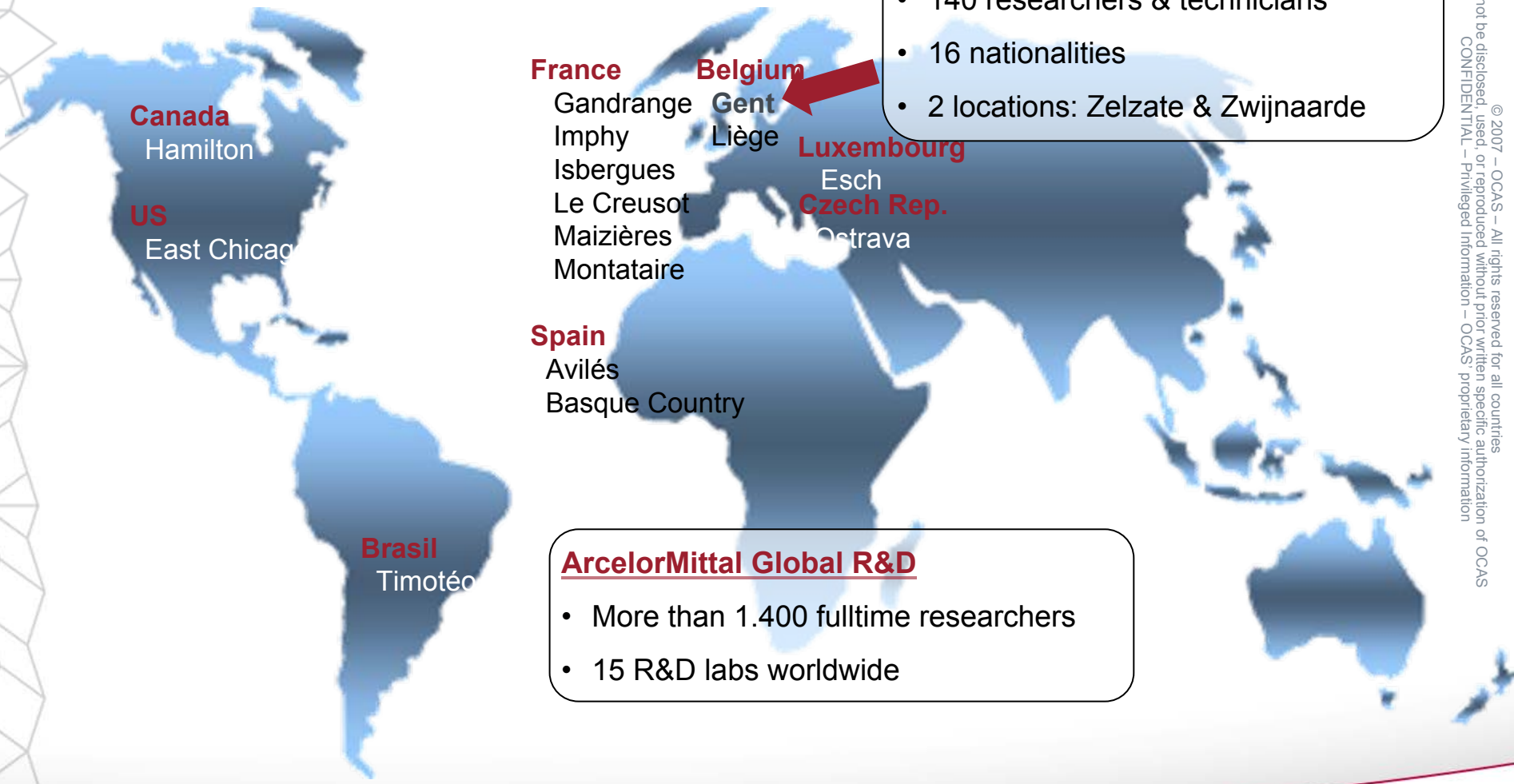
OCAS

General introduction

ArcelorMittal Global R&D



Global R&D Gent

- 140 researchers & technicians
- 16 nationalities
- 2 locations: Zelzate & Zwijnaarde

