

DURO-LAST® ROOFING, INC.

CUSTOM PREFABRICATED SINGLE-PLY ROOFING SYSTEM





Durable

Energy-efficient

Precision-fabricated for every building

Professionally installed by authorized contractors with minimal disruption

Code compliant

Delivers long-term value

Backed by the industry's best warranties

Proven Performance Since 1978



CORPORATE HEADQUARTERS



Duro-Last Roofing, Inc. is the pioneer of custom prefabricated single-ply roofing systems. Since our inception in 1978, Duro-Last has been the Proven Performer[®], with over 1½ billion square feet of membrane installed. This position of distinction has led industry leaders, corporations, and sources of specifications throughout the country to recognize our contributions to the roofing industry.

THE DURO-LAST MEMBRANE: STRONG AND DURABLE

The Duro-Last membrane is a proprietary thermoplastic formulation that provides exceptional flexibility, reflectivity, resistance to U.V. radiation, and flame retardance.

Roofing system performance is a balance between film formulation, membrane thickness, and reinforcement. Duro-Last adds no "filler" material to increase the membrane thickness; our film is the same proven formula from top to bottom. Plus, our membrane's top film thickness is equal to or greater than that of other single-ply products.

A key Duro-Last difference is the reinforcement scrim within the membrane. It's a weft-insertion scrim with a density of 14 x 18 threads-per-inch – among the highest in the industry.



Duro-Last offers membranes that are 40-mil, 50-mil, and thicker. The standard Duro-Last 40-mil membrane is classified as a ASTM D4434 Type IV PVC roofing system, but the strength characteristics pass all the standards for 50-mil products, which are classified as ASTM D4434 Type III PVC.

The Duro-Last membrane is available in terra cotta, tan, dark gray, gray, and white.

HEAT-WELDED ROOFING SYSTEM PROVIDES EASY INSTALLATION AND LOW MAINTENANCE

- Hot air welding bonds all Duro-Last field seams; no chemicals, torches or other unsafe seaming methods are used
- The Duro-Last membrane is non-curing; patches, curbs, stacks or other alterations can be easily heat-welded to the membrane throughout the life of the system
- The membrane can be installed over most new or existing substrates; it is watertight and virtually maintenance-free
- Costly tear off and disposal may be eliminated because a new Duro-Last system can often be installed over the roof currently in place.





COMPREHENSIVE WARRANTY COVERAGE

Duro-Last warranties provide unparalleled security for virtually all commercial roofing applications. Our standard, comprehensive 15-Year No Dollar Limit (NDL) Warranty is the best in the industry. It's transferable, has no exclusions for ponding water, and provides coverage against consequential damages that result from material defects and the authorized contractor's installation of Duro-Last products. We also offer 20-year warranties that include 15 years of consequential damage coverage as well as warranties for installations in hail and/or high-wind areas.

DURO-LAST'S CODE COMPLIANCE OFFERS PEACE OF MIND

- Duro-Last has met or exceeded all major fire/wind code requirements, and obtained necessary regional approvals throughout the United States and Canada
- Factory Mutual ratings, which apply both to mechanically-attached and fully-adhered systems: 1-60, 1-75, 1-90, 1-105, 1-120, 1-135, 1-150, 1-165, 1-195, 1-210, 1-270, 1-435, 1-495.
- Rated by Underwriters Laboratories (UL) as a Class A material
- Approved by International Building Code (IBC) and complies with the MIAMI-DADE building code
- Duro-Last is a charter partner of the EPA ENERGY STAR® Roof Products Program, a charter member of the Cool Roof Rating Council (CRRC), a member of the United States Green Building Council (USGBC), and a member of the Vinyl Roofing Division of the Chemical Fabrics and Film Association (CFFA)
- The Duro-Last roofing system can help obtain credits toward LEED® and LEED-EB certification
- Duro-Last participates in all major roofing industry technical committees, plus the American Society of Testing Materials (ASTM), American Institute of Architects (AIA), Construction Specifications Institute (CSI), Roof Consultants Institute (RCI), National Roofing Contractors Association (NRCA), and the Single Ply Roofing Industry (SPRI)



ENERGY STAR is only valid in the United States.

