

Siif

and your casting fits

THE BEST FINISHING FOUNDRY SOLUTIONS WORLDWIDE



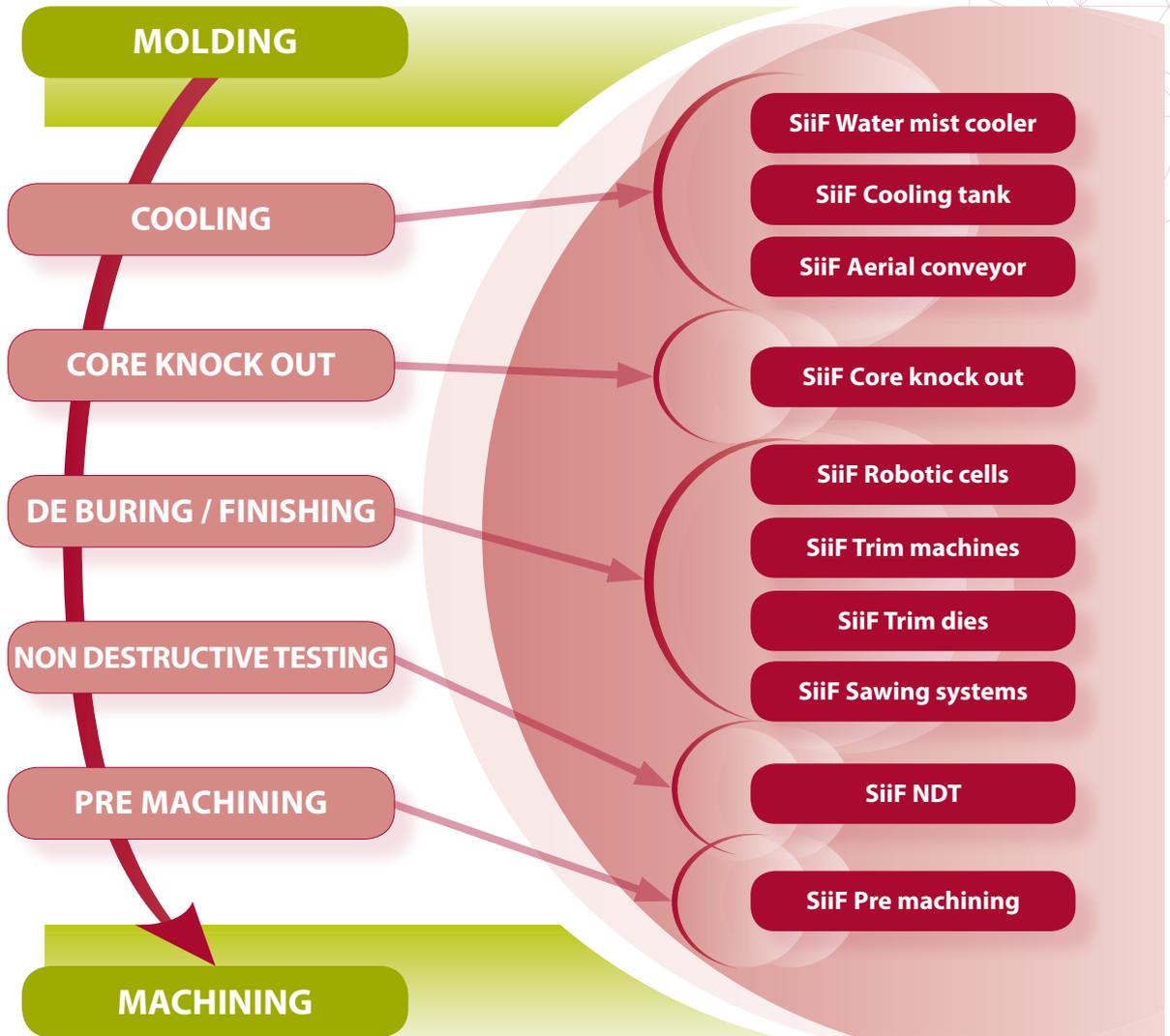
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Finishing in Foundry



Foundry Process

Foundry Process



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Expertise through experience



SiiF is the leader in foundry finishing equipments for iron, aluminum and steel castings.

