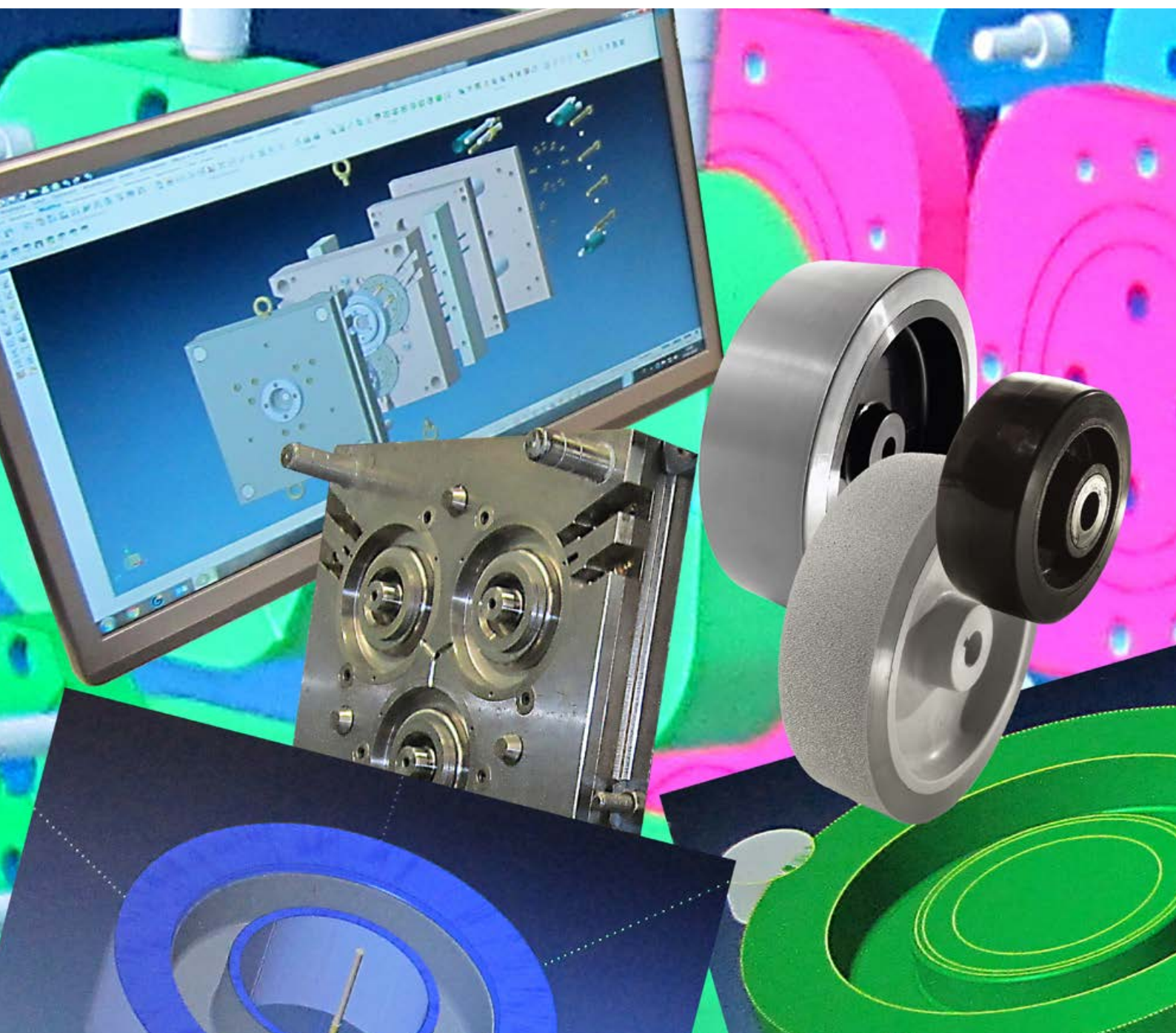




Fabbrica Italiana Ruote

[www.fir.it](http://www.fir.it)



# ELASTIC POLYURETHANE WHEELS

*YOUR IDEAS IN MOTION*

# The Company



## Our Vision, Our Mission

Each day, we commit ourselves, to provide the best value for our customers by using premium raw materials, advanced technologies and qualified personnel. Our aim is to develop innovative products, flexible solutions and superior customer service for safe, smooth and creative mobility systems.

The company mission, summarized in the slogan “your ideas in motion”, is to create value for our customers through the provision of quality, flexibility, innovation and service.

Modena is famous throughout the world for high quality engineering and excellent design. F.I.R. is one of the leading manufacturers of wheels and casters for the industrial and service sectors and is proud to be a part of the Modena engineering tradition.

F.I.R. was founded by Enrico Rota who pioneered the technologies and use of advanced materials that have made the company very successful. Today, F.I.R. is a leading manufacturer of stainless steel casters and wheels in polyamide and polyurethane.

In recent years, the F.I.R. success story has been the result of injection molding of elastic polyurethane. Our wheels are perfect for electric vehicles, robots, scrubber-driers, AGV and indoor mobility systems. The acquisition of a tooling unit in 2014 has made possible the design and building of molds for the production of new wheels and for modifying existing ones. The result is very flexible production and the capacity to design and produce customized products. Our wheels are highly versatile. You can choose color, size, mix of raw materials, bearings and design. The wheels are durable, resistant to chemicals, have an excellent grip and are cheaper than wheels in coated polyurethane.

