FERRY INDUSTRIES, INC.®

When Performance Counts...

Carousel Rotational Molding Machines

RotoSpeed®
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

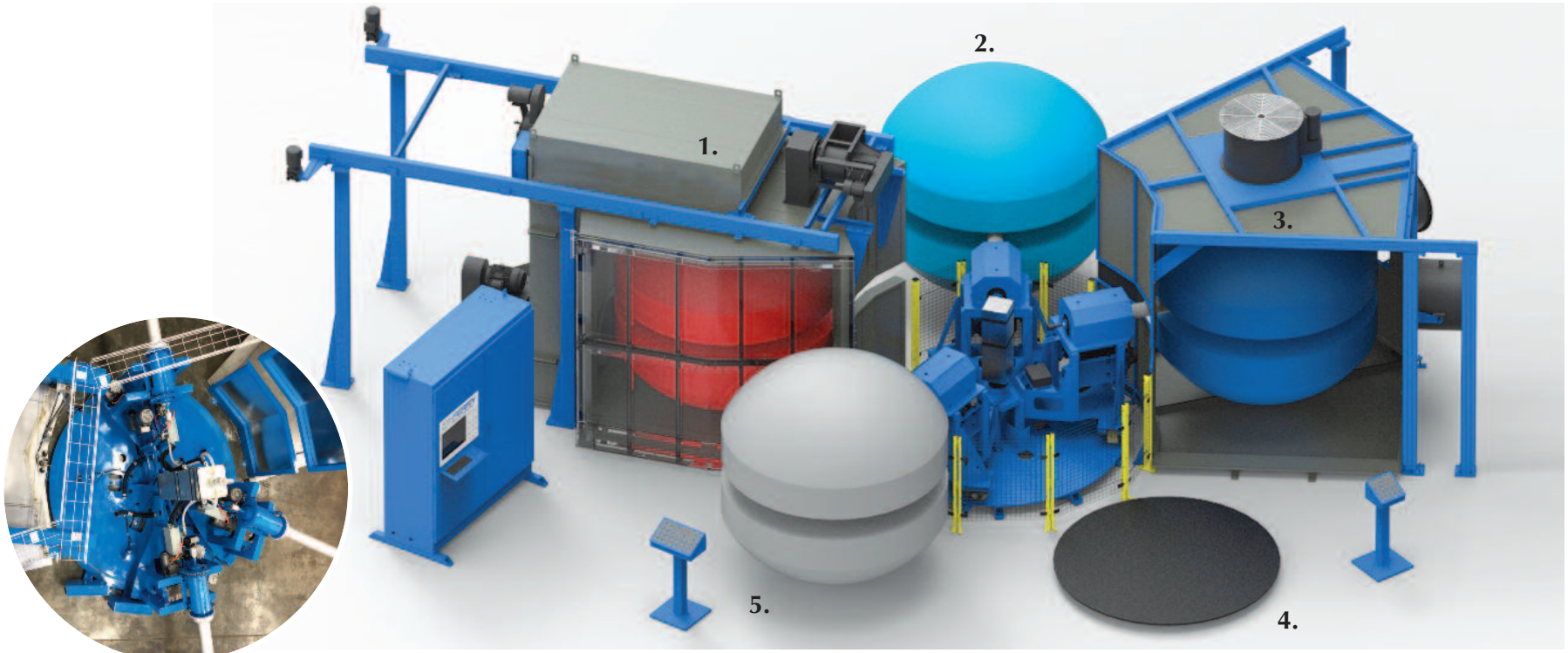
Ferry RotoSpeed™ Machines comprise 45 standard machine models:

- 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™ Independent-Arm Machines - a flexible system for production requirements



