Chemical Compatibility of DURALOC Polymers

Duraloc polymers exhibit varying levels of chemical compatibility, depending upon their polymeric structure and the presence of additives such as glass. Other factors influencing chemical compatibility include the reagent, reagent concentration, temperature, exposure time, and whether the polymer is under stress. Stress may be induced by an external load during use or residual internal stress may result from the processing of the material. Residual processing stresses can usually be minimized by adjusting processing conditions. It is necessary to evaluate compatibility in both the unstressed and stressed modes because some reagents which have no effect on the unstressed plastic may cause cracking when stressed.

Immersion Testing (no external load)

to evaluate native chemical resistance, test specimens were immersed in a variety of common reagents for seven days at room temperature. The results are shown in Table 1. The Duraloc polymers tested show excellent resistance to the aqueous solutions of both acids and bases. The aliphatic hydrocarbons have no or little effect on any of the resins tested. The aromatic hydrocarbons are shown to cause property degradation. Oxygenated reagents must be evaluated individually, because some of them attack the polymers aggressively and some cause almost no property change. Chlorinated hydrocarbons are shown to attack resins of this nature but Duraloc shows a measure of resistance to them.

Table 1

General Indication of Chemical Resistance of Duraloc	
N-Butane	E
Iso-Octane	E
Benzene	F
Toluene	F
Ethanol	E
Methyl Ethyl Ketone	P
2-Ethoxyethanol	G
1,1,1 Trichloroethane	G
Carbon Tetrachloride	E
Hydrochloric Acid (20%)	E
Acetic Acid (20%)	E
Sulfuric Acid (20%)	E
Sodium Hydroxide (10%)	E
7 day immersion at room temperature	

Rating System

Little to no effect	E	Excellent
No serious loss of properties	G	Good
Some negative effects, some useful properties retained	F	Fair
Severe attack or rupture	P	Poor

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