



WHEN PERFORMANCE COUNTS...

IN-LINE SHUTTLE ROTATIONAL MOLDING MACHINES



ROTO SPEED[®]
ROTATIONAL MOLDING MACHINES

 A PRODUCT OF FERRY INDUSTRIES, INC.



Ferry Industries, Inc., began operations in 1927 as a tool and die shop and later began to produce special machinery for the rubber companies, the aircraft industry and the bearing industry.

In 1981 Ferry completed its acquisition of the Femco range of bandsaws that are used to cut flexible and

rigid urethane foam and structural honeycomb for the aerospace industry.

Ferry produced its first rotational molding machine in 1983 and has since become a global leader in the rotational molding machinery industry having produced more than 1,500 machines, located in more than 60 countries.

The Ferry RotoSpeed™ product line is focused on improving value for the customer through accessibility for communication to the machine and from generation of reports, reduced energy consumption, and the improvement of processing speeds to enable customers to produce more products quickly and with less waste.

Innovation in Rotational Molding Since 1983



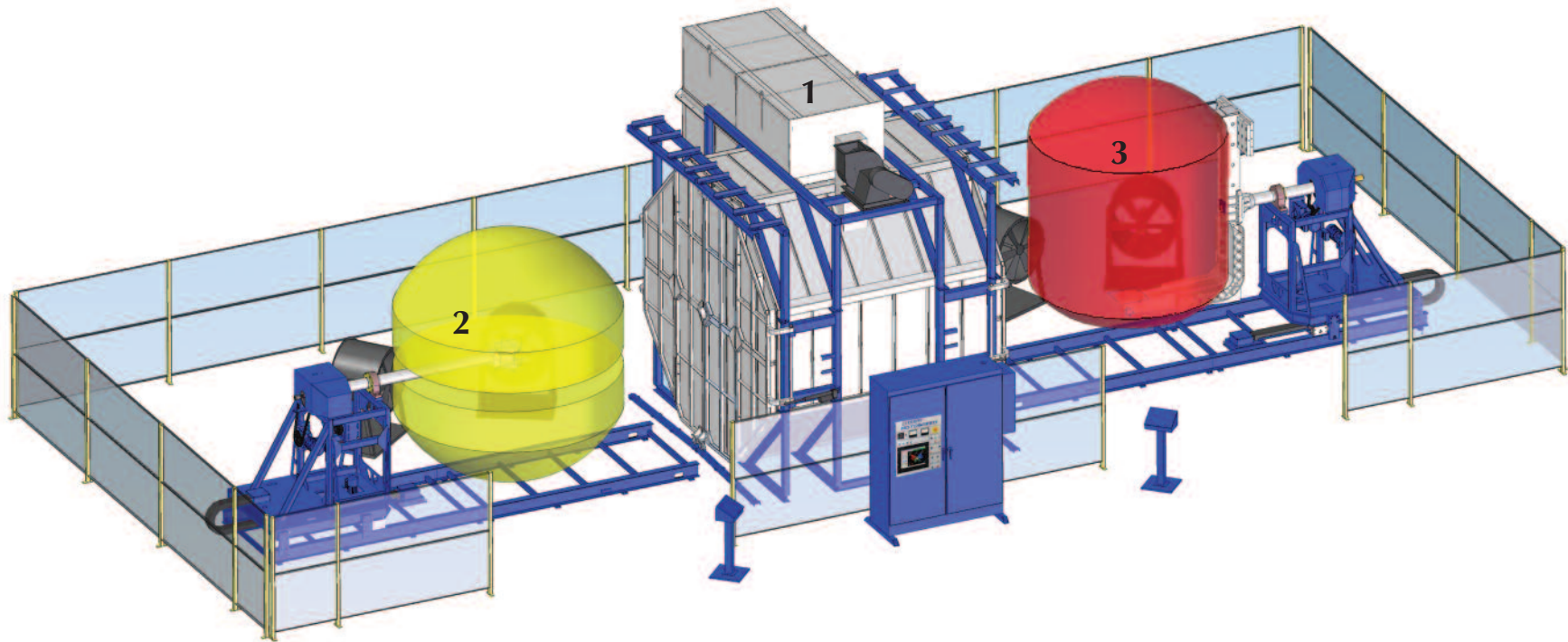
Ferry RotoSpeed™ Machines comprise 45 standard machine models:

