

ARKEMA

Deep dive sessions

27 September 2023

**CAPITAL
MARKETS
DAY 2023**

MA



Deep dive
Batteries



Our ambition

Sales

c. **€700m**
in 2028

c. **€1bn** in 2030

> +15%/y
CAGR over 2024-28

Our strengths

- 15-year experience in China coupled with a **worldwide footprint** (R&D and production)
- Broad **One Arkema portfolio** for inside and outside the cell across the 3 Specialty Materials segments, strengthened by **recent M&A**
- Unique offering** combining synergistic PVDF and acrylic technologies
- Cutting-edge innovation** for next generation of batteries and more **sustainable** processes

Market trends

Global battery cells demand

c. **+20%/y**

CAGR over
2024-30

in TWh

- Growing EV sales and higher capacity requirements
- 90% Li-ion technology in 2030
- Future gigafactories in EU and NA
- Market request for carbon footprint reduction and more sustainable solutions
- Strong innovation drive for higher energy density and safety

Source: internal estimation

Broad One Arkema portfolio for inside and outside the cell

Battery pack

Electrical insulation

- PA11 coating for busbars
- UV-curing acrylics coating

Assembly

- Smart adhesives for cell-to-cell and cell-to-module bonding
- Sealing solutions

Thermal management system

- PA11 & PA12 for cooling circuit
- Thermally conductive adhesive and gap filler
- Fluorinated booster for immersion cooling liquid

Towards more sustainable batteries

● **Specialty surfactants** for more efficient lithium mining and recycling

● **Bio-based (PA11) and bio-attributed (PVDF) materials** to lower carbon footprint of EV

● **Hydrogen peroxide** for recycling

● **Bonding and debonding adhesives** for servicing and recycling (under development)

