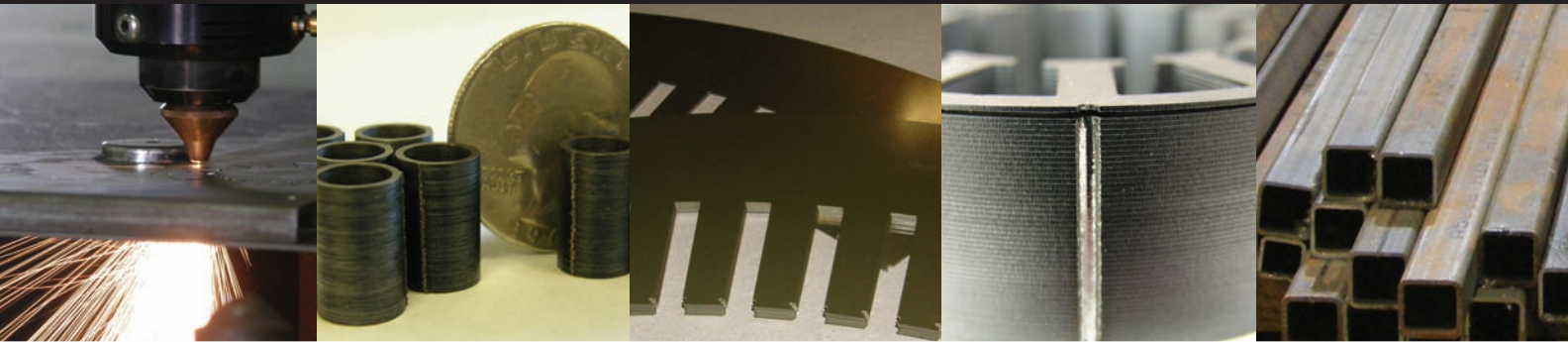




POLARIS
LASER LAMINATIONS, LLC.



• Laser cutting • Lamination stacking, welding, and bonding • C-5 Coating • Finger plates • Inspection

A Reliable Resource for Your Business

Laser Cutting

Polaris Laser Laminations is a laser cutting job shop specializing in the manufacture of electrical laminates. A wide variety of materials can be laser cut up to a maximum size of five feet by ten feet. All machines are computer controlled so any shape can be laser cut.

- **Part tolerance up to +/- .001 inch.**
- **Mild or stainless steel up to 3/4 inch thick.**
- **Aluminum up to 1/2 inch thick.**
- **Copper up to .030 thick.**

Our lasers can cut a variety of materials:

- **M-19**
- **Nomex**
- **G-9**
- **Mica**
- **Hiperco 50**
- **Carpenter 49**
- **Hymu 80**
- **Arnon**