- Independent-Arm Carousel Machines
- Fixed-Arm Turret Carousel Machines
- In-Line Shuttle Machines
- Giant In-Line Shuttle Machines
- Rocking Oven Machines
- Lab Machines
- Special machines to customer specifications

Many significant advances in rotational molding machinery over the past 39 years can be attributed to Ferry Industries, Inc.:

- The five-station, four-arm independent-arm rotational molding machine
- Multiple-passage internal air systems (2 & 3 passages)
- Computer-managed machines
- Infrared Thermometry (IRT) closed-loop process control.
- High efficiency down-flow oven systems
- Special cooling effects
- Highest weight capacity
- Large swing capacities
- Best energy efficiencies
- Multi-shot molding

Ferry RotoSpeed™ In-Line Shuttle modular design allows for single or two cart/arms



In-Line Shuttle machines provide a single oven and one or two arm/carts: 1. Oven, 2. Arm/Cart, 3. Additional Arm/Cart
Cooling, Unloading & Loading all occur in the station outside the oven.

The Ferry In-line Shuttle Machines have many of the proven RotoSpeed Carousel components engineered into this modular molding system that can have one or two arms — sharing a common oven. Each arm has its own processing cycle that is not dependent on the indexing of the other arm — the system is flexible.

The Ferry In-line Shuttle Machines are an excellent system for production of large products like boats, storage tanks for water, chemical and hazardous materials, and boat docks. Shuttles can be used for multi-shot moldings and foam filled moldings where processing cycles vary dramatically from arm to arm.

RotoSpeed In-Line Shuttle Machine Benefits:

- Capability for large, heavy molds
- High efficiency ovens
- Many components are shared with Ferry Carousel machines
- Separate oven & cooling stations for efficient molding
- Expandable from 1 to 2 arms for increased production
- RotoCure® System Manager
- Minimal capital investment
- Efficient in-line floor-space usage
- Ferry IRT compatible



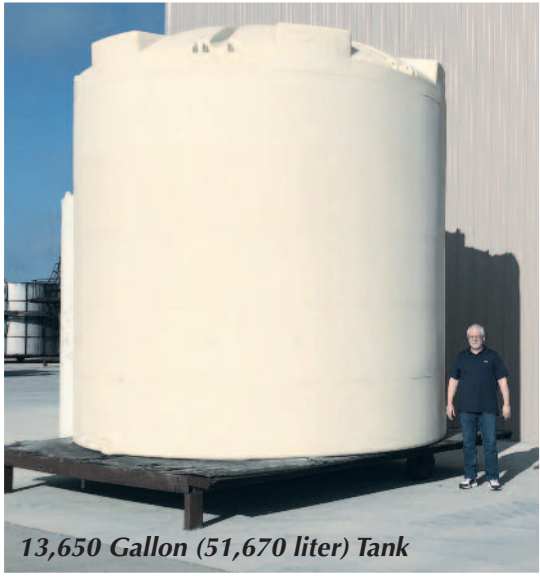
M-3000 Single-Arm In-Line Shuttle Machine

RotoSpeed™ In-Line Shuttle Standard & Custom Machines



M-3700 In-Line Shuttle with Optional Offset Arm/Cart

8 Standard Sizes of In-Line Shuttle Machines		
M-1600	M-3000	M-4600
M-2000	M-3700	M-5500
M-2600	M-4000	Custom sizes available

