

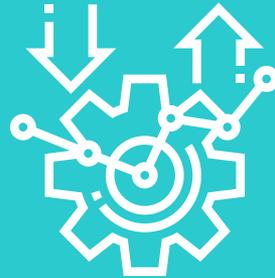
Imerys Innovation

Imerys Analysts visit | December 2021

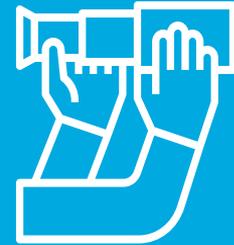
Frederic Jouffret - Vice-President Science & Technology
Global coordination for Performance Minerals



**Key figures
and organization**



**Innovation
Strategy**



**Performance
Minerals key
innovation projects**

Imerys Innovation Key Figures



350

Scientists
& Technicians



€70m

Total Spend
for R&D
and technical
support



7

Main Imerys
Technology
Centers (ITC)



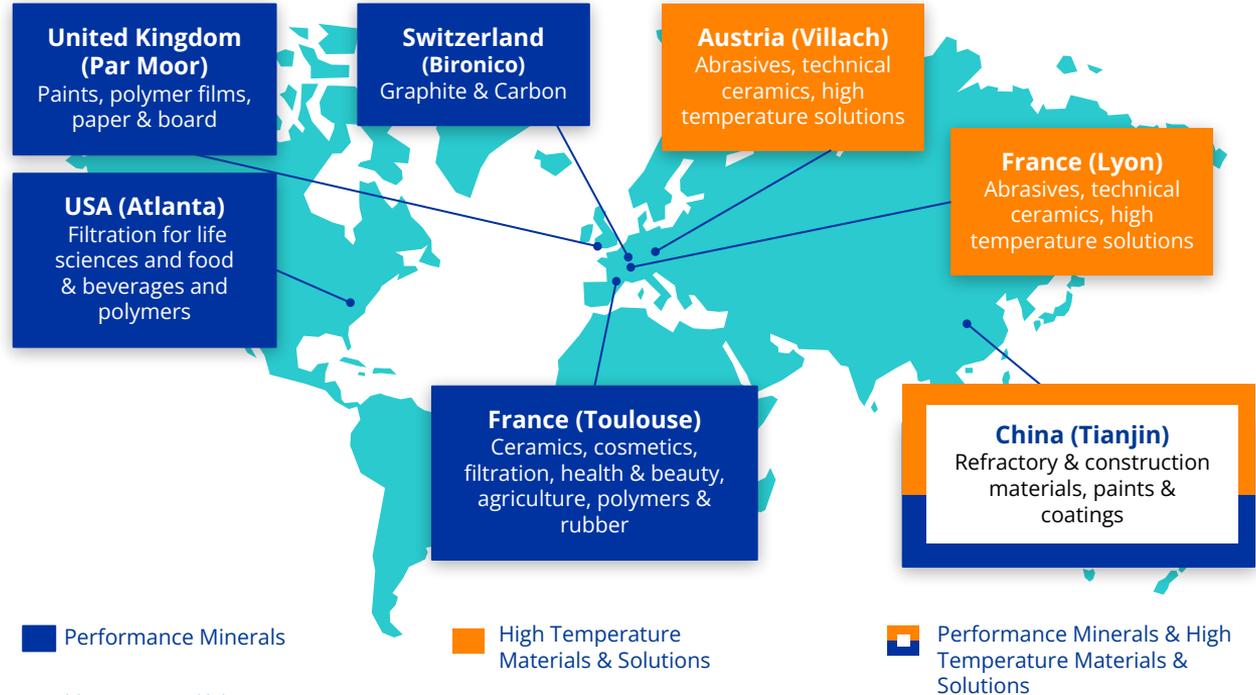
70

New product
launches
(2020)

Imerys Innovation Organization: Global footprint

Areas of innovation

- Mobile energy
- Green mobility
- Reuse and life cycle of minerals
- Synthetic minerals
- Natural solutions
- Building and sustainable construction
- Alternative food packaging
- Industry 4.0: automatisaton, robotics and engineering
- Sustainable solutions to reduce materials consumption



