Otto Environmental Systems

12700 General Drive

Charlotte, North Carolina 28273

CRCOG Capitol Region Council of Governments

Invitation for Bid #761

Recycling Bins

Otto Environmental Systems
12700 General Drive
Charlotte, North Carolina 28273

February 19, 2024

Capitol Region Purchasing Council
241 Main Street, 4th. Floor
Hartford, CT 06106

RE: Invitation to Bid #761 Recycling Bins
Bid Due: Tuesday, February 20, 2024 at 9:00 a.m.

Dear CRCOG:

Otto Environmental Systems is pleased to respond to the Council's referenced bid.

Otto has provided high quality containers to municipalities and the waste management industry since 1983. Since then, we have continually invested in both our Charlotte, North Carolina, and Eloy, Arizona, facilities in order to meet production capacity and the needs of our customers. It is estimated that there are currently over 100 million Otto containers in use around the globe.

Otto Environmental Systems appreciates the opportunity to submit our proposal, and we look forward to a long-lasting business partnership with the Capitol Region Purchasing Council. We understand you have choices, so we realize that we need to earn your business. With our experienced and qualified engineering and sales teams, our dedicated customer service department, and our high-quality products, we feel strongly that our proposal offers a solution that meets or exceeds the bid requirements.

Thank you for your interest in Otto, our products, and services.

Sincerely,

Sandra Abdow

Sandra Abdow
Municipal Manager

Otto Environmental Systems
12700 General Drive
Charlotte, North Carolina 28273

CAPITOL REGION COUNCIL OF GOVERNMENTS, CT

Solicitation 761 Recycling Bins
Due Date: February 20, 2024 at 9:00 a.m.

COMMENTS

The Multi-System Design "MSD" refuse containers manufactured by Otto Environmental Systems, are injection-molded with numerous premium features. The design specifications of the Otto MSD containers will meet virtually all the specifications outlined in this bid request.

I. MODIFICATIONS TO GENERAL TERMS AND CONDITIONS

DELIVERY ARRANGEMENTS: All recycling bins shall be delivered to various locations specified by each ordering Town within one week for 14, 16 and 18 gallons, and within 4-6 weeks for 64/65- and 95/96-gallon roll-out carts after receipt of a purchase order.

- Otto offers 4-6 weeks delivery, ARO, for the recycling bins and the 65/95 gallon containers.
- Otto offers Assembly and Distribution services. Unloading the containers is an option available when Assembly and Distribution is included.

Weight: Curbside 14, 16 and 18 gallon bins: Minimum 4 pounds
64/65 gallon and 95/96 gallon roll-out carts: minimum 40 lbs., fully assembled

Otto's MSD container have an assembled weight as follow:
MSD-65E "Edge" containers 29.5 lbs.
MSD-95E "Edge" containers 37.8 lbs.
MSD-95Mo "Momentum" containers 35.7 lbs.
MSD95M "Millennium" containers 34.5 lbs.
Though minimally lighter than specified, the 65 and 95 gallon containers surpassed all national ANSI standard testing.

TEN YEAR CART WARRANTY

1. Otto's 10 Year Cart Warranty

For all new carts, Otto warrants that they will meet applicable specifications and be free from defects in material and workmanship while in normal use for a period of Ten (10) years from the initial date of shipment from Otto's manufacturing facility.

2. Exclusions from Warranty Coverage

2.1 Normal wear and tear for serviceable containers
2.2 Negligent and Abusive Use: including improper storage, use and handling, vandalism, and damage from wildlife
2.3 Damage from incompatible, improperly installed, operated, or damaged lifting mechanisms
2.4 Improper use of container exceeding specifications
2.5 Unauthorized repair or alteration
2.6 Damage caused by natural calamities such as fire, storm, or high winds

The types of damage excluded from this warranty will be determined, each on its own merit, by your Otto representative.

