

Duro-Last[®] Roofing, Inc.

A GUIDED TOUR



Welcome To **DURO-LAST®**

– *THE PROVEN PERFORMER®*



As chairman of the board of Duro-Last Roofing, Inc., it is my pleasure to welcome you to Duro-Last – manufacturers of the “World’s Best Roof”®.

This booklet will take you through the entire process of how we create the Duro-Last roofing system. You will also learn about the other businesses that are a part of John R. Burt Enterprises.

Through intuition, trial and error, innovation, hard work, and solid products, Duro-Last has become the largest manufacturer of prefabricated, thermoplastic, single-ply roofing systems in the country. We continually test and improve our products so that our customers receive high-quality materials that deliver watertight roof protection for years to come. We are also proud of our record of providing excellent service, giving our customers exactly what they need for a worry-free roof.

Whether you are an architect, specifier, facility manager, property manager, building owner or contractor, we hope the information in this booklet will help you understand why the Duro-Last roofing system is The Proven Performer®, with over 1½ billion square feet of membrane installed throughout North America.

So enjoy learning about Duro-Last, and please do not hesitate to contact me with any questions. We look forward to working with you on future roofing projects.

Cordially,

A handwritten signature in black ink that reads "Jack Burt". The signature is fluid and cursive.

Jack Burt
Duro-Last Chairman
800-248-0280

The Duro-Last Roofing System Is The “WORLD’S BEST ROOF”®



Since our inception in 1978, Duro-Last has pioneered the manufacturing of prefabricated, single-ply roofing systems. Because of this tremendous distinction, industrial leaders, corporations, and sources of specifications throughout the nation have recognized our technological contributions to the roofing industry.

Over the years, Duro-Last has expanded not only our manufacturing facilities, but our product line as well to accommodate the roofing needs of customers. There are currently four Duro-Last plants: Saginaw, Michigan (Corporate Headquarters); Grants Pass, Oregon; Jackson, Mississippi; and Sigourney, Iowa. In addition to producing the Duro-Last roofing system, we also manufacture the Duro-Shield® metal retrofit roofing system, and the Duro-Last Cool Zone® roofing system.

The following members of John R. Burt Enterprises produce components of the Duro-Last roofing system as well as other fine products:



Plastatech® Engineering, Ltd.

Plastatech offers a wide range of production capabilities. It manufactures the single-ply membrane used in the Duro-Last® roofing system as well as coated supported and unsupported vinyl, laminates, calendered PVC films, weft-inserted knitted substrates, gravured printing, geomembranes, and material for architectural tension structures.



EXCEPTIONAL® Metals

Utilizing the latest computerized equipment, EXCEPTIONAL Metals manufactures a wide assortment of standard and custom metal edge detail products for use with the Duro-Last roofing system. EXCEPTIONAL Metals' product lines include edge treatments, drainage systems, and specialty items such as scuppers, collector boxes, pitch pans, and snow diverters.



Oscoda Plastics®, Inc.

Oscoda Plastics, Inc. manufactures Duro-Last roofing accessories as well as injected and extruded plastic parts used in the single-ply roofing industry. PROTECT-ALL® Commercial Flooring provides slip-resistance, stain and fire protection as well as durability, and is made from 100% recycled content. PROFLEX® Vinyl Expansion Joints are widely used in the construction industry.



TIP-TOP® Screw Manufacturing, Inc.

TIP-TOP Screw Manufacturing, Inc. produces commercial roofing fasteners, building and construction screws, and Tip-Crete Heavy-Duty concrete fasteners. TIP-TOP also provides E-coating services and has custom design capabilities.

HERE'S WHY DURO-LAST IS THE PERFECT CHOICE FOR YOUR ROOFING NEEDS:

Whether your roof is flat, low-sloped, new or retrofit, Duro-Last provides the watertight protection you expect from a roofing system.

PRODUCT DESCRIPTION

The Duro-Last membrane is a proprietary thermoplastic formulation of resins, plasticizers, stabilizers, biocides, flame retardants, and U.V. absorbents. A weft-insertion knitted scrim is laminated between two layers of film, giving the membrane its strength and durability. The Duro-Last membrane is available in white, tan, gray, and dark gray. The installed 40 mil system weighs .22 lbs. per square foot.



CUSTOM PREFABRICATION IS THE DIFFERENCE

Each Duro-Last project is prefabricated to fit every roof precisely. Duro-Last factory-welds material into large sheets, up to 2,500 square feet in size. By performing 80-85% of membrane seaming in our controlled factory environment, Duro-Last reduces the potential for rooftop installation errors and leaks.



