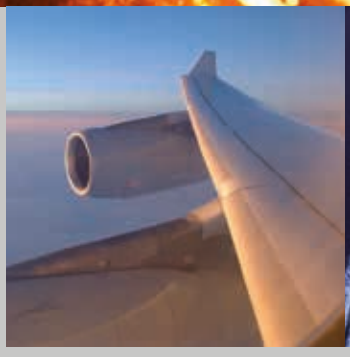
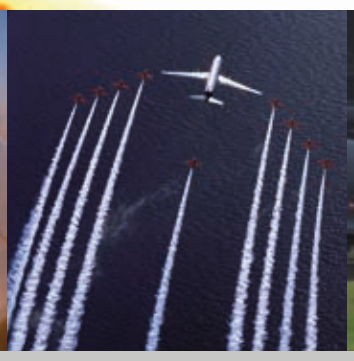
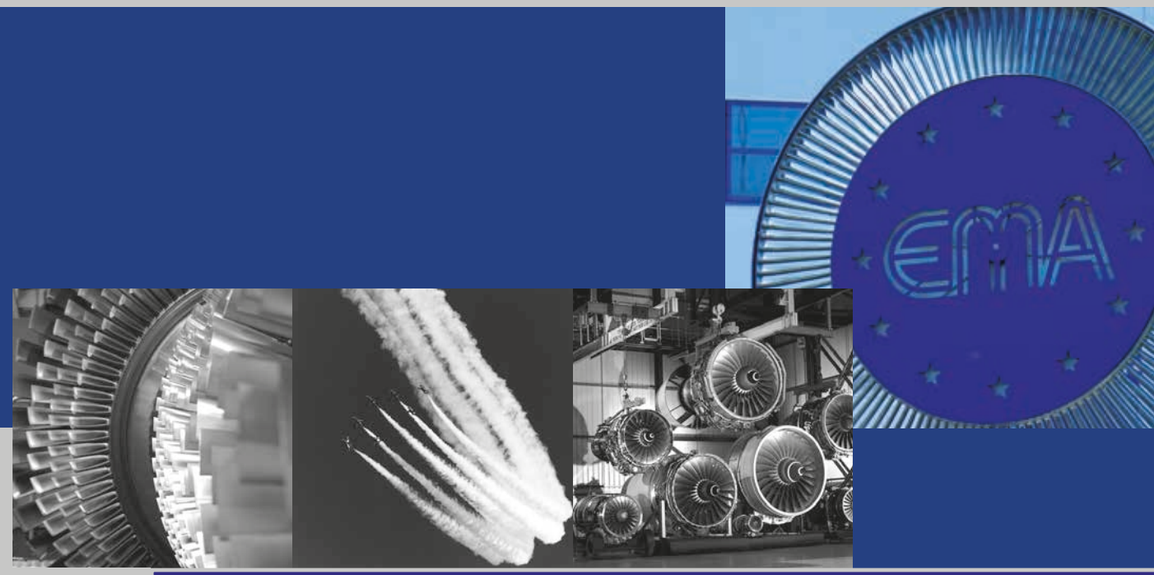




