



SOLVAY

asking more from chemistry®



Lightweight Composites for
Defense Applications

**COMPOSITE
MATERIALS**



Solvay has a rich history in delivering solutions across an ever increasing variety of defense applications. Solvay's prepregs, adhesives, process consumables and tooling are used extensively in the manufacture of ballistic and blast protection systems, structural components in armored fighting vehicles, military shelters and pallets, and in lightweight helmets and body armor.



Appliqué armor and spall liners applications on the UK MoD's Warthog vehicle.



Alpha Eagle aircrew helmet by Helmet Integrated Systems made with VTM® 264.

Composite Materials

- Suitable for low cost vacuum bag processing, and press and autoclave molding
- Offer a combination of good mechanical performance, toughness, and ballistic and blast protection
- Ease of use with a broad processing window
- Extensive mechanical databases available to support design optimization
- Supplied across a wide range of fabrics and fibers, including unidirectional and cross ply unidirectional S, E and R-Glass, aramid, carbon, UHMWPE and nylon.

Composite Materials Product Selector Guide

Category	Product	Out Life (days)	Service Temp °F (°C)	Cure Flexibility	Cure Method	Tg (DMA Onset) °F (°C)	Features
Spall Liners	MTM® 248S	30	176 (80)	195–300 (90–150)	Press/Vacuum/Autoclave	212 (100)	Epoxy, high adhesion levels, flame-retarded
	MTM® 85S	90	167 (75)	320 (160)	Press	176 (80)	Phenolic, optimized for high pressure press molding
	L-705	42	180 (82)	275 (135)	Press/Vacuum/Autoclave	-	Impact resistant aramid prepreg
Vehicle Structure	MTM® 48	30	176 (80)	248–275 (120–135)	Press/Vacuum/Autoclave	230 (110)	Epoxy, toughened, flame-retarded
	MTM® 248S	30	176 (80)	195–300 (90–150)	Press/Vacuum/Autoclave	212 (100)	Epoxy, high adhesion levels, flame-retarded
Appliqué Armor	MTM® 248S	30	176 (80)	195–300 (90–150)	Press/Vacuum/Autoclave	212 (100)	Epoxy, high adhesion levels, flame-retarded
	MTM® 85S	90	167 (75)	320 (160)	Press	176 (80)	Phenolic, optimized for high pressure press molding
	L-705	42	180 (82)	275 (135)	Press/Vacuum/Autoclave	-	Impact resistant aramid prepreg
	L-305	60	250 (121)	250 (121)	Vacuum	-	Energy broadcasting polymer resin film
Armored Vests	MTM® 28	90	176 (80)	185–248 (85–120)	Press/Vacuum/Autoclave	212 (100)	Epoxy prepreg, toughened, excellent impact resistance & adhesion
	MTM® 80S	30	480 (250)	284–320 (140–160)	Press/Vacuum/Autoclave	610 (320)	Phenolic, and excellent fire, smoke and toxicity performance
	Cycom® 950-1	90	220 (105)	260 (125)	Vacuum/Autoclave	-	Epoxy prepreg, toughened
	L-305	60	250 (121)	250 (121)	Vacuum	-	Energy broadcasting polymer resin film
	L-705	42	180 (82)	275 (135)	Press/Vacuum/Autoclave	-	Impact resistant aramid prepreg
Helmets	VTM® 264	30	212 (100)	149–248 (65–120)	Vacuum	248 (120)	Epoxy, prepreg excellent handling and processing
	L-305	60	250 (121)	250 (121)	Vacuum	-	Energy broadcasting polymer resin film
	L-705	42	180 (82)	275 (135)	Press/Vacuum/Autoclave	-	Impact resistant aramid prepreg
	MTM® 85S	90	167 (75)	320 (160)	Press	176 (80)	Phenolic prepreg, press molding
Antenna & radar domes	MTM® 248S	30	176 (80)	195–300 (90–150)	Press/Vacuum/Autoclave	212 (100)	Epoxy prepreg, high adhesion, flame-retarded
	LTM® 26	2-5	239 (115)	176–248 (80–120)	Press/Vacuum/Autoclave	-	Epoxy prepreg, adhesion to foam core materials
	VTM® 264	30	212 (100)	149–248 (65–120)	Vacuum	248 (120)	Epoxy prepreg, excellent handling and processing
	VTM® 244FRB	21	302 (150)	149–356 (65–180)	Vacuum	351 (177)	Epoxy prepreg, flame-retarded. For rapid lay-up of heavier weight bulk plies
	VTM® 243FRB	21	302 (150)	149–356 (65–180)	Vacuum	351 (177)	Epoxy prepreg, flame-retarded, high viscosity, low tack for lighter reinforcements
	VTF242FRB	7	320 (160)	149–356 (65–180)	Vacuum	351 (177)	Epoxy surface ply, flame-retarded

Adhesives and Surfacing Product Selector Guide

Our adhesive systems provide excellent structural performance, durability and environmental resistance. While our surfacing products mold to a tough, sandable, paint-ready surface directly from the tool.

