

HVAC GASKET DESIGN SOLUTIONS

COOPER STANDARD
INDUSTRIAL & SPECIALTY GROUP



FOCUSED ON YOUR SUCCESS

Through advanced material science and innovative design, Cooper Standard ISG works to achieve superior performance and efficient assembly of HVAC sealing components.

Rely on our years of experience with HVAC applications to improve installation or meet demanding performance requirements.

Resources for Your Next Design

Through our global resources and extensive manufacturing capabilities, we develop extruded and molded products to meet your application's unique challenges.

While standard materials and profiles are often used for HVAC seals and gaskets, our custom solutions can help you optimize both pricing and performance.

Our process begins with a review of operating requirements and design analysis by Cooper Standard ISG application engineers.

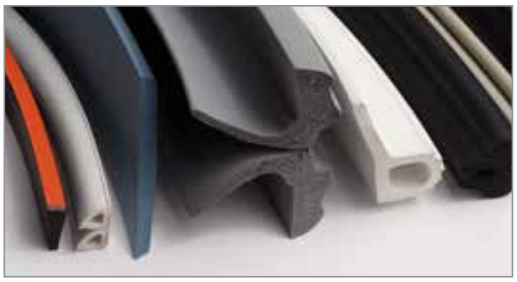
We are able to suggest improvements to an existing design or support the development of an entirely new component.

Our material experts offer insight into compounding and processing options for our many rubber and plastic materials.

HVAC SEALS & GASKETS

Commonly-Used Elastomers

EPDM



Strengths:

- Excellent for outdoor use
- Ozone, weathering and aging resistance
- Water and steam resistance
- Flexible at low temperatures
- Resistant to alkalis, acids & oxygenated solvents
- Color stable

Not recommended for resistance to oil, gasoline and hydrocarbon solvents.

TPV



TPV belongs to a family of elastomers known as TPEs, which have comparable properties and performance to their rubber counterparts. However, they are processed like other thermoplastic materials.

Strengths:

- Flame and ozone resistance
- Excellent flex fatigue properties
- Good performance in alcohol

Not recommended for resistance to aliphatic and aromatic hydrocarbon solvents as well as oil and gasoline.

Silicone



Strengths:

- Outstanding resistance to high heat
- Silicone has superior flame resistance and reduced smoke density
- Resistance to ozone, sunlight and oxidation
- Color stable
- Flexible at low temperatures
- Low compression set
- Good electrical insulator

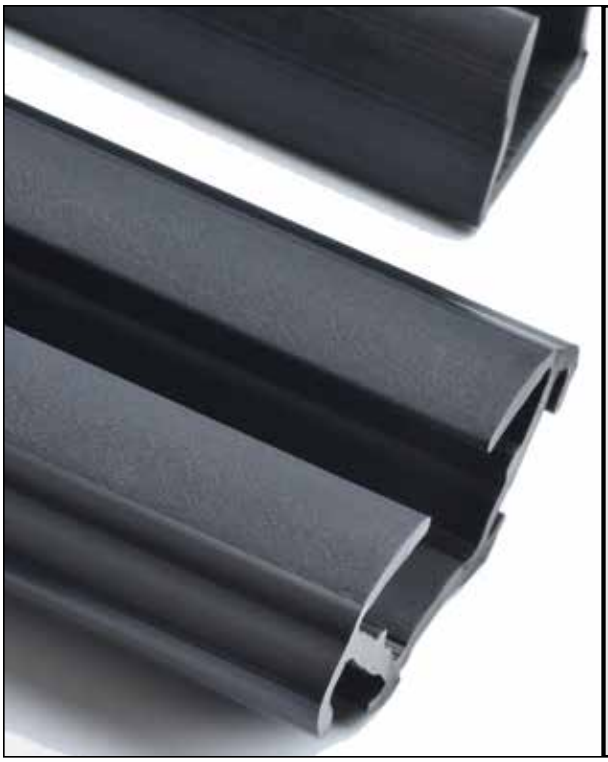
Not recommended for applications that require abrasion, tear and cut growth resistance, high tensile strength or resistance to oil, gasoline, solvents, alkalis and acids.

Additional Materials

Cooper Standard ISG is a single-source supplier of many other rubber and plastic materials, including **neoprene, nitrile, rigid and flexible PVC, polypropylene, polyethylene, nylon** and more.