3. Warranty Administration

3.1 The buyer representative shall notify your Otto representative in writing before the end of the warranty period for the allegedly defective container(s).
3.2. The Serial Number(s) of the alleged defective container(s) shall be submitted via email on the Otto Damage Submittal Form (F-9400) along with any supporting documentation.
3.3 The buyer agrees that your Otto representative shall have the right to inspect and test the allegedly defective container(s) at the customer's site or a predetermined location.
3.4 At the time a Damage Submittal Form is submitted, the containers become Otto's property. Otto requires the right to collect/reclaim and recycle the container(s). The buyer agrees to empty, disassemble, and stack containers for shipment set up by Otto.
3.5 Otto reserves the right to either repair, replace or grant credit for defective containers.

4. **Exclusive Warranty Remedy**

Upon determination of containers/parts as defective by Otto, said product shall, at Otto's sole option, be repaired, replaced, and shall be given credit for the amount of the original purchase price of the affected product. Any repaired or replaced containers/parts will assume the remainder of the Ten (10) –year (or) applicable warranty from the original containers initial shipment date.

This warranty is in lieu of any other remedy warranty, express or implied, including any implied warranty of merchantability or fitness for a particular purpose. In no event shall Otto be liable for incidental or consequential damages (including freight charges) or delay in performance resulting from the defect. Products manufactured by a supplier or third-party manufacturer, specifically RFID components, distributed products and customers specified items, are not covered by this warranty, and may be warranted by the manufacturer's warranty as offered.

Credits not used within six (6) months of issue will expire.

12700 General Drive, P.O. Box 410251 Charlotte, NC 28241
Attn: warrantyclaim@otto-usa.com
Phone: 1(800)-227-5885

Rev. 2023

Operational Experience

Company History

With a legacy spanning over 90 years, Otto began as a waste collection company in Kreutzal, Germany, in 1934. The company entered the waste management industry in 1950 with the design and with the introduction of metal waste containers, and with the introduction of injection molded containers in 1965. Otto pioneered the two-wheeled trash cart in use today and is the largest brand of plastic waste containers in the world with more than 170 million carts in service around the globe.

Otto, We Make More Than Carts. We Make Solutions.

When you're faced with a recycling problem, you turn to people who can give you more than just the best products in the industry. You turn to people who give you solutions.

You turn to Otto Industries, the world leader in recycling. Because at Otto, we make more than carts. We make solutions.

No two cities have exactly the same recycling needs. And those needs don't always fit neatly into a pre-arranged program or formula.

That's why creative thinking and innovative solutions are so important to any effective recycling program. And that's why it's so important to have an Otto representative on your team.

Otto representatives all over the country are working with cities to design a program that works for the specific needs of that area. We'll study your objectives and provide you with solid recommendations and alternatives that maximize your recycling dollar.

Whether you want a program for recycling newspaper, aluminum cans, glass, plastic or others, we've got the answers.

Call an Otto representative for a free consultation. You'll find the world's best carts aren't our only specialty. Solutions are too.

Made In The USA

A 240 L 2 wheeled plastic cart pioneered by Otto in 1965

Source-Separation-Simplicity
Good Habits Begin At Home

As we all know, recycling of our trash material has become the single most important factor in the preservation of our earth. As we become increasingly conscious of our individual responsibility, we are realizing that saving and separating recyclables is a good habit we must begin at home.

Otto Industries is pleased to introduce its Source Separation Simplicity program for homeowners. In this program, homeowners are provided different collection carts for different types of recyclables.

A typical curb-side collection program services each home with three different carts which are labeled for the homeowner: an Otto 32, 64, or 95 gallon cart in Grey for refuse, once-a-week pickup; an Otto 32 gallon cart in Blue for newspapers and an Otto 32 gallon cart in Green for cans and glass, both once-a-month pickup.

Since the key to any successful recycling program is citizen awareness and participation, Otto makes it simple for each community to choose a source separation system appropriate for their needs by offering four cart sizes: 24, 32, 64 and 95 gallon capacities, and seven color selections: grey, green, brown, blue, orange, red and yellow. You may choose the cart color, size and collection frequency best suited to your community's resource recovery program. Most important, your existing collection trucks can double as resource recovery collectors.

- Otto carts lead the industry in durability, quality design and construction.
- Otto Source Separation allows homeowners to easily understand which containers to use and encourages citizen participation.
- All Otto carts are constructed of recyclable materials.
- All Otto carts are in stock and ready for immediate delivery.

