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New Dow HDPE Resin for Pipe Applications Achieves Highest Performance Listing by The Plastics Pipe Institute

DOW DGDA-2490 BK 100 HDPE Resin Secures First North American Listing for 100-Year Pressure Rating and ISO Ratings at Elevated Temperatures

Orlando, FL - April 28, 2003

The Polyolefins and Elastomers (PO&E) Business Group of The Dow Chemical Company today announced that DOW DGDA-2490 BK100 High Density Polyethylene (HDPE) resin is the first ISO PE100 pipe material produced in North America to be listed with a 100-year rating at 20°C (68°F) by The Plastics Pipe Institute, Inc. (PPI). DOW DGDA-2490 BK100 HDPE resin also was given a 50-year rating at 40°C (104°F) and an 11-year rating at 60°C (140°F) by the PPI, making it the first PE100 resin to be listed at elevated temperatures. ISO PE100 is a leading global classification for polyethylene pressure pipe materials published by the International Organization for Standardization (ISO).

DOW DGDA-2490 BK100 HDPE resin offers significantly improved long-term ductile hoop strength combined with excellent resistance to slow crack growth (SCG) and rapid crack propagation (RCP) when compared to HDPE resins currently available for the production of polyethylene pressure pipe. The material will benefit pipe producers and other companies responsible for the design and maintenance of water systems, industrial and mining pipe, oil and gas production, and natural gas distribution.

PPI granted DOW DGDA 2490 BK 100 HDPE resin the 100-year listing based on the ISO 9080 standard, listing the resin with a Minimum Required Strength (MRS) of 10 MPa (1,450 psi) at a standard operating condition of 20°C (68ºF) for 100 years. Currently, ASTM (American Society for Testing and Materials) standards specify a hydrostatic design basis (HDB) at 23°C (73°F) based on an extrapolation for 11 years for all pressure pipe segments. The exception is for natural gas distribution, which requires linear substantiation of the extrapolation of long-term hydrostatic strength (LTHS) to 50 years at 23^{O}C (73°F) (ASTM D2513 - *Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings*). DOW DGDA-2490 BK 100 HDPE resin is validated by ISO 9080 for the ductile extrapolation to 250 years at 20°C (68°F).

"Dow is the first supplier to receive this 100-year listing at 20°C," explained Dr. Gene Palermo, technical director for the Plastics Pipe Institute. "The data also clearly confirm DOW DGDA-2490 BK 100 HDPE resin can be rated with the ISO method at 40°C and 60°C. Current ASTM guidelines in North America do not provide the flexibility for a gas engineer to design a system at selected times – like 100 years. As a result, we turned to the proposed ISO protocol described in *PPI TR-9*, which provides for design at selected use conditions."

Elevated Temperature Listing

Additionally, PPI listed DOW DGDA-2490 BK 100 HDPE resin at elevated temperatures, giving it an MRS rating of 8 MPa (1,160 psi) at 40°C (104°F) for 50 years and an MRS rating of 6.3 MPa (913 psi) at 60°C (140° F) for 11 years. Prior to the introduction of this resin, no PE100 materials had been listed at 40°C or 60°C. According to the new revision of the ASTM D2513 standard, which now includes MRS-rated pipe materials, DOW DGDA-2490 BK 100 HDPE resin has additional Pipe Category rating of code letters CJE (6.3 MPa (913 psi) MRS at 60° C (140° F) as a PE100 material. Further, DOW DGDA-2490 BK 100 HDPE resin has a CEC rating (1000 psi HDB at 60° C (140° F) as a PE3408 material.

"The capability to list PE100 resins at elevated temperatures is a significant step forward for PE100 materials in the U.S.," said Kevin Wettstein, North American marketing manager for pipes and durables, Dow Polyolefins & Elastomers Business Group. "In today's environment tremendous pressure is being placed on engineers to provide cost effective piping solutions with outstanding safety, durability and integrity. These new, highly engineered polyethylene resins from Dow will help our customers meet these demanding requirements and allow them to expand the PE pipe market into applications requiring higher performance."

DOW DGDA-2490 BK 100 HDPE resin is listed by both PPI and NSF and exceeds both ISO and ASTM standards for PE pipe grade materials. It is at least 60 times more resistant to slow crack growth (PENT is > 6000 hours) and offers at least twice the extrapolated lifetime at standard operating pressure versus the most stringent requirements specified for in ASTM D2513. In addition, DOW DGDA-2490 BK100 HDPE resin is at least three times more resistant to rapid crack propagation (e.g. S-4 Pc>12 bar @ 0°C for 10" SDR 11 pipe) than the most demanding requirements of ISO PE100 standards (e.g. S-4 Pc=4.2 bar). (Note: ASTM standard does not have RCP requirement). The S-4 critical temperature at 10 bar for RCP failure is below –17°C (1°F).

About Dow
Dow is a leading science and technology company that provides innovative chemical, plastic and agricultural products and services to many essential consumer markets. With annual sales of $28 billion, Dow serves customers in more than 170 countries and a wide range of markets that are vital to human progress, including food, transportation, health and medicine, personal and home care, and building and construction, among others. Committed to the principles of Sustainable Development, Dow and its approximately 50,000 employees seek to balance economic, environmental and social responsibilities.

For more information about DOW DGDA-2490 BK 100 HDPE resins for pressure pipe applications, visit www.dowpolyolefins.com or contact the Dow Customer Information Group toll free at 1-800-441-4369.

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