High speed laser best suited for large or thick parts



Laser best suited for close tolerances



Polaris Laser Laminations

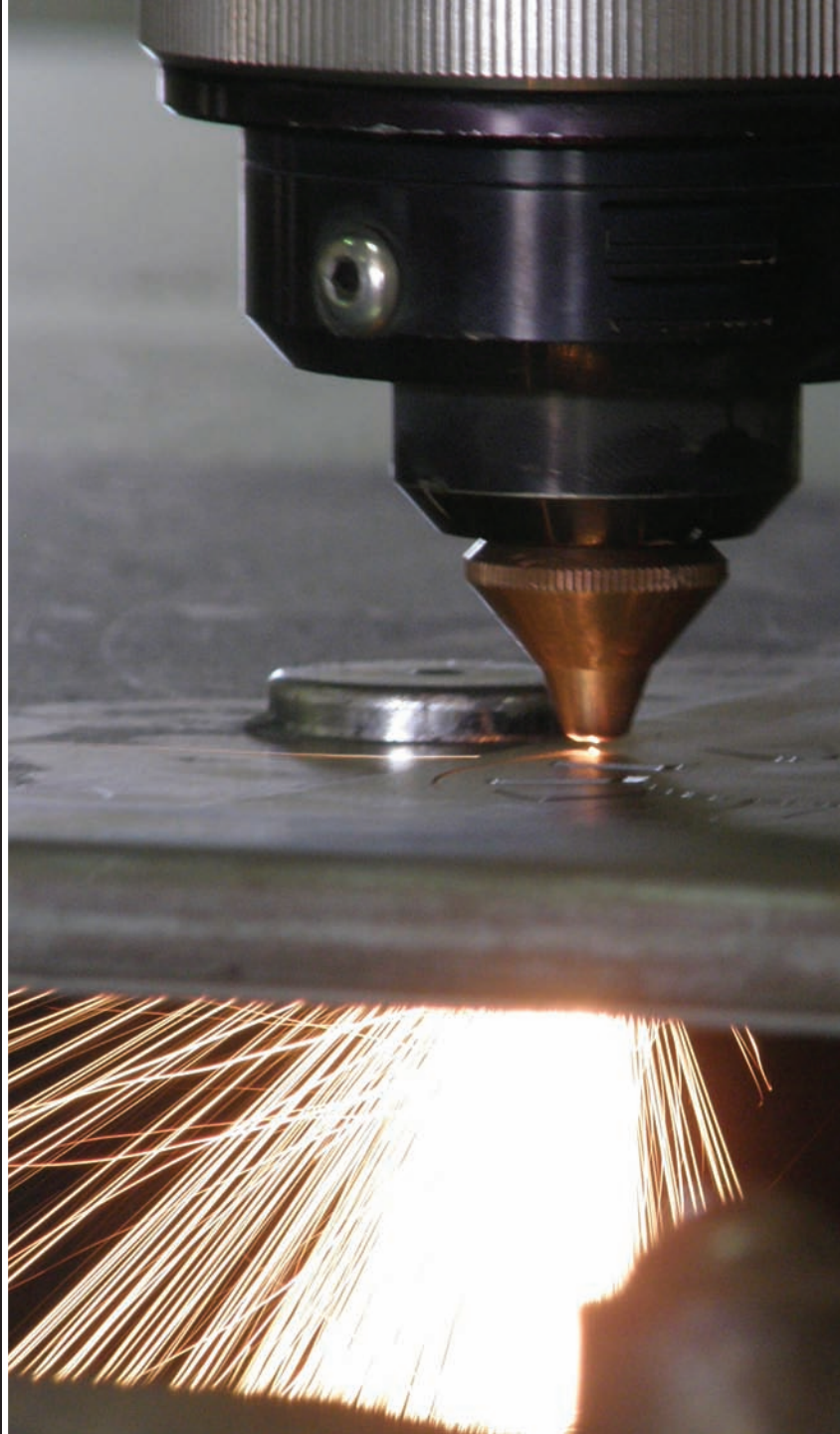
started primarily as a Laser Lamination shop with the intent on providing the best customer service from start to finish. We have succeeded in that mission and have taken the excellence we provide in laser cutting and applied it to all of the services we offer. We cater to the needs of our customers and we deliver excellent, quality products many of which are custom made.

Our knowledgeable and expert staff routinely work together to give you a high quality product on time. We work with you from prototyping to shipping. We pride ourselves in being honest and work diligently to provide creative solutions. We often assist our customers to ensure that they receive the best product to help meet their needs. We will help you meet your deadline by providing most quotes within one business day.

Polaris Laser Laminations uses leading technology to provide Laser Cutting, Laser & Tig Welding, Bonding, C-5 Coating, Refurbishing, Reverse Engineering, Spot Welded Finger Plates and Stacking. Our range of capabilities allows us to provide multiple services at one time, faster. We take the time to make sure that every one of these services goes through a quality inspection before it is delivered to our customer to ensure that it is engineered to exact specifications.

We listen to the needs of our customers and in doing so, we create long-term business relationships. We continue to serve and acquire experience in a wide range of markets.

Our extensive, collective experience makes us a dependable, reliable solutions driven resource for your business.



Lamination Refurbishment

Lamination Refurbishment takes an existing part and brings it back into operative condition. This is one of the methods we provide to save our customers money.

C-5 coating is used on electrical steels to reduce eddy current heat losses in electric machines. C-5 coating is suggested for use where superior insulation is required after stress-relief anneal. It provides a uniform, high-resistance insulation for the more severe requirements of large electric machines. In addition, C-5 insulation is not affected by oils, and provides some rust resistance.

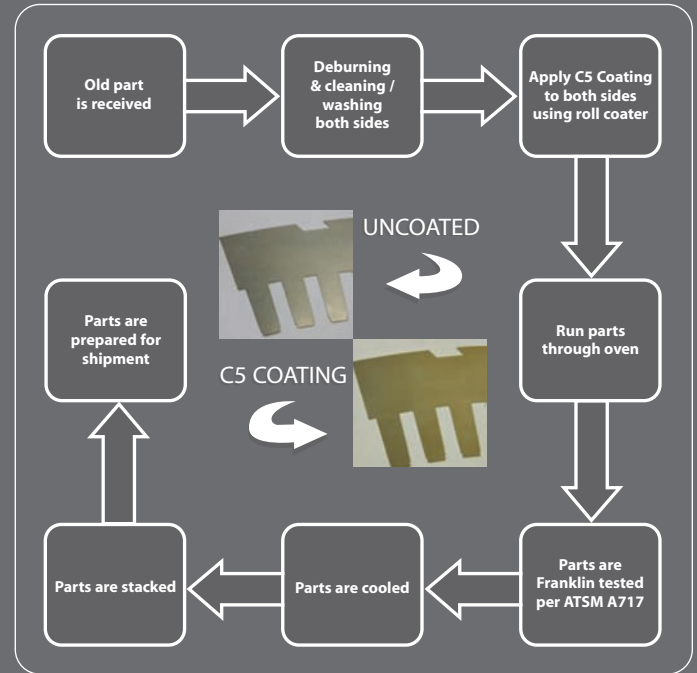
We can coat new laminations or refurbish existing laminations.