RS3-2600
Independent-arm machine center

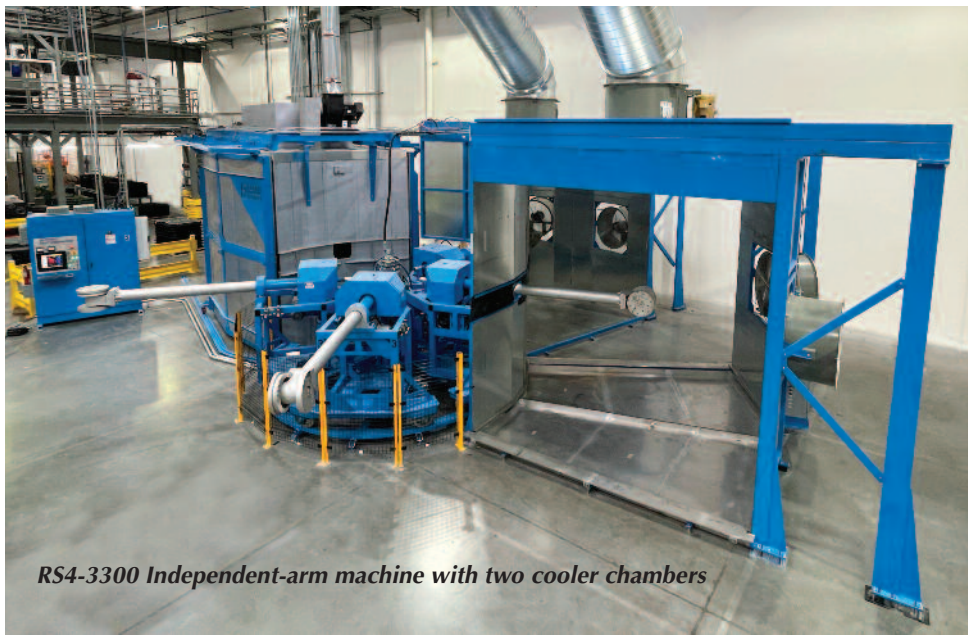
Independent-Arm machines provide five process stations: **1. Oven, 2. Pre-cool, 3. Cooling, 4. Unload, 5. Load**

The RotoSpeed Independent-Arm machines have three arms/carts as standard. However, the machine can be purchased with only one arm/cart and up to three additional arm/carts may be added in the future. A second oven or second cooling station can be provided due to the modular concept of the RotoSpeed independent-arm machine.

Ferry RotoSpeed Independent-Arm machines are equipped with our RotoCure System Manager©, a sophisticated, easy-to-use, Windows®-based control system that includes standard features for process management, report generation, maintenance and fault identification.

Advantages of the RotoSpeed™ Independent-Arm machine are:

- Capability of complete segregation of cure cycle times from one arm to another because each arm/cart indexes independently
- Provides for the arm in the oven to automatically exit to the pre-cool station to prevent over-cure of parts
- High mold weight capacity for each arm/cart assembly
- The most productive machine type
- Any cart can be independently advanced or reversed if the adjacent station is vacant
- Large swing capacity
- The highest efficiency operation



RS4-3300 Independent-arm machine with two cooler chambers

RotoSpeed™ Independent-Arm Carousel Machines

RS3-2800 Independent-arm machine with Offset Arms

Independent-Arm Machines - 18 Sizes

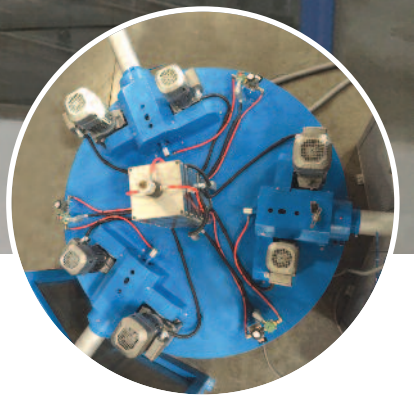
RS-1400
RS-1600
RS-1900
RS-2200
RS-2600
RS-3000
RS-3000 HD
RS-3300
RS-3300 HD
RS-3700
RS-3700 HD
RS-4000
RS-4600
RS-4600 HD
RS-4600 SHD
RS-5000
RS-5500
RS-6000

Custom sizes available

RS3-6000 Independent-arm machine under construction

RotoSpeed™ Fixed-Arm Turret Carousel Machines

RS3-2600 Fixed-Arm Turret



Fixed-Arm Turret 3-Arm machine center

Ferry RotoSpeed Fixed-Arm Turret Machines are available in three-arm or four-arm configurations.

