

# HARD ARMOR



## Barrday is a leading advanced material provider for the protective and composite markets.

We offer an extensive range of high performance solutions for hard armor applications in the ground vehicle, marine, aerospace, helmet and plate markets. Our solutions are developed to provide the best possible survivability solution based on your requirements for specific protection levels, total solution weight and cost. In addition to custom solutions, we offer standard material solutions that meet existing military specifications.



### GROUND-AIR-MARINE VEHICLE

Barrday supplies a broad array of composite materials for ground vehicle, marine and aerospace up-armorings based on our proprietary thermoset and thermoplastic resin systems. These materials range from aramid and glass-based mil-spec prepreg for spall liners to aramid and ultra high molecular weight polyethylene uni-directional products for seat, cockpit and floor armor.

### HELMETS

We are a leading material supplier for military, commercial and law enforcement helmet programs. Our broad offering of fabric and uni-directional products based on phenolic, epoxy and thermoplastic resin systems covers the full spectrum of value/performance requirements in both monolithic and hybrid helmet designs.

### PLATES AND SHIELDS

Our growing portfolio of aramid and ultra high molecular weight polyethylene uni-directional products for monolithic plates and shields are designed to meet the full range of NIJ standards. In addition, we offer cost-effective fabric prepreg for plate backing applications to minimize back-face deformation and improve trauma protection.



## BARRDAY MATERIALS FOR HARD ARMOR APPLICATIONS



	END-MARKET APPLICATION	AVAILABLE FORMATS & REINFORCEMENT	RESIN MATRIX	PROCESSING TEMP °F (°C)	FEATURES/BENEFITS		
<b>UNIDIRECTIONAL MATERIALS</b>							
U471	Plates	2-ply UD	Aramid	Thermoplastic	Rigid, high temperature performance resin. Good tile reinforcement.		
U681					Rigid, high temperature performance resin. High strength fiber reinforcement.		
U561	Vehicle	4-ply UD	Good performance against deformable projectiles.				
U531			PE tape reinforcement. Ideal for flat panels.				
U1551/XF23 Endumax	Vehicles	2-ply Tape	UHMWPE	265 – 275°F (129 – 135°C)	Higher performance PE tape reinforcement.		
U1751/XF33 Endumax	Plates						
<b>THERMOSET SYSTEMS</b>							
PSR814	Helmets	UD/Fabric Prepreg	Aramid: 1023 (850d PW) 1013 (3000d PW) 1117 (3000d BW)	PVB Phenolic	High strength, rigid system. Low temp and fast curing (20 min) system.		
LC815					Toughened system. Low temp and fast curing (20 min) system. Green pigmented option.		
LC799	Helmets Vehicle	Film			High performance system. Green pigmented standard, clear resin option.		
LC818	Vehicle				Low cost system. Meets MIL-DTL-62474F.		
PSR133	Vehicle	Fabric Prepreg	Glass: 1136 (WR) 7781 (E-glass) 6781 (S2-glass)	Neat Phenolic	320 – 325°F (154 – 163°C)	Excellent chemical, fire and heat resistance. Meets MIL-DTL-64154B. Low cost.	
EPM105	Plates		Toughened Epoxy	250°F (120°C)	High performance system.		
EP200HT	Plates		Carbon: 1041 (3k PW) 1144 (3k 2x2T) 12K UD	Epoxy	200 – 210°F (93 – 99°C)	Low temperature system. Good for co-molding with polyethylene materials.	
EPM301	Helmets Plates				275°F (135°C)	Fast cure (20 min), toughened system with fire retardant properties.	
LC310	Plates Vehicle		Spectra: 1255 (900d 2x2T) 1036 (900d PW)	Polyester	275 – 320°F (135 – 160°C)	Low cost, easy molding system under a wide range of pressures.	
VE	Helmets			Vinyl Ester	200 -260°F (93-127°C)	Easy processing, low cost, tough, fast-curing (20 min) system. Black pigmented option.	
NE9	Vehicle			Neoprene	260-380°F (127-182°C)	Tough, flexible composite. Excellent spall performance.	
<b>THERMOPLASTIC SYSTEMS</b>							
ARG	Vehicles		Fabric Laminate	Aramid: 1013 (3000d PW)	Olefin Copolymer	305 – 315°F (152 – 157°C)	Semi-rigid, resin, system with superior ballistics. Chemically stable 500F+.
NTA	Plates					270 – 320°F (132-160°C)	Hot melt, high flow resin, good adhesion. Fast curing (5 min) system.
CAF	Vehicles	Fabric Semi-Preg	Glass: 7781 (E-glass)	Modified Polyethylene	285 – 320°F (141 – 160°C)	Flexible system with good ballistic performance.	
PPF	Vehicles Plates				Polypropylene	350-360°F (166 – 182°C)	Rigid resin with good structural properties and temperature resistance.