



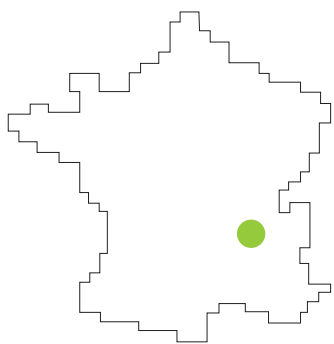
RHONE-ALPES RESEARCH CENTRE



CHEMICALS FOR EVERYDAY LIFE

Arkema's products are used for countless applications in every area of everyday life. They help make progress accessible to as many people as possible.





The Centre de Recherche Rhône-Alpes (CRRRA) is one of Arkema's 4 Research Centres in France. Located to the south of the Lyon conurbation, at the heart of the "chemical valley", CRRRA plays an active role in innovation both within Arkema and in the Rhône-Alpes region of France.

CRRRA AND INNOVATION

Innovation at CRRRA translates into the concrete realization of its researchers' work both in Arkema's facilities and at its customers' plants.

CRRRA's main successes include:

- the synthesis of molecules leading to new productions of hydrofluorocarbons and organic peroxides within Arkema;
- the development of products adapted to customers' requirements, e.g. high purity bleach, and additives for the manufacture of cold bitumen blends for road construction;
- productivity gains for Arkema's customers using hydrogen peroxide or sodium chlorate in paper pulp bleaching by modifying their processes;
- the diagnosis of corrosion using state-of-the-art analysis on products and non-intrusive techniques on plant and equipment such as acoustic emission.

A MAJOR ARKEMA INNOVATION PLAYER

STRONG SYNERGIES BETWEEN THE LYON TECHNICAL & IT CENTRE AND THE PIERRE-BÉNITE PLANT WITHIN ARKEMA

CRRRA is housed within the Pierre-Bénite industrial facility. Its proximity to the Centre Technique et Informatique de Lyon (CTIL), in charge of industrial projects, and to the Pierre-Bénite plant has helped the Centre gain highly specialized skills in catalysis and process, in fluorinated polymers, e.g. Kynar®, and in PVC, the latter being produced just a few kilometers away at the Saint-Fons plant.

CRRRA'S ACTIVE INVOLVEMENT IN THE SCIENTIFIC AND TECHNICAL COMMUNITY

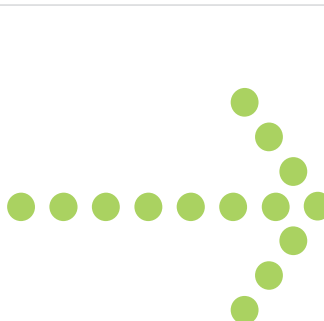
CRRRA has developed durable and constructive relations with researchers and academics from the Lyon region who play a particularly active role in chemistry, as well as with the French and international scientific and technical community. Participation in conferences, collaboration with universities through thesis and post-doctorate thesis contracts, and involvement in CNRS (National Scientific Research Centre) commissions are among the activities of CRRRA researchers.

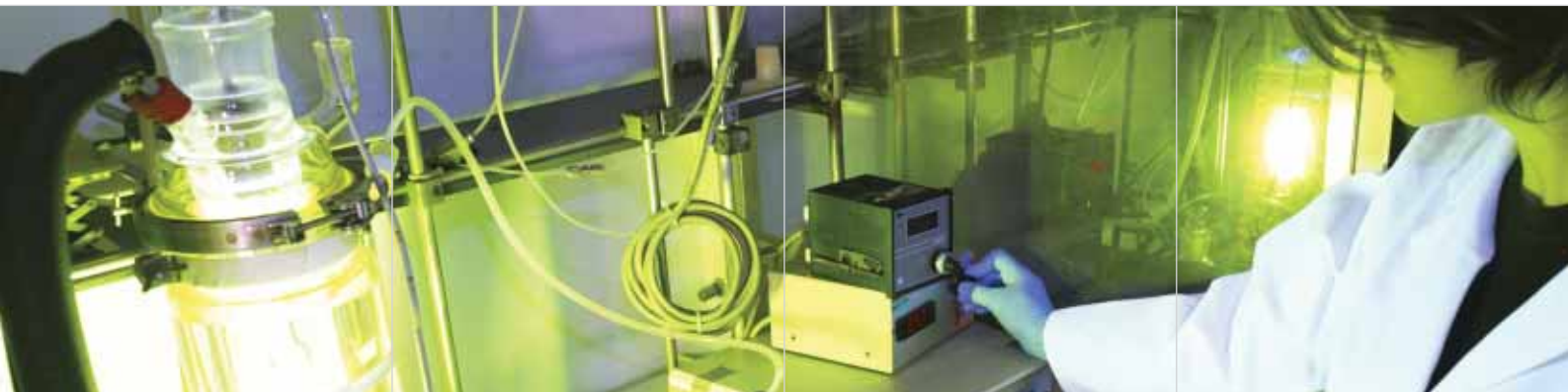
DEVELOPMENT PROSPECTS WITHIN THE CHIMIE-ENVIRONNEMENT LYON & RHÔNE-ALPES "COMPETITIVE HUB"

