



A Manufacturer's Guide to

ENGRAVED EMBOSSING ROLLS

A woman with blonde hair, wearing safety glasses and a grey long-sleeved shirt, is focused on inspecting a large, dark industrial roll. The roll has a textured, embossed surface. The background shows a factory environment with various pieces of machinery and equipment. The lighting is dramatic, with strong highlights and deep shadows.

PRS: FOCUSED ON **PRECISION**, COMMITTED TO **CRAFTSMANSHIP**

Embossing rolls are often used to apply textures and patterns to substrates, providing both aesthetic appeal and functionality to products. Embossing is also used to leverage certain substrate characteristics to improve product quality, tactility, and performance.

This guide provides an overview of embossing as a technique and some of the many ways it can be used to add value in web-based manufacturing processes. It also explores various engraving methods used to craft embossing rolls for use in a wide range of applications and industries.

Understanding how these textures and/or patterns can be achieved to make your products more effective, and how to put the capabilities to work for the benefit of your operations, can help guide your decision-making when it comes to partnering with an embossing roll provider. That's what the roll experts at Precision Roll Solutions are here for.

Precision is our promise to each customer that entrusts us with providing their engraved embossing roll solutions.

The PRS team understands how every design detail elevates product quality, performance, and aesthetic appeal. We are committed to creating engraved rolls that deliver to the highest standards.

EMBOSSING OVERVIEW

Embossing is a technique that uses designs with dimensional depth to enhance a substrate. In commercial use, embossing patterns are typically applied using an engraved embossing roll. The roll acts as a pattern die. When a substrate is compressed between the embossing roll and a supporting or matching roller on the production line, the impression is transferred to the substrate in uniform repetition.

Generally speaking, **embossing** is:

- Ideal for compliant and flexible materials
- Compatible with designs and patterns of varying degrees of complexity
- Versatile and strong enough to be applied to virtually any material

Embossing is the preferred solution for your application if it requires:

- A distinct pattern, for vivid impression
- Functionality improvement for a substrate (e.g., stretch poly without puncture)



PRS: VERSATILE SOLUTIONS FOR APPLICATIONS & INDUSTRIES

As proven experts in engraving, PRS helps leading manufacturers leverage texture, technology, and other process variables to deliver true differentiation and quality to products.

Collaborating with PRS adds value and versatility across a wide range of industrial applications, including:

- Plastic and film
- Building and industrial
- Tissue and towel

PRS engraved and precision rolls add value to processes and products in the following industries:

- Automotive
- Consumer Products
- Packaging
- Metal & Industrial
- Building Materials
- Medical
- Technical

ENGRAVING OVERVIEW

Engraving is a technique for removing or displacing material from a roll body to create a “die” of an intended design. Immense pressure is applied during the embossing process to transfer a consistent, recessed pattern to the substrate. Numerous mechanical and chemical engraving methods are used to achieve the desired results.



MORE ENGRAVING OPTIONS, QUALITY ROLL OUTCOMES

PRS offers more variety in engraving options than any other facility in North America including:

- Digital transfer technology (DTT) and chemical etching
- Laser engraving
- Laser ablation and chemical etching
- Electronic engraving
- Mechanical engraving
- Mill engraving

Regardless of the engraving process used to craft your roller, PRS is dedicated to quality assurance.

Measurements and quality checks are conducted throughout each phase of roll production by skilled technicians using advanced technologies including:

- 3D scanners
- Microscope inspection
- Gloss meter
- Profilometer for surface roughness

A CLOSER LOOK AT PATTERNS & DESIGNS

The experts at PRS are an invaluable source of guidance when it comes to pattern development.

PRS maintains an industry-leading pattern library with thousands of standard designs, some hand-cut by artisanal masters in the craft. PRS can also create fully custom patterns to meet virtually any need.

PATTERN OR DESIGN CUSTOMIZATION

Existing patterns or designs can be modified with the help of proven engraving craftsmen and technicians. The PRS process entails:

- Carefully studying a sample – be it product material, or material and/or roll castings – and capturing the design or pattern down to the micron-level using digital technologies such as 3d scanners, seamless drum scanners
- Having an experienced graphic designer review and prepare digital files for the desired process, and printing pattern renderings and variations for customer review and approval
- Prototyping approved pattern and design parameters on smaller scale test tools, then recording measurements, and submitting all information to a customer's team for review and approvals to create the full, final roll



1
**TEXTURE
PATTERN**
Engraved
Embossing Roll



2
**TEXTURE
PATTERN**
Engraved
Embossing Roll



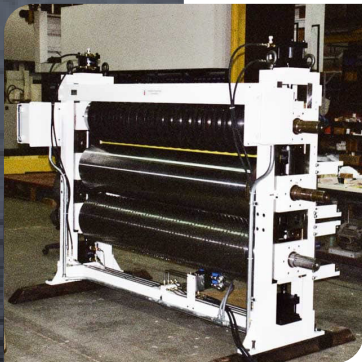
ROLLER REPAIR & REFURBISHMENT

Investing in high-quality engraved or precision rollers is a carefully considered business decision. Maintaining these assets can help maximize return on investment throughout a roller's natural life cycle.

The PRS team works with customers' preventive maintenance teams to bring old rollers back to spec with pattern refreshes, journal rebuild or replacement, roll face resurfacing, and rebalancing – all with a focus on the final quality parameters.

EMBOSSING EQUIPMENT MADE IN THE USA

PRS embossing equipment is custom-designed and engineered to meet customer needs and expectations, tapping into our years of precise and dependable experience.



EMBOSSERS

- **Single-station embossers** typically load from the top for simple roll handling and minimal downtime
- **Rubber to steel calenders/embossing stations** offer design flexibility that optimizes changeover times and efficiency
- **Thermal embossers** are equipped with heat transfer rolls for applications that require a consistent heat source



CUSTOM EMBOSSERS & EQUIPMENT

- **Steel to steel calenders** are similar to matched steel embossers and run two smooth steel rolls
- **Two-station embossers** feature two different patterns with separate runs as well as calender/embossing applications to minimize changeover time and maximize efficiency
- **Any multi-roll configuration** (triple, quad, etc.) can be designed to meet your production needs

Embossing is a time-honored process for adding texture, enhancing performance characteristics, and elevating quality in products created from any number of substrates in many industries.

Manufacturers that choose to collaborate with a recognized leader in engraved and precision roll design and production are best positioned to leverage the expertise and craftsmanship behind the solutions – and that can make all the difference. PRS is a trusted supplier and advisor to industries of impact domestically and internationally, and would welcome the opportunity to help you.



Contact the PRS team at 920.445.9089 to discuss your current and future engraving and precision roll needs. We're here and happy to help!