Research, development of new techniques and innovation allows **SiiF** to propose an extended range of machines for foundries specific needs.

SiiF is represented throughout the world and has installations running in all continents. **SiiF** adds to **SERF** know how in all foundry techniques all the experience in robotic finishing developed during the last years.

SiiF activities include:

- Engineering of new projects
- Manufacturing and tuning in **SiiF** workshop
- Installation and run off in foundries in Europe, America, Africa and Asia
- The after-sales service and supply of spare parts

Our company has more than 30 years experience in foundry finishing

Cooling

Cooling

WATER / AIR – Water Mist

SiiF has engineered a cooling process using water mist.

The advantage of this solution is a fast cooling without damping the castings, in particular for cored parts.

It avoids thermal shocks that could generate micro cracks in the castings with thin sections.



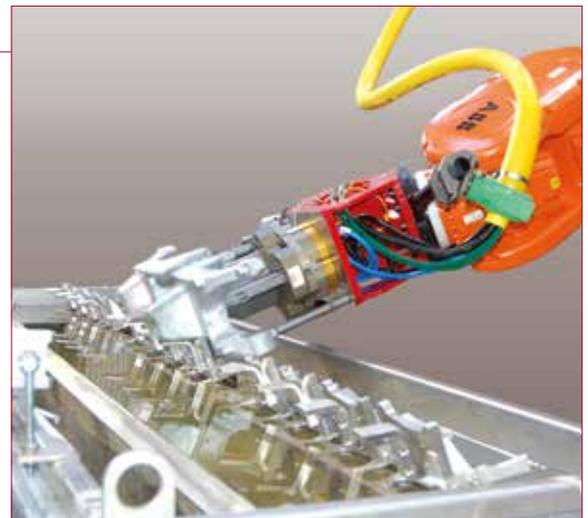
→ Water mist system

WATER – Cooling tank

SiiF engineers cooling systems where castings are immersed in water.

This solution is adapted to non cored castings.

- Low cost
- Compact solution



→ Water cooling tank with lift devices

AIR – Overhead conveyor

SiiF installs overhead conveyors for air cooling of castings.

The advantage is a natural cooling, buffering of a large number of castings and transfer to various workstations without the need of forklift trucks.



→ Overhead conveyor

Core Knock Out

Core Knock Out

Core Knock Out

SiiF core knock out machines are an efficient solution for removing the core sand out of the castings.

The range includes several sizes for all types of castings.

The "R" (for rotation) type core knock out machine has been engineered for tighter and tighter tolerances on remaining sand.

The SiiF system (patented) allows turn over of the castings (0 to 360°) during vibration phase. This optimizes cycle time and casting cleanliness.

Cycle time can be reduced by 30% compared to a standard CKO machine.

- Automatic check of hammer frequency
- Automatic check of vibration amplitude
- Heavy duty holding mechanism



→ "C" type core knock out machine



→ "R" type core knock out machine frame

Technical Data

	Processed castings	Castings size	Castings weight	Rotation 0 to 360°
"C" type core knock out machine	Cylinder head Turbo housing Control arm Manifold	Up to 300 mm x 450 mm x 750 mm	< 80 kg	No
"B" type core knock out machine	Engine block (up to 1000 kg) Casting for radiology application (300kg) Cylinder head for truck (200 kg)	Up to 300 mm x 450 mm x 750 mm	> 80kg	No
"R" type core knock out machine	Cylinder head	Up to 300 mm x 750mm x 750 mm	< 80 kg	Yes