A three-arm turret machine is generally used in applications where the oven, cooling and load/unload cycles for each arm require relatively equal process time.

Four-arm turret machines are used where one part of the process (curing, cooling or loading/unloading) requires up to twice as much time as the other functions, allowing that phase of the process to be split between two stations.

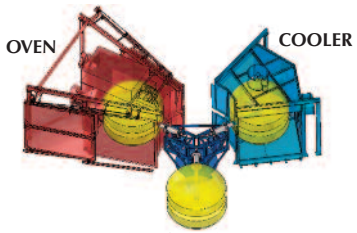
Ferry RotoSpeed Fixed-Arm turret machines are equipped with our RotoCure System Manager© a sophisticated, easy-to-use, Windows®-based control system that includes standard features for process management, report generation, maintenance and fault identification.

Fixed-Arm Turret Machines - 6 Sizes

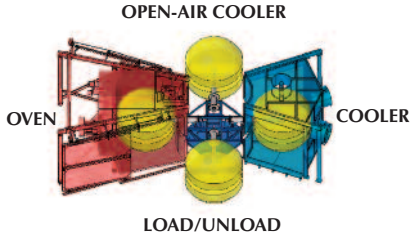
RS-1400	RS-1900	RS-2600
RS-1600	RS-2200	RS-3000