Battery cell

Anode

Waterborne acrylic based binders

Electrolyte

Ultra-pure electrolyte salts

Separator

PVDF and acrylic coatings

Cathode

PVDF binders

One Arkema

● Adhesive Solutions

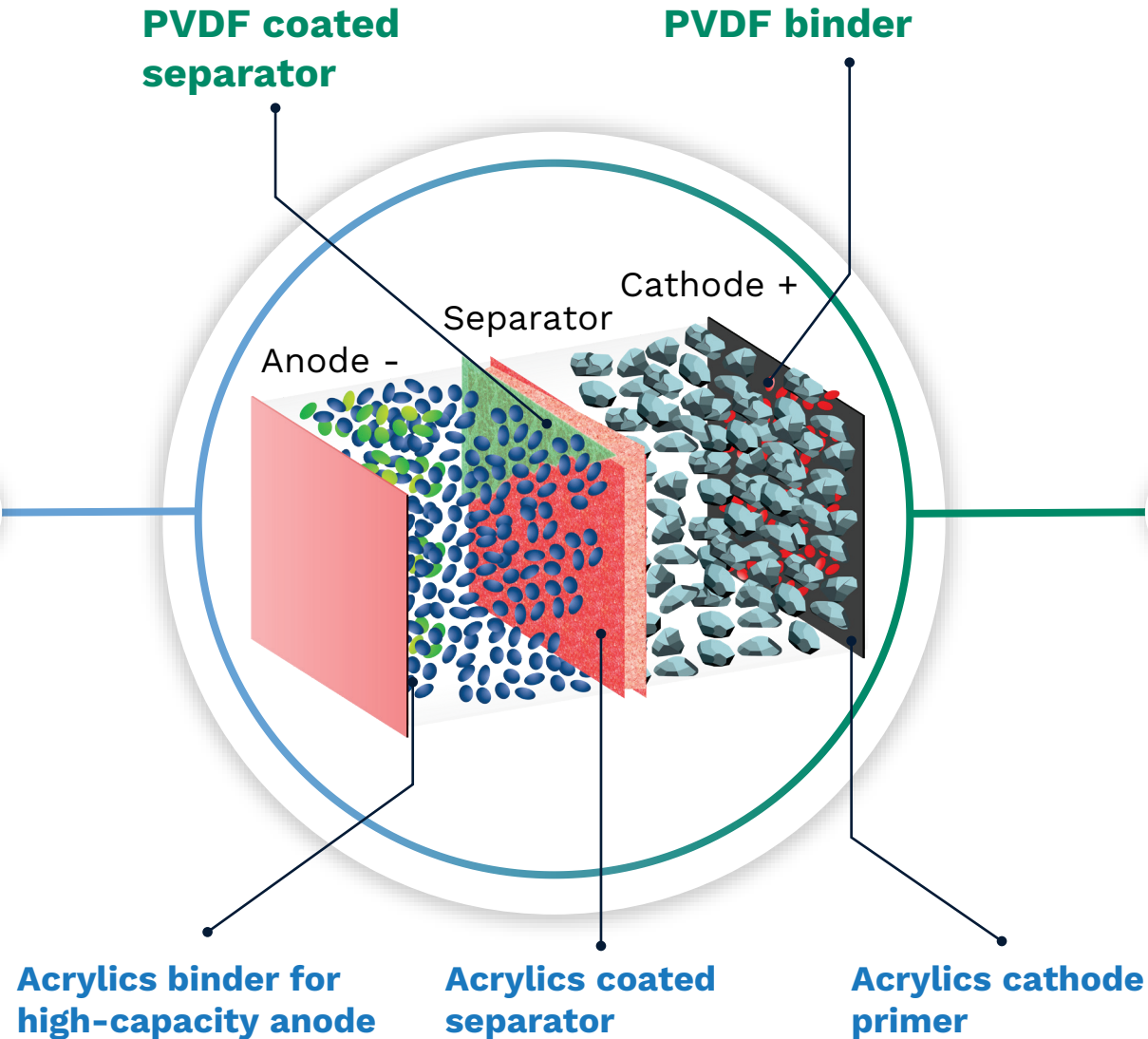
● Advanced Materials

● Coating Solutions

Unique offering combining synergistic PVDF and acrylic technologies

Waterborne acrylics

- **Complementary technology to PVDF** at anode and ceramic coated separators
- **Synergistic combination** when used with PVDF, enabling better performance
- **Sustainable solution** lower VOC emissions compared to solvent-based solutions



PVDF

- **Leadership position** cathode binder and separator coating
- **Kynar® PVDF, material of choice** to improve safety and durability of separators, and cathode performance
- **Solution for next battery generation** semi-solid and all solid-state ceramic based battery

Additional capacities to follow market demand

Recent **Kynar® PVDF** expansion in China & Europe *(start-up 2023)*

New **PA11** capacity in Singapore *(start-up 2023)*

Significant **Kynar® PVDF** capacity expansion in the US *(under review)*

Electrolyte salt unit in collaboration with Nippon Shokubai in the US *(under review)*

HFO-1233zd for thermal management system in the US *(start-up 2024)*



Recent M&A broadening our portfolio

Polytec PT with strong expertise in thermally conductive adhesives *(closing in June 2023)*

PI Advanced Materials¹ with promising development in electric vehicles *(closing expected end-2023)*

- FPCB for battery management systems
- Film for rechargeable battery insulation
- Varnish for electric motor wire insulation

1. Subject to the approval of relevant legal authorities

Cutting-edge innovation for next generation of batteries



Worldwide R&D network

State-of-the-art Center
of Excellence for batteries
Lyon, FR



*to accelerate development
of advanced materials
and processes for future
generations of batteries*



Technological evolution

Our innovative developments

Solid-state battery

Solid polymer electrolyte



High-Nickel and higher
voltage

High-voltage electrolyte



Recyclability and
debonding solutions

Bonding/debonding adhesives



Solvent-free electrode
production

Solutions and components for
water-based and dry processes

**CAPITAL
MARKETS
DAY 2023**

Deep dive
Efficient buildings
and homes



We are a key sustainability enabler combining lower carbon footprint and higher comfort

Our ambition

Sales

c. **€650m**
in 2028

c. **+10%/y**
CAGR over 2024-28

Our strengths

- Broad **One Arkema** portfolio of applications for home structure and indoor
- **Innovative and sustainable solutions** for greener, more comfortable and energy-efficient buildings and homes
- Unique combination of technologies for **cool roofing** to lower buildings' temperature
- **Bolt-on acquisitions** strengthening our technologies and reinforcing our global presence

Market trends

- **New regulations and standards** to lower CO₂ emissions of both new and existing buildings
- Government **incentives** for greener and energy-efficient buildings, in new builds and renovation
 - Renewable construction materials
 - Superior insulation technologies
 - Enhanced durability
- Better indoor **air quality** needs