Robotized cell

Robotized cell for aluminum castings

Robotized cell

Robotized cells for aluminum castings (*gravity, low pressure, HPDC*) are engineered for the following tasks:

- Handling (*mold unload, load downstream process*)
- Sawing of runners, air vents, risers
- De burring of parting lines
- Other tasks such as pre machining of specific areas or size qualifying

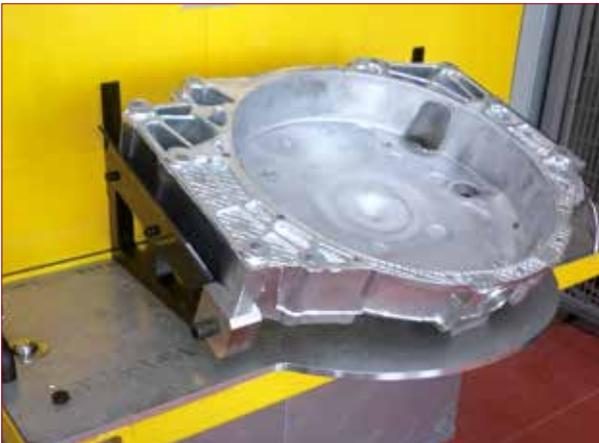
● High flexibility

(up to 200 types of casting processed per cell)

- Output from 20 to 100 p/h with one robot
- Robot carries the castings or the tools
- Automatic tool change



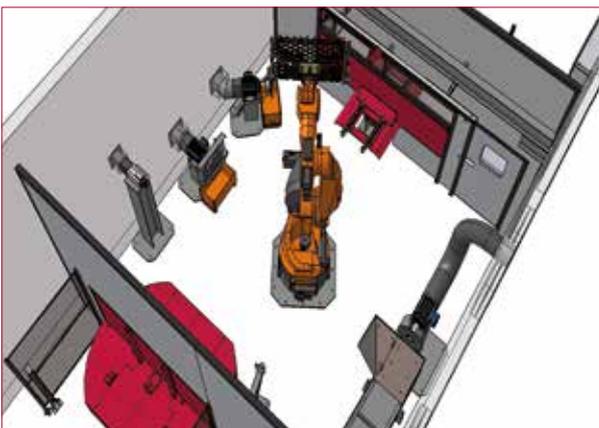
→ Robotized cell for aluminum castings



→ Truck clutch housing



→ Sawing station (control arm)



→ Feasibility study

Robotized cell

Robotized cell for iron and steel castings

Robotized cell

Robotized cells for finishing parts cast in grey, SG iron or steel are ideal for low or medium volumes.

Following work can be done:

- *Sawing of in gates and riser gates*
- *De burring of parting line and openings*

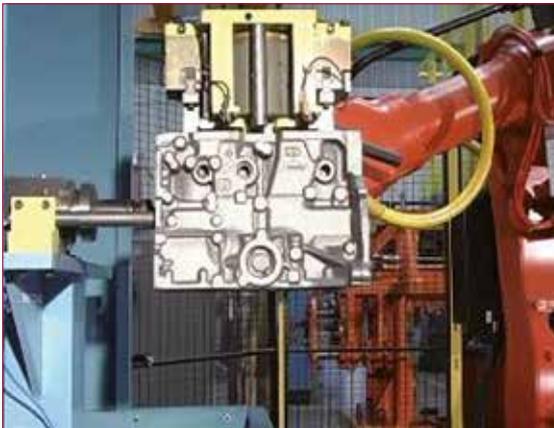
- **High flexibility**

(up to 200 types of casting processed per cell)

- **Output from 20 to 100 p/h with one robot**
- **Robot carries the castings or the tools**
- **Automatic tool change**



→ Robotic cell for iron parts
(145 shaker arms /h, 280 differential cases /h)



→ Finishing of a water pump



→ Grinding cell



07 → Automatic tool change



→ Feasibility study

Rotary trim machine

Rotary trim machine

Rotary trim machine

Siif has engineered rotary trim machines for finishing castings produced in high volumes.