Otto Industries, Inc.
12700 General Drive,
P.O. Box 410251
Charlotte, NC 28241-0251
Tel. (800) 227-5885
FAX (704) 588-5250
Tel. (704) 588-9191

Made In The USA

U.S. Patent applied for
©1990, Otto Industries, Inc.

Diversified Portfolio

Not only does Otto manufacture a wide range of waste container products, but Otto also owns a waste container service group along with a custom and contract molding group. Some of the principal activities of these divisions are:

- Waste Container Products: Municipalities and Private Haulers

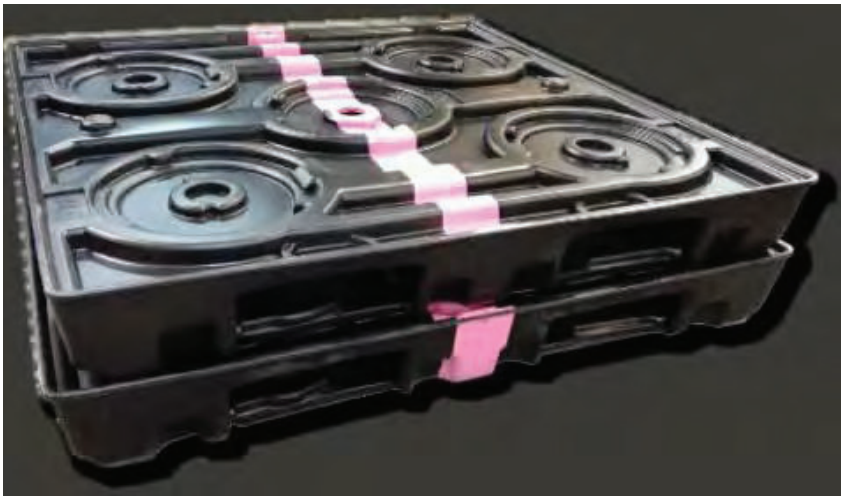
Otto serves nearly every city in the USA along with most small, medium, and large-scale garbage haulers, offering waste containers for various types of waste streams in both the residential and commercial categories. These include but are not limited to general waste, recycling, yard waste, organic waste, and e-waste. Below is an example from the City of San Jose, California:

- Container Management Services

Otto introduced cart services in 1999, based upon our original service contract in Paris, France in 1985. We provide services such as assembly, distribution, and recovery (A&D), logistics, cart repair, inventory management, warranty management, and cart re-branding for deployed waste containers.

- Contract Manufacturing

Otto serves automotive, medical, packaging, and industrial clients all over the USA, and is the exclusive supplier of pallets to the United States Postal Service. We provide a diverse array of plastics products delivered completely and on time. Our manufacturing footprint extending as far south as Mexico and as far north as Michigan proves valuable to our customers due to the added value of both manufacturing flexibility and lower logistics costs.



Recycling

Our in-house plastics processing centers allow us to reclaim nearly all plastic products at end of life and repurpose these materials into new products, thereby creating a circular economy, supporting internal sustainability initiatives, and offsetting the rising costs of raw materials for our customers.

Operations Overview

Otto Environmental Systems is a wholly owned subsidiary of Duramax Holdings, LLC. After entering the United States market in 1983, the company rapidly gained market share by importing containers from its European factories. In 1988, Otto invested $40 million toward its first domestic manufacturing facility located on a 16-acre tract of land in Charlotte, North Carolina. Due to the company's consistent growth, Otto has expanded this facility to accommodate additional machinery, assembly, and staging areas, along with a materials recycling center. The North Carolina facility now houses 177,000 square feet of indoor space, including Otto's North American corporate offices. It is also equipped with an impressive array of injection molding equipment.

In 2002, Otto opened its second North American facility in Eloy, Arizona. The Eloy facility contains 27,300 square feet of manufacturing space, 400,000 square feet of inventory space, and 4,700 square feet of administrative office space. The plant features several large injection molding machines and various types of manufacturing equipment, which have significantly increased production capacity.

Alongside the facilities in Charlotte and in Eloy, our business maintains manufacturing for the automotive, for the medical, and for the packaging sector in Mexico, in Ohio, in Michigan, in Indiana, and in Oregon, with even more acquisitions planned in 2024.