Choose the Turret machine configuration for your processing needs

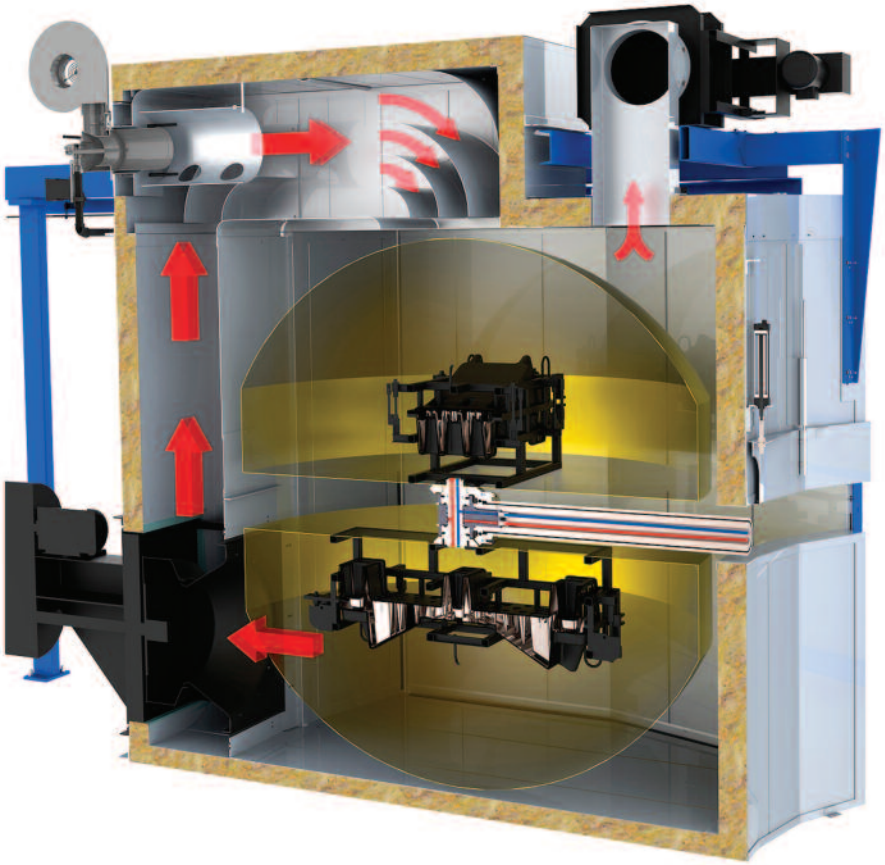
3-ARM

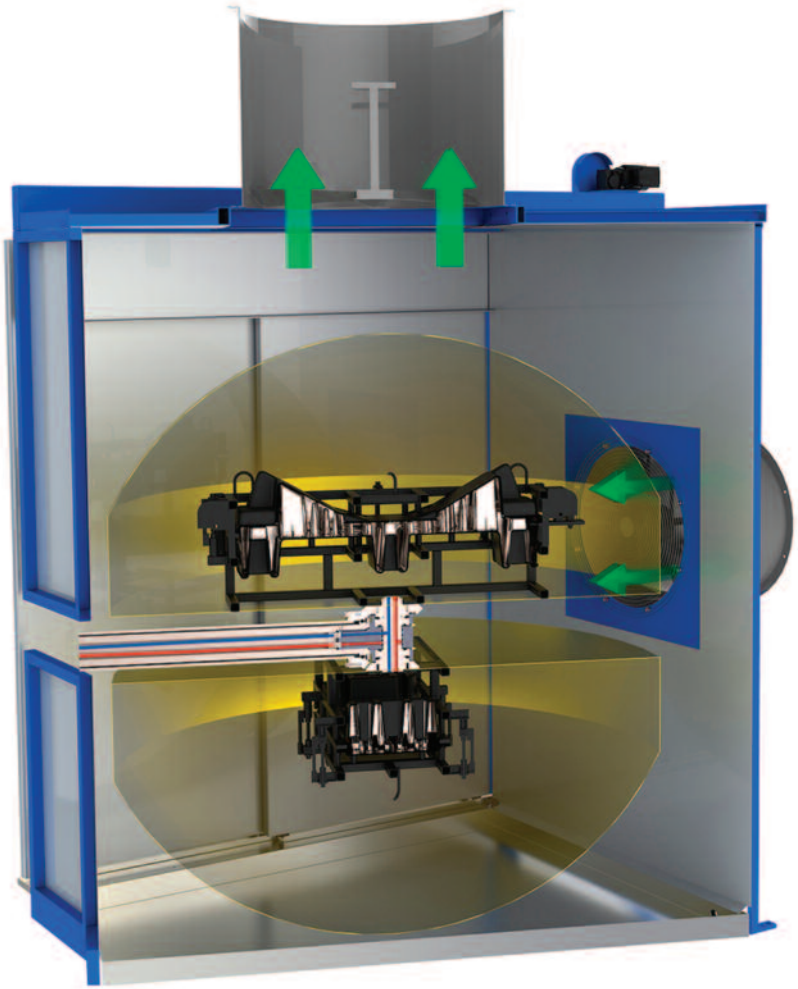


4-ARM



RotoSpeed™ Oven & Cooler Advantages





RotoSpeed Oven are engineered to provide molders with energy savings, fast cycles, quick recovery time and are integrated with RotoCure 7 and IRT for energy and cycle reduction.

- Quick oven temperature recovery
- Fast cook cycles
- Efficient use of energy — savings of 10% gas with management of oven exhaust gas as standard
- Available heat exchangers to recuperate up to 25% of gas consumption
- Variable speed circulation fans to reduce heat loss when doors are open

RotoSpeed Coolers provide molders with energy savings, fast cycles, low-sound levels and are integrated with RotoCure 7 and IRT for energy and cycle optimization.

- High-efficency inlet and exhaust fans are standard
- Optional cooler doors maximize cooling efficiency
- Water mist is provided with programmable cycles

RotoSpeed™ Straight & Optional Offset Arms

Standard straight-arms have a high-weight capacity

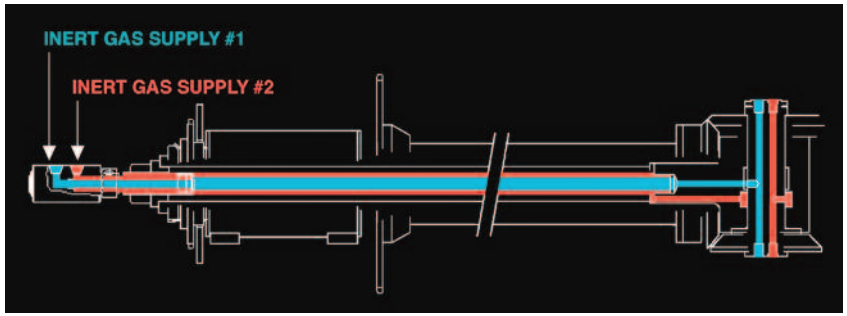
Optional offset arms available as "L" style