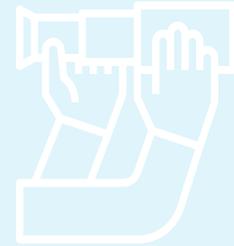
- In addition, regional labs:
- Japan (Kawasaki); lithium-ion batteries
 - Brazil (Bras Cubas); paints & coatings



Key figures
and organization



Innovation
Strategy



Performance
Minerals key
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Innovation Strategy at Imerys



Driving an innovation culture

→ Excellence in people, execution and equipment



Investing in sustainable growth

→ Sustainability as a lever for growth



Addressing global challenges

→ Market driven innovation



Creating value for stakeholders

→ Explore all mineral capabilities



Excellence in People, Execution & Equipment



- **Global coordination of projects** to avoid duplication per region with 40 new projects entering in the pipeline every year
- **International pool of talent** with PhD (50) and scientists coming from the industry and academia
- **Management portfolio governance** through stage gate process (Accolade), business lead, analytics and KPIs review
- **Monthly project review with** all marketing, sales and technical teams on key projects (“go to next gate”); 63% of R&D time spent on top priority projects
- **Quarterly “Portfolio Review”** meeting under the leadership of Senior VPs, Market segment VP & S&T VP
 - Reporting of New Product Development (launches, sales) intended for measuring the vitality of the product portfolio
- Balancing **New product development vs technical support** for long term and short term projects

Sustainability as a lever for growth



- **Sustainability inclusion in our NPD development process** during stage gate process (2022 target with 50% market launched NPDs as sustainable solutions)
- **Product Sustainability Assessment** used for each Innovation project analysis to pass gate 1 together with market perspective
- Assessment of the **current portfolio** is underway (2022 target to assess 40% of our portfolio)
- Launch a **pilot wave of products with highest sustainability rating** and assess market response before potential expansion
- Introduce **projects on circular minerals** as new business model
- **Product Stewardship and REACH certification**, a license to operate

“We are finding ways to embed sustainability in all we do; integrating it within our processes, tools, and operations. It is a part of how we innovate and guides the way we spend money”





Market driven & customer centric R&D organization



AkzoNobel



JM Johnson Matthey
Inspiring science, enhancing life



RENAULT



NISSAN



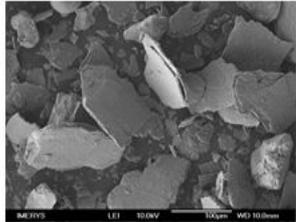
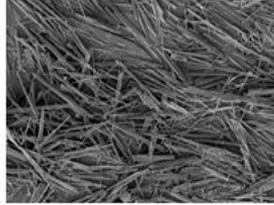
MITSUBISHI



- R&D Directors and Innovation teams **organized by markets or applications**
- Our main focus: develop solutions, applications and services based on **market trends and customers needs**
- Create **development partnerships** through open innovation at our customers and tech days
- **Recognition at our customers** as key innovative supplier at multiple occasions (Akzo, UPM, Tarkett, Duracell, Premix, SK, JM, ...)



Explore all Industrial Mineral Capabilities



Natural minerals: majority of our sales and development; New technologies includes sustainable and/or natural solution for global mega trends, replacement of oil based materials, new process innovations....



Circular Minerals: answers to market key questions on ore availability, recyclability and sustainability; re-use, regenerate, design out of waste



Synthetic Minerals: New functionalities (tailor made solutions) for high value niche applications

Minerals 'naturally' different: not every market or customer need can be addressed by a single mineral in its natural state....