Otto: Serving Municipalities and Private Haulers

Since 1983, Otto has developed and maintained lasting relationships with many diverse municipalities and private haulers. As a result, Otto's reputation is that of a valued and dependable partner.

Otto provides a range of products including a broad array of two-wheeled carts, recycling bins, and related products, along with commercial dumpsters for a variety of waste streams in both residential and commercial sectors. For complex municipal contracts, Otto offers consultation services to guide you through the waste collection process. Whether it is going to council meetings or educating residents, Otto has experts with hands-on experience to help every step of the way.

Our strategically located facilities, manufacturing partners and distributors help improve product lead time and decrease freight costs.

- Euclid, Ohio
- Evansville, Indiana
- Arteaga, Mexico
- Charlotte, North Carolina
- Eloy, Arizona
- Muskegon, Michigan
- South Bend, Indiana
- Dallas, Texas (Future)
- McMinnville, Oregon

Otto: Container Management

A division of Otto, OCM Solutions, LLC (OCMS) is a logistics company that focuses on container management – assembly, distribution, and recovery (A&D); container evaluations and maintenance; inventory management; and container re-branding.

Originating in Europe, OCMS and its predecessor, Otto Container Management, LLC (OCM), has nearly 60 years of experience in cart maintenance and repair programs with service contracts throughout France, Italy, Britain, Germany, Spain, Mexico, and Brazil. OCMS has taken the best practices from these locations to bring the greatest value to its customers in the United States.

OCM began U.S. operations in 2000 and merged into OCMS in 2018. OCMS is headquartered alongside its product manufacturing division in Charlotte, North Carolina. OCMS currently employs 50 full-time team members and has a fleet of 40 service box trucks identifiable with professionally applied graphics and 17 trucks with trailers. The fleet operates under D.O.T. standards, and all trucks are equipped with GPS systems linked to route planning software that provides accurate service verification.

OCMS has a growing fleet of locations across the United States, collectively handling about 7 million carts, using only zero-emission diesel or CNG trucks for existing and future projects.

Expert Engineering

Otto strives to provide a breadth of products and services for its customers. Our engineering and product design team has the expertise to provide the best cost-effective solution to meet your needs for quality, durability, and longevity. Otto uses a plastic injection molding process using high density polyethylene (HDPE) to produce many of its products, including two-wheel carts, dumpsters, and contracted and custom molded parts. Injection molding provides consistency and durability with design features that are built into the mold to strengthen areas that face unique stress points. Otto containers are

engineered with the appropriate balance of stiffness and flexibility to provide flex and conformity for an vautomated grabber, resulting in fewer stress points. Special features of our two-wheel carts feature a molded-in wear ridge at the bottom of the cart to prolong the container lifespan and patented dimples at four sides to assist with gripping power during collection in wet weather.

Quality Management

Otto Environmental Systems is ISO 9001:2015 certified. Otto is regularly audited to maintain this certification. Every order is inspected to meet specified project requirements. Otto carts are manufactured using high density polyethylene (HDPE). Otto only uses HDPE grades that have longer molecular chains to decrease the melt index and give the material "melt strength." The higher molecular weight also gives the material increased environmental stress crack resistance (ESCR), impact strength, and cold-temperature toughness over a material with a similar density but shorter molecular chains. Each lot of resin is put through extensive testing to verify the melt flow index and check for moisture and contamination to ensure the resin meets Otto's established standards.

Advantages of the Otto Injection Molded Container

Otto's refuse containers are manufactured by an injection molding process. The injection molding process can make products with complex designs that would not be possible by other manufacturing processes such as rotational or blow molding.

- HDPE (high-density polyethylene) composition is heavy duty and fully recyclable.
- Injection molding allows for intricate design features, such as wear strips, support ribs, and assembly slots, where other molding processes create simpler outputs with limited mold design capability.
- Consistency in wall thickness allows isolation of special features to strengthen areas where the container faces special stress, for example:
    - Lid attachments are cylindrical-shaped and double-ribbed, creating a robust attachment to the container body.
    - The container base is manufactured with a dual molded-on "wear strip" to take the brunt of the wear and abuse. The flat bottom of the container does not touch the ground.
    - Molded gussets contribute greater strength to the axle mounting details.
    - High pressure injected resin ensures complete and even coverage throughout the mold, providing overall consistent wall thickness and eliminating thin spots or "windows."
    - An extra deep toehold assists with handling heavy loads.