ArcelorMittal Global R&D

- More than 1.400 fulltime researchers
- 15 R&D labs worldwide

ArcelorMittal Global R&D: business & market oriented

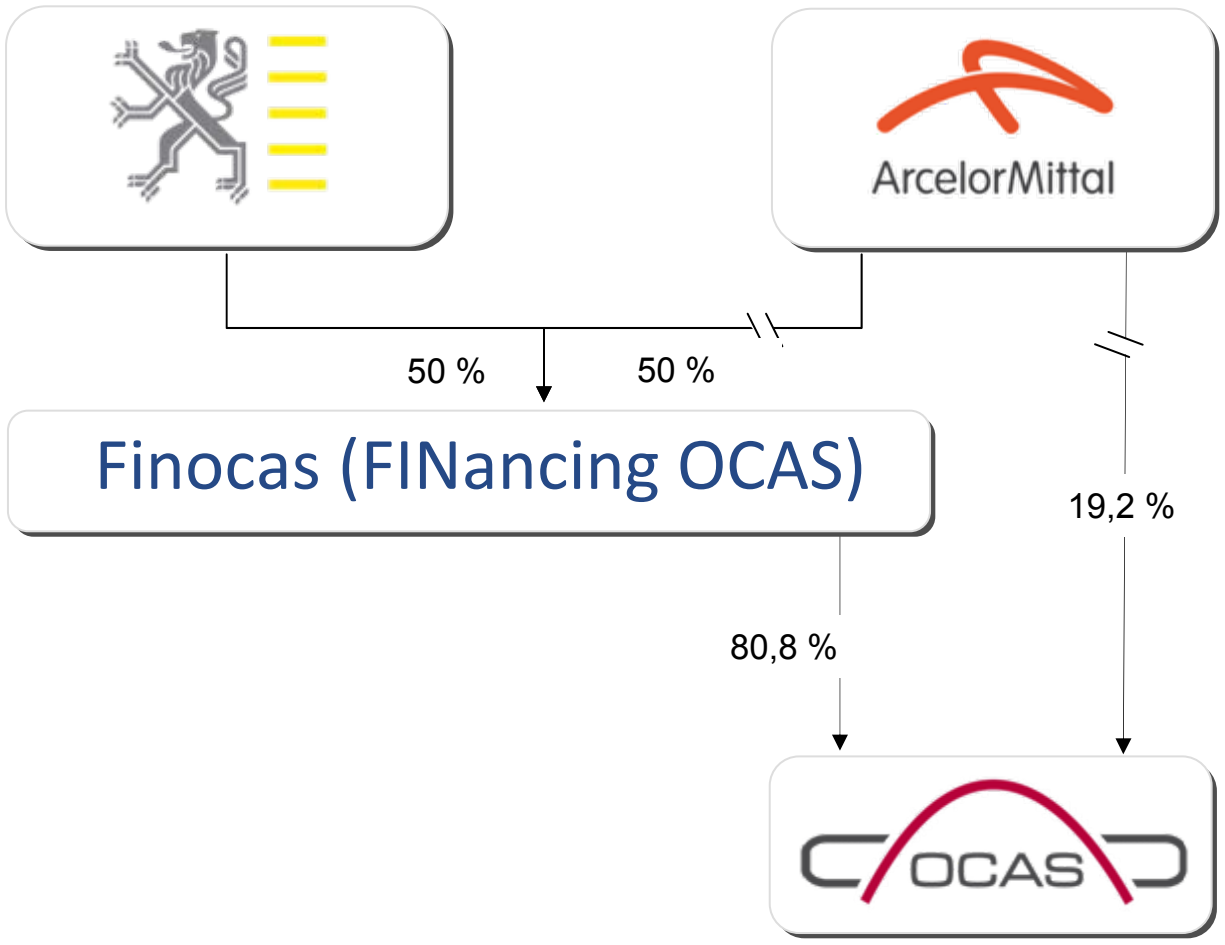
	Flat Carbon	Long Carbon	Stainless Steel	Plates	Other
Hamilton					
East Chicago					Electrical Steel
Timoteo					Electrical Steel
Gandrange		Bars & Wires			
Imphy					Nickel Alloys
Isbergues					
Le Creusot					
Maizières	Automotive, Packaging, Industrial Operations				
Montataire	Automotive				
Avilés	Industrial Operations				Systems optimization
Basque Country		Process			
Gent	Industry				Electrical Steel
Liège	Industry				
Esch		Structural			
Ostrava	Industrial Operations				