Arkema is one of the leading players in the "Chimie-Environnement Lyon et Rhône-Alpes" competitive hub, one of several competitive hubs with an international remit. The organization of this hub is structured around an association called Axelera.

This hub brings together professionals from the chemistry-environment sector (manufacturers, researchers, higher education, organizations, etc.), with the support of regional bodies.

Its strategic ambition is to develop the chemicals of the future, taking environmental concerns into account from the design stage of processes and products, and to become a major industrial and scientific hub in Europe by 2010. A dozen projects focusing on catalysis, processes and materials lie at the heart of this hub.





ASSISTING PEOPLE, PROFESSIONS AND PRODUCTS

Through their respective professions, the men and women of Arkema dedicate their professionalism and know-how to the design, manufacture and continuous improvement of products.





PROFESSIONS

Our Research & Development Centre employs an extensive range of professions, including “BTS” advanced vocational diploma, “DUT” vocational diploma, engineering degree and PhD.

CRRA professions cover every area of chemistry: synthesis and process, application, development, and technical assistance. Test and analysis teams provide assistance in these fields of competence by conducting measurements and characterizations.

Research also relies on crossfunctional competences available within CRRA, relating for example to process and product safety, crystallization, the follow-up of corrosion problems, the construction and running of pilot plants, technological watch, and scientific communication.

CRRA personnel - engineers and higher technicians alike - also establish international contacts as part of R&D missions.

CRRA AND TOMORROW'S RESEARCHERS

Every year CRRA takes on a large number of interns from engineering schools, universities and 'IUTs' (Technological University Institutes), to allow them to share in its expertise and know-how.

2004 KEY FIGURES

› PERSONNEL

260 people

› NUMBER OF PATENTS REGISTERED OVER 10 YEARS

270 patents

› FLOOR AREA OF INFRASTRUCTURES (LABORATORIES AND APPLICATIONS BLOCK)

16,000 m²

TRAINING

All new recruits are systematically trained in their workstations. By providing its researchers with training throughout their career, CRRA bolsters the expertise of its teams.