BEFORE

The Duro-Last roofing system comes with all the accessories included. The custom fabricated stacks and curb flashings eliminate the majority of on-site work from the most critical areas of the roof – penetrations and transitions.

DURABLE

The Duro-Last roofing system is fire retardant, resistant to chemicals, grease, high winds, and punctures, and easily accommodates wide temperature extremes. Duro-Last's custom flashing resists ponding water and helps solve roof problems before they happen. Once installed, a Duro-Last roof is watertight and virtually maintenance-free.

BUSINESS AS USUAL

Year-round installation is quiet and safe without loud machinery, hazardous materials, noxious fumes, hot tar or mess. A new Duro-Last roofing system can often be installed over an existing roof without a costly tear-off, virtually eliminating debris that could disrupt building activities or damage sensitive and expensive equipment.



AFTER

BACKED BY THE INDUSTRY'S BEST WARRANTIES

Duro-Last is so confident in the durability of our roofing systems that we protect commercial and industrial installations with the best warranties in the industry. Our standard, comprehensive 15-year No Dollar Limit (NDL) warranty is transferable, has no exclusions for ponding water, and provides coverage against consequential damages that result from defects in the Duro-Last material and/or installation workmanship. Duro-Last also has 20-year warranties available.

ENERGY-EFFICIENT

The Duro-Last white membrane is highly-reflective throughout its life span on the roof, saving significant energy and money for building owners all over North America.



CODE COMPLIANT

Duro-Last has met or exceeded all major fire and wind code requirements as well as regional approvals throughout the country, reinforcing Duro-Last's leadership in providing the consistent watertight integrity that architects, specifiers, contractors, facility managers, property managers, and building owners expect.



PROFESSIONALLY INSTALLED

The "World's Best Roof"® is installed by authorized contractors who can draw on the expertise of Duro-Last's designers, engineers, and quality control technicians to ensure that every roof is installed to specification.

DELIVERS LONG-TERM VALUE

Custom prefabrication. Energy savings. Durable, leak-proof, virtually maintenance-free performance. Industry-leading warranties. Installed by authorized, professional contractors. The Duro-Last roofing system is the best long-term investment for your building.



FACILITY TOUR

Duro-Last takes pride in setting extremely high standards in the manufacturing process of the Duro-Last®, Duro-Shield®, and Duro-Last® Cool Zone® roofing systems. The following photos will demonstrate the steps we take to create these systems.



Duro-Last's Engineering Services Department offers technical support, including CAD services, to create a roof customized to each building's specifications.

The Quality Control Lab performs a variety of standardized tests on all components of the Duro-Last roofing systems.



To ensure quality at the onset, this calender machine distributes film evenly.

Duro-Last sets high standards

Knitting machines produce a high-density polyester weft-inserted scrim.



The laminator then bonds together the top and bottom layers of the film with the scrim.



Quality control is a priority. This employee performs an inspection of a completed roofing membrane.



Duro-Last stresses high-quality workmanship



Rolls of membrane are re-inspected off the line.

Membrane sheets are welded together and prefabricated to a building's exact dimensions as specified by the architect, specifier or contractor.



A fastening tab is welded into the membrane sheet for attachment to the roof deck.

Duro-Last relies on teamwork

Orders are measured
and squared-up
on the folding floor.



Folding floor inspectors
examine every factory seam
of the Duro-Last roofing
system before it leaves the
manufacturing facility.

Custom-made pieces are
folded from fastening tab
to fastening tab, making
installation easier.



Duro-Last has everything you need for a leak-proof roof



Duro-Last provides custom-made accessories for all penetrations and details.

All pieces are rolled and stretch-wrapped, ready for delivery to the job site.



Duro-Last's in-house training classes provide contractors with the know-how to install the Duro-Last roofing systems.

Complete your project with details from **EXCEPTIONAL[®] METALS**

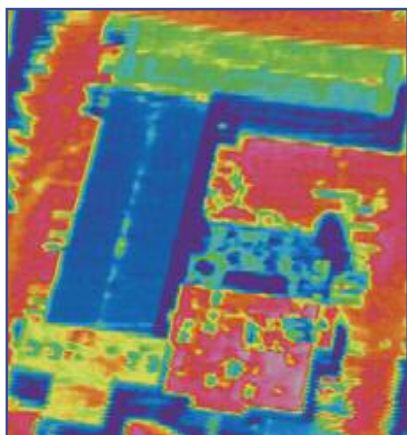
EXCEPTIONAL Metals' state-of-the-art equipment precisely fabricates products with consistent high-quality and provides a quick turnaround time.



Scuppers, pitch pans, and collector boxes eliminate the need for field fabrication and help increase installation efficiencies.

