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,

Jack Burt
Duro-Last Chairman
800-248-0280
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, dark gray, and terra cotta. 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.

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.
BACKED BY THE INDUSTRY’S BEST WARRANTIES

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.

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


REPORT ESR-1660
FM APPROVED
MIAMI-DADE COUNTY APPROVED
CLASSIFIED
CULUS
BCA
CRRC
ENR odbył ESG
SPRI
Green for Roofs Kansai
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.
A fastening tab is welded into the membrane sheet for attachment to the roof deck.

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

Rolls of membrane are re-inspected off the line.

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

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

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

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

**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 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.

**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.

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:

1. The Duro-Shield roofing system is applied right over your existing metal deck. No tear-off required.
2. Insulation is cut and placed to fill the flutes.
3. Another insulation layer is added to ensure a flat surface and increase the R-value.
4. The prefabricated membrane is mechanically-fastened to the deck over the insulation.
5. Prefabricated flashings for stacks and other penetrations are heat-welded on-site to create a monolithic covering and assure a leak-proof seal.
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**

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

**Additional Tests**

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Test Method</th>
<th>Metric Results</th>
<th>U.S. Standard Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungi Resistance</td>
<td>ASTM G-21</td>
<td>No sustained growth or discoloration</td>
<td></td>
</tr>
<tr>
<td>Solar Reflectance</td>
<td>ASTM C1549</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Thermal Emittance</td>
<td>ASTM C1371-98</td>
<td>87%</td>
<td></td>
</tr>
<tr>
<td>Thermal Emissivity</td>
<td>ASTM E408</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>EMMAQUA Exposure</td>
<td>ASTM G90, Desert Sun</td>
<td>339,790 M/J/m²</td>
<td>&gt;8.1 million Langleys</td>
</tr>
<tr>
<td>Moisture Vapor Transmission</td>
<td>ASTM E-96, Proc. B, Method A</td>
<td>&lt;.086 g/hr/m²</td>
<td>&lt;.25 U.S. Perms</td>
</tr>
<tr>
<td>Weight</td>
<td>ASTM D 751</td>
<td>1.1 kg per m²</td>
<td>.22 lbs. per sq. ft.</td>
</tr>
<tr>
<td>Underwriters Laboratories</td>
<td>UL-790</td>
<td>Classes A, B &amp; C approved</td>
<td></td>
</tr>
</tbody>
</table>
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

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.

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

*15-Year No Dollar Limit (NDL) Warranty