HUNTSMAN

Technical Bulletin

Irradiation Evaluation of Polyurea Spray Elastomers

100% Solids, two-component polyurea spray elastomer systems are being utilized in a wide variety of application areas. In most cases, the systems are exposed to typical environmental conditions with excellent performance. A recent interest has been in coating applications were levels of nuclear radiation may be present.

To evaluate the performance of polyurea spray elastomer systems in this environment, samples were irradiated for various exposures using a Cobalt-60 source. The polyurea sample systems included a black InstaCote™ system, and a standard gray and blue system prepared by Huntsman Corp., Austin Labs. Nuclear irradiation exposure work was done at the Ford Nuclear Reactor, The University of Michigan. Dose rates were measured with a Reuter-Stokes ion chamber, Model RS-C4-1606-207.

The attached Table gives the elastomer physical property retention of these select systems after varying degrees of exposure to the Cobalt-60 source.

Because of the simplistic nature of this evaluation and applications factors which are beyond the control of Huntsman Corp., no guarantee or warranty concerning the use of these elastomer systems is either intended or implied. These test results are reported to serve as a guide to the applicability of polyurea spray elastomers in a variety of applications. It is the responsibility of the system supplier and/or end user to assess the suitability of polyurea spray elastomers for specific applications.

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	InstaCote™ Black	Huntsman Blue	Huntsman Gray
After 10.0 Mrad Gamma Dose:			
Tensile strength, psi	2195	2745	1860
Elongation, %	145	260	520
Tear strength, pli	370	450	375
Shore D Hardness	58	58	50
100% Modulus, psi	1900	1770	965
300% Modulus, psi	---	---	1400
After 49.97 Mrad Gamma Dose:			
Tensile strength, psi	2085	2220	1015
Elongation, %	135	190	260
Tear strength, pli	400	400	295
Shore D Hardness	54	53	43
100% Modulus, psi	1870	1751	820
After 100 Mrad Gamma Dose:			
Tensile strength, psi	1790	1620	900
Elongation, %	90	80	160
Tear strength, pli	360	335	230
Shore D Hardness	55	50	48
100% Modulus, psi	---	---	855
After 200 Mrad Gamma Dose:			
Tensile strength, psi	1520	940	800
Elongation, %	15	15	50
Tear strength, pli	330	200	165
Shore D Hardness	56	56	48

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