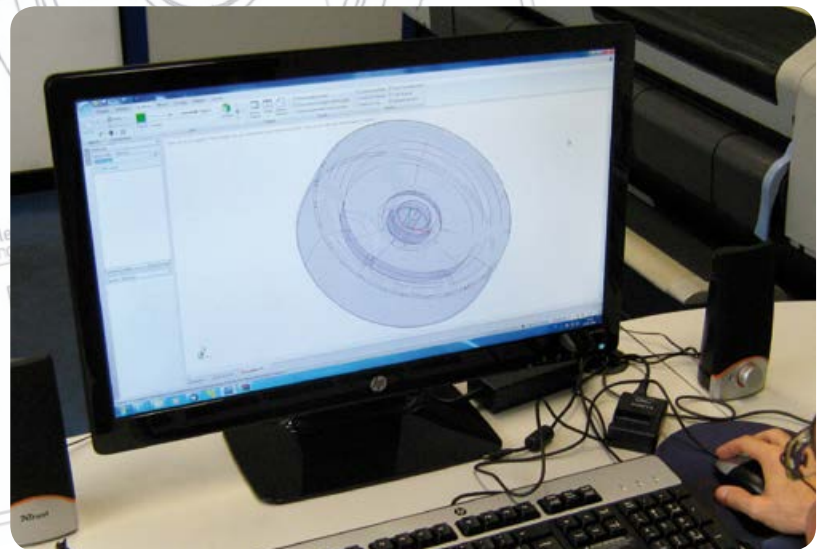


# Your Wheel



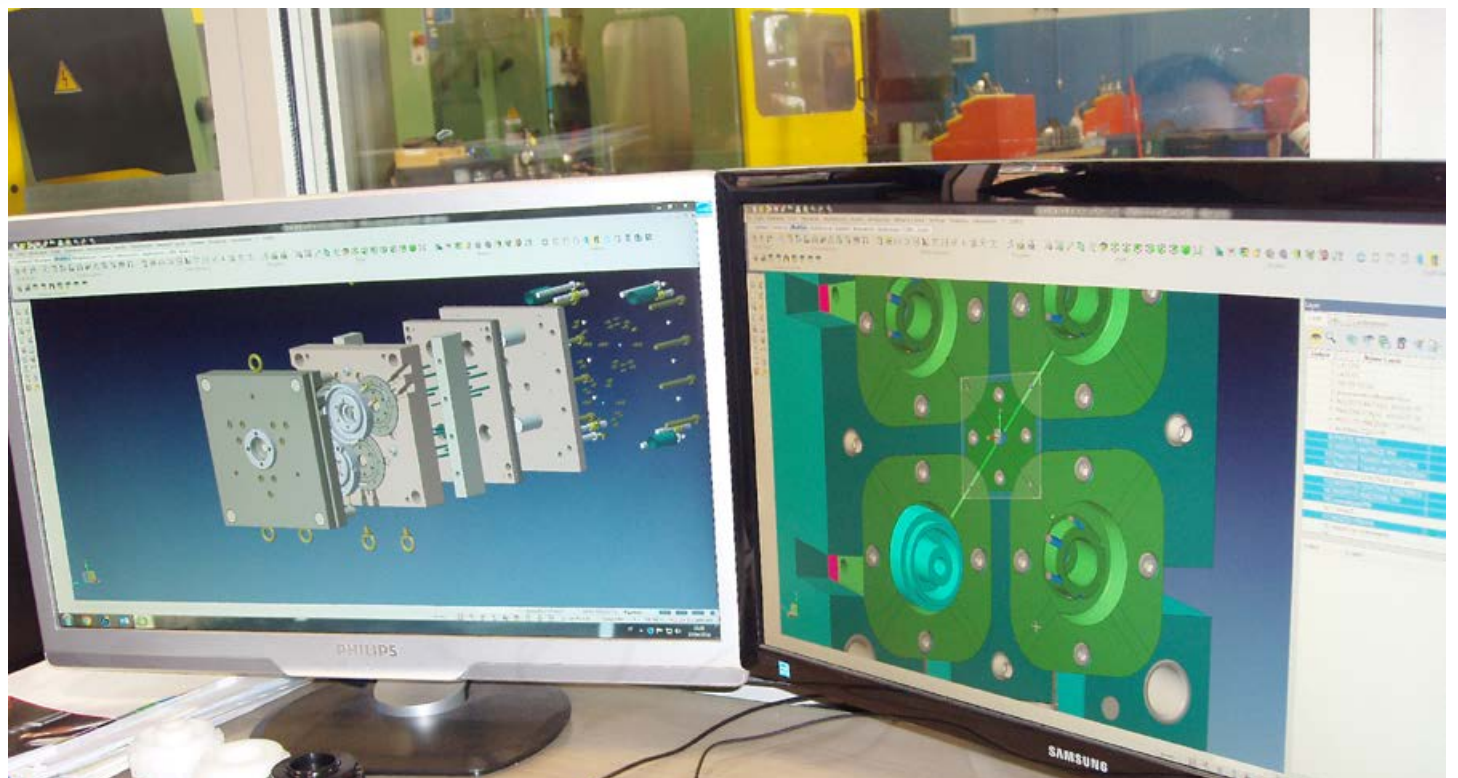
You choose the specifications to meet your requirements. We design, produce and deliver your wheels.

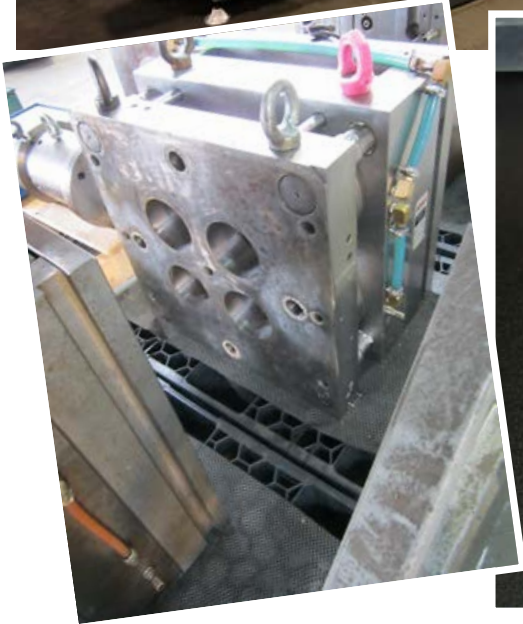
The F.I.R. Technical Department designs innovative products and creates personalized solutions to satisfy all customer needs.