Europea Microfusioni Aerospaziali

TEN YEARS OF HISTORY

www.emaht.com



THE MISSION

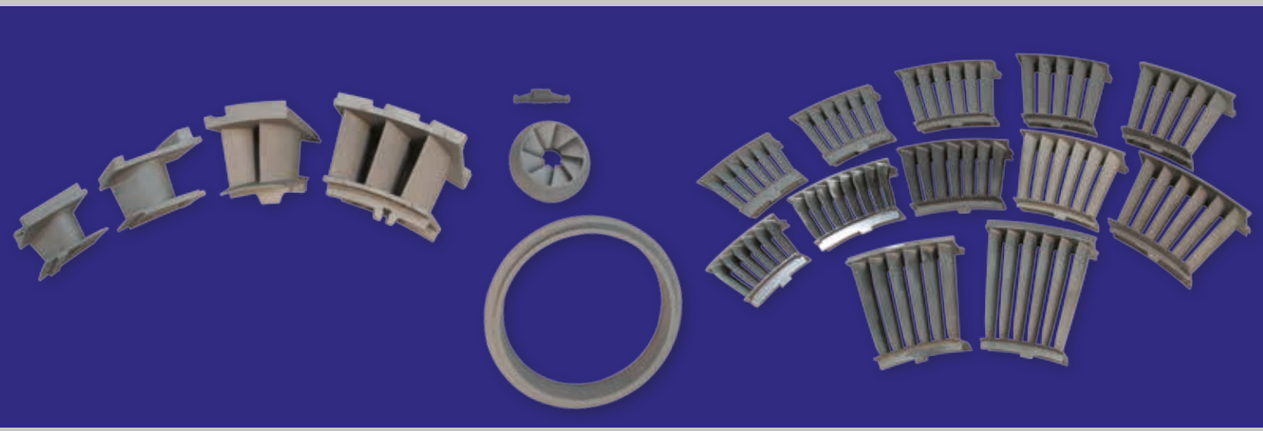
EMA is Europea Microfusioni Aerospaziali.

EMA is a precision casting foundry, is the most modern development and application of the ancient technique of “lost-wax-process”.

EMA is world class leader in airfoil super-alloy Nickel and Cobalt base precision casting production: produces a range of components serving the aircraft engines defence and commercial aviation, industrial gas turbines and other applications.

EMA has unique plant located in Italy, Morra De Sanctis, Avellino employing over 800 people with a constant growth.

EMA has founded the network “POEMA” together with prime suppliers to create a synergy for casting production.



EMA

CORE-BUSINESS

AIRFOILS of High and Intermedium Pressure Turbines
- Single Crystal airfoils
- Complex intricate ceramic core shapes
- Directionally solidified airfoils
- Equiax airfoils

VANES of High/Intermedium Pressure Turbines
- Single Crystal
- Directionally Solidified

VANES of Low Pressure Turbines
- Equiax multivane
- Very thin airfoil trailing-edge thickness
- Shaped annulus
- Solid and Cored multivanes

- SEGMENTS, cored and un-cored, equiax and single crystal
- SHROUDS
- EXPERIMENTAL TEST PIECES of last-generation alloys

Discover **EMA** at www.emaht.com

PRODUCTS

- Airfoils: Single-Crystal, Directionally Solidified, Equiax
- Shrouds and Segments
- Ceramics cores

SERVICES

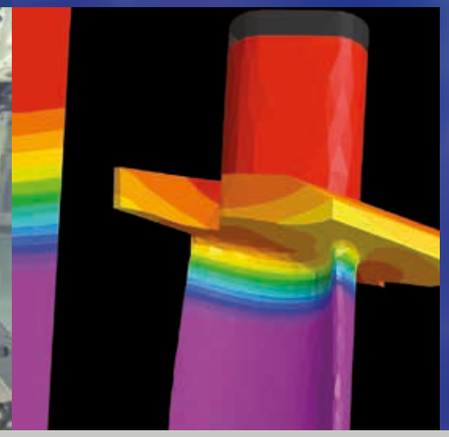
- Optimisation of the component design
- Simulation of casting processes
- Rapid prototyping
- Tooling design
- Core manufacture optimization

ADDING VALUE

• **EMA** objective is the improvement.

Improvement of the life of the component, Improvement of the performances, Improvement of efficiency.

EMA Improvement are recognised by the world's class-leading aerospace engine manufacturers and energy gas turbines companies.



EMA use a global-process:

- Customer requirement review
- Design to cost
- Time to market
- Supply chain management

- Customer requirement review
  - Alloy selection
  - Geometry optimisation
  - Core optimisation

- Design to cost
  - Highest alloy efficiency
  - Optimised casting process
  - Optimised control techniques

- Time to market
  - New part introduction time
  - Wax-prototypes
  - Ceramic-prototypes
  - Die-prototypes

- Supply-chain management
  - Strategic supplier constant survey
  - Dual links customer-supplier alignment
  - Deployment of commitment through supply-chain