THE DURO-LAST DIFFERENCE — CUSTOM PREFABRICATION



Since 1978, Duro-Last has been the leader in manufacturing custom fabricated single-ply roofing systems. We design each roof to fit building specifications exactly, then manufacture it under controlled factory conditions.

Custom prefabrication begins with an authorized Duro-Last roofing contractor precisely measuring the rooftop surface, projections and perimeters. Duro-Last's design resources can help determine the best plan for roofing the building. Once the contractor places the order, the roof is manufactured by Duro-Last in sections up to 2500 square feet at one of our four factory locations. The entire roofing system, including all components and accessories, is then delivered to the jobsite for installation.



Custom prefabrication offers several advantages:

- Studies of roof failures show that most problems occur because of installation errors, particularly at changes in plane, such as projections, curbs, drains, perimeters and abutting walls. Duro-Last's prefabrication eliminates up to 85% of rooftop membrane seaming and also mitigates many factors that cause seam problems, such as variables in climate, jobsite working conditions, traffic, contamination, and labor.
- Prefabrication enables greater control over scheduling. Larger membrane panels require less labor to install than roll goods, and the reduced seaming requirements make the Duro-Last system more suitable for installation on challenging projects.
- Prefabricated systems are easier to install throughout the year, even during adverse weather conditions. Installation time is reduced so crews can get off the job quickly. The relatively small amount of field seaming is completed with hot-air welding methods, which are virtually unaffected by cold or damp weather conditions. Prefabrication can also accommodate building owners who feel rushed to get a roof installed before winter.
- Prefabrication significantly reduces waste, both during the manufacturing process and installation. The contractor orders the exact amount necessary for roof coverage, rather than a collection of raw materials.



- Prefabrication also appeals to engineers and architects who would like to address a particular structural or aesthetic design problem. For example, fastening tab spacing for mechanically-attached systems can match deck configurations for irregularly-shaped areas, concrete "tees," and specific wind designs. Aesthetically, panel sizes, shapes and colors can be designed and prefabricated to achieve desired visual results.
- Finally, prefabrication lends a certainty to the roof application that does not exist otherwise. It allows the roofing contractor to take control of a construction operation in a highly unstable environment. Contractors must plan their work carefully, and are rewarded with greater worker productivity, and a higher-quality, less disruptive installation.





Duro-Last Roofing Systems are proudly manufactured in the United States of America.

ROOFING SYSTEMS MANUFACTURED TO EXACT BUILDING SPECIFICATIONS

This illustration shows how three prefabricated Duro-Last panels completely cover a roof approximately 7,000 square feet in size. The field welding that is required (dashed blue line) is much less than the welding done beforehand in Duro-Last's controlled factory environment (solid lines).



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STANDING SEAM

EXCEPTIONAL Metals is pleased to offer standing seam panels with over 30 metal colors and finishes that will enhance the appearance of any sloped roof design. Profiles are available for architectural, structural, and flush wall/soffit panel standing seam applications.

Depending on where your project is located, the roof panels will be produced at or near the job site, or at EXCEPTIONAL Metals' Saginaw, Michigan facility. In either case, your standing seam panels will be made with the attention to detail and quality that our customers have come to expect.

Whether your facility needs both the Duro-Last single-ply membrane and metal roofing, or metal roofing alone, our standing seam roofing system will be ideal for your project.











EM 150SL

The 1½″ Snap Lock metal roofing system is designed to be installed quickly, reducing labor costs and offers the designer a concealed fastener and clip application that allows for expansion and contraction.



EM 150SS -

The $1\frac{1}{2}$ " traditional mechanically seamed metal roof system enhances the architectural appearance and is engineered to exceed most wind-load requirements in the country. The seamed profile allows the designer the ability to specify various applications. The concealed fasteners and patented articulating two piece floating clip assist in minimizing the appearance of oil canning.