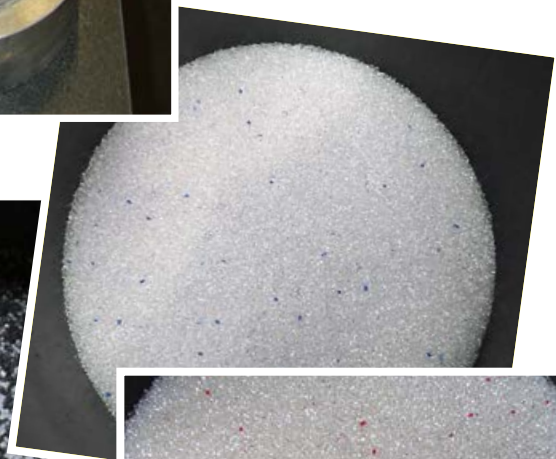
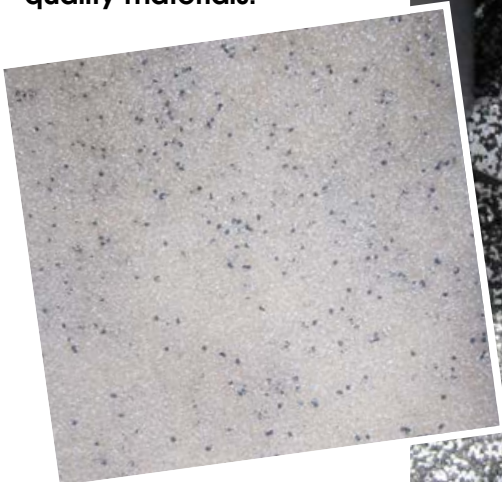
code/Codice cliente: 288/26  
Note:  
- Poliuretano antirivincitura  
- Portata testata 165 Kg a 4 Km/h  
- Nessun olio o altro liquido contaminante sul rivestimento  
Notes:  
- Polyurethane elastic non-marking  
- Capacity tested 165 Kg up to 4 Km/h  
- No oil or other contaminants allowed on tread

The newly integrated Tooling Division has increased flexibility and has enhanced our ability to design and develop customized products to meet your specific requirements.





We only choose top quality materials.



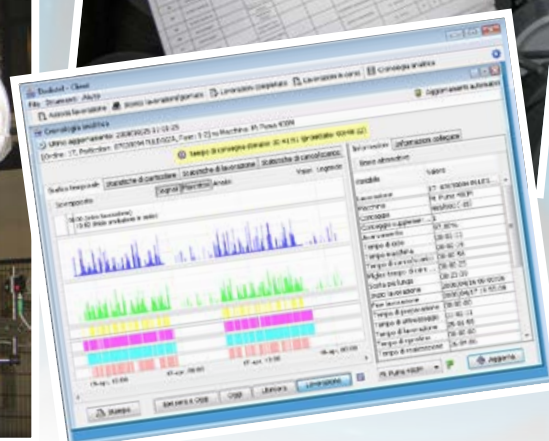
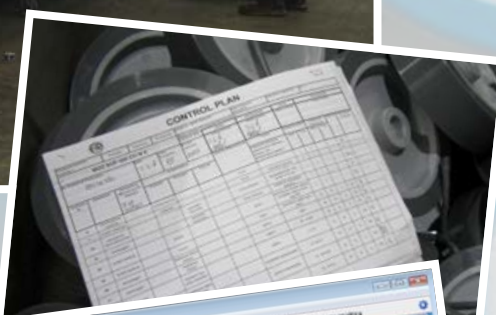
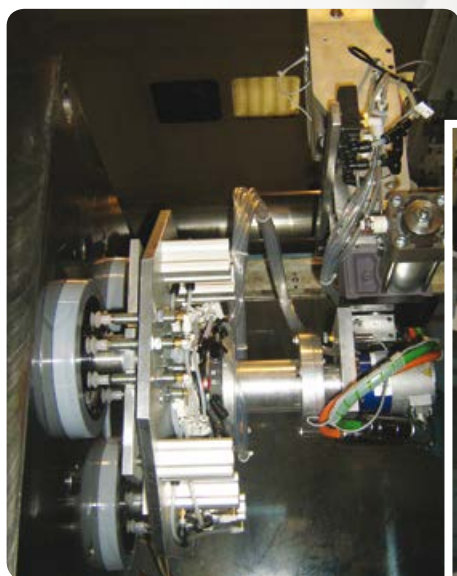
Fabbrica Italiana Ruote

