

# Building Blocks for Technology

*Performance begins with the basics. Smaller, smarter, faster products rely on superior components. Those components depend on the best technical materials available. With dozens of basic materials and processes to choose from, experience makes all the difference in selection, engineering, and execution.*

*At Sheldahl, we helped pioneer today's advanced materials technology. Our volume manufacturing capabilities are second to none, delivering engineered materials to meet today's most rigorous demands. And all the while, our R&D team is addressing today's most difficult challenges to develop tomorrow's solutions.*

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*From laminates for advanced electronics to ITO films and specialty tapes to multilayer insulation blankets, count on Sheldahl for innovative, targeted, cost-effective solutions.*

**Better Basics.**

**Superior Performance.**

# Sheldahl



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# Delivering

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## Materials Advantages



# Material Performance



## Aerospace



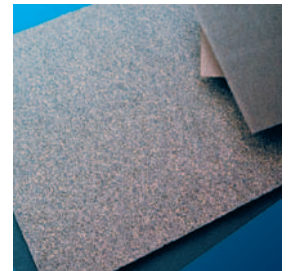
## Automotive



## Electronic



## Industrial



# in the Market Place

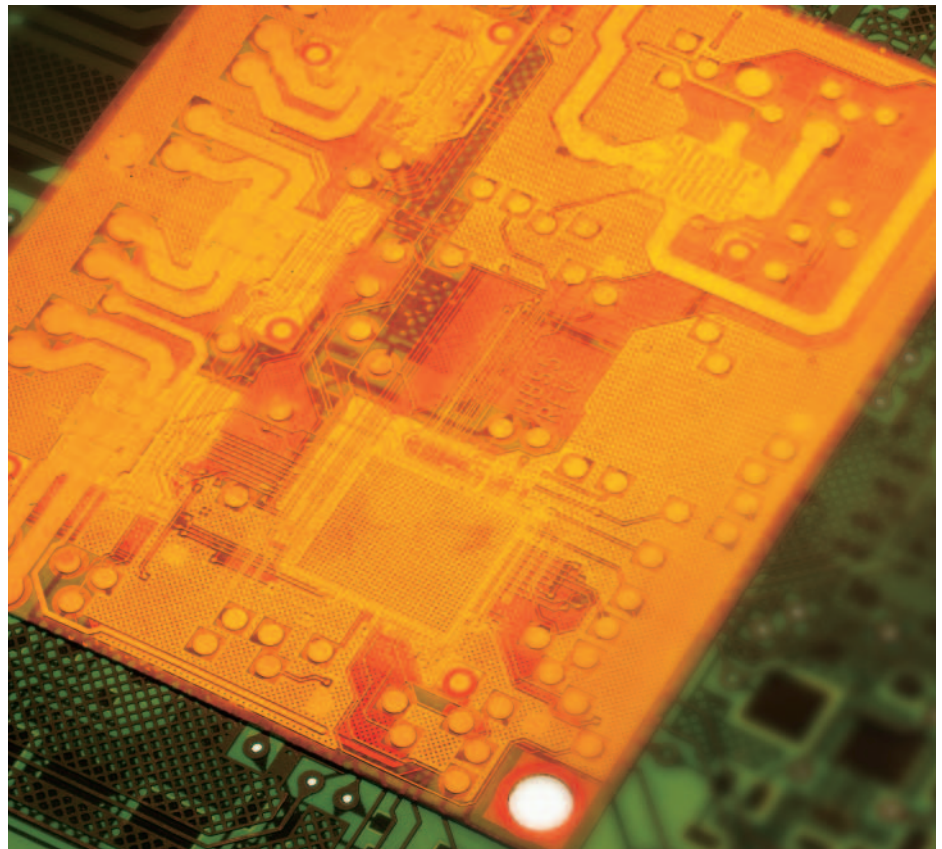
*Understanding applications is the key to developing materials that meet technical and business requirements*

From high-strength splicing to automotive electronics to aerospace thermal control, Sheldahl performance materials are engineered to meet the need. Layering, laminating and coating; combining films, foils, and fabrics with metals and non-metals; Sheldahl puts decades of research, investment, and experience to work creating cost-effective solutions.

Working with customers, Sheldahl application engineers select and combine materials to match the market's most exacting requirements. Where no solution ideally matches the need, our innovative experts develop new ones that will.

### **Sheldahl materials can be specifically engineered for:**

- *High signal speeds*
- *CTE matching*
- *Thermal dissipation*
- *Heat resistance*
- *Moisture impermeability*
- *Tensile strength*
- *Long-term weathering*
- *Transparency*
- *Tear strength*
- *Bond strength*
- *Flame resistance*



# Value without Compromise

*Sheldahl composite materials push back the boundaries of product design. Materials are chosen and specifications fine-tuned to meet applications requirements. Processes are controlled and products tested to ensure strict conformance to specifications. Thorough documentation guarantees traceability of raw materials and processes.*



## Lamination and Coating

Films, foils, fabrics and adhesives include:

### Foils

Aluminum	Inconel®
Beryllium Copper	Lead
Constantan	Nickel
Copper Steel	
Stainless Steel	

### Films

FEP	Polyester-PET
PPS	PSO
PFA	Polyethylene
PVDF	Polyimide
PVF	Polypropylene
PES	PolyStyrene
TFE	Metalized films
Nylon	Polycarbonate
PEN	

### Fabrics

Glass	Polyester
Nomex®	Spectra®
Nylon	(UHMW polyethylene)
Kevlar®	Urethane foam

### Adhesives and Coatings

Acrylics	Polyester
Epoxies	Nylon epoxy
Flame retardant	Phenoxy
Conductive	Polyurethanes
Pressure sensitive	Butyral phenolics
3P	
Nitriles	



## Vacuum Metalizing

For applications including aerospace thermal control and specialty electronics, Sheldahl offers proprietary film treatment, high-speed deposition, and state-of-the-art optical and physical testing. Choices of process and material allow precise control of thickness, resistance, absorption/emittance, and reflectance.



### Processes

Evaporation/sputtering
Resistive evaporation
DC magnetron sputtering
RF sputtering
Electron beam evaporation

### Substrates

Mylar® (PET)	Kapton® (PI), Apical® (PI)
Teflon® (FEP)	Tedlar® (PVF)
Teonex® (PEN)	Non-woven cloth
PTFE/glass cloth	Beta cloth
Aluminum foil	Polycarbonate

### Deposition Materials

Aluminum	Chromium
Copper	Germanium
Gold	Indium-tin oxide
Lead	Lithium
Monel	NiChrome
Silicon oxide	Silver
Black chrome	