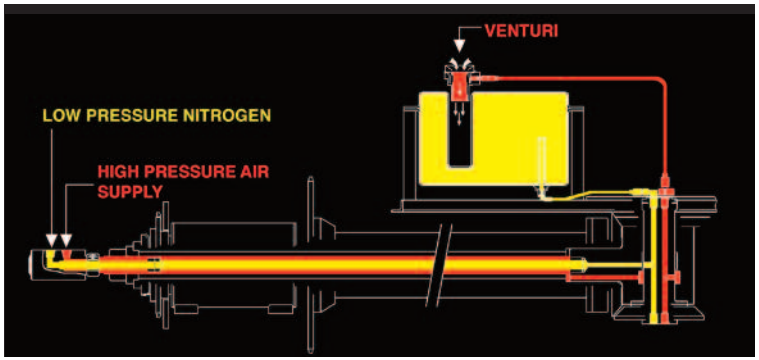
"C" Style Offset Arm; the "C" support is removable

RotoSpeed Arms

- Straight Arms are used for producing at least 1 part per side, or up to many parts per side for high volume production.
- L-Shaped Offset Arms are used typically for molding one large part which can't fit on the straight arm of the same size machine; utilize the swing space more effectively for a single large part.
- C-Shaped Offset Arms are used for heavy and awkwardly mounted parts between two mold plates; parting line and direction of draw facilitates demolding the part with mold mounted and supported at both ends.

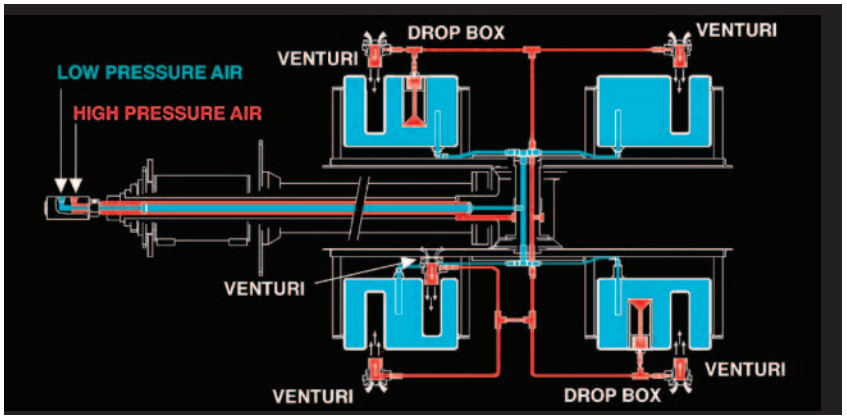
Internal Air Passages





Internal Gas Passages, 1 to 4 per arm, provide molders with options to improve molded parts.

- High or Low pressure gas routes to the mold plates on each arm
- Intergrated to the RotoCure Process control system
- Run inert gas or amplified air to tools or fixtures on the arm or the molds on the arm
- Improve part quality - less scrap



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.

Power operated platform shuttle motion (In/Out) and roll-over safety gate. Powered platforms interlock to machine controls and safeties. All powered platforms come with wireless controller.

Manually-operated platform with integral perimeter guards and stairs.

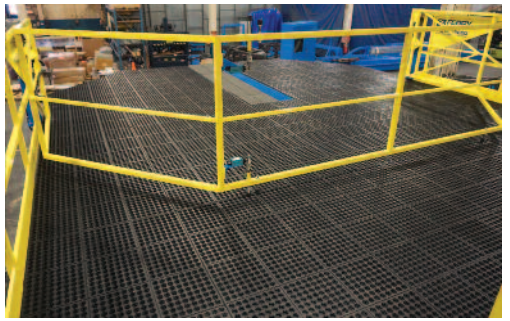
Closed position to work on molds • Opened to allow moving into position around mold on arm

Power-operated platform with integral perimeter guards and stairs.