Comparing Elastomers

Elastomer Properties	EPDM	Silicone	TPV
Tensile Strength	Very Good	Fair-Good	Good
Compression Set	Good	Good-Excellent	Fair-Good
Heat Resistance	Very Good-Excellent	Excellent	Fair
Abrasion Resistance	Good-Excellent	Poor-Fair	Fair-Good
Flame Resistance	Poor	Fair-Good	Good
Weathering Resistance	Excellent	Excellent	Excellent
Low-Temp Limit	-20° to -60°F	-65° to -100°F	-30° to -70°F
High-Temp Limit	350°F	450°F	275°F



ADVANCED MATERIAL SOLUTIONS

Our extruded and molded products can be developed to meet many specifications such as **REACH & RoHS** compliance.

Our UL compliant solutions include **UL746C, UL555s** and **UL94 materials.**

Fortrex™

Fortrex™ is a material innovation developed by Cooper Standard that combines the strengths of EPDM, TPV and Silicone.

A lightweight elastomer, Fortrex™ offers excellent compression set characteristics, weathering and aesthetic performance with an environmentally-friendly footprint.



A LOW-COMPRESSION EPDM FOR DYNAMIC HVAC APPLICATIONS

This innovative compound requires significantly less closing force, achieves greater recovery and provides a better appearance than similar materials.

Due to its excellent compression set, it can provide superior sealing in dynamic HVAC applications such as access door gaskets.

Why it's Unique

In a dynamic sealing application, a material should minimize the amount of pressure required to achieve full surface contact. At the same time, it must adequately rebound from its compressed state to withstand repeated use.

This EPDM accomplishes both at a level not typically achieved with closed-cell materials.

Features

Tested to ASTM D1056 standards, this EPDM has a compression set of 5 to 10 percent and compression deflection of less than 2 psi.

- Lightweight Compound
- Material Density of 8 pcf
- Resists Water Absorption
- Cured Rubber Skin on All Sides for Added Durability
- Good Weatherability and UV Resistance
- Extruded to Enhance Sealing Performance



MULTIPLE-DUROMETER & PUSH-ON TRIM SEALS

Multiple-durometer products combine two or more materials through a single die.

Typically, a rigid or dense portion of the seal allows for installation while a flexible or sponge profile meets compression requirements.

Cooper Standard ISG creates multiple-durometer extrusions from polymers such as EPDM, silicone and plastics.



iDea® Seals

Cooper Standard ISG's iDea® Seal process was designed to reduce installation time while maintaining superior performance.

These seals feature a rigid plastic base that will smoothly slide into a channel. This eliminates the need for adhesives and prevents stretching of the material.

The seals offer excellent compression set and labor savings. A custom EPDM bulb can be created from sponge or dense material.



Push-on Trim Seals

Cooper Standard ISG offers a broad product line of Push-On Trim and Self-Sealing Weatherstrips Seals.

Our products are developed and tested to the highest standards to ensure our customers are provided with superb quality and reliability.





PRESSURE SENSITIVE ADHESIVES (PSA)

Cooper Standard ISG offers three different PSA adhesive systems, allowing the application of adhesive to a multitude of surfaces.

Each system offers specific benefits depending upon the surfaces to be joined, the strength of the bond required and environmental factors such as temperature, ozone/weathering, smoke and flame resistance, and chemical resistance.

Our adhesives are designed to meet the most demanding industry requirements, including UL746C, UL555s, UL94, REACH, and RoHS compliant solutions.



DOUBLE-COATED PAPER & FILM TAPES

Made up of a layer of adhesive, a paper or film carrier, another layer of adhesive and a release liner.

Benefits: Ideal for high-volume assembly processes and for use on opposing carrier surfaces to join different materials.



ADHESIVE TRANSFER TAPES

The same capability as a double-faced product, but does not have a carrier.

Benefits: Without a reinforcing carrier, the adhesive is extremely pliable and can be used on substrates that are conformable.



DOUBLE-COATED FOAM TAPES

Composed of a layer of adhesive, a foam carrier, another adhesive layer and a release liner.

Benefits: These tapes are conformable and can join irregular surfaces. They dampen sound and provide impact resistance.



HIGH-PERFORMANCE MOLDED CORNERS AND OVERMOLDING

Corners

Corners can be fabricated into a variety of configurations. Molded corners yield the ultimate performance. Rubber is injected under high pressure to connect two pieces into a complete corner. This creates a strong bond and provides a superior seal.

Our engineers evaluate factors such as assembly processes and compression requirements to ensure ongoing performance of a sealing system. Because corners present the greatest risk for leaks, we pay special attention to this design element.



Overmolding

Overmolded products are an advanced science of molding rubber or plastic material around or conjoined to a polymer extrusion, metal or other component.