Three station for trimming the parting line and four station for multidirectional trimming of parting line and core prints.

Linked to a non destructive testing line, the equipment is the ideal solution for safety related parts such as brake anchor, brake calipers, control arms, knuckles, etc...

Following options are available:

- Scrap conveyer
- Gantry for tool change
- Link to testing line



→ Four station rotary machine with differential case tooling

Casting	Production
Knuckle	Up to 800 p/h
Brake caliper	Up to 1000 p/h
Manifold	Up to 450 p/h
Compressor housing	Up to 900 p/h
Control arm	Up to 450 p/h



→ Four station rotary machine with brake caliper tooling

Technical Data

	3 stations		4 stations	
			1 st station	2 nd station
Force /T	80	150	150	30
Opening /mm	900	900	900 / 1000	900 / 1000
Maxi casting size /mm	300 x 450 ht 200	300 x 450 ht 200	300 x 450 ht 200 300 x 600 ht 200	300 x 450 ht 200 300 x 650 ht 250
Number of cycles /h	500	500	400 to 500	400 to 500

Shuttle trim machine

Shuttle trim machine

Shuttle trim machine

SIIF has developed a complete range of shuttle trim machines for single plane trimming.

Used for trimming brake parts, knuckles, manifolds, brackets etc. either in iron or aluminum.

They can process up to 500 p/h (2 parts at a time) depending on the height and size of the part.

Following options are available:

- Automatic casting unload
- Scrap conveyor
- Gantry for trim die change
- Link to testing line
- Side trim
- 180° turn over of part support on shuttle (for pressure die cast)



→ Trimming machine for HPDC castings with turnover shuttle for lower die cleaning



→ Robot loading of "Arcade" trimming machine



→ "Arcade" trimming machine with shuttle

Technical Data

Force /T	30	60	80	100
Opening /mm	900	900 to 1320	900	900 to 1130
Maxi casting size /mm	300 x 450 ht 200			
Number of cycles /h	250	250	250	250
Average energy /kW	18	22	30	35

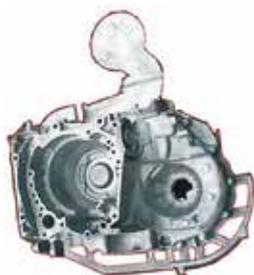
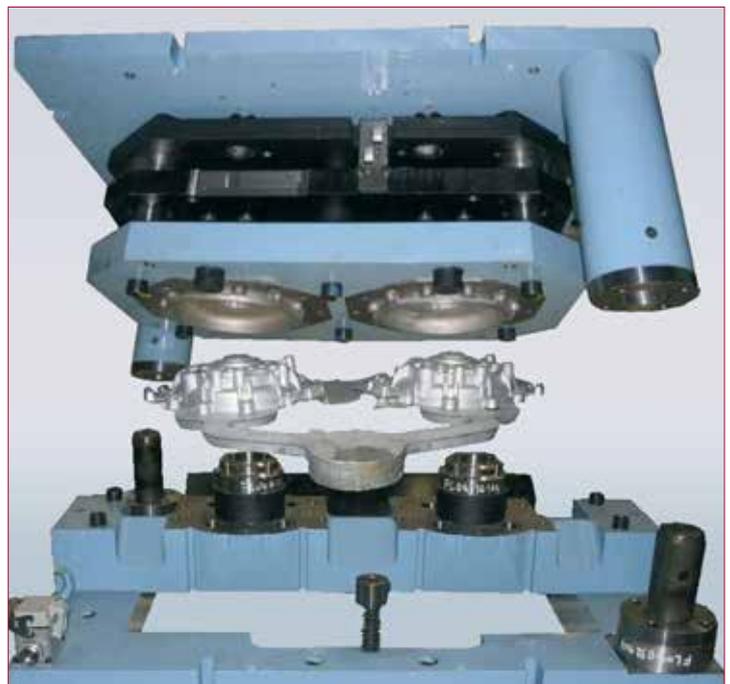
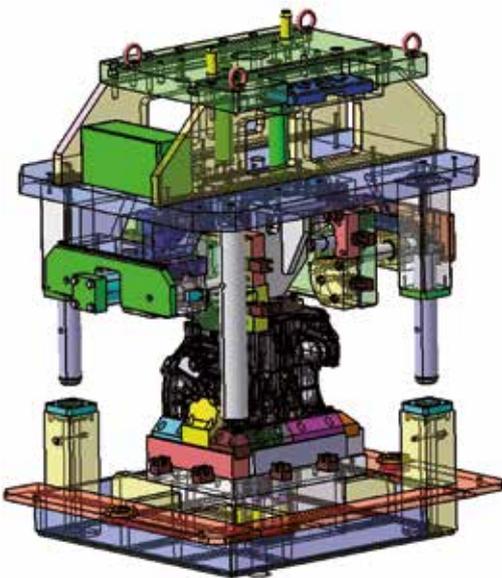
Trim dies for aluminum