Roll-over gate in rear position

Roll-over gate indexing

Textured floor surface with caution markings, also available optional rubber mat material.



High-Intensity Mixers

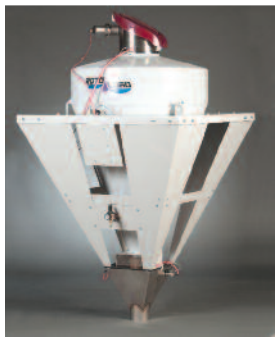
The use of high-intensity mixers will improve the appearance, quality and economies of rotomolded parts through efficient, uniform mixing of a base resin with colorants and additives. High-intensity mixing can maximize color usage, reduce scrap and "borderline" parts, enhance customer satisfaction, resulting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

Full Color Development

Powder-Dispensing Systems



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

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

Machine Interface
- *Live Machine Graphics*
- *Supervisory Control*
- *Fault Diagnostics*
- *Equipment Configuration*

RotoCure
Rotational Molding Machine Process Control

Scalable
- *Single or Multi Machine Capable*
- *Central Production Database*
- *Management Displays & Dashboards*

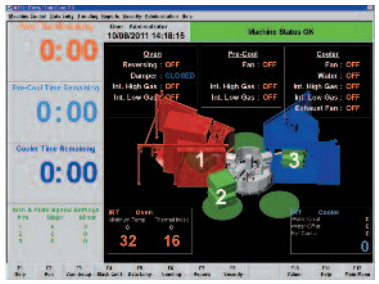
Integrated Process Optimization
- *Temperature modeling with embedded sensors*
- *Cycle optimization based on IR Temperature monitoring*
- *Product Profile Management*

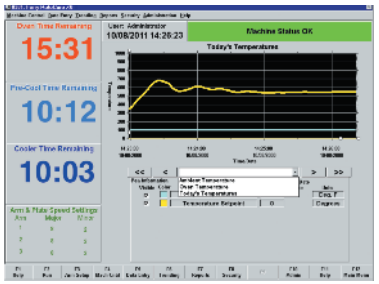
Historical Data Collection
- *Long Term Data Storage*
- *User Customizable Trends*
- *Trending by Production Identifiers (Work Order & Product ID)*
- *Data Export For Offline Analysis*

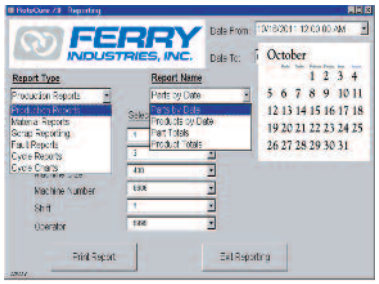
Reporting
- *Machine and Production reports*
- *Reporting by Production Identifiers (Work Order & Product ID)*

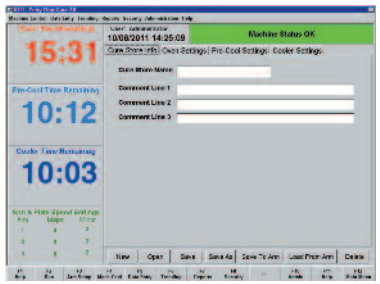
RotoCure 7 System Manager features Ferry's multiple-function software in five distinct sections:
1. Process Management
2. Process Trending
3. Report Generation
4. Recipe Database
5. Maintenance & Fault Monitoring