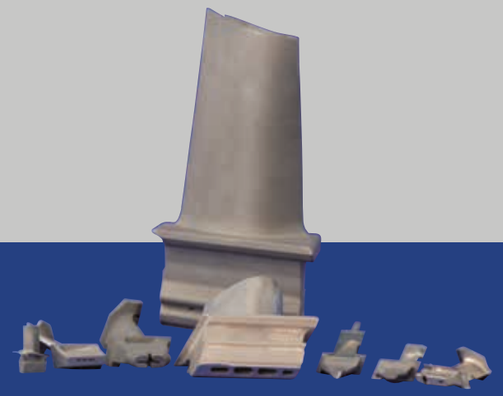
SPECIALISATION

Dedicated engineers focused on technology Single crystal, Directional solidification, Equiax integrated with Process Stability specialised engineers. EMA offers a rare high level of expertise that follow the combination of the theoretical metallurgical elements with the practise of the fabrication method and equipment knowledge. This allow a proper design-phase to build a robust and repeatable casting process.

COMPETITIVENESS

EMA pursue with principal customers real cost reduction opportunities. The concept to remain as much competitive inside the world market is a must for the success of each company. Focus on element are mandatory at EMA:

- minimum alloy consumption through weights optimisation,
- recycling opportunities
- best practice for time reductions



EFFICIENCY

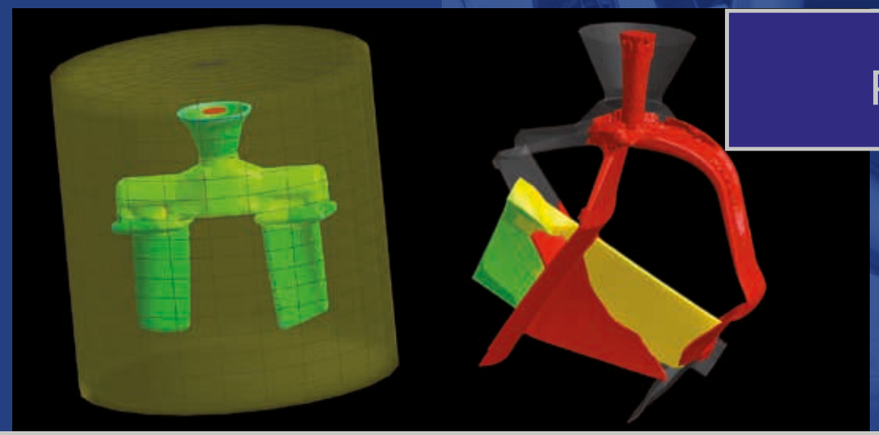
EMA imprinting is deliver to the customers
a continuous added value

EMA Technical Departments:
A team of experienced graduated engineers integrated with experienced process owners is the major strength of EMA. The key element is the development of the people:

- Continuous training
- University access: stable relation with Aeronautical department of Napoli, Salerno, Bari, Lecce
- Centre of Research access: stable relation with advanced material centres of research, Italy and UK

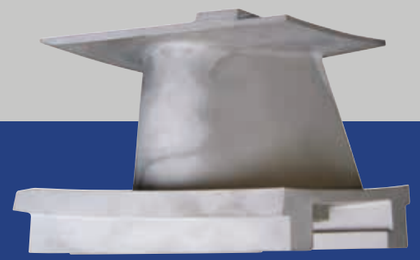
The **EMA** technical community mission:

- Focus in Customer request
- Focus in Casting Process Stability
- Application of state of the art tools for design cad and statistical software



RELIABILITY

Total quality of the product is the fundamental warrantee EMA want to give to the customers. EMA products are actually on the most critical programs for commercial and defence aviation and on the most diffused gas turbines, improved performance together with increased life of the components is today the feed-back we receive from the customers. In response EMA perform a non-stop research to durability.



THE PROCESS

Process for EMA is innovation and improvement: fundamental concepts achievable through efficient equipments based and supported by a simple strategy: invest to compete.

EMA facility cover an area of 60.000 square meters.

