

Avoided Emissions from ArmaGel XGH

By reducing heat transfer in industrial pipework, Armacell's ArmaGel® XGH insulation lowers energy demand and helps reduce use-phase greenhouse gas emissions in industrial applications. ArmaGel XGH is estimated to enable approximately 425 ktCO₂e of avoided emissions over its lifetime, compared with a mineral wool insulation reference scenario in industrial pipework applications. The estimate uses a forward-looking approach based on 2025 product net sales and modelled lifetime use.

ASSESSMENT DETAILS

- // **Functional unit:** m³ of insulation sold.
- // **Impact - Emissions Avoided:** 114.51 tCO₂e avoided per m³ of ArmaGel XGH.
- // **Time Period:** 30-year assumed product lifetime.
- // **Scope:** Industrial pipework applications across Armacell's global sales network.
- // **System Boundaries:** The assessment includes use-phase emissions associated with heat transfer through industrial pipework. Upstream embodied emissions associated with the production of ArmaGel XGH and mineral wool are excluded from the avoided emissions calculation.

LOW-CARBON SCENARIO

- // The low-carbon scenario reflects the use of ArmaGel XGH in industrial pipework applications.
- // ArmaGel XGH is a flexible, high-performance aerogel blanket designed for elevated-temperature industrial insulation. It reduces heat transfer in industrial pipework compared with the mineral wool reference scenario, reducing the energy required to maintain operating conditions.
- // The avoided emissions are calculated as the difference in emissions between the low-carbon scenario with the application of ArmaGel XGH and the mineral wool reference scenario.

REFERENCE SCENARIO

- // The reference scenario is mineral wool insulation used in industrial pipework applications.
- // Mineral wool was selected as the reference scenario because it is widely used as a standard insulation material and represents a conservative market alternative for the assessed industrial applications.
- // A no-insulation counterfactual has not been selected as it could materially overstate the avoided emissions claim. Indicative sensitivity testing showed that a no-insulation scenario for ArmaGel XGH could result in avoided emissions approximately 20 times higher than the mineral wool reference scenario.



METHODOLOGY

ASSUMPTIONS & LIMITATIONS

- // The avoided emissions result is a modelled estimate and is subject to uncertainty.
- // The model accounts for a range of industrial project types, including refinery, petrochemical, LNG, chemical, field development, pipeline and power applications.
- // ArmaGel XGH and mineral wool are assessed across four process temperature ranges, including <-50°C (<-58°F), -50°C to 125°C (<-58°F to 257°F), 125°C to 250°C (<257°F to 482°F), and >250°C (>482°F), with representative process temperatures applied in the model.
- // The insulation thickness applied in the model varies by industrial project type, based on inputs provided by Armacell.
- // Industrial systems are assumed to operate for 90 percent of the year, reflecting continuous operation with limited downtime for planned and unplanned maintenance.
- // The model calculates heat transfer through radial conduction only. Convection and radiation on the outer surface of the insulation are excluded from the current modelling approach.
- // The methodology does not account for site-specific climatic conditions or operating profiles within each country.