Trim dies for aluminum castings

◀ Trim dies for aluminum

Siif provides trim dies for aluminum castings produced in high pressure, low pressure or gravity die casting. The trim dies are designed for middle and high volume production and makes possible the combination of de-gating, braking off risers and cutting off burs simultaneously.

Very constant in dimensioning and with a high lifetime they allow a calibration of the produced castings before machining.



Trim dies for iron castings

Trim dies for iron castings

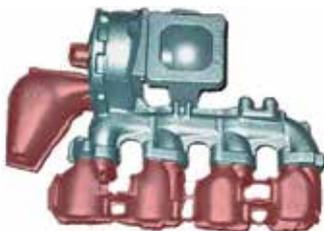
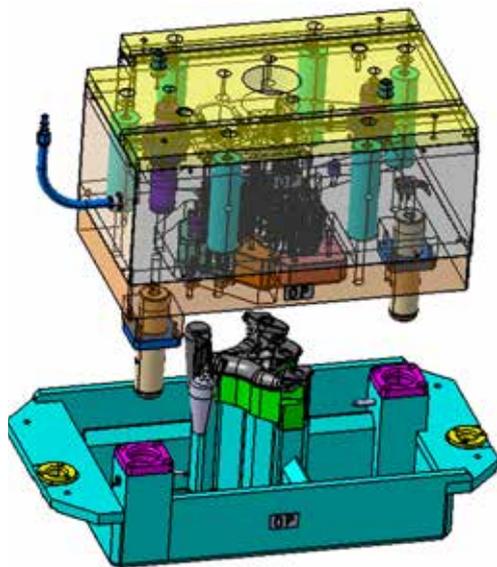
Trim dies for iron

SiiF engineers and manufactures trim dies for all types of iron (*grey and SG iron*) castings.

The SiiF unique design makes possible the combination of de-gating, braking off risers and cutting off burs simultaneously.

On SiiF trimming machines the output rate reaches 1000 p/h.

Cutters are made out of the highest grade steels for a precise and repeatable finishing. Cutters' life goes up to 1 million cuts.