Our skilled craftsmen take pride in fabricating a variety of products and materials, including components made from copper, aluminum, and stainless steel.





DURO-LAST COOL ZONE® ROOFING SYSTEM DELIVERS THE FIVE E'S OF HIGH-PERFORMANCE ROOFING

A truly “cool” roof is one that provides trouble-free service, competitive life-cycle costs, and environmental advantages.



We've defined five interrelated attributes that are important in the selection of a high-performance roofing system. We call them the Five E's:



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.



ECONOMICS

A high-performance roof makes economic sense at the time of purchase and in the long run. A true economic comparison analyzes the cost of a roof throughout its life-cycle.



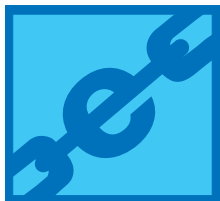
ENVIRONMENT

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.



ENGINEERING

The right materials, design, and manufacturing process enable the other four E's, resulting in a complete, integrated roofing system that can be installed quickly and easily, and performs reliably over the long run.



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.

When you consider these Five E's, alone and together, high-performance roofing takes on a new meaning and one very cool solution emerges: the Duro-Last Cool Zone roofing system.

The Duro-Last Cool Zone roofing system has the following attributes:

- One of the most energy-efficient and environmentally-friendly roofing products.
- White membrane can significantly reduce a building's energy requirements.
- Combats urban heat island effect.
- Can help obtain Leadership in Energy and Environmental Design (LEED®) certification (a rating system to help in designing and constructing buildings that minimize the negative impact on occupants and the environment) and LEED-EB certification for buildings.

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

If your building has a metal roof, you know the frustrations that go along with years of exposure to the elements, hot and cold extremes as well as rust and corrosion that combine to compromise your metal roof's integrity.

You have also learned that a lot of money can be spent repairing a metal roof, only to have to revisit the same problems a few years later. Sealing and coating, spray-on foam and sealant or complete roof replacement (with new insulation and steel) are only short-term solutions to metal roof problems. You need a long-term, economical, and easy option: the Duro-Shield metal retrofit roofing system.



The Duro-Shield roofing system:

- Can be installed over an existing metal roof without an expensive tear-off.
- Is a cost-effective, long-term way to protect buildings against rain, temperature changes, interior drips, ice build-up, and rust/corrosion.
- Is a flexible membrane that expands and contracts with the weather, minimizing the risk of rooftop leaks.

Here's how the Duro-Shield roofing system works:

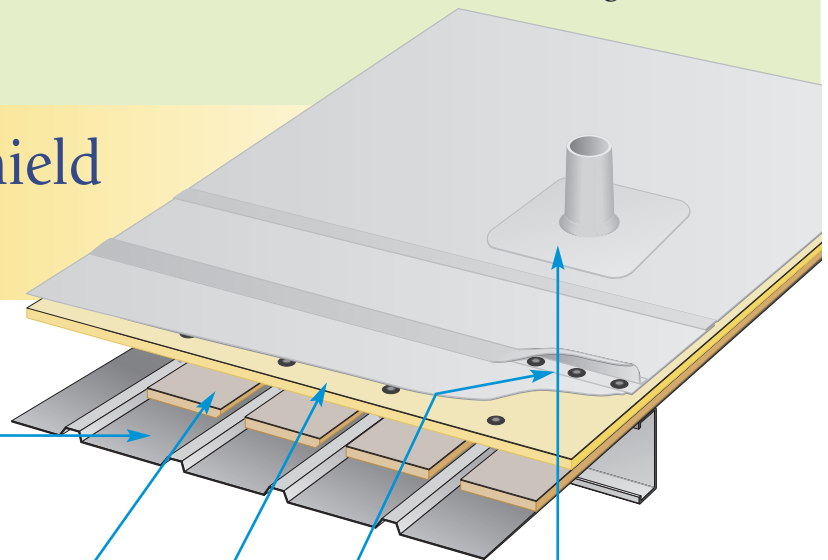
The Duro-Shield roofing system is applied right over your existing metal deck. No tear-off required.

Insulation is cut and placed to fill the flutes.

Another insulation layer is added to ensure a flat surface and increase the R-value.

The prefabricated membrane is mechanically-fastened to the deck over the insulation.

Prefabricated flashings for stacks and other penetrations are heat-welded on-site to create a monolithic covering and assure a leak-proof seal.



DURO-LAST MEETS REQUIRED CODES AND SPECIFICATIONS

If you're an architect, specifier or consultant, you understand the importance of a roofing system meeting FM and UL requirements. You also know that having superior tear and tensile strengths, elongation, and puncture resistance are crucial to the performance of a roofing system.

