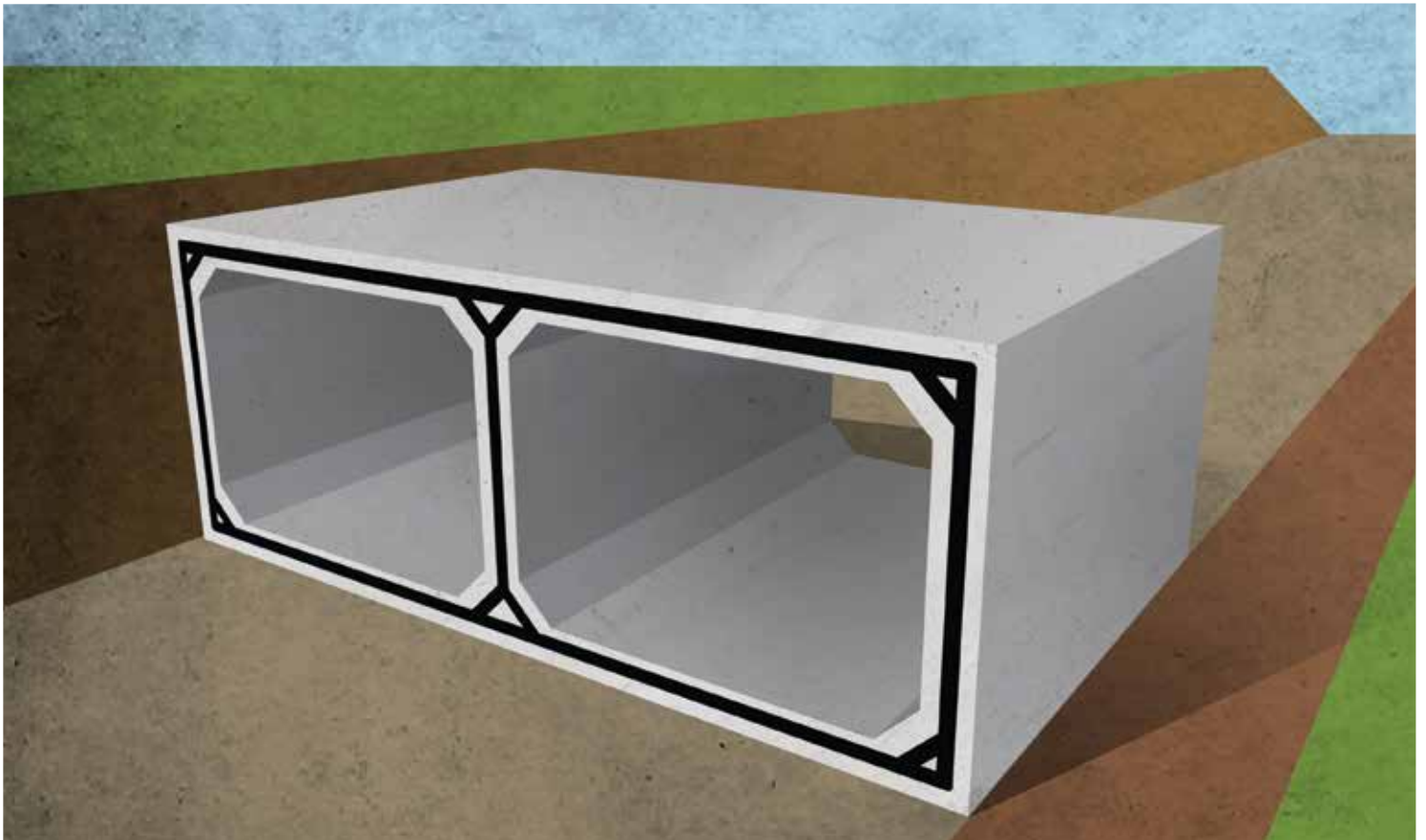


Armacell Approved By PennDOT

Pennsylvania Department of Transportation’s (PennDOT) rigorous product scrutiny process requires consistent, reliable testing results and tolerances. Being approved to be on the PennDOT Bulletin 15 qualified products list means customers, converters, fabricators, and specifiers can rest assured that included product solutions have demonstrated a high performance in accordance with department specifications.

Armacell’s Monarch® 2062 and 2045 were approved in 2005 by PennDot as sources for specified seals used between sections of pre-cast, reinforced concrete box culverts. Monarch 2062 is also approved as closed-cell joint material for preset concrete bridge beams. Armacell’s EnsoLite® IG2, IG3, and IV3 were recently added to Bulletin 15 as approved closed-cell Neoprene joint material as well. Ensolite IG2, like Monarch 2062, specifically can be used in both culverts and bridge beams. This totals five products that Armacell offers to support the infrastructure market.