Global R&D Industry

- **OCAS - Global R&D Gent**
  - Metallurgy
  - Surfaces
  - Applications & Solutions
  - Material Characterisation & Testing

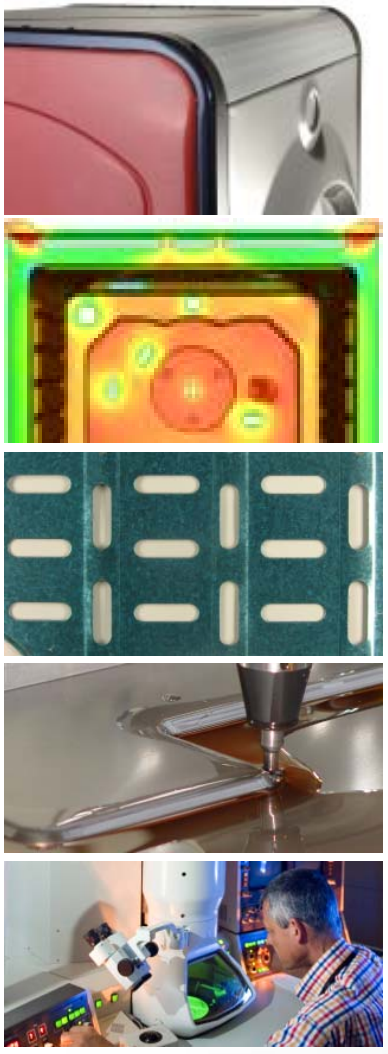
- **Global R&D Liège**
  - Organic coatings
  - New coating technologies
  - Steel solutions & design (construction)

OCAS - Shareholders' structure



OCAS - Missions

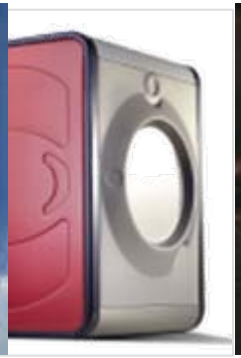
- Provide steel and metal-based products, services and solutions, to satisfy and anticipate our customer's needs
- To realise breakthrough developments
- To set up new industrial spin-off activities



OCAS - Markets

- Industry includes
  - appliances, mechanical construction and engineering, heavy plate, tubes and pipes, HVAC, radiators, drums, furniture, electro-magnetic applications, energy generation, transport and storage systems, off-shore applications etc.
  - Covering product mix from 0,2 to 100 mm



OCAS - Core expertise

Metallurgy

steel grades for energy transport

steel grade develop-ment for plates

improved efficiency electrical steel

weight reduction thanks to ultra high strength steel

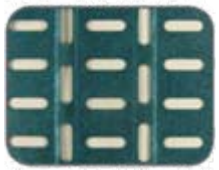
steel grades for future hydrogen economy

Metal Processing Centre

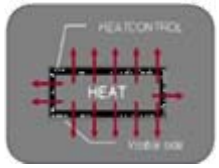
Surfaces

enhanced aesthetics

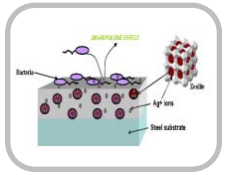
increased corrosion resistance



easy manufacturing: forming, painting, glueing, enamelling,...



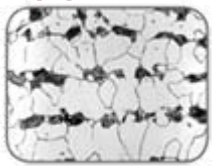
heat transfer coatings



bio-active coatings

self-cleaning surfaces

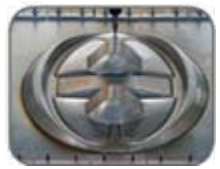
Applications & Solutions



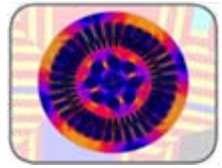
smart materials selection

structural design of components

welding



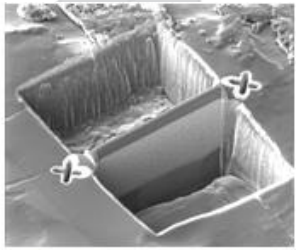
metal sheet rapid prototyping

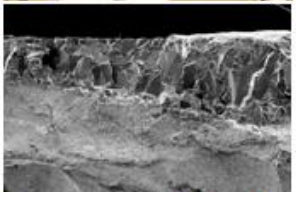


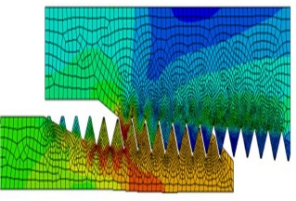
FEM simulations: forming, electro-magnetic, heat,...

product safety: risk assessment of welding fumes, CrVI, VOCs,...

