



ZEUS HEAT SHRINK KEEPS PRODUCTION FLOWING

You've got challenges. We've got solutions.

Every day across industries ranging from oil and gas, aerospace, automotive, medical and fiber optics, Zeus heat shrink technologies are put into production to make your world easier, safer and more efficient. With exclusive breakthrough products such as **PEEKshrink®**, our focus is simple and straightforward - provide solutions to make components robust, minimize downtime and keep your production flowing.

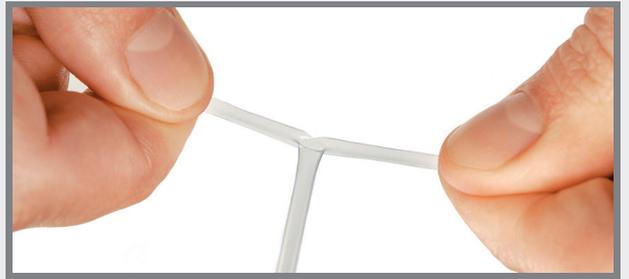
What Is Heat Shrink?

Heat shrink tubing provides a state-of-the-art method for applying a tight, protective insulation for wires or other critical components subjected to the extremes of heat, corrosion, shock, moisture and other harsh environmental conditions.

Zeus offers an array of custom heat shrink products with varying recovery temperatures. Our team of technical experts can make recommendations based on your needs and work with you to develop a precise heat shrink solution to overcome your design challenges.

Insulation Solutions for Demanding Applications

Our heat shrinks are utilized to insulate everything from motor wire to laproscopic medical devices and rock core samples. They provide security against costly equipment failure while ensuring optimal performance.



FluoroPEELZ™ Peelable Heat Shrink allows for easy removal with one simple, linear tear.

Catheter construction is a delicate process that leaves no room for error. The last step of removing the recovered heat shrink over the outer shaft is often the most critical and laborious. Zeus **FluoroPEELZ™** brings simplicity to this complex process.



PEEKshrink®. Zeus is the first company in the world to create a heat shrinkable PEEK product.

PEEKshrink® delivers an abrasion and chemically resistant heat shrink solution with an incredible strength-to-weight ratio and a continuous service temperature of up to 260°C/500°F. The world's only heat shrinkable PEEK, this product makes the spliced joint more reliable and is available in custom shrink ratios to cover round, square and braided wires and components.

HEAT SHRINK PRODUCTS

Zeus FluoroPEELZ™ Peelable Heat Shrink -

An optically clear peelable heat shrink designed to improve the reflow of the catheter jacket - the final step in the construction process. Operators can quickly and easily peel **FluoroPEELZ™** away from the outer shaft, improving efficiencies and work place safety by eliminating the need for razor blades on the production floor. **FluoroPEELZ™** reduces downstream processing, increases yields and produces minimal scrap; all of which provide cost savings. With shrink ratios up to 1.65:1, **FluoroPEELZ™** is available in sizes ranging from critical neurological builds to complex AAA profiles.

Dual-Shrink® - Aerospace wire harness manufacturers utilize **Dual-Shrink®** daily to splice wiring. Engineers are confident this material is robust enough for the most extreme wire environments. Zeus **Dual-Shrink®** provides all the outstanding electrical, chemical and mechanical properties of PTFE with remarkable durability and protection against corrosion. Constructed with an exterior of heat shrink PTFE and an inner layer of FEP, our **Dual-Shrink®** provides a tight, moisture-proof bond over wires, cables, connectors, splices, terminals and other components.

PTFE Sub-Lite-Wall®; 4:1 & 2:1 Heat Shrink -

Zeus makes the smallest heat shrink in the world - which is thin as a human hair - with our **PTFE-Sub-Lite-Wall®** products. These products have wall thicknesses down to .001" and tolerances of +/- .0005". Zeus also has PTFE Heat Shrink catalog sizes which range up to 4.00" expanded ID's with a maximum shrink ratio of 4:1 and meets the **M23053/12** standard. These excellent insulators are chemically inert and withstand high temperatures (500°F/260°C) for a wide variety of applications.

FEP Lay-Flat®; 1.3:1 & 1.6:1 Heat Shrink -

When aerospace composite engineers need a more efficient alternative to films and tapes, they turn to Zeus for ultra-thin **FEP Lay-Flat®** heat shrink for composite forming applications. Available in a variety of diameters with wall thicknesses down to 0.004", the efficient lay-flat form increases process productivity due to its easy removal and improved surface finish. FEP is also a good choice for electrical insulation and has shrink ratios up to 1.6:1. Our catalog sizes meet the **M23053/11** standard.