Other benefits include:

- A guaranteed ten-year warranty.
- Standard Snap-On wheels that roll easily, quietly and provide greater control of the cart.
- A large solid steel axle, which is manufactured from recycled material, to provide exceptional durability.
- A cart design that leads the industry in wind stability.
- A virtually maintenance-free container, decreasing costly labor for repair.
- A durable metal lower "catch" bar.
- Industry leading and value-added graphic design services for instructions and container branding.
- A selection of nearly fifty colors and superior hot stamping using the latest heat sink technologies.
- An aesthetically pleasing container that complements both inside and outside environments.

Innovative Technology

Otto is actively investing in cloud-based technologies to change our world for the better. Our investment in "the cloud" aims to reduce our manufacturing footprint and in turn, increase efficiencies that will lead to a cleaner community, less printed paper, more recycled products, and reduced product lead times.
All Otto carts can be equipped with RFID tags or permanent barcodes that can link a cart to a specific address. With RFID, a plastic RFID tag is placed inside the handle of the cart during assembly at Otto's manufacturing facility and secured in place once the hinge pins are fastened to the lid. Barcodes are available at the time of manufacture with several application options.

ANSI Approved

Otto carts meet or exceed A.N.S.I. (American National Standards Institute) Z245 standards for compatibility dimensions to ensure that containers and lifters work together to safely empty and return the container to the ground after collection. These include bib and lift bar dimensional requirements based on the container type. For required markings, Otto carts include a code for the date of manufacture, the maximum payload weight rating, the volumetric capacity, and safety "close lid before moving" along with "no hot ashes" instructions. Cart testing is always executed with the maximum load weight of 3.5 pounds per gallon. Additional proprietary tests are also performed and recorded to ensure variables such as different working shifts, raw materials, and equipment are consistent for optimal output.

a. **Curb Test:** This test determines whether the cart's handles, wheels and axles will withstand the repeated impact forces experienced during a normal 10-year useful life. A maximum loaded cart is pushed off a curb of 5.5 inches and repositioned at the top and repeated for 520 cycles! Otto's steel axles and strong axle ribs ensure a strong base to absorb the impact without breaking.

b. **Lid Test:** Otto cart lids can withstand a load of 80 pounds (comparable to the weight of a small child) without collapsing.

c. **Force to Tip Test:** Cart testing measures the force required to start container movement or tip a maximum loaded cart to ensure ease of operation. Otto carts are well below the industry standard of not exceeding 120 pounds of force.

d. **Center of Balance Position Test:** To further ensure ease of operation, Otto carts are tested to ensure that the height of the handle at the center-of-balance position is between 29-40 inches.

e. **Slope Stability Test:** This test checks the static stability of an empty and loaded cart on a 5-degree slope. Otto carts stand, without tipping or moving, in three different orientations.

f. **Volumetric Loading Capacity Test:** To determine the volume of a container, Otto carts are immersed in a tank of water to verify the volume of the cart.

g. **Loading and Unloading** – Automated (Cycle Test): A loaded cart is engaged by the lifter and emptied. The cart is reloaded, and inspections are made every 100 lifts.

h. **Loading and Unloading** – Semi-Automated (Cycle Test): A loaded cart is engaged by the lifter and emptied. The cart is reloaded, and inspections are made every 100 lifts.

Corporate Sustainability

Otto is committed to corporate sustainability at our manufacturing locations and in our community. Within the manufacturing process, Otto uses the highest possible levels of recycled content without compromising product integrity, and sources this material from our own in-house recycling center.

Otto has centered its policies and procedures around environmental sustainability – those actions that reduce the impact that the company's manufacturing has on both local and global environments. Our manufacturing operations have increasingly incorporated additional efforts to reduce their carbon footprint. In the past few years, Otto has been able to reduce six-fold its solid waste generation through reclamation, recycling, and recapturing efforts. Otto recycles over 100 million pounds of plastic annually through both internal and externally sourced operations.