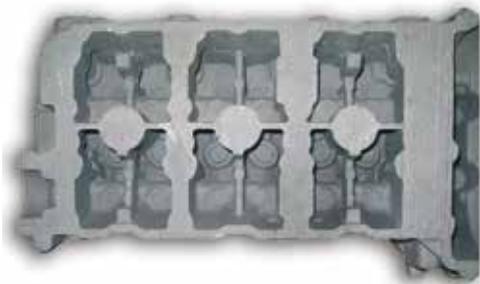
Sawing systems

Sawing systems

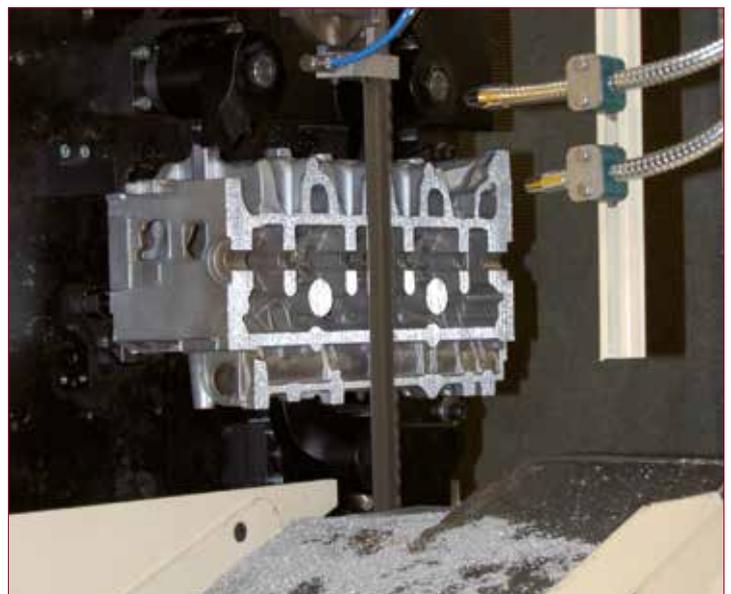
◀ Sawing - Cutting

Siif has engineered bandsaw and circular saw systems for different types of aluminum castings.

- *Cylinder heads*
- *Frame parts*
- *Suspension arms*
- *Knuckles*
- *Engine blocks*



→ *Circular saw, overview*



→ *Bandsaw*

Non destructive testing

Non destructive testing

Non destructive testing

SiiF has developed non destructive testing lines for critical parts as brake calipers, knuckles, control arms, suspension parts, etc.

Directly linked to trim machines or stand alone they guarantee that all tests are performed following final customer specifications and allow no interpretation as limits for acceptance are set in specific programs.

Bad castings are automatically rejected, good castings are marked.

Available tests:

- Eddy current for hardness
- Ultrasonic for nodularity, wall thickness, shrink
- Resonance frequency for nodularity
- Magnetic particles for cracks
- Laser for dimensional testing
- Die penetrant for cracks on aluminum
- X-ray for internal defects

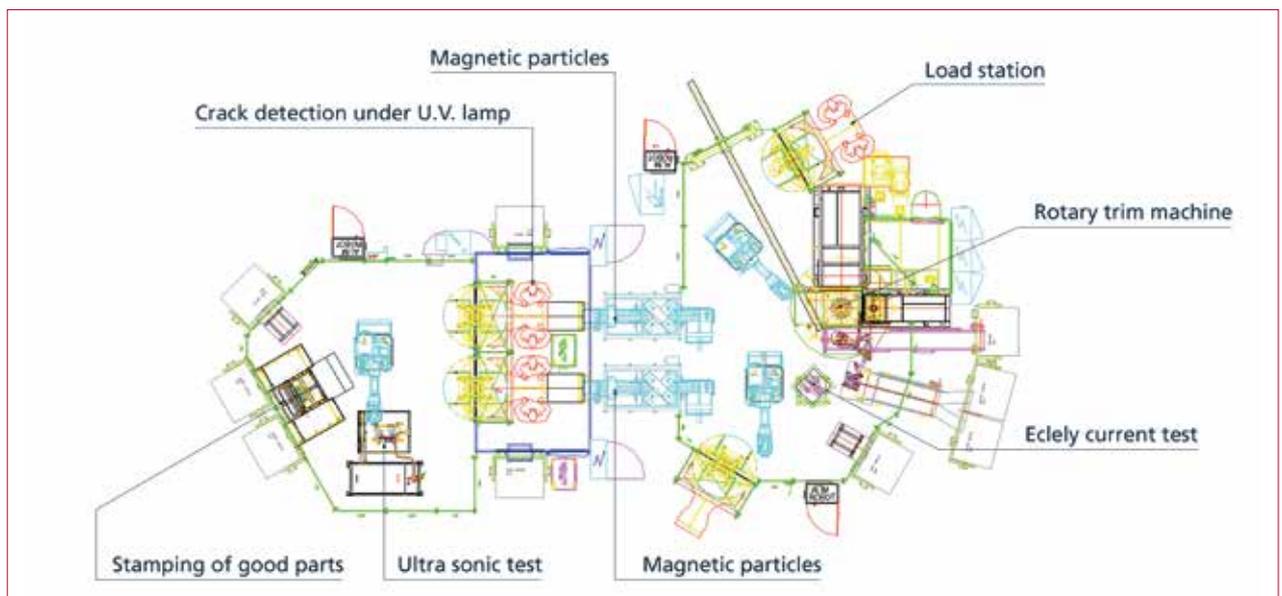
Castings are moved from station to station either by high speed manipulators or robots.