Performance Minerals markets served



Polymer & Coatings

Gloss and opacity, conductivity and lightweighting



Paper and Board

Whiteness, opacity, gloss and Pitch control



Ceramics & Building

Whiteness and hardness



Filtration & Life Sciences

Purification of liquids, moisture absorption and smoothness



Mobile Energy

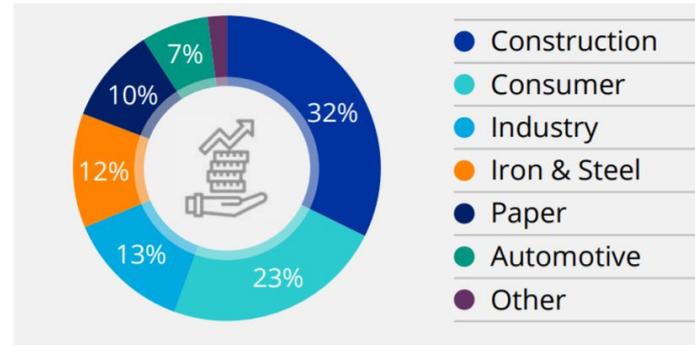
Lifespan and fast charging

... Applications at Imerys Technology Center Toulouse

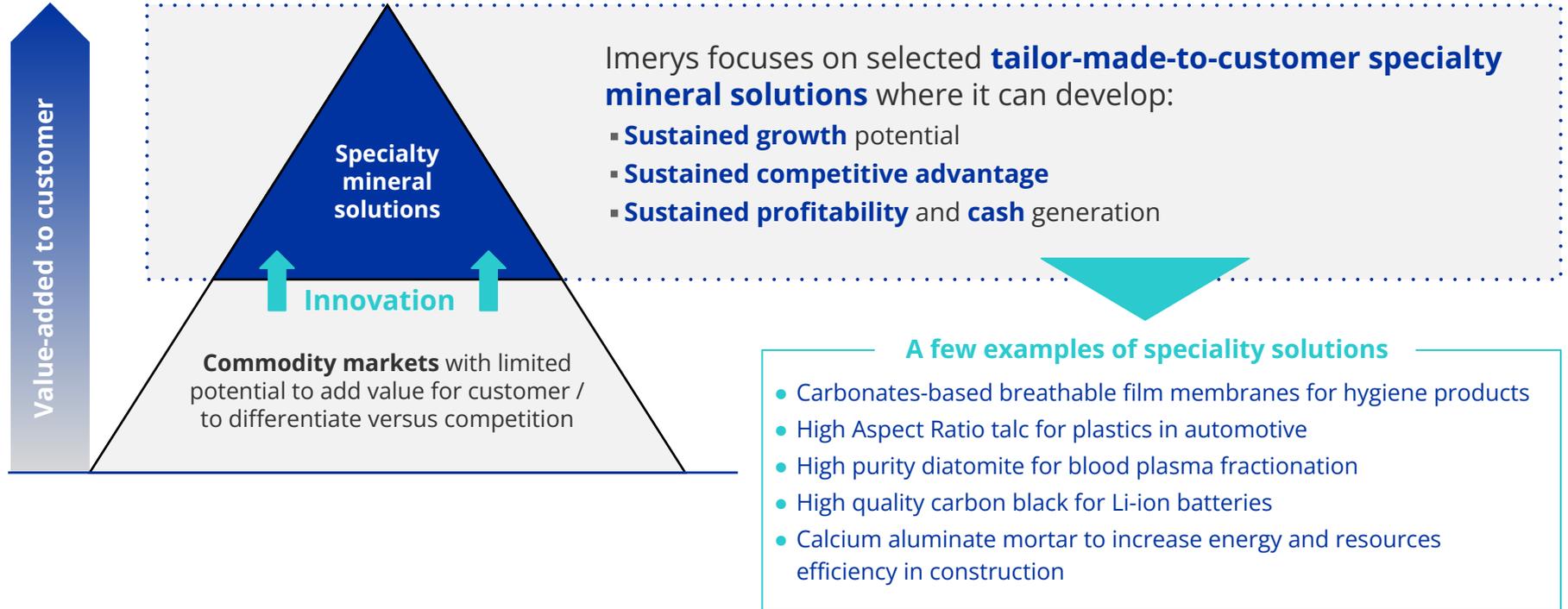
Imerys delivers value-added solutions that are formulated to meet the technical specifications of each customer
The solutions contribute to the performance of a multitude of products in different categories:

1. **Functional additives:** added to the mineral formulation of customers' products
2. **Mineral components:** essential constituents in the formulation of customers' products