Penn DOT Bulletin 15 Section	Penn DOT Bulletin 15 Subsection	Penn DOT Bulletin 15 Product Classification	Armacell Product
1085: Precast Reinforced Concrete Box Culvert	1085.2(m)1 Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 5	Armacell (Monarch®) 2045
1085: Precast Reinforced Concrete Box Culvert	1085.2(m)1 Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 2	Armacell (Monarch®) 2062
1085: Precast Reinforced Concrete Box Culvert	1085.2(m)1 Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 3	Armacell (EnsoLite®) IV3
1085: Precast Reinforced Concrete Box Culvert	1085.2(m)1 Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 3	Armacell (EnsoLite®) IG3
1085: Precast Reinforced Concrete Box Culvert	1085.2(m)1 Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 2	Armacell (EnsoLite®) IG2
1107: Prestressed Concrete Bridge Beams	1107.02(p) Neoprene Joint Material	Closed-Cell Neoprene Sponge, Type 2, Class C, Grade 2	Armacell (Monarch®) 2062 and (EnsoLite®) IG2

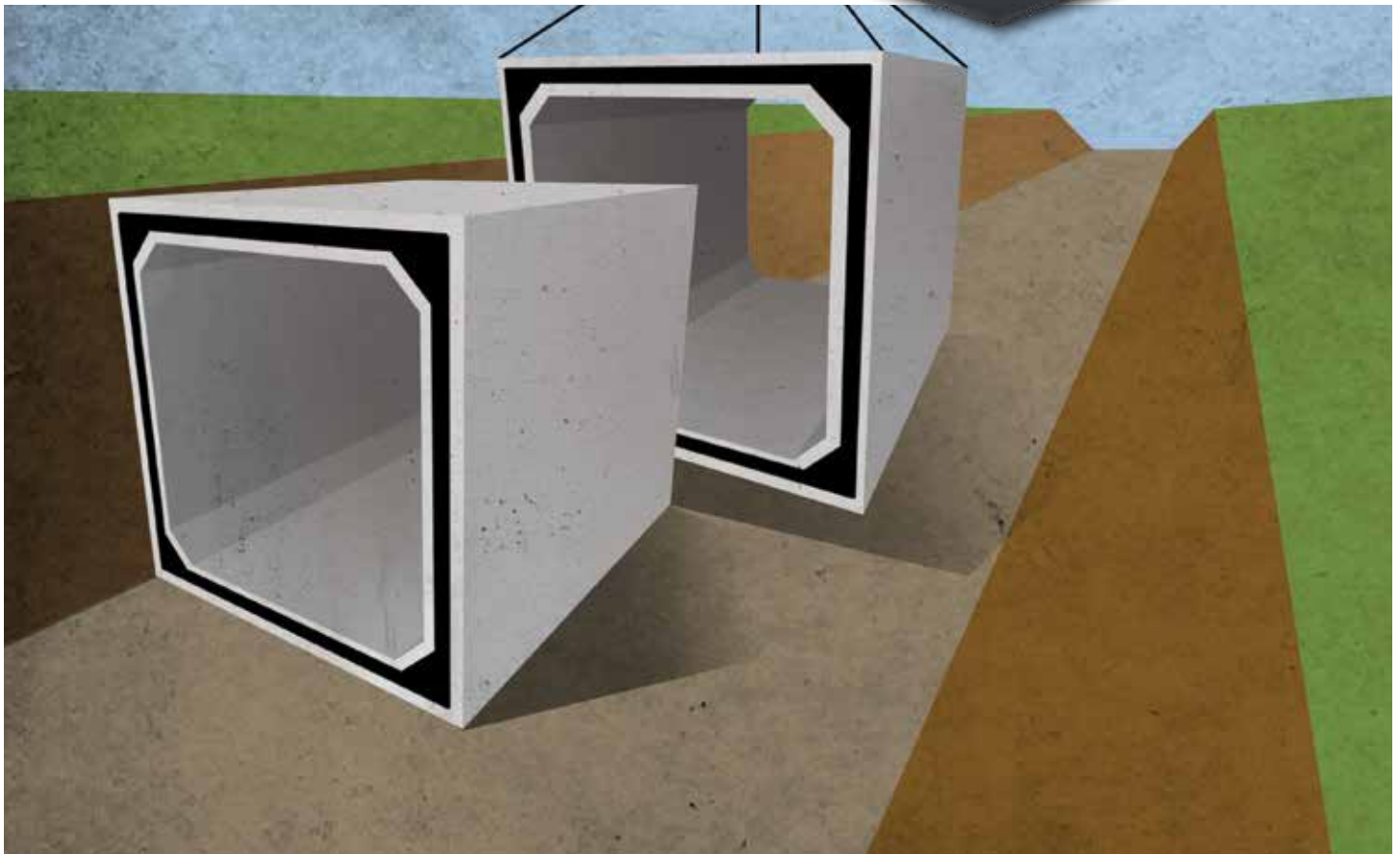
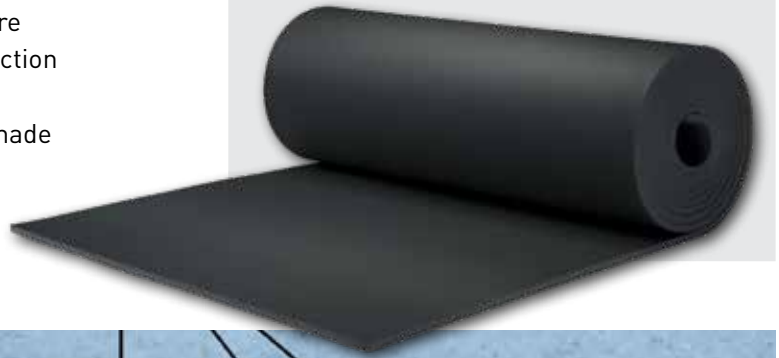