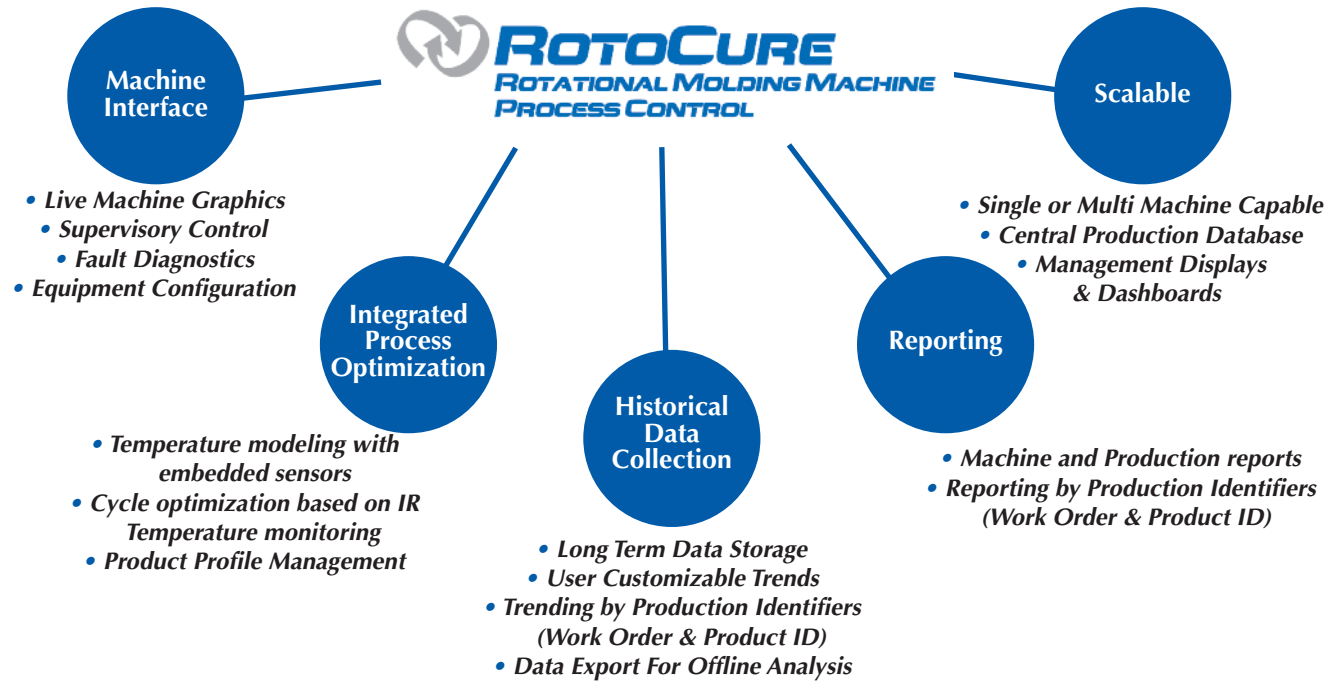


13,650 Gallon (51,670 liter) Tank



Custom M-7500 Two-Arm/Cart In-Line Shuttle

Ferry RotoCure™ System Manager - comprehensive, intergrated machine & process control



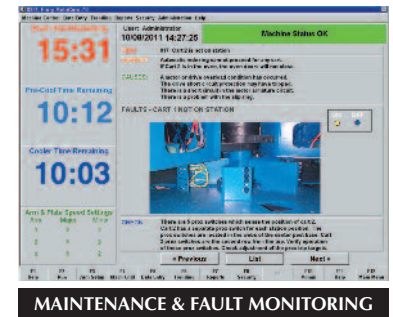
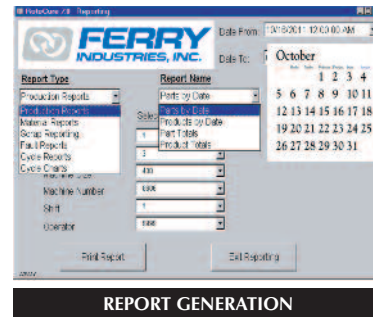
RotoCure 7 System Manager features Ferry's multiple-function software in five distinct sections:

1. Process Management
2. Process Trending
3. Report Generation
4. Recipe Database
5. Maintenance & Fault Monitoring

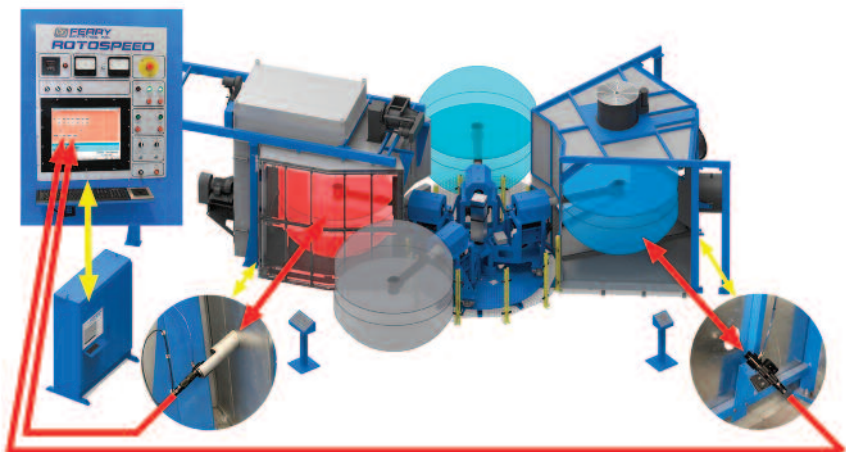
RotoCure 7 System Manager Overview:

- Set-up process parameters for oven, cooling station, and servicing station

- Multiple-step curing and cool programs
- Multi-shot programs
- Password protection-multiple levels
- Status screen for oven temperature, oven time, cooling time, arm rotation speeds
- Trending screens for recording machine activity
- On-screen display of error messages and self-diagnostics
- On-screen display of machine operating instructions and adjustments
- On-screen display of real-time arm and plate rotation speeds
- Storage and retrieval of cure recipes, mold codes and scrap codes
- Ability to record and generate reports for:
 1. Production
 2. Material Usage
 3. Reasons for scrap
 4. Downtime caused by machine
 5. Downtime caused by operator
- Ability to network RotoLog and IRT
- System networking capability
- Remote access for Trouble-shooting



Ferry RotoSpeed™ Cycle & Diagnostics Systems to Optimize Production



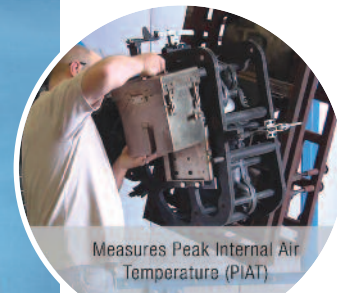
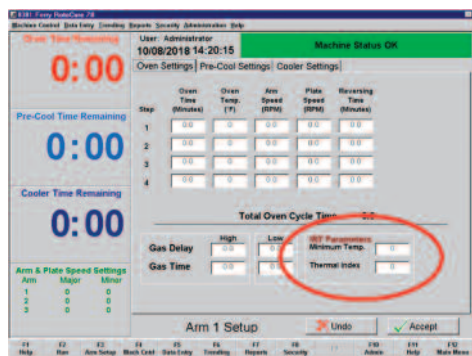
Ferry InfraRed Thermometry IRT™

The Ferry InfraRed Thermometry System Control™ (IRT) provides continuous process control for heating and cooling cycles on Ferry rotational molding machines. It is designed to enhance the repeatability of cure, cycle to cycle. IRT uses remote sensors to monitor the temperature of the surface of the rotating mold(s) and interprets this data for analysis. This map of temperature is used to provide key data values during the heating and cooling cycles; this data is used to determine the end of the oven and the cooling cycles for repeatable cycles.