EM 175S

The 1¾″ Snap Lock profile provides a continuous interlocking metal roof system. The system offers the designer a concealed fastener and clip application that allows for expansion and contraction. The Snap Lock metal roofing system can be installed quickly, reducing labor

costs. This is a simple installation for extremely high design pressures.





EM 200S

The 2^{*r*} mechanically seamed metal roof system enhances the architectural appearance and is engineered to exceed most wind load requirements in the country. The versatility of this profile's engineering allows

the designer the ability to specify from low to steep slope applications. The concealed fasteners and patented articulating two piece floating clip assist in minimizing the appearance of oil canning.

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DURO-LAST PHYSICAL PROPERTIES: 40-MIL MEMBRANE



Tests outlined by ASTM D-4434	Test Description	Test Method	Metric Results	U.S. Standard Results
	Thickness-Nominal	ASTM D 751	1 mm.	40 mil - Type IV
	Breaking Strength	ASTM D 751 - Grab Method	1579 x 1961 N	355 x 441 lbf
	Elongation at Break	ASTM D 751 - Grab Method	28 x 31%	
	Heat Aging	ASTM 3045, 56 days @ 176°F	90% of Control-no cracking, chipping or crazing	
	Factory Seam Strength	ASTM D 751 - Grab Method	1601 N	360 lbf
	Tearing Strength	ASTM D 751 - Procedure B	605 x 556 N	136 x 125 lbf
	Low Temperature Bend	ASTM D 2136	-40° C	-40° F
	Accelerated Weathering	ASTM G 154 (Formerly G53)	No cracking, checking, crazing or erosion at 5,000 hours of exposure.	
	Linear Dimensional Change	ASTM D 1204 - 6 hrs. @ 176°F	-0.45 x -0.40%	
	Water Absorption	ASTM D 570 - 166 hrs. @ 158° F	2.60%	
	Static Puncture	ASTM D 5602	250 N	56 lbf
	Dynamic Puncture	ASTM D 5635	20 J	14.75 ft-lbf

* Above information is based on the latest 3rd party testing data available.

	Test Description	Test Method	Metric Results	U.S. Standard Results
Additional Tests	Fungi Resistance	ASTM G-21	No sustained growth or discoloration	
	Solar Reflectance	ASTM C1549	88% - Initial / 68% - 3 year aged	
	Thermal Emittance	ASTM C1371-98	87% - Initial / 84% - 3 year aged	
	Thermal Emissivity	ASTM E408	95%	
	Solar Reflectance Index (SRI)	ASTM E1980	110 – / 81 - 3 year aged	
	EMMAQUA Exposure	ASTM G90, Desert Sun	338,904 MJ/m ²	> 8.1 million Langley
	Moisture Vapor Transmission	ASTM E-96, Proc. B, Method A	< 0.086 g/hr/m ²	< 0.25 U.S. Perms
	Membrane Weight	ASTM D 751	0.88 kg per m ²	0.22 lb per ft ²
	Underwriters Laboratories	UL-790	Class A, B & C approved	
	(US) FM Approvals	ASTM E-108; FM 4450 & FM 4470	Class 1-60, 1-75, 1-90, 1-105, 1-120, 1-135, 1-150, 1-165, 1-195, 1-210, 1-240, 1-270, 1-345, 1-435, 1-495	
	Underwriters Laboratories (Canada)	CAN/ULC-S107	Class A, B & C approved	
	Underwriters Laboratories (Canada)	CAN/ULC-S101	R210, R212, R214, R220, R221, R222, R223, R600, R700, R701, R703, R801, R802, R803, R805, R806	

* Contact Duro-Last or visit website for data on other membranes.

MATERIALS THAT ARE COMPATIBLE WITH THE DURO-LAST ROOFING SYSTEM

The Duro-Last roofing membrane is extremely durable and can withstand contact with dozens of chemicals, construction products, and other materials*. Some of the most common are below. For information about other materials, contact the Engineering Services Department at 800-248-0280.