Revenue by end market



Focusing on specialty niches to bring high value to customers





Key figures
and organization



Innovation
Strategy



Performance
Minerals key
innovation projects

Performance Minerals: Development areas in project portfolio



**Low-Emission
Mobile Energy**



**Green
Mobility
Materials
(Lightweight)**



**Sustainable
Construction**



**Natural
Solutions
for Consumer
Goods & Life
Science**



**Circular
Minerals**

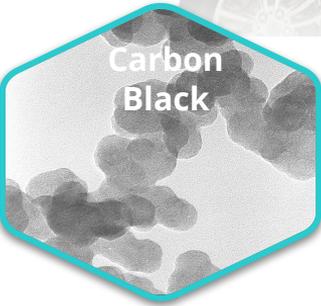
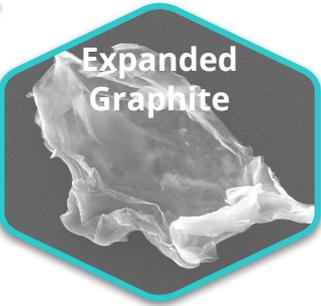
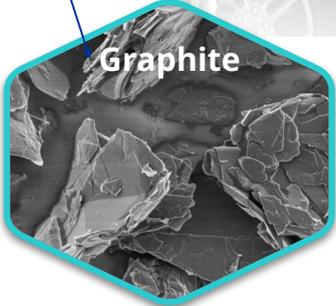
Focus #1: Low-Emission Mobile Energy



Li-ion batteries & Fuel cells for EV

- **Conductive additives** for anode and cathode (G&C)
- **Fuel cells:** High purity Carbon Black and Graphite for microporous layer and catalyst support
- **Participation to ERMA, European Institution,** "securing access to critical raw material"
- **Lithium** as raw material supply
- **Ceramics products** for production of electrode active material
- **Special additives** for better conductivity in electrolyte
- **Permeable films** for battery separator

2kg of Carbon Black for each BEV



Focus #2: Green Mobility



Lightweighting in automotive

- **Lightweighting focus**
for automotive for low emission and longer driving range; main target on EV
- **Supply of innovative reinforcing minerals** to lighter plastic parts (exterior & interior)
- **Regional source of barrier minerals for tire inner liner** (lower weight by reduced thickness)



*Citröen AMI:
6 kg of mineral
in exterior
plastic parts*

12-15kg
of talc in
plastic per
vehicle in
Europe

Focus #3: Sustainable Construction



Lightweighting and waste management

- **Lightweighting** for ceramics large tiles (slabs) and facade
- **Mineral foams:** Lightweight foamed material (insulation, fire-resistant, no organic volatile compounds)
- **Sustainable building material** with Geopolymers
- **Circular waste management** from construction in tile ceramic business (sanitaryware waste recycling)
- **Kiln furniture** to replace single use plates in sanitaryware (patented)
- **Functional minerals for ETICS** (External Thermal Insulation Composite System): lightweighting and better insulation with expanded perlite
- **Pozzolans as low CO₂ additive** in construction hydraulic binders
- **Long lasting inorganic** additives for waste water pipeline protection



Up to -60%
reduction
in CO₂
emissions

Focus #4: Natural Solution



Applications for Consumer Goods & Life Science

- **Barrier coating for carton board and paper containers** replacing plastic packaging
- **Natural minerals for Personal care:** French mica for cosmetic applications
- **Agriculture:** Natural solutions as **biocontrol** agents against pesticides and as **biostimulants** (Plant available Silicon) against toxic chemicals
- **Biofuels:** New absorbent purifying waste feedstocks for conversion into renewable diesel (Hydrotreated Vegetable Oils) and aviation fuel
- **Paints & Coatings:** Lightweight renders, zero titanium dioxide solutions
- **New bleaching earth** for oil discoloration
- **Pet Litter:** **Lightweight** solutions for ageing population having pets as company



- **French patented mica:** **ImerCare® 6M** for make up powders



**-25%
reduction
In chemical
products**



Focus #5: Circular Minerals: from linear to circular economy



- **Imerloop project in board & packaging** to reprocess industrial mineral waste
- **Re-mining as key example** in North America with Sylacauga operation (reclassification of Imerys waste)
- **Waste filtration cakes** as feedstock for ceramics
- **New ideas through “start up Innovation challenge”**
Alternative (post-industrial) feed materials or assisting external circular value chains

Circular solution with 40% recycled content



IMERLOOP™ F NEW

New range of Recovered Minerals by Imerys.
From the paper & board industry to paper & board.