YOUR IDEAS IN MOTION

# Your Wheel

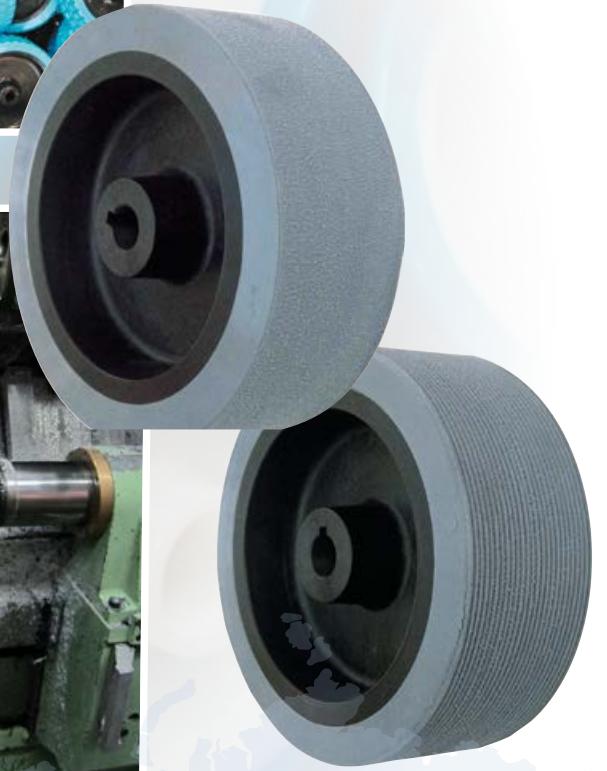
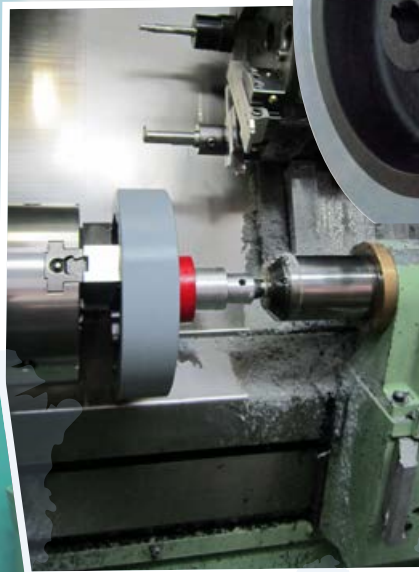


The robotized injection molding equipment is at the forefront of automated technology.





The machining unit finishes the wheel to your precise specification.



**We produce and sell quality.**

F.I.R.'s commitment to innovation is ever-present. We have invested in automation and robotics to increase flexibility and quality. Product quality is monitored throughout the entire production process using modern equipment allowing us to test our products in-house in relation to international standards.

*F.I.R. wheels and casters are manufactured according to the following standards:*

- UNI 9223
- UNI EN 12527
- UNI EN 12532
- UNI EN ISO 9001
- UNI EN ISO 22768-1
- UNI EN ISO 22768-2
- ISO 22884
- REACH
- ROHS II



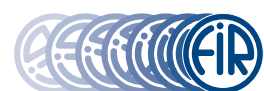




Quality is an important component of F.I.R.'s objectives. F.I.R. has built its reputation over the years by producing high quality wheels and casters. In collaboration with our customers and suppliers, F.I.R. has devoted increasing resources to the improvement of the quality of its products and service in conjunction with customers.



We put health, safety and environment at the heart of our business.



# Product Innovation

F.I.R. is committed to continuous product and process innovation.



- In 2012, F.I.R. was granted the European Patent, Patent no. 2236317
- In 2014 F.I.R. was granted a United States Patent, Patent no. US 8,911,025 B2.
- In 2014, F.I.R. obtained 6 Registered Community Designs for wheels at OHIM, Office for Harmonization in the Internal Market, Trade Marks and Designs:

Registrations no.: 002460139-0001-002460139-0002-002460139-0003-002460139-0004-002460139-0005-002460139-0006