OCAS - Facilities





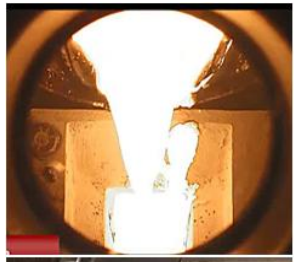


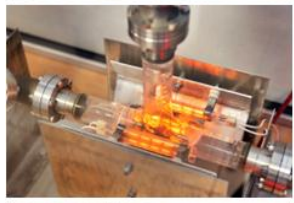
Unique facilities in processing & characterisation of metal alloys

- Fully equipped chemical characterisation laboratory
- Extensive electron microscope facilities
- Complete coating laboratory including novel curing techniques and corrosion laboratory
- All major welding and cutting techniques available ((hybrid) laser, SAW, MIG/MAG/TIG)
- Forming and rapid prototyping capabilities
- Complete facilities for electromagnetic characterisation
- Large experience in Finite Element Modelling

Fully integrated metallurgical processing centre

- Wide range of casting possibilities
- 5 rolling stand of which 2 continuous
- Multi-purpose dynamic annealing line with transverse flux inductor
- Complete mechanical testing facilities
- Advanced characterisation equipment like dilatometry, torsion and easy access to high speed-compression
- Complete sampling preparation facilities including waterjet cutting
- Unique reactive continuous annealing simulator
- Fully equipped hydrogen lab





OCAS – Example of market driven R&D

- Improved steel grades for industrial use
  - Development of new products
  - Co-engineering and technical assistance
  - Stronger and lighter steels

Weight reduction 20%

Cost reduction 10%

OCAS – Example of market driven R&D

- Customer appliances with reduced environmental footprint
  - Energy saving design
  - Ready-to-use steel products
    - Skip labour intensive and energy consuming pre-treatment
    - Reduce firing time

Energy saving 30%

OCAS – Example of market driven R&D

- Integrated steel solutions: the winds of change
  - Steel windmills are more cost-effective and longer lasting
  - Windmill tower height increased thanks to new steel grades, providing larger generators producing more green energy

Tower height increase x 2
2000-2010

Installed generator power x 10
2000-2010

OCAS - Spin-offs and partnerships

- Incubation of new industrial activities and spin-offs by leveraging steel related product and solution expertise
  - elytra: continuous manufacturing of light weight sandwich panels
  - xcelcoat: industrial deployment of advanced functional coatings
  - borit: embossed panels

- Leverage effect of R&D through partnerships
  - Design and forming centre for industry (JV with AM TOP)
  - Metal Processing Centre (JV with CRM)
  - Flamac, a division of SIM

DFC DESIGN & FORMING CENTRE

MPC Metal Processing Centre Gent

flamac a division of SIM

OCAS Day-to-day

- People year 2010
  - 140 employees
  - 16 nationalities, 45% researchers of non-Flemish background
  - 17 sponsored PhD's and post docs
  - 42 international trainees for a 3-9 month period

- Skills
  - Metallurgy
  - Surfaces
  - Application technologies (forming, welding, numerical simulations, etc.)

OCAS - History

1989	Creation of OCAS (Shareholders: Sidmar, Arbed, ALZ)
1995	SWB becomes shareholder in OCAS, Arbed↔LDD
1999	Aceralia becomes shareholder in OCAS
2001	Merger Arbed-Aceralia-Usinor: Arcelor
2003	Restructuring R&D Arcelor “Innovation 2005”
	from competence centre towards market oriented research from automotive to industry research centre
2004	Ocas becomes joint venture Arcelor - Flemish Region
2005	Deployment of R&D Business Development Unit (BDU)
2006	Merger Arcelor - Mittal
2006	Creation of 1st spin-off “Elytra”
2007	Creation of 2nd spin-off “XcelCoat”
2008	Creation of “Design and forming centre” a joint venture with AM TOP
2008	Creation of “Metal processing centre” a joint venture with CRM
2009	Creation of “Metal structures centre”
2009	Creation of spin-off “borit”

OCAS - Sites

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