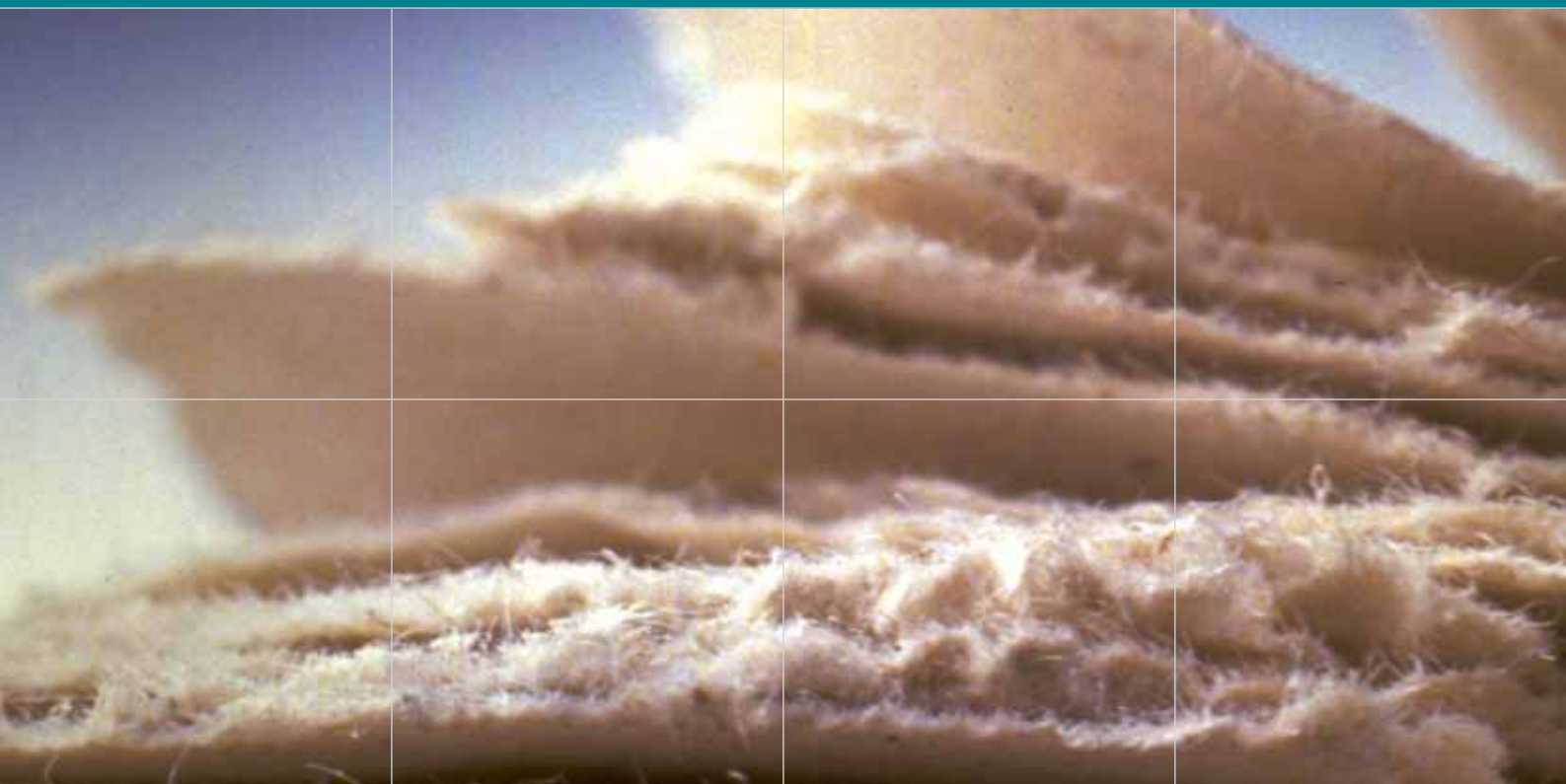




MISSIONS AND COMPETENCES



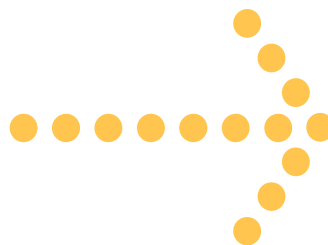
Arkema's research innovates, and optimizes its processes as well as the products and technologies intended for its customers.