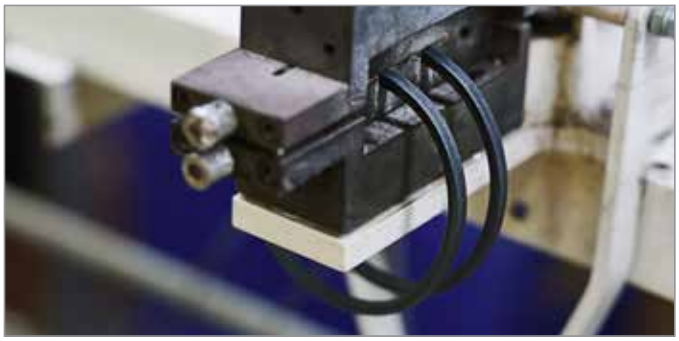
Cooper Standard ISG's highly engineered and custom overmolded products can enhance the functionality, performance, appearance and longevity of products as well as reduce shock and vibration, dampen sound, provide insulation and improve chemical/UV resistance.



MOLDING & SPLICING PROCESSES



Molding creates products that are conjoined and transitional between planes, rather than continuous, non-transitional profiles of extruded products.



Splicing is used when an application requires a continuous seal such as a multi-sided frame or an o-ring.

Compression Molding

As two plates of a mold are forced together, a rubber compound, or preform, is compressed and forced to conform to the mold cavity.

Excess material, or flash, that squeezes out is pushed into overflows and/or tear trims and later trimmed off.

Transfer Molding

A unique attribute of transfer molding is that a rubber preform is heated and forced by a plunger through a funnel-shaped opening, or sprue, into the mold cavity. This keeps direct flash to a minimum.

Most of the excess rubber is contained in the flash pad away from the finished part.

Injection Molding

Injection molding is similar to transfer molding in that the rubber is forced into a cavity through sprues.

The most significant difference is that the mold halves begin the process clamped together. Once the mold is clamped, preheated rubber is forced into runners that then flow to the sprues and into the mold cavity.

Injection molding can be combined with compression or transfer molding. This results in shorter cycle times because the rubber entering the mold is preheated and therefore vulcanizes quicker.

Hot Splicing

This process uses a rubber-based adhesive (excluding products made from silicone). The splice is cured in place and retains many of the properties of the original seal as well its aesthetic appearance. Tooling costs may be incurred for specific cross-sections.

Cold Splicing

Two or more pieces of a seal are adhered using quick-setting glue, such as a cyano-acrylate. This involves few, if any, tooling costs. However, the splice may become brittle and sometimes proves to be less effective than other options.

Transfer Splicing

Two or more pieces of a seal are inserted into a mold. A polymer is transferred into the mold cavity, adhering the pieces together. The process allows for enhanced detail and aesthetics.

Film Welding

This process involves using a plastic film as media to bond EPDM materials. It is typically used for parts with pre-applied adhesive or that have complex cross-sections. The benefit is that there are no adverse effects on the adhesive performance at or around the joint.

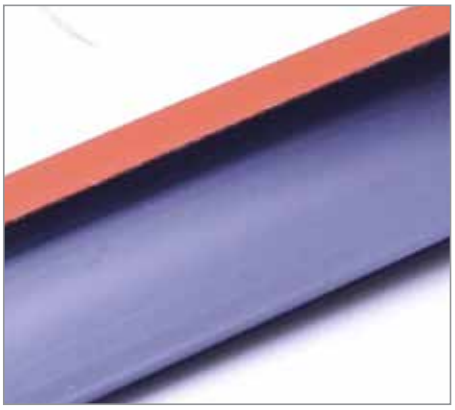


SURFACE COATINGS

Coatings enhance rubber parts in a number of ways. For HVAC applications, a primary use can be long-tem durability.

Coatings can be applied to an entire seal or a localized area on a part. The process is performed in-line with the polymer extrusion making it a cost-effective way to add value for your customers.

Request a Sample Kit to see how coatings affect the look and feel of rubber.



Additional Benefits

Coatings can help performance by reducing noise, wear and abrasion. They also are commonly applied as an assembly aid to improve installation time:

- Reduction in Coefficient of Friction
- Long-term Durability
- Available in Clear & Black
- No Free Silicone that Could Affect Paint Systems



GET STARTED

Our dedicated ISG team provides technical, material and product expertise, as well as extensive market and material knowledge to develop customized, high-performing solutions.

We work with you to help take your project to the next level, reviewing your industry's specific needs and the end-use conditions of your application.

Call us today to get started on your next project.

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