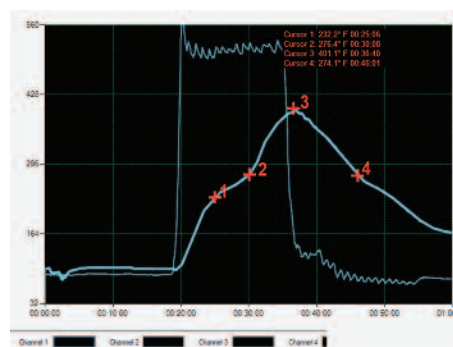
Features of IRT include:

- Decrease scrap due to ambient temperature changes
- Recover quickly from operator- or machine-induced faults
- Saves valuable machine time--no need to pre-heat the oven
- Assure optimum cure for optimum part properties
- Add consistency to everyday molding
- Save time by preventing cycle redundancy
- Maintain dimensional stability
- IRT integrates into Ferry RotoCure system manager



Ferry RotoLog™

Real-Time Rotomolding Cycle Diagnostics System



The RotoLog™ 5.0 Wi-Fi transmitter is housed in a portable stainless steel canister which is mounted on the framework of the mold. RotoLog™ 5.0 Wi-Fi monitors the temperature using K-type thermocouples and transmits the data to your computer using a Wi-Fi Router. No receiver is necessary. Your computer is used to display the data on-screen, in graphical format, and records the cycle data for printout and future reference in .csv format.

RotoLog Cycle Time Temperature Log

Advantages:

- Optimize cycle times - Develop optimum cure time and set points & optimum cooling time and set points
- Develop correct molding cycles for new molds the first time
- Optimize cycle times for multi-cavity spiders
- Reduce scrap
- Save energy
- Improve quality of rotationally-molded plastic products
- Provide quality control certification for customers
- Evaluate new materials
- Check oven/cooler performance
- Now available for continuous use, 24 hours per day

Production Automation Systems - improved ergonomics, less waste, higher output

Operator Work Platforms

Ferry manufactures single-station and dual-station configurations as well as manually-operated and powered configuration platforms for Fixed-Arm Turret Carousels, Independent-Arm Carousels and In-Line Shuttle Machines. Ferry's work platforms

provide stable, elevated work space for operators, materials, hand tools and equipment used to service rotational molding machine arms and molds. Special platform designs are available on request.

Shuttle machine platform with powered extension lift & roll-over gate with integral perimeter guards & stairs.

Closed & down position for working on molds • Roll-over gate indexing back • Extension segment raising for arm/cart indexing



High-Intensity Mixers

The use of high-intensity mixers will improve the appearance, quality and economies of rotomolded parts through efficient, uniform mixing of a base resin with colorants and additives. High-intensity mixing can maximize color usage, reduce scrap and "border-line" parts, enhance customer satisfaction, resulting in higher profits for the molder.



High-Intensity Mixer Advantages:

- Fast mixing cycles—approximately 8 minutes per cycle
- Available batch sizes from 100 to 1,000 lbs
- Repeatable results by use of carefully-measured components and exiting at a pre-set temperature
- Less labor for material handling
- The use of concentrates yields better dispersion of the color onto the resin
- Powder granules lose their "tails" and roll better in the mold
- More homogeneous mixture
- Less wasted powder

Powder-Dispensing

RotoLoad Dispensing Systems are automatic powder weighing and dispensing system that will quickly, safely and cleanly dispense your powder directly into the molds.