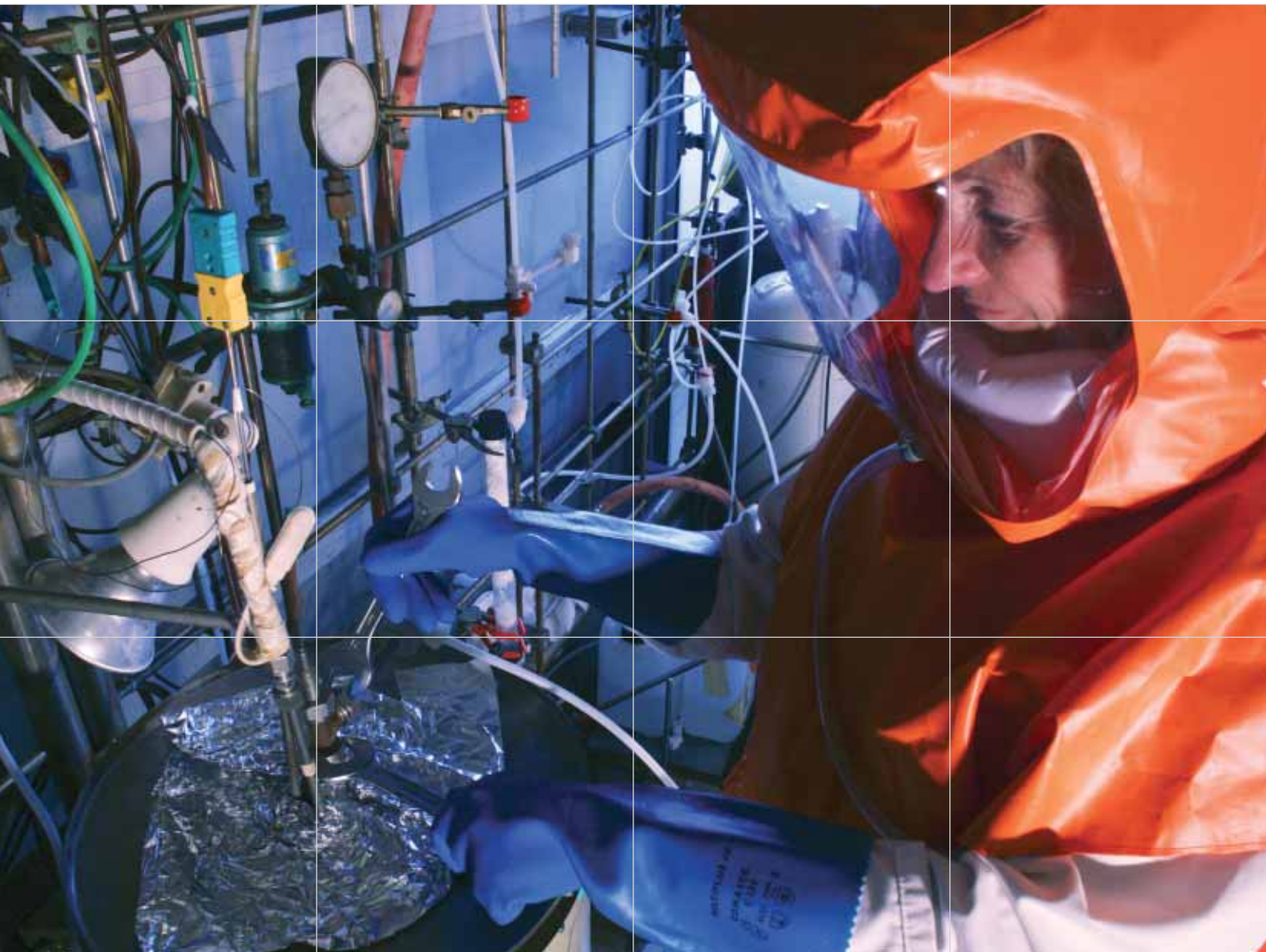
MISSIONS

- Design and develop new products and processes.
- Improve the quality and competitiveness of existing products and processes.
- Develop new applications and new markets.
- Provide technical assistance and customer support.
- Provide information on the control of the environmental impact of our products and processes.

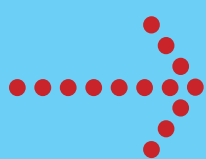


FIELDS OF COMPETENCE

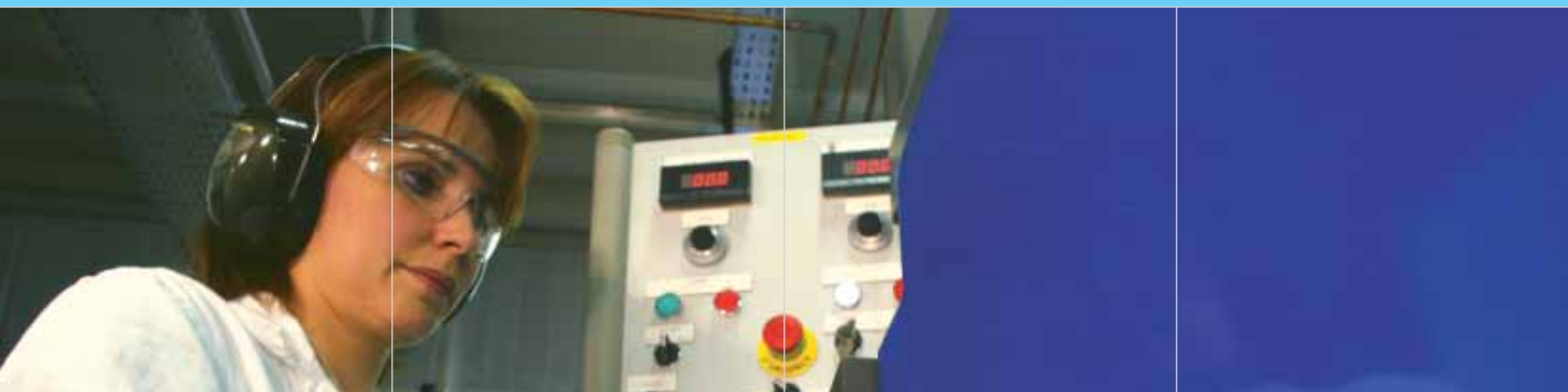
- Industrial risk:
 - process and product safety;
 - characterization of industrial emissions.
- Polymerization in dispersed medium.
- Catalysis and catalysts.
- Process development.
- Crystallization.
- Electrochemistry.
- Organic synthesis.
- Paper.
- Water treatment.
- Plastic additives.
- Surfactants.
- Organic peroxides.
- Organic fluorochemicals.
- Inorganic chlorochemicals.