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


PROCESS MANAGEMENT

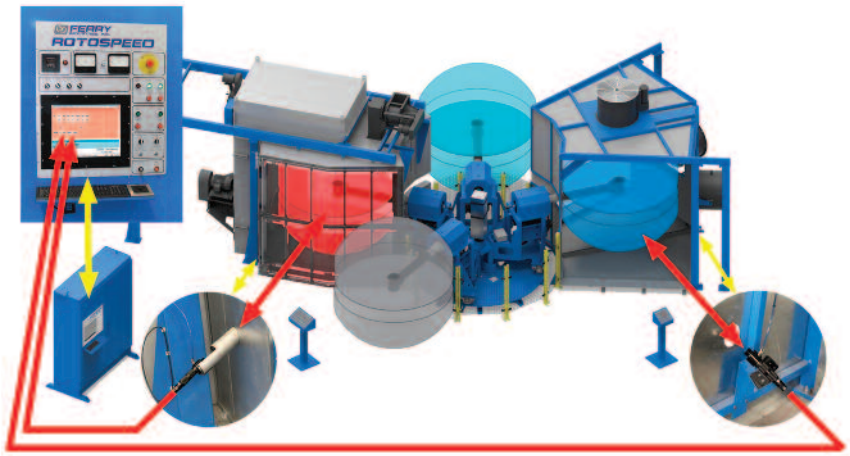

PROCESS TRENDING


REPORT GENERATION


RECIPE DATABASE


MAINTENANCE & FAULT MONITORING

Ferry RotoSpeed™ Cycle & Diagnostics Systems to Optimize Production

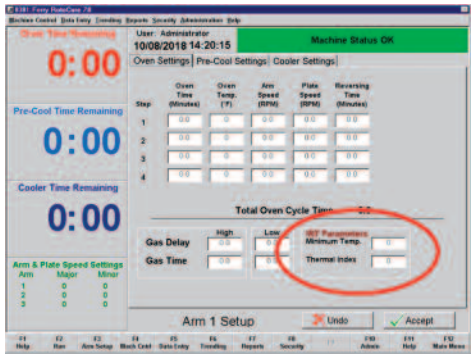


Ferry InfraRed Thermometry IRT™

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:

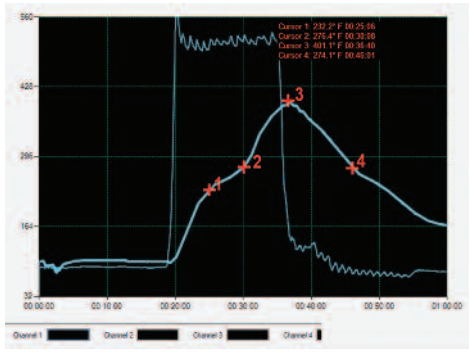
- Decrease scrap due to ambient temperature changes



- 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.

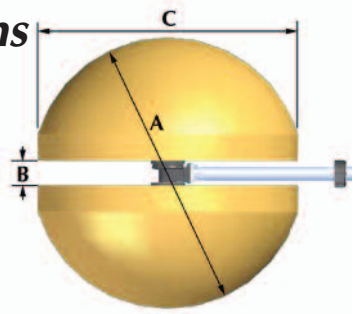
RotoLog Cycle Time Temperature Log

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

Carousel Mold Swing Areas

Straight Arms



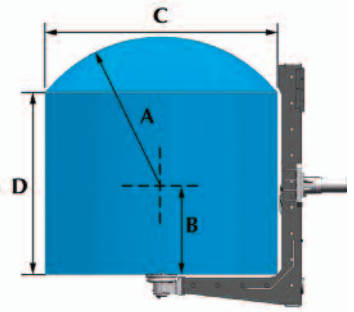
Straight-Arm Models	A Inch	A mm	B Inch	B mm	C Inch	C mm	Weight Capacity lbs	Weight Capacity kg
RS-1400	55	1400	5.5	140	50	1270	1000	450
RS-1600	64	1626	8.5	216	64	1600	1500	680
RS-1900	75	1905	11	279	75	1880	1500	680
RS-2200	88	2235	11	279	78	1981	2200	1000
RS-2600	102	2591	11	279	92	2337	3000	1365
RS-3000	120	3048	11	279	120	3048	4000	1820
RS-3000 HD	120	3048	14	356	120	3048	6000	2730
RS-3300	131	3327	11	279	131	3327	4000	1820
RS-3300 HD	131	3327	14	356	131	3327	6000	2730
RS-3700	145	3683	11	279	131	3327	4000	1820
RS-3700 HD	145	3683	14	356	131	3327	6000	2730
RS-4000	160	4064	14	356	160	4064	6000	2730
RS-4600	181	4600	14	356	175	4450	6000	2730
RS-4600 HD	181	4600	14	356	175	4450	8000	3640
RS-4600 SHD	181	4600	18	457	175	4450	12000	5460
RS-5000	200	5080	18	457	185	4700	12000	5460
RS-5500	218	5537	18	457	209	5309	12000	5460
RS-6000	239	6070	18	457	220	5588	12000	5460