	FluoroPEELZ™	PEEKshrink®	Dual-Shrink®	PTFE Sub-Lite-Wall®	PTFE
OPERATING TEMPERATURE	200°C/400°F	260°C/500°F	232°C/450°F	260°C/500°F	260°C/500°F
SHRINK RATIOS	Up to 1.65:1	Up to 1.4:1	Up to 1.6:1	Up to 4:1	Up to 4:1
RECOVERY TEMPERATURE*	215°C/420°F +/- 10°C/50°F	343°C - 385°C (650°F - 725°F)	343°C/650°F +/- 10°C/50°F	343°C/650°F +/- 10°C/50°F	343°C/650°F +/- 10°C/50°F
DIELECTRIC STRENGTH (V/MIL) (ATSM D149)	2000	3500	2000	800	800
SPECIAL FEATURES	<ul style="list-style-type: none"> •Peelable •Clear •USP Class VI 	<ul style="list-style-type: none"> •High temperature resistance •Abrasion resistant •Lightweight •Non-flammable 	<ul style="list-style-type: none"> •Combines the best properties of PTFE & FEP for a dual layer heat shrink •Keeps out moisture •Non-flammable 	<ul style="list-style-type: none"> •Thinnest recovered wall in the world •Smallest PTFE HS diameters •High temp. resistance •Chemically resistant •Highly lubricious •UV resistant 	<ul style="list-style-type: none"> •High temperature resistance •Chemically resistant •Lubricious •UV resistant •Mil-Spec 23053/12
APPLICATIONS	<ul style="list-style-type: none"> •Catheter manufacturing •Packaging •Catheter manufacturing aids 	<ul style="list-style-type: none"> •Wire splicing •Lead wire insulation •Replacement for Kapton® tape 	<ul style="list-style-type: none"> •Environmental seal over wires, cables, connectors, splices, terminals and other components 	<ul style="list-style-type: none"> •Splice for fiber optics •Guide wire coating 	<ul style="list-style-type: none"> •Insulation •Protective Cover •High temperature shrink

*Always assure good ventilation in the immediate work area prior to beginning the heat shrink process. Caution: Fumes may cause nausea and dizziness. Ovens are the most reliable way to recover heat shrink products due to their ability to ensure even heating and reduce the risk of overheating the material (which can lead to brittleness and cracking). Heat guns can also be used to recover heat shrink material.

APPLICATIONS

Guide Wire Coatings: PTFE Sub-Lite-Wall® spiral stripe heat shrink is used to provide a lubricious jacket and to indicate movement of the wire.

Laparoscopic Insulation: FEP and PTFE heat shrinks protect the physician and patient during energy based procedures.

PEEKshrink® can also be used as preventative maintenance or for repairing lead wires.

Fiber Optics/Sensors: Ensure accurate, continuous data by protecting connections with **PEEKshrink®** or **Dual-Shrink®**.

Battery Pack Encapsulation: Heat shrinks help protect battery packs from moisture and chemicals and offer an additional thermal barrier.

Wire Splicing: Protect your weakest link with **PEEKshrink®**. Zeus **PEEKshrink®** replaces films and tape, turning what was once the weakest point in coil windings into the strongest and most reliable.

Dual-Shrink® is most commonly used for wire splicing and provides moisture proof encapsulation.

Kapton® Replacement: Electrical submersible pumps (ESP) applications currently use Zeus PEEKshrink® to replace their Kapton® tape when splicing wire.

Core Sampling Encapsulation: Insulate core samples and apply a durable skin that is a chemically inert, high-temperature, transparent jacket.

Light Bulb Encapsulation: Make light bulbs safe by providing a shatterproof encapsulation with PET Lay-Flat® heat shrink, or utilize FEP Lay-Flat® heat shrink for germicidal light bulb encapsulation as it withstands ultra-violet (UV) light.

Complimentary samples for prototyping are available - Call Zeus today.

All Zeus heat shrinks are available in colors with custom sizes and thicknesses. Contact Zeus to request a quote.