Duro-Last roofing systems meet or exceed all major fire and wind code requirements, and necessary regional approvals throughout the country.

Tests outlined by ASTM D-4434

Test Description	Test Method	Metric Results	U.S. Standard Results
Thickness-Nominal	ASTM D 751	1 mm	40 mils - Type IV
Breaking Strength	ASTM D 751 - Grab Method	1579 x 1961 N	355 x 441 lbf./in.
Elongation at Break	ASTM D 751 - Grab Method	31%	
Heat Aging	ASTM 3045, 56 days @ 176°F	Pass	
Factory Seam Strength	ASTM D 751 - Grab Method	1601 N	360 lbf.
Tearing Strength	ASTM D 751 - Procedure B	604 x 556 N	136 x 125 lbf.
Low Temperature Bend	ASTM D 2136 @ -40°F	Pass	
Accelerated Weathering	ASTM G 154 (Formerly G53)	No cracking, checking, crazing or erosion at 5,000 hours of exposure. Pass	
Linear Dimensional Change	ASTM D 1204 - 6 hrs. @ 176°F	-0.40%	
Water Absorption	ASTM D 570 - 166 hrs. @ 158°F	2.6%	
Static Puncture	ASTM D 5602	25 kg	56 lbs.
Dynamic Puncture	ASTM D 5635	20 J	474 pdl-ft.

Additional Tests

Test Description	Test Method	Metric Results	U.S. Standard Results
Fungi Resistance	ASTM G-21	No sustained growth or discoloration	
Solar Reflectance	ASTM C1549	88%	
Thermal Emittance	ASTM C1371-98	87%	
Thermal Emissivity	ASTM E408	95%	
EMMAQUA Exposure	ASTM G90, Desert Sun	339,790 MJ/m ²	>8.1 million Langley's
Moisture Vapor Transmission	ASTM E-96, Proc. B, Method A	<.086 g/hr/m ²	<.25 U.S. Perms
Weight	ASTM D 751	1.1 kg per m ²	.22 lbs. per sq. ft.
Underwriters Laboratories	UL-790	Classes A, B & C approved	
Factory Mutual Research	ASTM E-108; FM 4450 & FM 4470	Rated 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	



The Duro-Last® roofing system is proudly manufactured in the United States of America.

MATERIALS THAT CAN BE USED SAFELY WITH THE DURO-LAST ROOFING SYSTEM

The Duro-Last roofing membrane is extremely durable and compatible with dozens of chemicals, construction products, and other materials. Some of the most common are below.

- Acid Rain
- Acrylic/Latex Paint
- Bird Droppings
- Bleach
- Brick & Masonry Cleaner
- Cooking Grease
- Detergent Solution
- Diatomaceous Earth
- 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

NOTE

This is only a partial list of safe materials. For a complete list, contact the Duro-Last Engineering Services Department at 800-248-0280.

THE FACTS PROVE IT...

Compare the facts below to see how the Duro-Last roofing system outperforms other roofing systems to give you a leak-proof roof for years to come.

Company	Duro-Last	A	B	C
Membrane Type	PVC	TPO	EPDM	Modified Bitumen
Custom Prefabricated Deck Sheets?	Yes, eliminates 80-85% of field seams	No, all seams are handmade on-site	No, all seams are handmade on-site	No, all seams are handmade on-site
Sheet Construction	Factory prefabricated into panels up to 2,500 sq. ft.	Roll goods only; 500 – 1,000 sq. ft. coverage per typical roll	Roll goods only; 1,000 sq. ft. coverage per typical roll	Roll goods only; 100 sq. ft. coverage per typical roll
Custom Prefabricated Curb & Stack Flashings?	Yes	Yes	No	No
Custom Prefabricated Scuppers & Parapets?	Yes	No	No	No
All Flashing Material Reinforced?	Yes	No	No	No
Flashing Method	All heat-welded	Adhesive or heat-welded	Adhesive	Hot mopped, cement or torch applied
Warranty Coverage	Repair and replacement	Repair only	Repair only	Repair only
Warranty Issued At No Additional Cost?*	Yes	No	No	No
Warranty Coverage For Consequential Damages?*	Yes	No	No	No

*15-Year No Dollar Limit (NDL) Warranty



DURO-LAST MANUFACTURING FACILITIES

525 Morley Dr.
Saginaw, MI 48601
800-248-0280
Fax: 800-432-9331

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

6200 I-55 South
Jackson, MS 39272
800-434-3876
Fax: 866-602-4387

www.duro-last.com



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