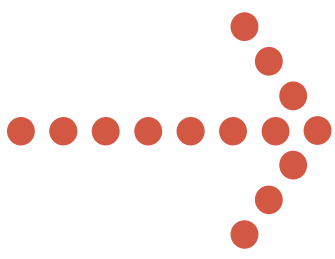


ENSURING HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION



Arkema places safety and the protection of health and the environment at the heart of its corporate objectives: controlling risks, minimizing the impact of its activities on the environment, conserving natural resources, and optimizing the quality of its products throughout their lifecycle.





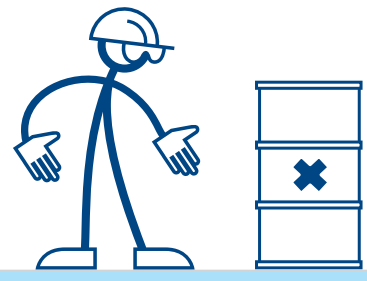
SAFETY...

safety in action

SAFETY MANAGEMENT

CRRA has developed a progress initiative for the ongoing improvement of safety and the protection of health and the environment, embodied in an annual progress plan. Safety is everybody's business, and should be a permanent concern.

In a drive to improve its safety performance, CRRA uses inter alia information and communication tools both internally (publication of Health Safety Environment newsletters, feedback, etc.) and externally, while also implementing the "Safety in Action" scheme, an Arkema worldwide safety information and rallying program.



AN AVOWED SAFETY CULTURE

Arkema's policy and commitments place industrial safety at the heart of its corporate objectives with a stated commitment to establishing a durable safety culture throughout the Company's activities. Arkema's safety initiative is based on the identification and control of risks. It relies on a management system designed for the prevention of major risks and the safety of people at their workstation. Periodic evaluations help ensure the relevance of the actions undertaken, measure progress achieved, and define new progress actions. These actions, defined worldwide, are applied locally in line with Arkema's internal requirements as well as current regulations. Educating, training and involving all concerned, both Arkema employees and subcontracted personnel, represent areas of ongoing improvement.

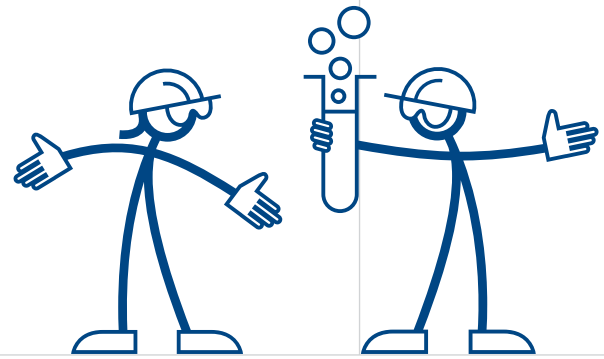
SAFETY

PROTECTION OF HEALTH

- Provision for the personnel of ventilated equipment when testing high-risk products.
- Provision of personal protective equipment, e.g. gloves, masks, ventilated hoods, etc.
- Monitoring of work atmosphere.
- Special medical control of personnel working with regulated products.

ENVIRONNEMENT

- Elimination of laboratory waste through specialist bodies.
- Treatment of gas effluents.