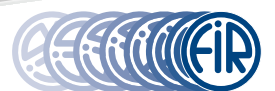
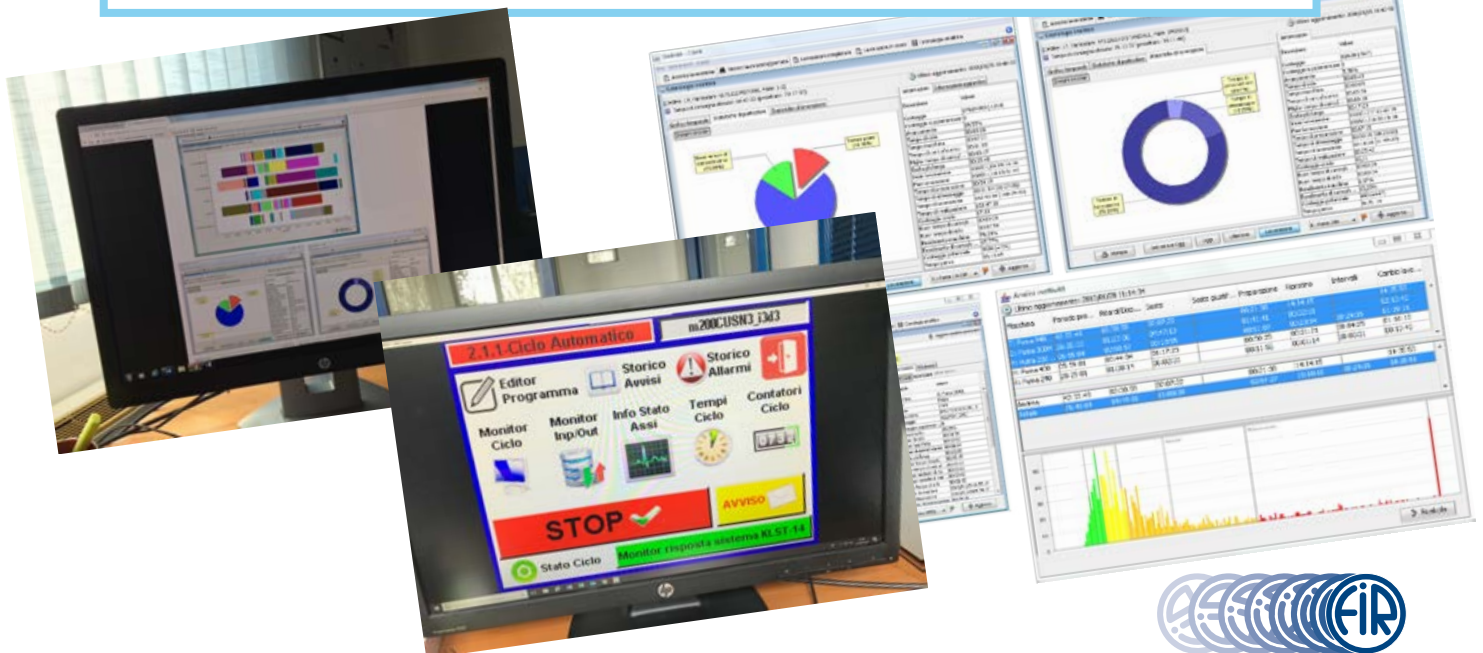
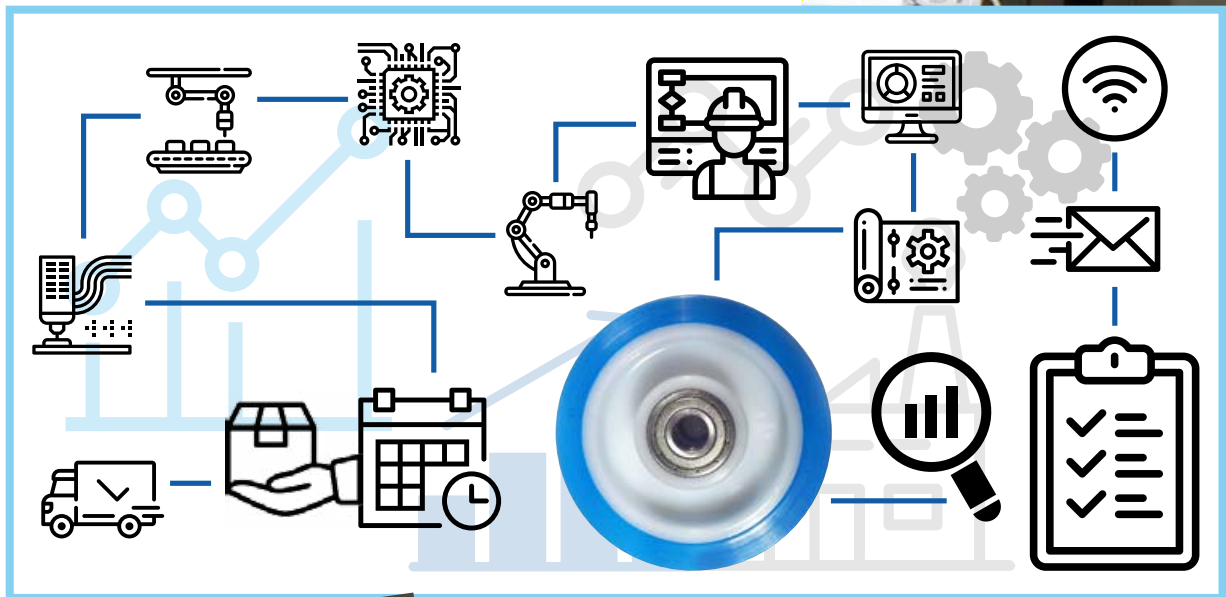
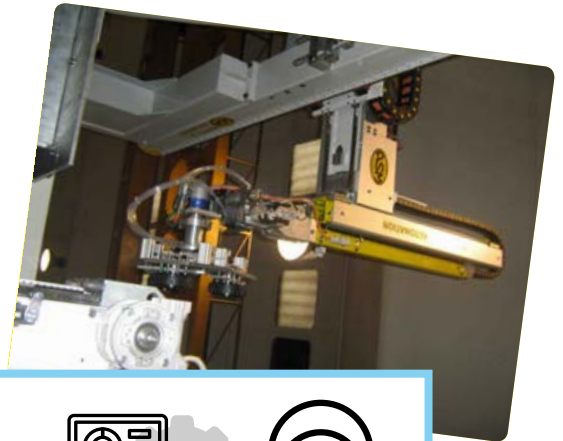


# Process Innovation

The F.I.R. 4.0 objective is the digital integration of purchasing, production and sales. F.I.R. is investing in IT and automation in order to have continually smarter product manufacturing: from product planning to product development, supply chain and sales. We are investing in big data analytics to improve efficiency, reduce costs and increase productivity.



## F.I.R. 4.0



Fabbrica Italiana Ruote

YOUR IDEAS IN MOTION

F.I.R.'s products are shipped from the Modena factory



Fabbrica Italiana Ruote  
www.fir.it

**F.I.R. s.r.l.**  
Via Ho Chi Minh, 2  
41122 Modena - ITALY  
Tel. +39 059 255 77 00  
Fax +39 059 255 77 33  
www.fir.it