→ Trimming machine and testing line for suspension arms



→ Tandem of 2 magnetic particle lines (800 p/h)



→ Trim and test line for knuckles and control arms - output : 800 p/h

4 Face grinding, pre machining

4 Face grinding, pre machining, cubing

4 face grinding

For the finishing of iron engine blocks and cylinder heads **Siif** proposes 4 face grinding machines.

The machines are designed for high speed and longlifetime.

Output: 300 p/h

- High output rate
- Compact design



→ 4 face grinding

Pre machining

Siif developed a pre machining center for cylinder heads and engine blocks (*milling, drilling, etc.*).

Output: 100 p/h

- High output rate
- Compact design



→ Pre machining

Cubing

Siif also proposes cubing cells for aluminum cylinder heads; these cells have a compact design and are designed to fit in limited space.

Output: 150 p/h

- High output rate
- Compact design



→ Milling spindle



→ Cubing machine aluminum cylinder head

Our services

Our services

Training

- *Operator*
- *Robotics*
- *Automation*
- *Maintenance*

Remote service

SiiF offers online assistance with the possibility of remote service for the delivered equipments

Our after sales service center proposes:

- *Diagnostics and equipment customized services*
- *Wear and spare parts (cylinders, bushes, mechanical parts, pumps, blades, ...)*
- *Reconditioning of trimming machines, trimming tools, sawing equipment and others*

Our service center proposes the after sales service for all SERF and SiiF equipment.

Package robotics

(Trajectories- Tooling- Commissioning)

SiiF proposes for new castings the off line pre programming, it is the best way to increase the pay back of robotized cells with quick production ramp up.

By using 3D casting files we propose:

- *The design and manufacturing of tooling and grippers*
- *The development of the finishing trajectories in off line programming*
- *The quick ramp up of production at customer's site*





Some of our customers:

Brasil: Honda, SEW, Fagor

Bulgaria: Montupet EOOD

China: Teksid, FAW, SAIC

France: Renault, PSA, SIF St Quentin, La Rhodanienne,
St Jean Industries, Montupet, LFA, Heinrich, Groupe Arche

Germany: Daimler, Nemak/Rautenbach, KSM, St Jean Industrie,
Honsel, Weigl

Hungary: Weslin

India: Neosym, Brakes India, Hinoday, Rico, Kirloskar

Italy: Teksid, Isotta Fraschini

Poland: Volkswagen

Portugal: Funfrap, Sakthi

Romania: DACIA

Serbia: Le Belier Kikinda

Slovenia: Talum

South Africa: AIF ZF, Girling, Autocast

Spain: Fagor, Infun, ALA

Turkey: Ay Dokum, Ferro Dokum, Demisas, Trakya Dokum

USA: GM, Grede, HMAc, Waupaca, DMI, Nemak, Urick, Neenah

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Technical data are subject to changes and adjustments.

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