Bio's – Otto Team

Brian Coll
CEO
Years of experience: 20 +
Highlights: Brian, a military veteran of 10 years, leverages his over 20 years of industry experience to drive operational improvements and oversee operations. He also actively leads M & A within the company.

Jorge Aguirre
President
Years of experience: 14+
Highlights: With more than 14 years of experience in the Automotive industry Jorge can adapt to any work environment and technological process. He can provide the leadership to face and turn around any challenge in the fields of engineering and operations.

Shawn McNeil
CFO
Years of experience: 30+
Highlights: Shawn, a military veteran of 21 years, is responsible for all financial reporting and controls of Duramax Solutions LLC. He formerly served as the Director of Finance before being promoted to CFO in 2022.

Reyes Muzquiz
COO
Years of experience: 30+
Highlights: Reyes is a senior executive and a skilled program, business, and plant manager, with over 30 years of progressive experience in both the automotive and plastics industries.

Shawn Whiteman
EVP
Years of experience: 25+
Highlights: Shawn has lead responsibility for the execution of our strategic initiatives. Shawn leads the organization's Key Performance Indicator (KPI's) measurables across all functions and disciplines in the organization.

Travis Dowell
VP Sales
Years of experience: 30+
Highlights: Travis leads the sales function for Solid Waste, which encompasses our container and services offerings to the waste and recycling business sector. With 26 years of industry customer experience at Otto, he is uniquely equipped to ensure we bring solutions to solve our customer's problems, competitively priced and effectively delivered.

References

Otto has approximately 170 million containers in service around the world in over 80 countries. A partial list of references is shown below.

Nationwide – 8,678,855 carts
2007 - Present
Republic Services
Marc Weingel, Category Manager
480 627 2155
MWeingel@republicservices.com

San Jose, California - 500,000 carts
1983 - Present
Green Waste Recovery and California Waste Solutions
Omar Lopez, General Manager
408 421 3592
Olopez@greenwaste.com
Matt Bussing, Chief Operations Officer
408 477 6943
mbussing@calwaste.com

Charlotte, North Carolina - 400,000 carts
1998 - Present
Ellen Price, Deputy Director of Administration
Solid Waste Services Department
704 353 1183
eprice@ci.charlotte.nc.us

Houston, Texas Metroplex - 350,000 carts
2021 - Present
Best Trash
Dane Turner, Partner
281 313 2378 or 713 203 4377
dturner@besttrashtexas.com

Sacramento, California - 300,000 carts
1996 - Present
Wendell Brown, Integrated Waste
General Supervisor
916 808 4841
wbrown@cityofsacramento.org

DeKalb County, Georgia - 200,000 carts
2002 - Present
Tracy Hutchinson, Director of Sanitation
404 294 2177
tahutchinson@dekalbcountyga.gov

Minneapolis, Minnesota - 150,000 carts
1983 - Present
Scott Norbeck, Equipment Supervisor
612 673 5699
Scott.Norbeck@minneapolismn.gov

Dallas, Texas Metroplex – 150,000 carts
1999 - Present
Community Waste Disposal (CWD)
Gary Blackwell, Operations Manager
214 364 8699
GBlackwell@communitywastedisposal.com

PERRY JOHNSON REGISTRARS, INC.

Certificate of Registration

Perry Johnson Registrars, Inc., has audited the Quality Management System of:

Otto Environmental Systems N.A., Inc.
12700 General Drive, Charlotte, NC 28273 United States
(This is a multisite scheme. See Appendix for site specific details.)

(Hereinafter called the Organization) and hereby declares that Organization is in conformance with:

ISO 9001:2015

This Registration is in respect to the following scope:

Manufacture and Assembly of Injection Molded Plastic Parts for the Solid Waste Industry and Contract Molding

This Registration is granted subject to the system rules governing the Registration referred to above, and the Organization hereby covenants with the Assessment body duty to observe and comply with the said rules.

PERRY JOHNSON REGISTRARS, INC.