- Acid Rain
- Acrylic/Latex Paint

Brick & Masonry Cleaner

- Bird Droppings
- Bleach
- Detergent Solution
- Diatomaceous Earth

Cooking Grease

- Ethyl/Methyl Alcohol
- Furnace Residue
- Hydrofluoric Acid Cleaner
 Incinerator Ash
- Linseed Oil
- Nitrogen Sulfate
- Polyethylene
- Polypropylene
 Sea Water
 - Soldering Acid/Flux
 - Tannic Acid
 - Triethylene Glycol

* Compatibility is dependent on concentration and time of exposure.

Duro-Fleece® Roofing System



The Duro-Fleece system combines Duro-Last's proven thermoplastic membrane and a high-quality, five-and-a-half-ounce fleece material that's bound to the underside of the membrane during manufacturing. The fleece offers enhanced adhesion characteristics between the membrane and the substrate. For some applications, it can also act as a separation barrier, which may reduce project material costs and speed up installations that otherwise would require an additional separator sheet.

The Duro-Fleece system is made with Duro-Last's highly-reflective white membrane. It is delivered to the job site in full rolls only, in 50- or 60-mil thicknesses. All standard prefabricated 40-mil flashings and other accessories are compatible and available for use with the Duro-Fleece roofing system.

The Duro-Fleece system can be applied using Duro-Last's water-based WBII adhesive or the two-part bead-applied Duro-Fleece adhesive.

Common Applications for the Duro-Fleece System:

- Project specifies a fully-adhered application
- Installation requires a smooth, finished appearance
- Projects where the membrane may be applied directly to:
 - Non-nailable surfaces
 - Concrete, lightweight concrete, and gypsum decks
 - Aged, clean, smooth BUR systems (pull test required)
 - ACFoam[®]-IV polyisocyanurate insulation
 - Parapet walls over granulated asphalt.



Duro-Last Duro-Bond® Roofing System

The Duro-Bond system uses non-penetrating "induction weld" technology that bonds Duro-Last's PVC membrane to a specially coated fastening plate beneath the roof membrane. The plate is also used to mechanically fasten insulation and recovery board materials to the roof deck. To fasten the system, an induction welding tool generates an electromagnetic field that heats the plate through the membrane, welding the plate's special coating and bottom membrane film layer together and forming a very strong bond between the two.

This technique has several advantages over conventional mechanical and adhered systems:

- The installation is a Factory Mutual-approved system that does not create any point of entry for moisture and provides superior wind uplift performance.
- It requires 25% to 50% fewer fasteners, yet provides better uplift characteristics than conventional systems.
- It is essentially a non-penetrating system; any fasteners that penetrate the membrane are used at the perimeter of the roof.
- No foul-smelling bonding adhesives are needed in large quantities, making it ideal for hospitals, schools, and other occupied building applications.





RHINOBOND[®] Induction Fastening System



DURO-LAST COOL ZONE® SYSTEM: DEFINING ROOFTOP SUSTAINABILITY

What does sustainability really mean for building owners, facility managers, architects, and other specifiers? It means that the design, manufacture, maintenance, life-cycle impact, adaptive re-use, destruction, and recycling of roofing components help meet the long-term environmental standards demanded by today's high-performance buildings.

Five interrelated attributes are important in the selection of a high-performance roofing system:



Energy – It's more important than ever to select a roof that can reduce energy use and improve a building's efficiency in any climate.



Environment – High-performance roofing minimizes the impact on the Earth's environment throughout the roof's life and helps maintain a healthy, productive environment inside the building.



Endurance – A high-performance roof meets or exceeds performance requirements for long life: all-weather reliability; chemical, fire, and puncture resistance; and ease of maintenance and repair.



- **Economics** A high-performance roof has to make economic sense in the long run. A true economic comparison analyzes the cost of a roof throughout its life-cycle.
- **Engineering** Utilizing the right materials, design, and manufacturing process is the key enabler of the other four E's, resulting in a complete, integrated roofing system that can be installed easily and performs reliably over the long run.



The Cool Zone roofing system is ideal for rooftop photovoltaic installations. Prefabricated flashings help ensure watertight coverage for roof-penetrating support structures. The Cool Zone membrane provides long-term, maintenance-free protection beneath any type of mounting system.