Product	Out Life (days)	Min. Cure °F (°C)	Available Formats	Notes
VTF 266	30	149 (65)	Supported/unsupported film	Surface improvement film compatible with VTM®260 series prepregs. Molds to a sandable, paint ready finish
VTA® 260	30	149 (65)	Supported/unsupported adhesive film	Use VTM®/MTM® prepregs. Available with reinforcement carrier to aid placement or non-supported as a resin film
MTA® 240	30	176 (80)	Supported/unsupported film	Structural adhesive film; formulated for cure compatibility with many structural prepreg matrices
FM® 73	15–30	250 (120)	Supported/unsupported film	Structural adhesive film; formulated to bond metals and many composite systems
FM® 94	30	250 (120)	Supported/unsupported film	Structural adhesive film offering a combination of high-temperature performance, toughness, and moisture resistance
MTM® 248S	30	195 (90)	Prepreg	Bonding ceramic tiles, either in high-resin-content prepreg format or in resin film format

Tool Design and Manufacturing

Our tooling prepregs offer outstanding surface finish and longevity for the manufacture of complex mold tools. We also offer soft tooling technology including reusable vacuum bags, integral heater blankets, intensifiers and caul sheets. Our design service can support tool design optimization to ensure a fit-for-purpose solution.

Tooling Product Selector Guide

	Product Form	Out Life (days)	Service Temp. °F (°C)	Cure Flexibility/Recommended Cure °F (°C)	Cure Method
LTM® 12	Epoxy Prepreg	3	356 (180)	70 hours at 86 (30) or 5 hours at 158 (70) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Autoclave
LTM® 16	Epoxy Prepreg	6	356 (180)	70 hours at 104 (40) or 4 hours at 176 (80) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Autoclave
LTM® 212	Epoxy Prepreg	2	356 (180)	40 hours at 95 (35) or 8 hours at 140 (60) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Autoclave
LTM® 217	Epoxy Prepreg	8	356 (180)	20 hours at 131 (55) or 5 hours at 176 (80) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Autoclave
LTF 318B/ LTF 318U	Epoxy Prepreg	7	356 (180)	16 hours at 150 (65) or 5 hours at 176 (80) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Vacuum/ Autoclave
LTS 317	Syntactic Core	21	302 (150)	24 hours at 150 (65) or 1 hour at 248 (120) Post-cure 2 hours at 356 (180)	Vacuum/ Autoclave
CYFORM® 22	Epoxy Prepreg	3 to 4	350 (177)	168 hours at 68 (20) or 5 hours at 131 (55) Post-cure 5 hours at 390 (200)	Autoclave
CYFORM® 777	Epoxy Prepreg	12–15	351 (177)	48 hours at 122 (50) or 3 hours at 194 (90) Post-cure 5 hours at 390 (200)	Autoclave
DForm® Fabric	Epoxy Prepreg	3	356 (180)	8 hours at 140 (60) Post-cure 15 minutes at 392 (200) plus 8 hours at 374 (190)	Autoclave



VestGuard UK MAX-7 hard armor vest with plates made from MTM® 28.