Broad One Arkema portfolio of applications



One Arkema



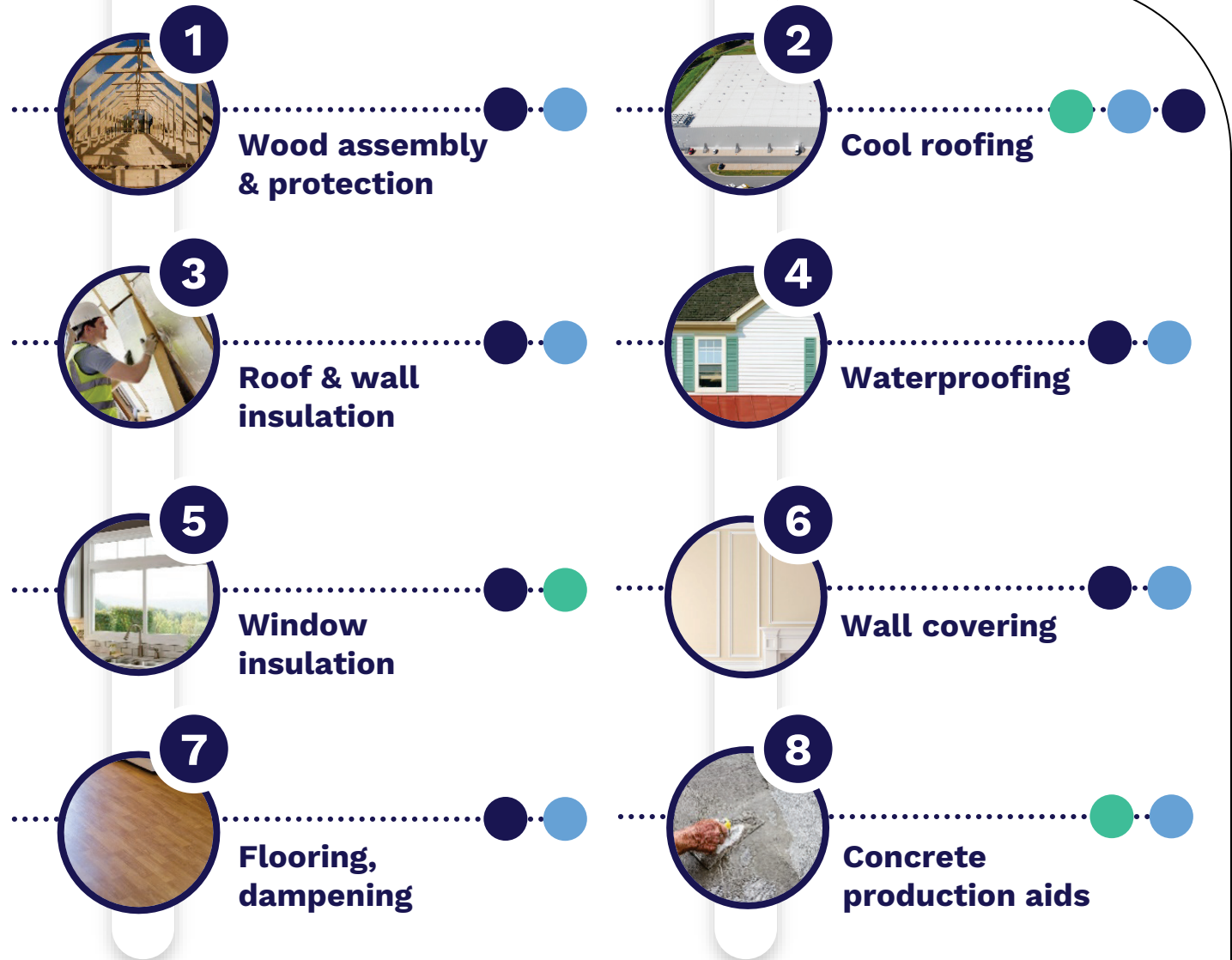
Adhesive Solutions



Advanced Materials



Coating Solutions



Innovative and sustainable solutions improving building structure efficiency



Concrete using less water

Partner on additive technologies to lower water consumption and reduce drying time when making concrete