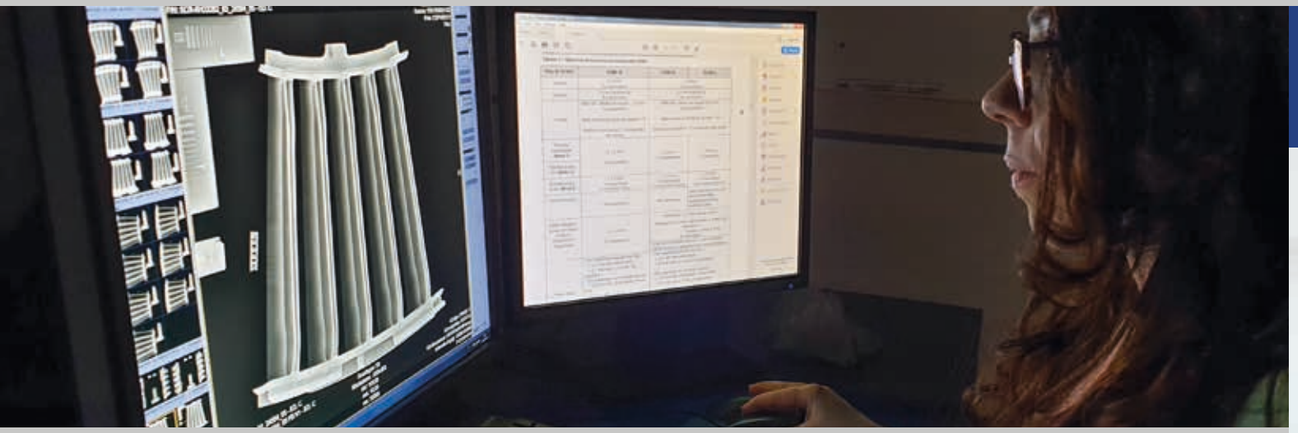
Automation, remote parameters controls, research focused on fully repeatability of the processes, allow EMA to produce castings with:

- high volumes,
- no quality escapes,
- flexible planning.

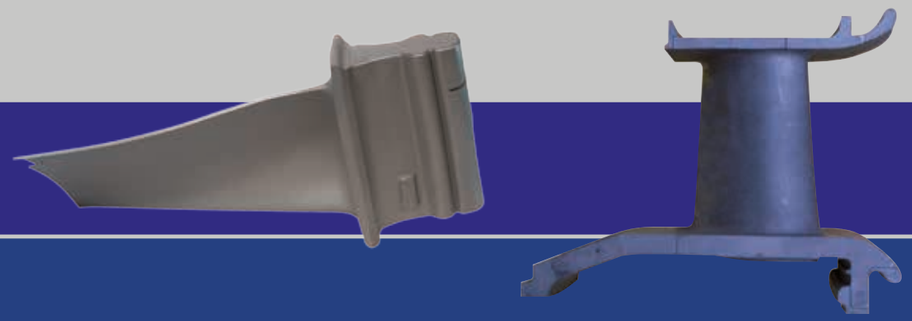
A range of products from helicopter hp turbine blades of few grams of weight, up to gas turbine castings, heavy and big.

Key process steps of EMA:

- Engineering department, the area where EMA technical community with high school graduated scientists serve to the production their intuitions and researches;
- Core room: ceramic cores production lines with dedicated dimensional cmm and surface treatment line;
- Wax room: wax injection flexible presses to cover a wide field of application from parts of little grams to very big models;
- Shell room: completely automated robotic cells for perfect shell application;
- Furnace: without any doubts, the heart of the company. The shapes of the parts become real using mixtures super-alloys, nickel and cobalt base to produce single cristal, direct solidified and equiax castings;
- Heat treatments area: to complete the vertical process up to the highest temperatures of the single cristal castings;
- Dimensional controls: cmm, dedicated gauges, optical measurement scans, airfoil profile analyser, wall-thickness ultrasonics;
- Non destructive testing: X-ray laboratory, digital X-ray, fluorescent penetrant inspection, visual and penetrant fibroscopic inspection, with level 3 skill in house;
- Grain structure: single cristal and ds grain assessment, single cristal primary and secondary orientation, tetha and R value measurement.