ESTABLISHING A COMMUNITY DIALOG

Through Common Ground[®], Arkema is committed to a resolutely novel approach to relations between its facilities and their environment: building with neighbouring communities relationships based on mutual understanding in order to relentlessly explore new areas for dialog.



terrains d'entente®

FÊTE DE LA SCIENCE

Every year, CRRA is involved in the Fête de la Science (Science Fair) as part of the Arkema stand. This special opportunity for exchanges based on demonstrations, samples and posters allows CRRA professionals to establish a dialog and explain their activities to the general public.

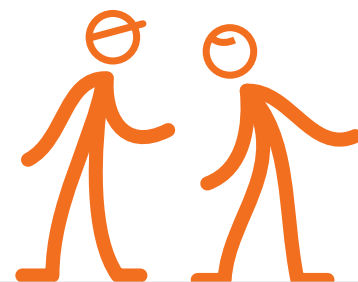
COMPUTER DONATION

CRRA takes part in the Arkema Pierre-Bénite facility's donation of computers to local schools, associations and municipalities in the south-west of the Lyon area.

This donation program is a long-term initiative for Arkema, with some 350 items of IT hardware donated between 1999 and 2005.

VISITS

CRRA regularly receives students, teachers and local elected officials from nearby towns, to whom they present the Centre's activities.

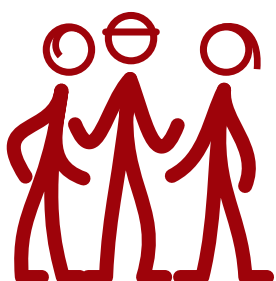
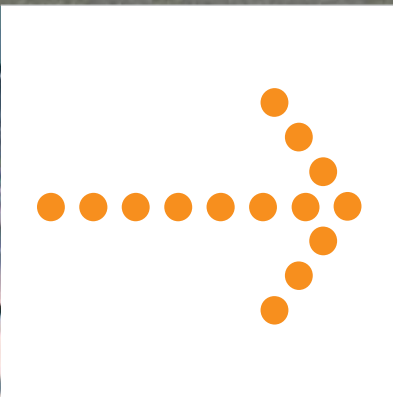


COMMON GROUND®:

inform, exchange, build, explore new kinds of relations between the Company, its industrial facilities and their environment.

Through its Common Ground® initiative, Arkema reaffirms its commitment to opening up its plants to the outside world in order to structure and establish lasting exchanges with the nearby communities.

The program entails developing relations with local people based on mutual understanding and trust in order to be known, understood and perceived better.



› LISTEN

to grasp and understand the expectations of our stakeholders.

› DIALOG

to answer their legitimate questions.

› PROGRESS

to relentlessly improve safety and protect the environment.



CRRA TIMELINE

- 1948** > Creation of Centre de Recherche Rhône-Alpes.
- 1959** > Development of preparation of uranium hexafluoride (UF₆) on behalf of CEA [French Atomic Energy Authority].
- 1970** > Development and industrial roll-out of clean and environmentally sound hydrazine process.

- 1974** > Research into PVDF leads to original product marketed as Foraflon®.
- 1987** > Development and industrial roll-out of 1st generation CFC substitutes: F134a, F141b, F142b.
- 1992**
- SINCE 1990** > Development and industrial roll-out of 2nd generation CFC substitutes: F32, F143a.
- 2002** > Transfer of Applications and Technical Assistance activities formerly based at Centre d'Application de Levallois.

A WORLD-SCALE COMPANY

A global chemical player, Arkema consists of 3 coherent and balanced business segments:

- **Vinyl Products:**
Chlorochemicals and PVC, Vinyl Compounds, Pipes and Profiles (Alphacan).
- **Industrial Chemicals:**
Acrylics, PMMA (Altuglas International), Thiochemicals, Fluorochemicals, Hydrogen Peroxide.
- **Performance Products:**
Technical Polymers, Specialty Chemicals (Ceca), Organic Peroxides, Additives, Urea Formaldehyde Resins, Agrochemicals (Cerexagri).

environmental protection, client proximity, industrial reliability, and competitiveness.

Present in over 40 countries with 18,600 employees, Arkema achieves sales of 5.2 billion euros.

With its 6 research centres in France, the United States and Japan, and internationally recognized brands, Arkema holds leadership positions in its principal markets.



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