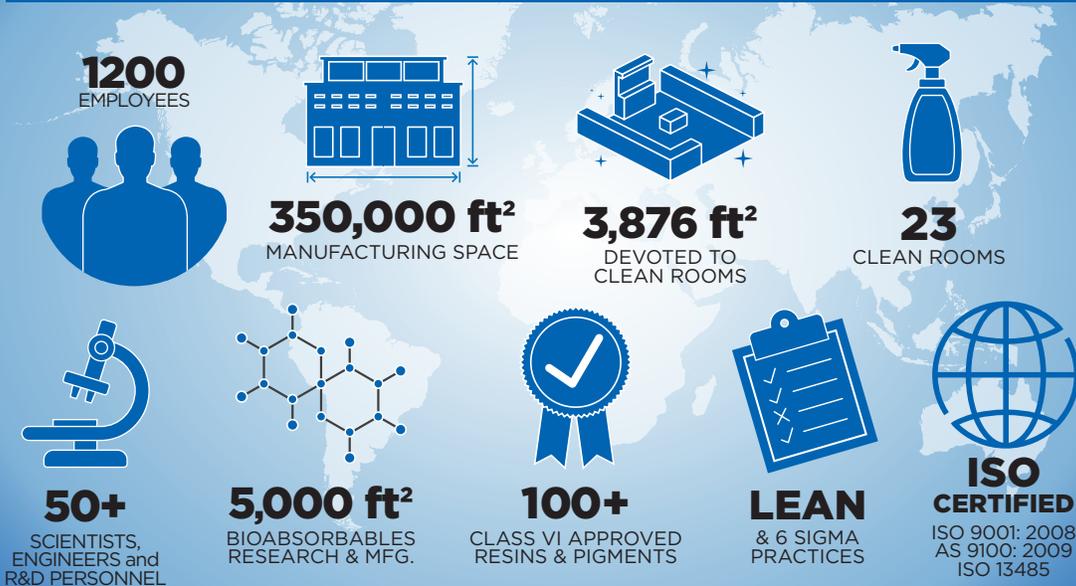


FEP	FEP Roll Cover	FEP Lay-Flat®	ETFE	PFA	PET Lay-Flat®
200°C/400°F	200°C/400°F	200°C/400°F	150°C/302°F	260°C/500°F	145°C/293°F
Up to 1.6:1	Up to 1.6:1	Up to 1.6:1	Up to 1.6:1	Up to 1.6:1	Varies
215°C/420°F +/- 10°C/50°F	215°C/420°F +/- 10°C/50°F	215°C/420°F +/- 10°C/50°F	174°C/345°F +/- 10°C/50°F	210°C/410°F +/- 10°C/50°F	89°C/180°F
2000	2000	2000	1800	2000	N/A
<ul style="list-style-type: none"> •High temperature resistance •Chemically resistant •Lubricious •UV resistant •Long lengths •Non-flammable •Mil-Spec 23053/11 	<ul style="list-style-type: none"> •High temperature resistance •Chemically resistant •Lubricious •UV resistant •Long lengths •Larger diameters •Mil-Spec 23053/11 	<ul style="list-style-type: none"> •High temperature resistance •Thin walls combined with large diameters •Long lengths 	<ul style="list-style-type: none"> •Abrasion resistant •Chemical resistant •Non-flammable 	<ul style="list-style-type: none"> •Temperature resistant •More flexible than PTFE •Melt processable 	<ul style="list-style-type: none"> •Low recovery temperature •Quick recovery •Long lengths •Easy shipping •Cost effective
<ul style="list-style-type: none"> •Insulation •High temp shrink •Bulb encapsulation •Catheter construction •Catheter manufacturing aids 	<ul style="list-style-type: none"> •Thicker wall for durable covering of rollers 	<ul style="list-style-type: none"> •Seamless composite release aid 	<ul style="list-style-type: none"> •Abrasion resistant wire insulation 	<ul style="list-style-type: none"> •High temperature insulation •Available in long lengths 	<ul style="list-style-type: none"> •Light bulb encapsulation

The information presented in this table is believed to be accurate and is not intended to constitute a specification. Property characteristics are dramatically impacted by geometry and processing methods; therefore the properties of extruded parts may vary. This table is only meant to serve as a general guideline. Users should evaluate the material to determine the suitability for their own particular application.

meet ZEUS

ZEUS HAS BEEN A LEADING GLOBAL PRESENCE THROUGHOUT THE AMERICAS, EUROPE & ASIA FOR ALMOST 50 YEARS.



Design as Expected.

No cutting corners, no rubber-stamping a design. Potential issues are addressed before a product exits the development stage to insure long-term reproducibility.

We're in Compliance For You.

We stay abreast of any industry changes, policies or statutes to help you through your regulatory process.

Who We Work With.

Academia. Clinicians.
Entrepreneurial start-ups.
Global medical device and contract manufacturers.
Rest assured, every project receives our full attention.

ABOUT ZEUS

Zeus is the world's leading polymer extrusion manufacturer and material science innovator. Almost 50 years of experience in medical, aerospace, energy exploration, automotive, fiber optics and additional industries allows us to leap past **can't** and move directly into **how**.

Headquartered in Orangeburg, South Carolina, Zeus employs approximately 1,200 people worldwide and operates multiple facilities in North America and internationally.