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17021-1
MANAGEMENT SYSTEMS CERTIFICATION BODY

Terry Boboige

Terry Boboige, President
Perry Johnson Registrars, Inc. (PJR)
755 West Big Beaver Road, Suite 1340
Troy, Michigan 48084
(248) 358-3388

The validity of this certificate is dependent upon ongoing surveillance and fulfillment of required sampling of sites.

Effective Date: November 15, 2022
Expiration Date: November 14, 2025

Certificate No.: C2022-04387

PERRY JOHNSON REGISTRARS, INC.

Appendix

12700 General Drive, Charlotte, NC 28273 United States	***Manufacture and Assembly***
901 North Tweedy Road, Eloy, AZ 85131 United States	***Manufacture and Assembly***

Manufacture and Assembly of Injection Molded Plastic Parts for the Solid Waste Industry and Contract Molding

Terry Boboige

Terry Boboige, President

Certificate No.: C2022-04387
Page 2 of 2

Perry Johnson Registrars, Inc. (PJR)
755 West Big Beaver Road, Suite 1340
Troy, Michigan 48084
(248) 358-3388

The validity of this certificate is dependent upon ongoing surveillance and fulfillment of required sampling of sites.

ExxonMobil™ HDPE HD 6605.70

High Density Polyethylene Copolymer Resin

Product Description

HD 6605.70 is a narrow molecular weight hexene copolymer designed for a wide range of injection molding applications, offering excellent ESCR with good stiffness-toughness balance. Ideally suited for articles requiring rugged physical performance in cold temperature environments.

General

Availability [1]	• Latin America	• North America	• South America
Additive	• Anti-gas fading: Yes		
Applications	• Automotive Components • Industrial Closures	• Recreational Vehicle - Components • Waste Carts	
Revision Date	• March 2013		

Resin Properties	Typical Value	(English)	Typical Value	(SI)	Test Based On
Density	0.948	g/cm³	0.948	g/cm³	ASTM D4883
Melt Index (190°C/2.16 kg)	5.0	g/10 min	5.0	g/10 min	ASTM D1238

Thermal	Typical Value	(English)	Typical Value	(SI)	Test Based On
Deflection Temperature Under Load (DTUL) at 66psi - Unannealed	156	°F	69	°C	ASTM D648
Deflection Temperature Under Load (DTUL) at 264psi - Unannealed	108	°F	42	°C	ASTM D648B
Peak Melting Temperature	266	°F	130	°C	ASTM D3418

Molded Properties	Typical Value	(English)	Typical Value	(SI)	Test Based On
Tensile Strength at Yield	3400	psi	23	MPa	ASTM D638
Elongation at Break	1000	%	1000	%	ASTM D638
Flexural Modulus					ASTM D790B
1% Secant	160000	psi	1100	MPa	
2% Secant	140000	psi	970	MPa	
Environmental Stress-Crack Resistance					ASTM D1693B
10% Igepal, F50	20	hr	20	hr	

Impact	Typical Value	(English)	Typical Value	(SI)	Test Based On
Notched Izod Impact (-40°F (-40°C))	1.0	ft·lb/in	55	J/m	ASTM D256

Additional Information

- Properties are based on compression molded samples.
- Test procedures may be modified to accommodate operating conditions or facility limitations.
- Tensile Strength at Yield and Elongation at Break tested using ASTM D638 Type IV, 50 mm/min.

Typical properties: these are not to be construed as specifications.

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Legal Statement

Contact your ExxonMobil Chemical Customer Service Representative for potential food contact application compliance (e.g. FDA, EU, HPFB).

This product is not intended for use in medical applications and should not be used in any such applications.

Notes

[1] Product may not be available in one or more countries in the identified Availability regions. Please contact your Sales Representative for complete Country Availability.

For additional technical, sales and order assistance:

Worldwide and the Americas
ExxonMobil Chemical Company
13501 Katy Freeway
Houston, TX 77079-1398
USA
1-281-870-6050

Asia Pacific
ExxonMobil Chemical Asia Pacific
1 HarbourFront Place
#06-00 HarbourFront Tower One
Singapore 098633
+86-21-24173999

Europe, Middle East and Africa
ExxonMobil Chemical Europe
Hermeslaan 2
1831 Machelen, Belgium
420-239-016-274

Typical properties: these are not to be construed as specifications.