We now offer just in time delivery from our logistics hub in the USA at

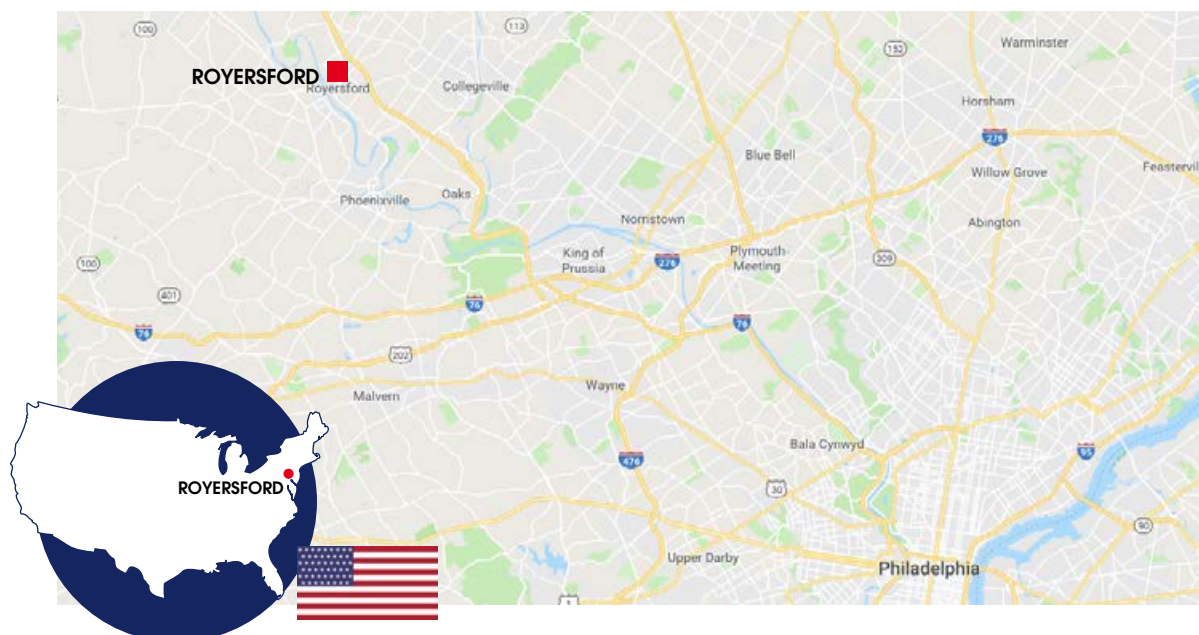
**Royco Logistics**

98 Main Street, Royersford, PA 19468

Phone +1 610 948 4440

Fax +1 610 948 4511

www.royersfordspring.com





Wheel Diameter



Designed and made in Italy



Load capacity



Recyclable



Speed



Shock absorbing



Hardness



Non-marking



Temperature



Non-slip



Price



Noise-free



Plain bore



Resistant to chemicals and detergents



Ball bearings



Choice of colour



Key hole



Custom-made



Flanged hub



Splined hub

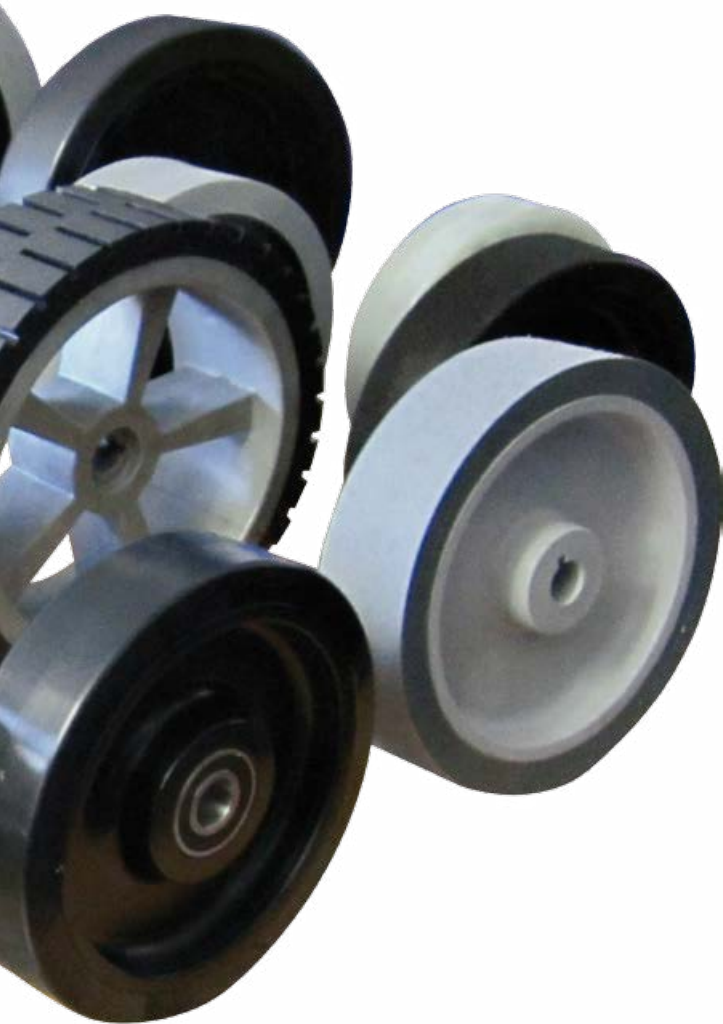
# Create your wheel: Series Alpha

14

## **α** TPU+TPU, thermoplastic polyurethane injected onto a thermoplastic polyurethane center

F.I.R.'s top range, the Alpha series, features a combination of hub and tread both made from top quality TPU. These wheels have both mechanical and chemical interlocking systems making them exceptionally strong. They are ideal for high speed applications of up to 10 km/h or 6 mph. They are very durable and resistant to tearing. The elastic polyurethane, from 70 to 80 Shore A, allows excellent grip and the ability to overcome obstacles. The wheels are noiseless and do not vibrate; they are suited to most surfaces.





from 150 mm to 300 mm  
from 6" to 12"



from 160 kg to 300 kg  
from 350 lb to 660 lb



maximum speed 10 km/h  
maximum speed 6 mph



Hub can be reinforced with fiberglass



from 70 to 80 Shore A

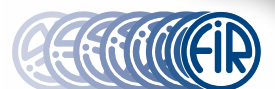


from -20°C to +60°C  
from -4°F to 140°F



Available in different colors, sizes and surface patterns

Available with double ball bearings, key seat or flanged hub



# Create your wheel: Series Beta

16

## **β** TPU+PA6, thermoplastic polyurethane injected onto a polyamide center

F.I.R.'s most popular range, the Beta series, features a combination of hub made in polyamide 6 and tread made from top quality TPU. These wheels have mechanical interlocking system. This series has the best price-quality ratio. The wheels are very strong, durable and resistant to tearing. They are ideal for applications that require a speed of up to 6 km/h or 4 mph. The elastic polyurethane, from 70 to 80 Shore A, allows excellent grip and the ability to overcome obstacles. The wheels are noiseless and do not vibrate. They are suited to most surfaces.







from 150 mm to 300 mm  
from 6" to 12"



from 160 kg to 300 kg  
from 350 lb to 660 lb



maximum speed 6 km/h  
maximum speed 4 mph



Also available in ESD (electrostatic discharge) polyamide and polyurethane



Hub can be reinforced with fiberglass



from 70 to 80 Shore A

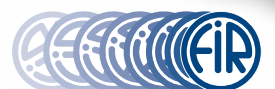


from -20°C to +60°C  
from -4°F to 140°F



Available in different colors, sizes and surface patterns.