IMERYS

The graphic features a blue background with a white windmill in the lower left. A circular logo with three arrows forming a cycle is positioned in the upper right, with the text "Making minerals circular" written below it. The Imerys logo is at the bottom right.

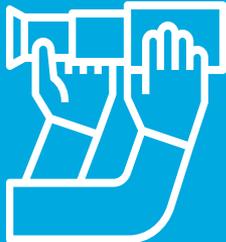
New Imerys circular mineral product launch



**Key figures
and organization**

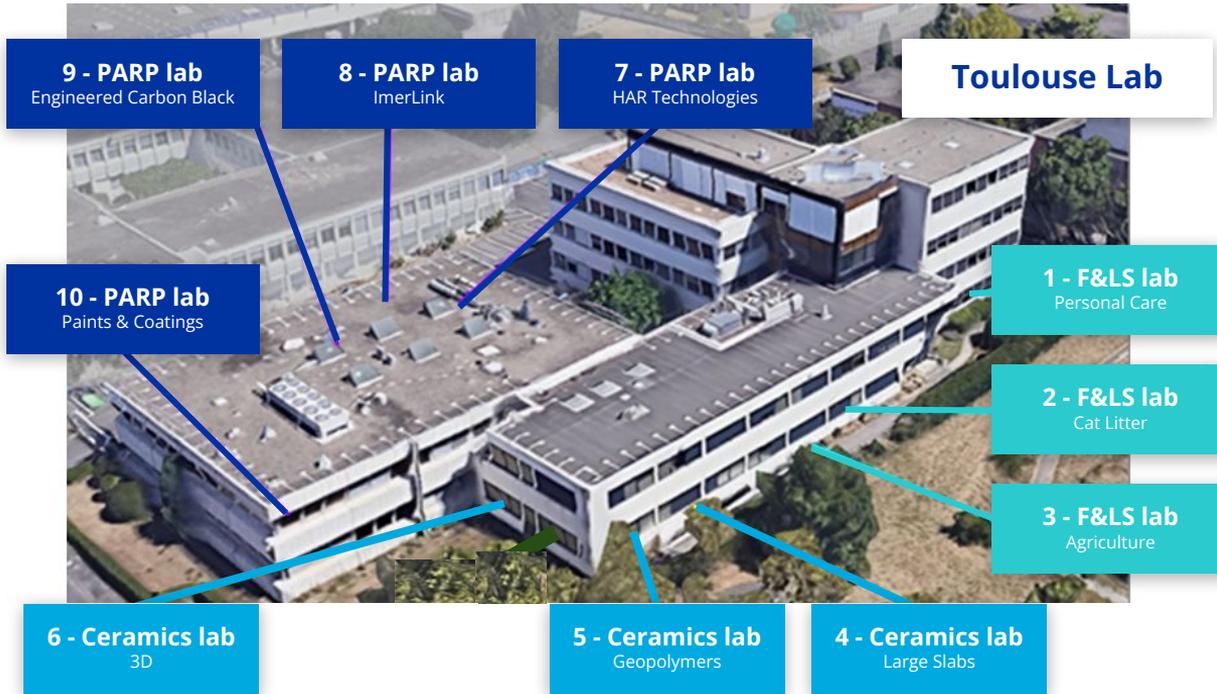


**Innovation
Strategy**



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Minerals key
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Imerys ITC Toulouse - Laboratories