Converter or Fabricator Benefits

Monarch® high-performance elastomeric, closed-cell foams, which are produced in bun or block form, offer low water absorption, low-temperature resistance, high ozone resistance, exceptional compression deflection, flexibility, and the durability required to make an effective gasketing product to use between interlocking concrete structures. EnsoLite® foam solutions are also, high-performance, elastomeric closed-cell foam with the added benefit of being produced in continuous rolls. Using continuous roll material, gasket fabricators can gain efficiency when converting EnsoLite foam rolls into long sections of gasketing or tape. This efficiency is a benefit not only to the convertor, but also the installer as longer segments of gasketing are easier to apply. These advantages not only reduce production and installation costs, they also increase savings for the end user. Both Monarch and EnsoLite are also proudly made in the USA.

Armacell PennDOT approved products are excellent for use in the following applications:

- ✓ Highway Construction
- ✓ Tunnel Installations
- ✓ Utility Trench or Tunnel Systems
- ✓ Bridge Construction and Replacements
- ✓ Water Conveyance
- ✓ Stormwater Management Systems (Retention, detention, filtration)
- ✓ Environmental Encasements
- ✓ Underground Pedestrian and Wildlife Tunnels



Product Attributes and Specifications

- // Closed-cell foam
- // Low water absorption
- // Low change in compression deflection after heat exposure
- // Good ozone resistance
- // Low temperature resistance
- // Meets the requirements of ASTM D 1056

Did You Know?

Traffic jams caused by poor transit infrastructure cost Americans

4 billion hours
and nearly

3 billion gallons
of gasoline a year.

(source: <https://www.carinsurance.org/15-startling-facts-about-americas-infrastructure/>)

Buns

Product	Width (inches)	Width (meters)	Length (feet)	Length (meters)	Thickness (inches)	Thickness (mm)
Monarch 2045	40	1.02	4.00	1.22	1.00	25.40
Monarch 2062	40	1.02	4.50	1.37	2.00	50.80

Rolls

Product	Width (inches)	Width (meters)	Length (feet)	Length (meters)	Thickness (inches)	Thickness (mm)
EnsoLite IG2	54	1.37	100	30.48	1.25	31.75
EnsoLite IG2	54	1.37	50	15.24	1.25	31.75
EnsoLite IG2	58	1.46	100	30.48	0.88	22.35

Product	Width (inches)	Width (meters)	Length (feet)	Length (meters)	Thickness (inches)	Thickness (mm)
EnsoLite IG3	54	1.37	50	15.24	1.00	25.40
EnsoLite IG3	54	1.37	50	15.24	1.25	31.75

Product	Width (inches)	Width (meters)	Length (feet)	Length (meters)	Thickness (inches)	Thickness (mm)
EnsoLite IV3	54	1.37	100	30.48	1.25	31.75
EnsoLite IV3	54	1.37	50	15.24	1.50	38.10
EnsoLite IV3	48	1.22	50	15.24	1.25	31.75
EnsoLite IV3	54	1.37	50	15.24	1.25	31.75



All data and technical information are based on results achieved under the specific conditions defined according to the testing standards referenced. Despite taking every precaution to ensure that said data and technical information are up to date, Armacell does not make any representation or warranty, express or implied, as to the accuracy, content or completeness of said data and technical information. Armacell also does not assume any liability towards any person resulting from the use of said data or technical information. Armacell reserves the right to revoke, modify or amend this document at any moment. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. This document does not constitute nor is part of a legal offer to sell or to contract.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,200 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

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