Available with double ball bearings, key seat, flanged hub or splined hub.



# Create your wheel: Series Gamma

18

## **γ** TPE+PP, thermoplastic elastomer injected onto a polypropilene center

F.I.R.'s budget range, the Gamma series, features a combination of hub made in polypropylene and tread made from thermoplastic elastomer. These wheels have both mechanical and chemical interlocking systems. This series is best suited for low loads (up to 180 kg or 395 lb) and they are ideal for applications that require a speed of up to 4 km/h or 2.5 mph. The elastic elastomer, from 60 to 80 Shore A, allows excellent grip. The wheels are noiseless and do not vibrate. They are suited to mostly smooth surfaces.





from 150 mm to 300 mm  
from 6" to 12"



from 80 kg to 180 kg  
from 175 lb to 395 lb



maximum speed 4 km/h  
maximum speed 2,5 mph



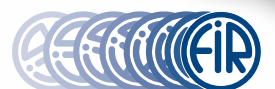
from 60 to 80 Shore A



from -20°C to +60°C  
from -4°F to 140°F

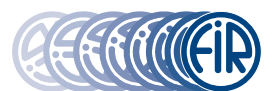


Available in different colors and size.  
Available with double ball bearings.

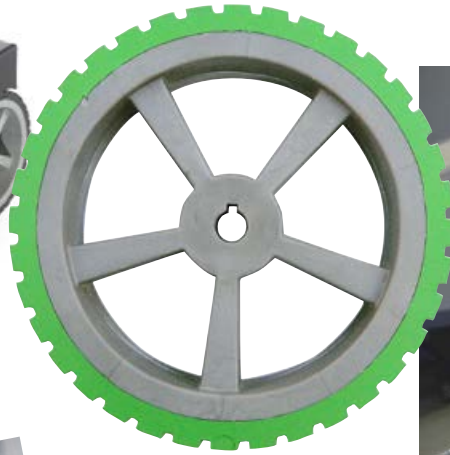


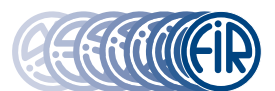
# Custom-made wheels and applications





# Custom-made wheels and applications

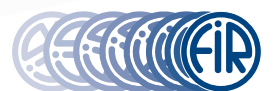
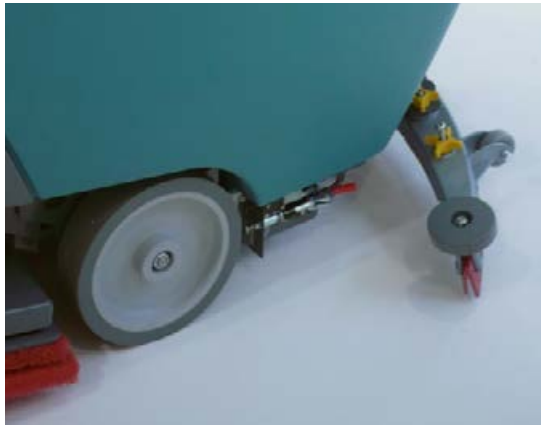




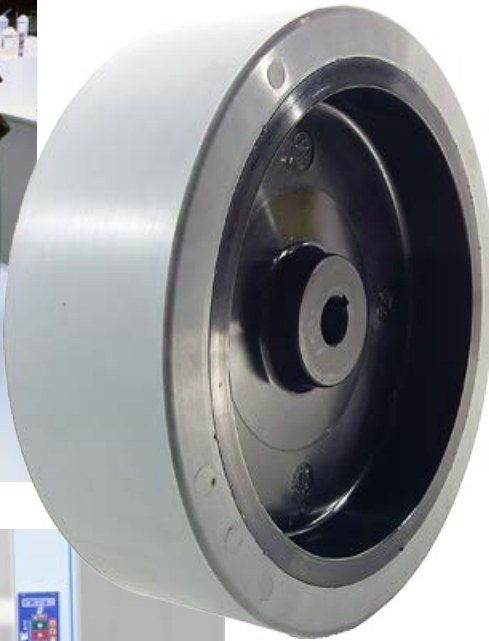
# Custom-made wheels and applications







# Custom-made wheels and applications





# Our classic range

## wheels



From 50 mm to 300 mm diameter  
From 2" to 12" diameter



recyclable



high load capacity



choice of colour



size



choice of hardness



resistant to chemicals and detergents



designed and made in Italy

## bearings



**ZINC-PLATED OR  
STAINLESS STEEL AISI 304**



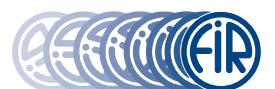
**casters**



**From 45 kg to 1000 kg load capacity  
From 100 lb to 2200 lb load capacity**

Top plate swivel brackets, bolt hole swivel brackets, stem swivel brackets, threaded stem swivel brackets, fixed brackets, brackets with front or rear brake, brackets with directional locking system.