EMA Managing Director, Ing. Domenico Sottile



PEOPLE

The success of the company is the people: high motivation, high level of skill, continuous training, become devotion to the job.

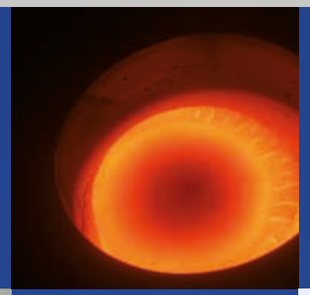
Operation and Engineering Team

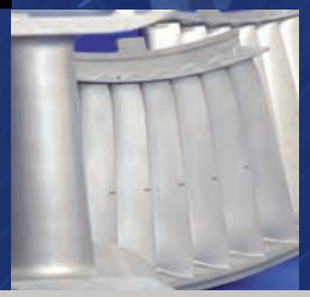
Quality at EMA:

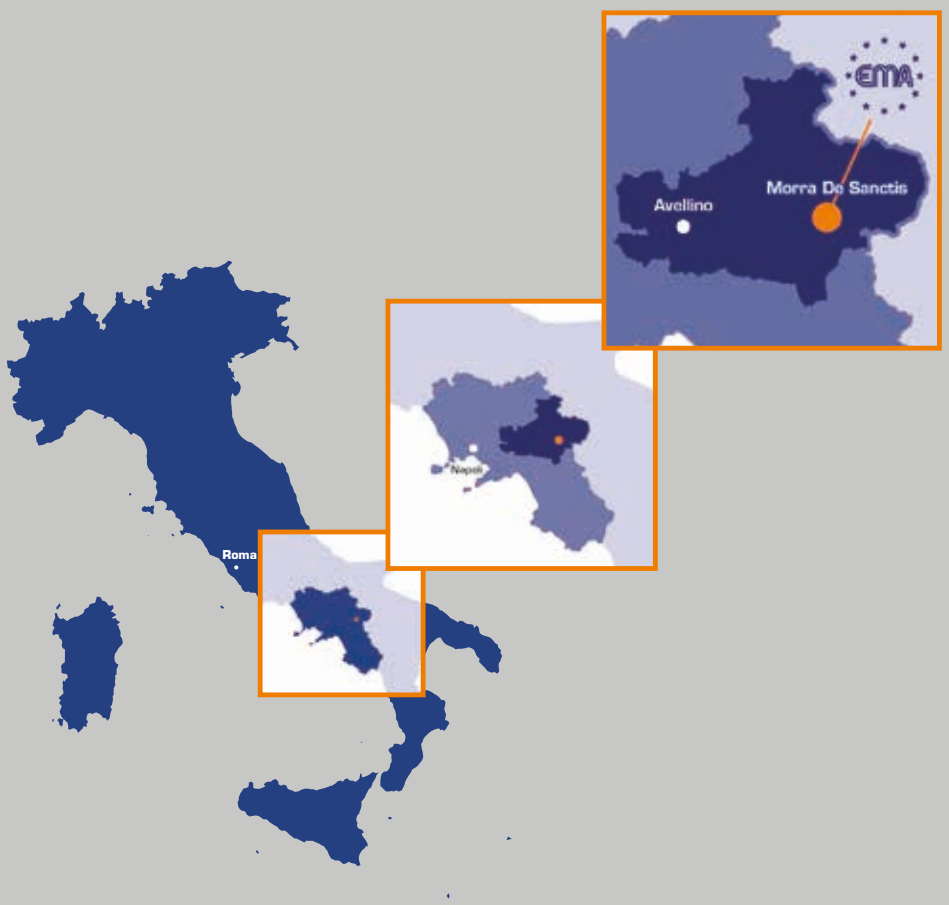
EMA has an integrated system to manage with synergy the Quality according to ISO9001 and EN 9100, the Environmental according to ISO14001, the Health and Safety according to OHSAS 18001.

The special processes are certified by NADCAP: Heat Treating, Chemical Processing, Welding repair, Non Destructive Testing.

EMA Management







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