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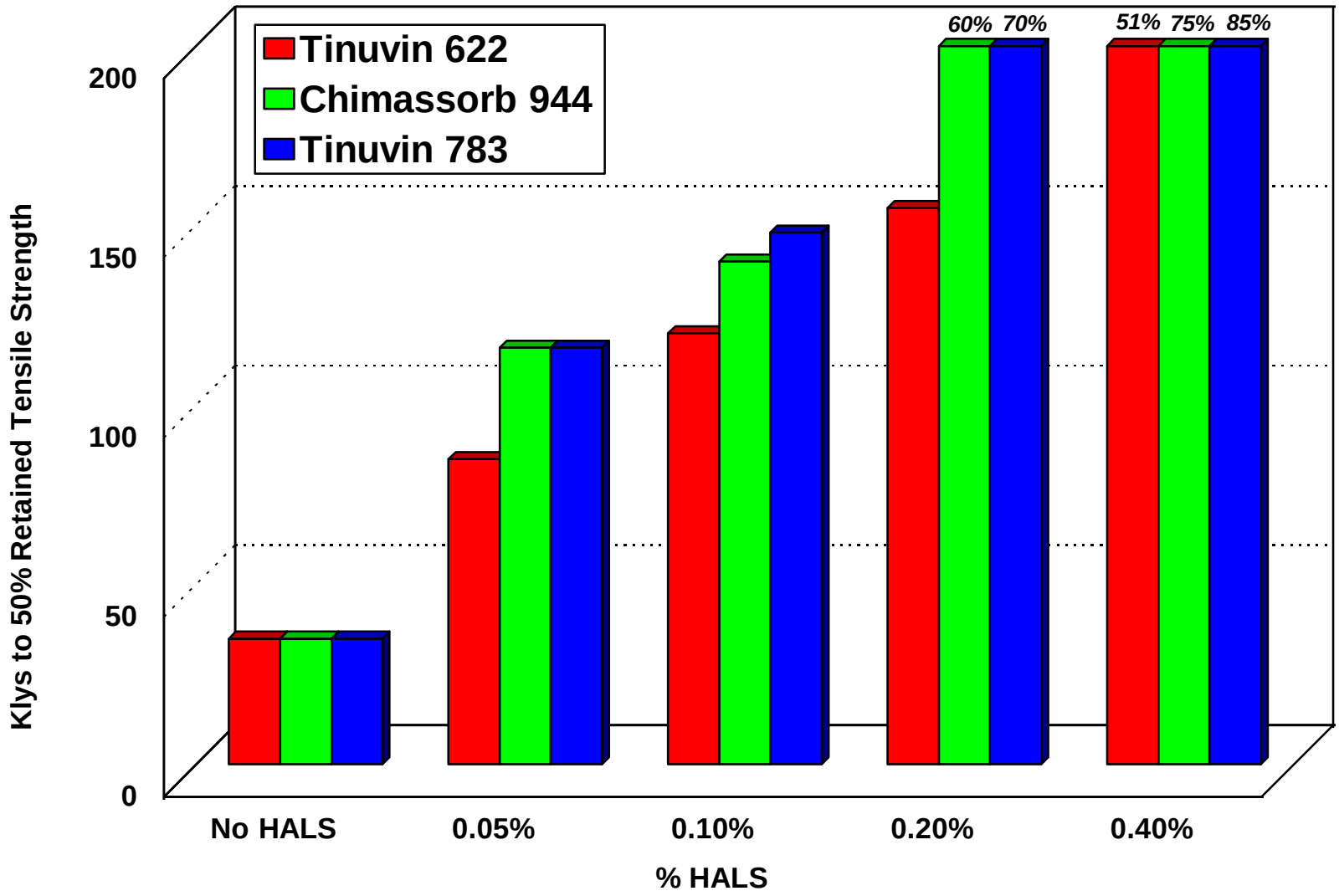
Weathering



PP homopolymer containing 0.1% Irganox B-225 and 0.1% calcium stearate; 40 mil plaques; Florida exposure (45° south)

Ciba