Applications:

- Fill mixers with multiple ingredients from holding bins
- Direct-fill molds from overhead or floor-mounted dispensers

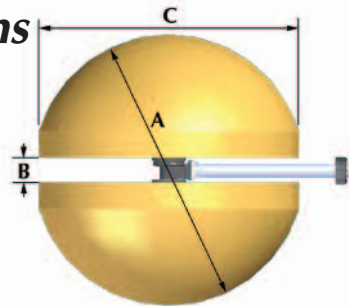
Advantages:

- Fast, consistent & accurate
- Reduce waste
- Cut labor content
- Improved cleanliness
- Reduce operator fatigue
- Lessen contamination
- Standard or custom systems
- PLC Controlled
- Automatic hopper refill
- Barcoding & reporting
- Monitor material consumption
- Industry 4.0 capable



SHUTTLE MOLD SWING AREAS

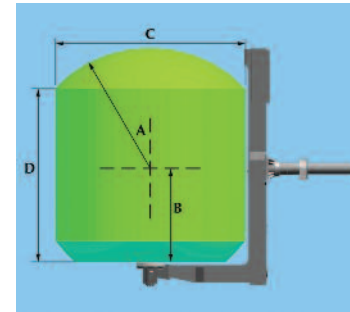
Straight Arms



Straight-Arm Models	A		B		C		Weight Capacity	
	Inch	mm	Inch	mm	Inch	mm	lbs	kg
M-1600	64	1626	8.5	216	64	1600	1500	682
M-2000	80	2032	11	279	78	1981	1500	682
M-2600	102	2591	11	279	92	2337	3000	1365
M-3000	120	3048	11	279	120	3048	4000	1820
M-3700	145	3683	11	279	131	3327	4000	1820
M-4000	160	4064	14	356	160	4064	6000	2730
M-4600	181	4597	14	356	165	4191	6000	2730
M-5500	218	5537	18	457	209	5309	10000	4545

Offset Arms

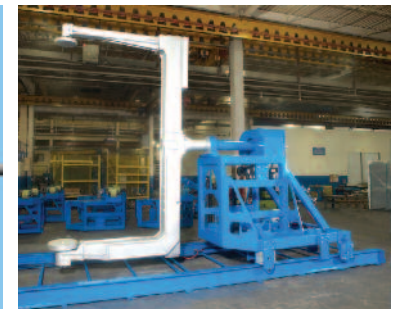
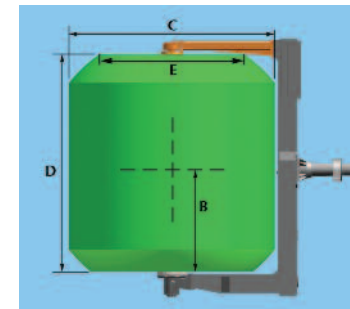
"L" Style Offset Arm



"L" Offset Arms Models	A		B		C		D		Weight Capacity	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	lbs	kg
M-1600	32	813	16	406	52	1321	34	864	800	360
M-2000	40	1016	28	711	56	1422	51	1295	1200	545
M-2600	51	1295	31.7	805	76	1930	66	1669	2000	907
M-3000	60	1524	43.6	1107	102	2591	75	1905	3000	1365
M-3700	72.5	1842	57	1448	113	2870	102	2591	3000	1365
M-4000	80	2032	56	1422	135	3430	100	2540	4000	1820
M-4600	90.5	2299	71	1803	143	3632	128	3251	4000	1820
M-5500	109	2769	69.4	1763	165	4191	140.7	3574	6500	2950

"C" Style Offset Arm

"C" support is removable to provide "L" style mold area use.



"C" Offset Arms Models	B		C		D		E		Weight Capacity	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	lbs	kg
M-3700	57	1448	113	2870	117	2972	90	2286	3000	1365
M-4000	58	1475	135	3430	122	3100	110	2794	4000	1820
M-4600	71	1803	143	3632	142	3607	112	2845	4000	1820
M-5500	69.5	1765	165	4191	161	4089	118.5	3010	6500	2950



4445 Allen Road • Stow, Ohio 44224 • U.S.A

Phone: +1.330.920.9200 • Fax: +1.330.920.4200

www.ferryindustries.com • sales@ferryindustries.com

Note: For display purposes some safety equipment or situations may be illustrated that are not representative of proper operating practices. Construction, components and dimensions subject to change without notice.

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