Lamination refurbishment is a two step process. First, the lamination is wet sanded on both sides. Next, C-5 insulation is applied to both sides of the lamination and it is oven cured.

We have C-5 coating in stock. Other coatings such as C-6 are available.

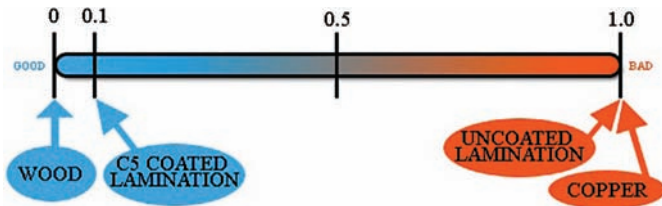
- Parts can be coated on one side or both sides
- Parts are oven cured per the coating manufacturer's specifications
- We perform Franklin testing per ATSM A 717
- We also perform lamination factor testing per ATSM A 719

Take a look at our **Process for C5 Coating:**



Franklin Test of Surface Insulation Resistivity

(Measured in AMPS)



Once a lamination is coated, you will notice a change in the "tint" of the material. Uncoated material has a "silver" tone whereas C-5 coated material has a "gold" tone.

Our parts are Franklin tested per ATSM A717. Franklin testing consists of running a current through the metal to check its resistivity. As you may already know, Copper is a good conductor. An uncoated lamination is also a good conductor. Once laminations are coated with our C-5 coating, there is a drastic improvement in resistivity.

If your laminations are too damaged to be recoated, they can be replaced with new laminations. Our expert in house staff will help you find the right solution.

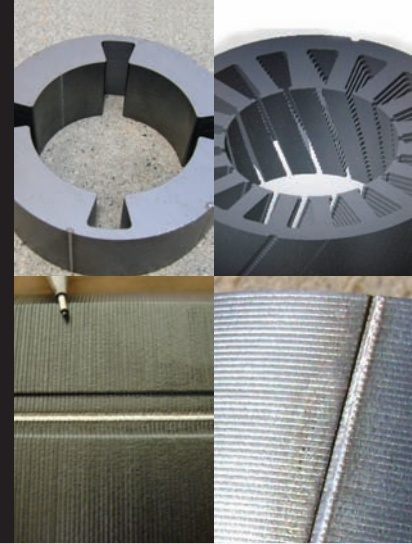
Lamination Stacking & Welding

Laminations can be stacked and welded.

- **Straight stacks** – several parts are aligned in the same position and stacked together to form one larger stack.
- **Skewed stacks** – several parts are stacked together in a skewed manner together to form one larger stack.

Lamination welding is a process in which we weld laser cut materials together. We offer two (2) types of welding:

- **Laser Welding** – Laser welding is a process in which we use our laser machine to weld parts together
- **TIG Welding** – TIG welding is an arc welding process commonly used to weld parts together



Spot Welded Finger Plates

Fingers are spot welded to each slot on a lamination. These vent plates are used to cool electrical machines and are strategically placed in the core stack.

- Fingers can be fabricated from cold rolled steel or stainless steel



Lamination Bonding

If there is a need for a clean, non-welded stack, we offer Lamination bonding.

Reverse Engineering

If you have an existing part that needs to be duplicated, we offer reverse engineering.

1. Send us your old part
2. We will measure all dimensions of old part
3. A new drawing is created
4. Laser machine is programmed
5. A new part is created



Inspection -- is performed on laminations to meet with industry standards.

- We inspect laminations with our state of the art inspection equipment.
- We offer fully automated inspection to 20 millionths resolution.
- PPAP certification

Materials in stock

- 24 ga (.025) M-19 with C-5 Insulation (ATSM A677 64F200)
- 26 ga (.0185) M-19 with C-5 Insulation (ATSM A677 47F165)
- 29 ga (.014) M-19 with C-5 Insulation (ATSM A677 36F145)
- Arnon 5 and Arnon 7 with C-5 Insulation
- .014 thick Hiperco 50
- .010, .015, .020, .030 thick Nomex 410
- .005 thick Kapton
- 16 gage and 22 gage cold rolled steel
- 1/4 inch thick hot rolled steel



phone: 630.444.0760
toll free: 888.477.1969
fax: 630.444.0761

2725 Norton Creek Drive
West Chicago, IL 60185
www.PolarisLaserLaminations.com