**accessories**



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1985



**RUOTE E SUPPORTI PER L'INDUSTRIA ALIMENTARE**  
**WHEELS AND CASTORS FOR THE FOOD INDUSTRY**

MOVIMENTO ALLE IDEE - YOUR IDEAS IN MOTION

AUTOMATIC - STARTERS	
SPINDEL	SPINDEL
PASTRY - FIRST COURSES	
MIXER	MIXER
SECONDARY - ENTRANCES	
MIXER	MIXER
DRINKS - DESSERTS	
WHEEL	WHEEL

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**HIGH TEMPERATURE WHEELS**

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**WHEELS AND CASTORS FOR THE WINE AND OIL INDUSTRIES**

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**WHEELS FOR PROFESSIONAL CLEANING EQUIPMENT**

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**RUOTE E SUPPORTI PER FLIGHT CASE  
WHEELS AND CASTORS FOR FLIGHT CASES**

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**M-ROLL** RUOTA IN NYLON MONOCUSCINETTO  
SINGLE BALL-BEARING NYLON WHEEL

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**RUOTE E RULLI PER TRASPALLET  
WHEELS AND ROLLER FOR TRASPALLETS**

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## AVAILABLE BEARINGS AND ACCESSORIES



### PLAIN BEARING

Suggested for intermittent wheel use. It will not require further lubrication. However axle tube wear and squeaking can be evident in dusty and gritty work conditions.



### ROLLER BEARING AND STAINLESS STEEL ROLLER BEARING

Suggested for frequent wheel use. It will not require further lubrication and it is ideal for applications involving high radial and low axial loads. Roller bearings are shielded to retain the bearing and to avoid penetration of dust and dirt. Low inertial force.



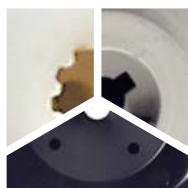
### BALL BEARINGS

Suggested for continuous wheel use. They do not require further lubrication. They are ideal for applications featuring high radial and axial loads. Ball bearings are shielded to avoid penetration of dust and dirt. Waterproof version also available. Very low inertial force.



### DOUBLE BALL BEARINGS

All the wheels shown in this catalogue have double ball bearings with spacer.



### KEY HOLE, FLANGED AND SPLINED HUB

These are suited for drive wheels and adapt to different traction devices.



F.I.R. products are manufactured in compliance with European Directive no. 1907/2006/CE, REACH "Registration, Evaluation, Authorisation and Restriction of Chemicals".



F.I.R. products are manufactured in compliance with European Directive 2011/65/UE, RoHS2 "Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment".



FIR combines quality, innovation and respect for the environment. To this end, we have identified those products that may be recycled or regenerated. We strongly encourage use of these products.



### ● ROLLING RESISTANCE

Rolling resistance is the force necessary to maintain the equipment at a constant speed. This force is inversely proportional to wheel diameter and depends on the type of bearing. It also depends upon the surface conditions and load.

### ● SPEED

F.I.R. casters and wheels nominal load capacities relate to a maximum speed of 4 Km/h ( 1,1 m/s) - 249 mph (1,2 yds/s)

### ● LOAD CAPACITY

F.I.R. recommends calculation of load capacity on a single caster by use of the formula (equipment weight + solid load)/3 and (equipment weight + liquid load)/2. Please ask our technical staff in relation to load requirements close to the maximum carrying capacities

### ● TEST CONDITIONS

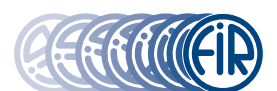
Load capacities and tests are determined according to the ISO 22884, UNI EN 12527, UNI EN 12532 Standards. They refer to use under normal conditions: 1) TEST LOAD = nominal load 2) TEST SPEED = 4Km/h  $\pm$ 50 m/h or 249 mph  $\pm$ 55 yds/h 3) TEST TEMPERATURE = 20°C  $\pm$  10°C or 68°F  $\pm$ 50°F 4) SURFACE in good conditions, hard and solid, with obstacles having the following characteristics: height equal to 5 % of wheel diameter in the case of soft tread (up to 90 Shore A); equal to 2.5% of wheel diameter, in the case of hard tread (beyond 90 Shore A). 5) CYCLE: sequence of cycles each 4 minutes maximum, included a maximum pause time of 25% of the cycle duration.

### ● ENVIRONMENT CONDITION

F.I.R. casters and wheels are manufactured in controlled production processes using the highest quality materials. The following standard conditions are considered as "normal working conditions":  
- temperature range: +5 °C to +30 °C +41°F to +86° F - relative humidity: 40% to 80% - no direct sunlight exposure - no aggressive physical or chemical agents

### ● STORAGE

F.I.R. recommends that products are stored in a ventilated environment, with temperature between -10 °C -50° F and +30 °C - +86° F without high humidity and protected from dust. Do not store for long periods of time, and protect from direct sunlight.







**Fabbrica Italiana Ruote**

[www.fir.it](http://www.fir.it)

## Why choose F.I.R.:



### EXPERIENCE

we have been producing wheels and casters for more than 30 years



### TOTAL QUALITY

F.I.R. Quality Management System is in compliance with UNI EN ISO 9001:2008 standard.



### INDUSTRY 4.0

we believe in smart manufacturing and we are committed to create a continually smarter factory



### INNOVATION

we are at the forefront of polyurethane injection processes. We are committed to continuous process and product innovation



### SUPPLY CHAIN

we choose the most reliable suppliers and the best performing materials



### LOGISTICS

we offer fast delivery from our factory in Modena, Italy and from USA logistics hub in Royersford, PA



### COLLABORATION

we create and supply value by interacting with our customers. Our slogan "your ideas in motion" summarizes our mission



### LEAN MANUFACTURING

we believe in continuous improvement and apply "lean manufacturing".



### CUSTOMER SATISFACTION

we provide prompt response, value for money and fast delivery to our customers



### FLEXIBILITY

we meet special and individual requests by designing and developing custom-made products



### CONVENIENCE

we provide a top class service by bringing together product quality and client convenience



### ENVIRONMENT

we comply with European standards for the protection of the environment



### MADE IN ITALY

we produce and sell "made in Italy"



To see the complete range of F.I.R. wheels and casters visit [www.fir.it](http://www.fir.it)

*YOUR IDEAS IN MOTION*



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Fax +39 059 255 77 33  
[sales@fir.it](mailto:sales@fir.it)



Azienda con  
sistema di gestione  
UNI EN ISO 9001:2015  
certificato

Quality  
management  
system ISO 9001:2015  
certified company