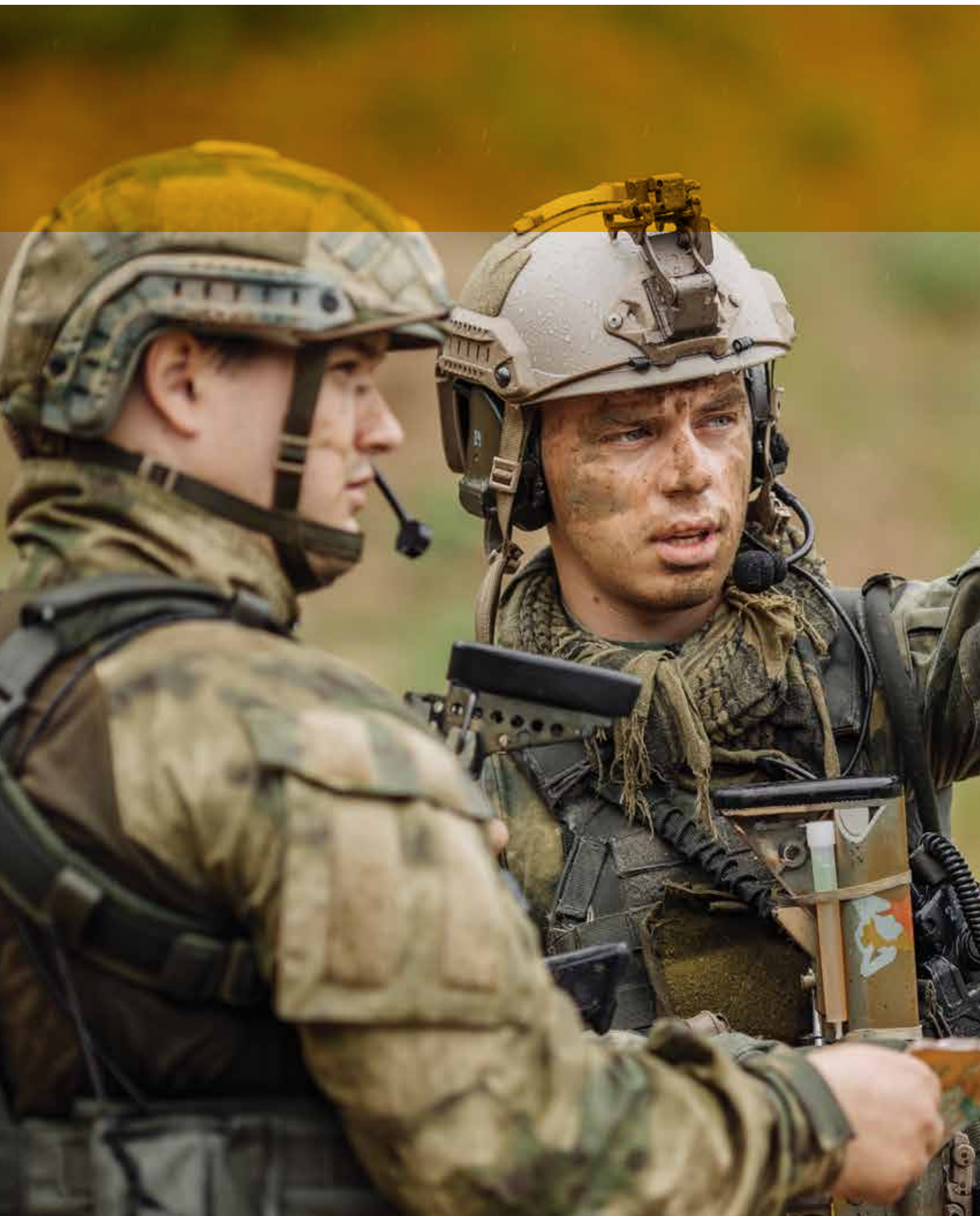
Structural epoxy prepregs for radar dish antennas.

Process Materials

Solvay offers a complete package of vacuum bagging process materials to support the use of our prepregs in oven or autoclave curing processes. These materials are available as roll stock or pre-cut as kits. Using a range of kitting equipment allows us to pre-cut both simple and complex shapes of all our materials and combine them to deliver a complete kit ready for part manufacture. We also offer reusable bags that can offer hundreds of cycles and save hundreds of man hours.

Process Materials Product Selector Guide

Prepreg Product °F (°C)	Bagging Film	Release Film	Sealant Tape	Peel Ply	Breather	Flash Tape
250°F (120°C) Epoxy OOA	VACFILM™	A6000	LTS90B	A100	AB100	FT1
	VF450V	A5000	UCS180	B100	AB10	FT2
	HS8171					FT5
	STRETCH-VAC™ 3000					
250°F (120°C) Epoxy in-autoclave	VACFILM™	A6000	LTS90B	A100	AB100	FT1
	VF450V	A5000	UCS180	B100	AB10	FT2
	HS8171		SM5142			FT5
	STRETCH-VAC™ 3000					
350°F (180°C) Epoxy OOA	HS8171	A6000	SM5142	A100	AB100	FT1
	STRETCH-VAC™ 3000	A5000	SM5127	B100	AB10	FT2
			SM5130			FT5
350°F (180°C) Epoxy in-autoclave	HS8171	A6000	SM5142	A100	AN40N	FT1
	STRETCH-VAC™ 3000	A5000	SM5127	B100	AB10	FT2
			SM5130			FT5
Phenolic	VACFILM™ 450V	A2000	SM5142	G500	AB40N	FT1
		A6000	SM5127			FT2
			RS200			FT5
Epoxy Infusion	VACFILM™ 300R	A2200	LTS90B	A100PSI	AB100	FT1
	VACFILM™ 400Y	A2000	UCS180		AB10	FT2
	VACFILM™ 450V	E2760			VMS3	FT5
	VACFILM™ 800G	A6200			Vi1	
					Vi2	
Polyester Infusion	VACFILM™ 300R	A2200	LTS90B	A100PSI	AB100	FT1
	VACFILM™ 400Y	A2000	UCS180		AB10	FT2
	VACFILM™ 450V	E2760			VMS3	FT5
	VACFILM™ 800G				Vi1	
					Vi2	





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