Roofing thermal insulation

Low GWP HFO-1233zd blowing agents for insulation blocks



Highly insulated windows

High-performance sealants and molecular sieves for durable insulating glazing

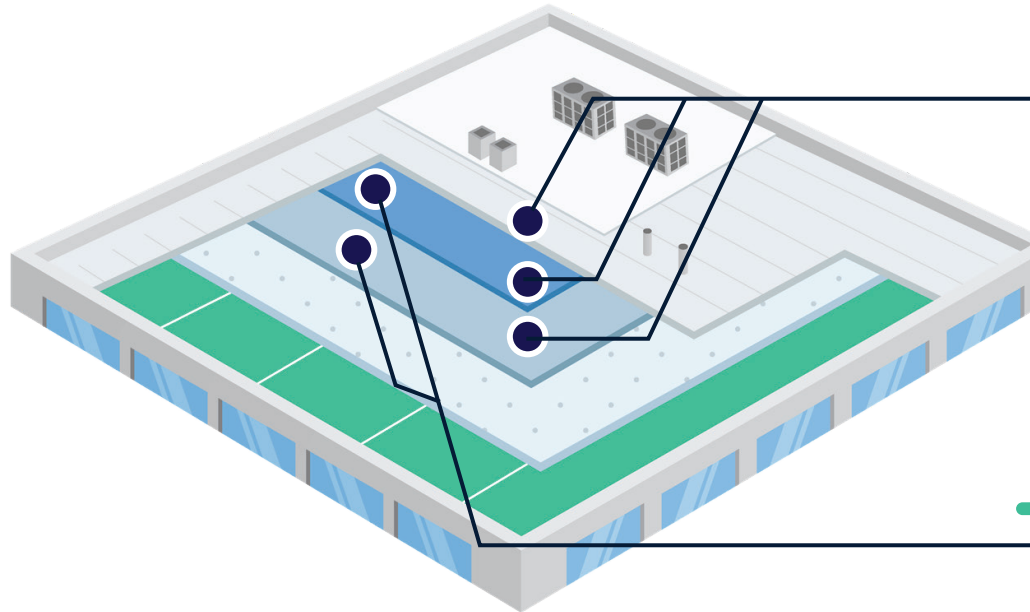


Walls thermal insulation

Performance acrylic binders replacing formaldehyde-based systems



Unique combination of technologies for cool roofing to lower buildings' temperature



Resins and additives

- **Topcoat layer**

PVDF-based emulsions and rheology additives

- **Primer and basecoat layers**

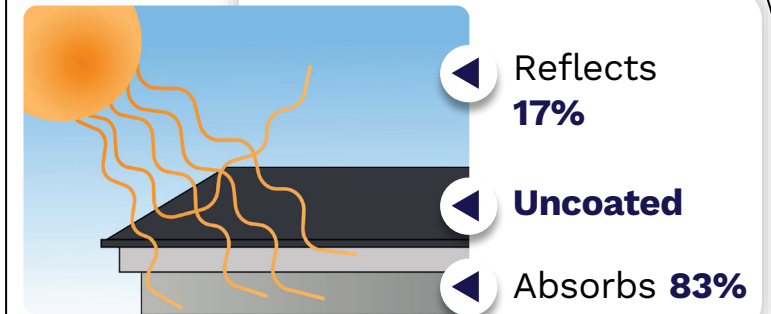
Acrylic-based solutions and rheology additives

Formulations

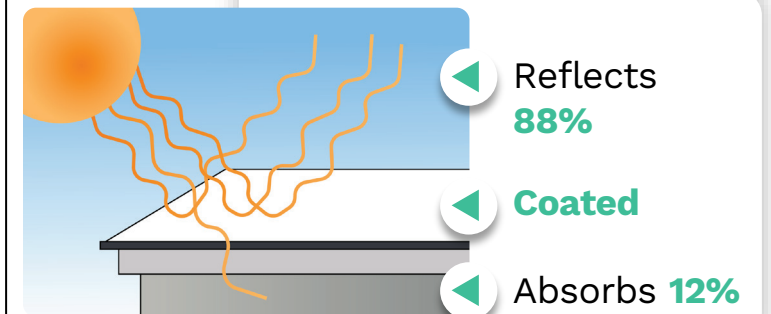
- **Primer and basecoat layers**

Bostik Boscoseal membrane

Uncoated roof



Highly reflective white coated roof



Up to 30%
energy savings in air conditioning



Good adhesion



Extreme durability



Improved cleanability



Good compatibility

Innovative and sustainable solutions enhancing indoor air quality, comfort and well-being