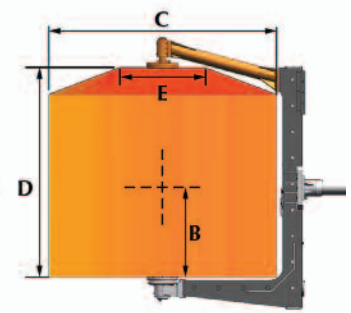
Offset Arms

"L" Style Offset Arm

"C" Style Offset Arm

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





"L" Offset Arms Models	A Inch	A mm	B Inch	B mm	C Inch	C mm	D Inch	D mm	Weight Capacity lbs	Weight Capacity kg
RS-1600	32	813	16	406	52	1321	34	864	800	360
RS-1900	37.5	953	20.5	521	62	1575	41.6	1057	1200	550
RS-2200	44	1118	27	686	66	1676	56	1422	2000	900
RS-2600	51	1295	31.7	805	76	1930	65.7	1669	2200	1000
RS-3000	60	1524	31.6	803	102	2591	63	1600	3000	1365
RS-3000 HD	60	1524	31.6	803	102	2591	63	1600	4000	1820
RS-3300	65.5	1664	34	864	113	2870	67.4	1712	3000	1365
RS-3300 HD	65.5	1664	34	864	110	2794	67.4	1712	4000	1820
RS-3700	72.5	1842	43.5	1105	113	2870	88.7	2253	3000	1365
RS-3700 HD	72.5	1842	43.5	1105	113	2870	88.7	2253	4000	1820
RS-4000	80	2032	43.6	1107	135	3429	86.5	2197	4000	1820
RS-4600	90.5	2299	55.5	1410	143	3632	111	2819	4000	1820
RS-4600 HD	90.5	2299	55.5	1410	143	3632	111	2819	5500	2500
RS-5000	100	2540	58.5	1486	147	3734	129	3277	6500	2950
RS-5500	109	2769	69.4	1763	165	4191	140.7	3574	6500	2950
RS-6000	116	2946	76	1930	170	4318	153	3886	6500	2950

"C" Offset Arms Models	B Inch	B mm	C Inch	C mm	D Inch	D mm	E Inch	E mm	Weight Capacity lbs	Weight Capacity kg
RS-3000	31.5	800	101.5	2578	76	1930	44.5	1130	3000	1365
RS-3000 HD	31.5	800	101.5	2578	76	1930	44.5	1130	4000	1820
RS-3300	34	864	113	2870	84	2134	47	1194	3000	1365
RS-3300 HD	34	864	110	2794	84	2134	47	1194	4000	1820
RS-3700	43.5	1105	113	2870	99.5	2527	42.5	1080	3000	1365
RS-3700 HD	43.5	1105	113	2870	99.5	2527	42.5	1080	4000	1820
RS-4000	43.5	1105	135	3429	108.5	2756	46.5	1181	4000	1820
RS-4600	55.5	1410	143	3632	130	3302	50	1270	4000	1820
RS-4600 HD	55.5	1410	143	3632	130	3302	50	1270	5500	2500
RS-5000	58.5	1486	147	3734	134.5	3416	50	1270	6500	2950
RS-5500	69	1753	165	4191	164.5	4178	33.5	851	6500	2950
RS-6000	76	1930	170	4318	176	4470	42	1067	6500	2950

FERRY INDUSTRIES, INC.

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.