50
French and international technicians and scientists in the laboratories

2020
The lab expansion was done in 2020

>2500m²
of laboratories

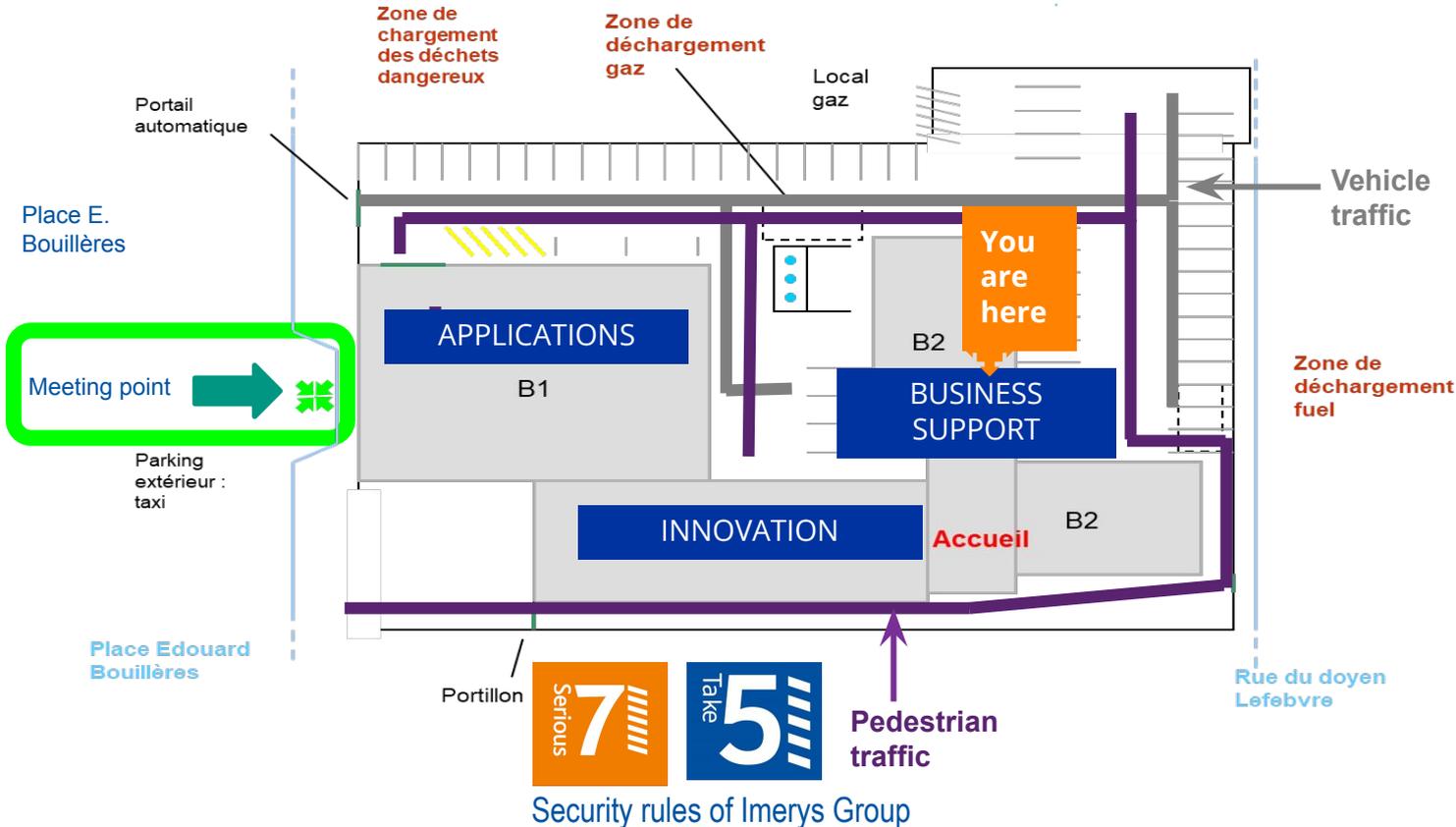
Imerys technology world center of excellence for polymers development

Laboratories & safety instructions

- **Safety equipment:** safety glasses in all laboratories, plus, if applicable, other safety equipment notified on the front door
- **Do not touch the equipment,** the products and respect the safety limits marked on the ground
- **Indicate your presence** to the guide before the visit
- **If you see an unusual situation** (immediate danger, start of fire, etc.), notify your attendant
- Some machines may be in operation for demonstration, please **respect the safety distances**



Emergency exit in case of fire alarm



If you hear the siren or if an evacuation is requested ...

- Go to the meeting point in front of the building (Place E. Bouillère side)
- Indicate your presence to your evacuation manager

Who's who - Performance Minerals EMEA



Frédéric JOUFFRET

S&T Vice President
Performance Minerals



Philippe BARRE

PARP S&T Director



Christel CAREME

F&LS S&T Director



Murielle PERRONNET

Ceramics & Building
Products S&T Director

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