PROTECTING YOUR ROOF AND THE ENVIRONMENT

The bright white Duro-Last[®] Cool Zone[®] membrane has an established history of providing environmental benefits to facilities throughout North America. We're committed to being the industry leader when it comes to environmentally-friendly roofing systems. The white Cool Zone system is the best green choice for your building.



Green, as in environmental responsibility

The Duro-Last Cool Zone roofing system has an excellent environmental reputation. From lowering a building's energy consumption to helping facilities obtain LEED credits to reducing the urban heat island effect to recyclability at the end of its rooftop life, the Cool Zone system is a leading building sustainability product.





Green, as in the money you can save by reducing your roofing system's life-cycle costs

Electricity costs continue to escalate, driving a significant market shift toward highly-reflective, energy-efficient roofing systems. In addition to reducing utility bills, the Cool Zone system can improve worker productivity in non-conditioned space and extend the life of other roof assembly components.

Green, as in the best system to be installed under your rooftop garden or solar application

A growing trend in the facilities market is turning "forgotten" roofs into usable space. Vegetative roofing systems require a reliable waterproofing membrane beneath them, and a new Cool Zone roof is ideal for this application.





THE DURO-SHIELD® ROOFING SYSTEM IS THE PERFECT FIT FOR METAL RETROFIT



Fix seam and fastener problems



Perfect for cracks or leaks around penetrations







Lock out leaks. Lock in your investment.

- Can be installed over an existing metal roof without an expensive tear-off.
- A cost-effective, long-term way to protect buildings against rain, temperature changes, interior drips, ice build-up, and rust/corrosion.
- Flexible membrane expands and contracts with the weather, eliminating the risk of rooftop leaks.
- The Duro-Shield system with EPS flute filler has been tested and approved according to UL 1256. Polyiso flute filler may also be used.



leak-proof seal.

fastened to the deck over the insulation.

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DURO-LAST DESIGNER SERIES: THE IDEAL COMBINATION OF WATERTIGHT INTEGRITY AND AESTHETICS

The Duro-Last Designer Series of roofing systems is ideal for applications where building appearance is important, but conventional shingles, ballast, or architectural standing seam may not be practical. Each Designer Series system provides an aesthetic look plus the watertight performance and long-term durability of Duro-Last's single-ply roofing system – a proven performer since 1978.

Our Shingle-Ply[®] system has a shingle design printed onto the membrane. A special polymer coating helps protect the finish from marring, fading, and dirt accumulation. Shingle-Ply rolls are delivered to the job site ready to be unrolled, positioned, and installed by an authorized Duro-Last contractor. Each piece is aligned with the installed adjacent piece and mechanically attached to the roof deck. Overlapping edges are heat-welded together, forming a watertight, monolithic covering. The Duro-Last Shingle-Ply roofing system can be ordered in Slate Gray or Sandstone in 50-mil thickness only.

Like the Duro-Last roofing system, the Rock-Ply[®] system is prefabricated to fit the dimensions of the roof space, ready to be installed by an authorized Duro-Last contractor. A ballast design is printed on the membrane and protected by a special polymer coating. Deck sections are mechanically-attached or adhered to the roof deck and adjacent edges are heat-welded together, forming a watertight, monolithic covering. The Duro-Last Rock-Ply roofing membrane is available in 50-mil thickness only.

The Vinyl Rib system consists of the Duro-Last single-ply membrane and separate vinyl ribs. Membrane sections are fully-adhered to the roof deck and overlapping edges are heat-welded together, forming a watertight, monolithic covering. Ribs are then heat-welded to the installed deck membrane for a permanent, secure installation. The Vinyl Rib system is available in light gray and white, and requires the use of Duro-Last's 60-mil membrane, fully-adhered to the roof deck to provide a smooth roof surface.

Aesthetic looks with watertight performance.















The "World's Best Roof"®







DURO-LAST MANUFACTURING FACILITIES

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111 N. Valley Dr. Grants Pass, OR 97526 800-356-6646 Fax: 866-258-2858 1409 E. SADC Ave. Sigourney, IA 52591 888-500-3574 Fax: 888-501-3574

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