Renewable-based decorative paints

Up to 97% bio-based solvent-free resins and biomass balance acrylic solutions for interior paints



Very low VOC flooring

Solvent, phthalate or isocyanate-free, 35% bio-based Bostik flooring adhesive



LEED
and
BREEM
compliant



Thermally insulated renovated walls

Bostik technology for wall preparation, reducing heat loss by 15%, an ideal choice for interior renovation



Recent bolt-on acquisitions strengthening our technologies and reinforcing our global presence

Bringing new technologies and supporting geographical expansion



LIP (Denmark)

Tile adhesives and flooring preparation in Northern Europe



Ideal Work (Italy)

High-end decorative flooring technologies



Edge Adhesives Texas (United States)

High-performance adhesives for residential construction



Permoseal (South Africa)

Adhesive solutions notably for DIY and construction



Polimeros Especiales (Mexico)

Solvent-free waterborne acrylic resins for architectural & decorative paints

**CAPITAL
MARKETS
DAY 2023**

Deep dive
Sustainable lifestyle



Our ambition

Sales

c. **€400m**
in 2028

c. **+10%/y**
CAGR over 2024-28



Our strengths

- **Unique range of sustainable solutions** including advanced bio-based and recycled polymers, adhesives and coatings enabling more sustainable product design and a lower CO₂ footprint
- **Preferred partner** helping customers bring sustainable innovations to market
- Providing end-of life **recycling solutions** thanks to the acquisition of Agiplast in 2021 enabling new circular business models

Market trends

- **Consumer behavior change** towards more eco-friendly and premium products
- Redesign of sports, lifestyle and luxury brands products to be **more sustainable**

More bio-based and recycled materials

Lower carbon footprint

More durable

Recyclable

Source: internal estimation

High-performance and sustainable solutions for sports & lifestyle

	<ul style="list-style-type: none"> ● Bio-based Pebax® elastomer for helmet ● 3D printed customized helmet 	<p>H X R Riddell.</p> <p>SPEKTRUM</p>
	<ul style="list-style-type: none"> ● Bio-based Pebax® breathable membrane with specialty hot melts liner 	<p>PICTURE</p>
	<ul style="list-style-type: none"> ● Bio-based Rilsan® PA11 textile ● Adhesives for textile lamination, bonding and printing, enabling recycling 	<p>α NO SC</p>
	<ul style="list-style-type: none"> ● Bio-based Rilsan® Clear for eyewear frames and lenses ● 3D UV cured printed fashionable eyewear 	<p>VUARNET LACOSTE MARCHON a vsp vision company</p> <p>GENERA. Creation made reliable.</p>
	<ul style="list-style-type: none"> ● Bio-based Rilsan® PA11 watch casing and bracelet 	<p>CASIO.</p>
	<ul style="list-style-type: none"> ● Bio-based Pebax® foam for outsoles ● Bio-based Rilsan® PA11 textile and plates ● 3D UV cured printed midsoles ● Bio-based adhesives with easy de-bonding 	<p>NIKE adidas</p> <p>DECATHLON α MIZUNO</p>

One Arkema



Adhesive Solutions



Advanced Materials



Coating Solutions

Listed customers are illustrative and not exhaustive

Preferred partner helping customers bring sustainable innovations to market



The world's lightest gaming mouse

(54g) made from ultra-lightweight bio-based Rilsan® PA11 compounds



A unique plant-based brush

Entirely made from Arkema bio-based materials to enable recycling at the end of life



More circular home appliances

Durable, solvent free and coated with up to 40% rPET-based powder paints



Solvent-free solutions for e-bike assembly

Several parts assembled with solvent-free, low odor Born2Bond™ engineering adhesive ranges



Extending lifetime of glass bottles up to 50 cycles

Through full package offering including niche additives supply, equipment & services

Providing recycling solutions, enabling new circular business models



Run on clouds.



Innovative upper construction with **Rilsan®** polyamide 11

Responsive foam layer with a combination of **Pebax® Rnew®** and ON's Speedboard® design



Leased by ON

to customers to ensure collection at end of life

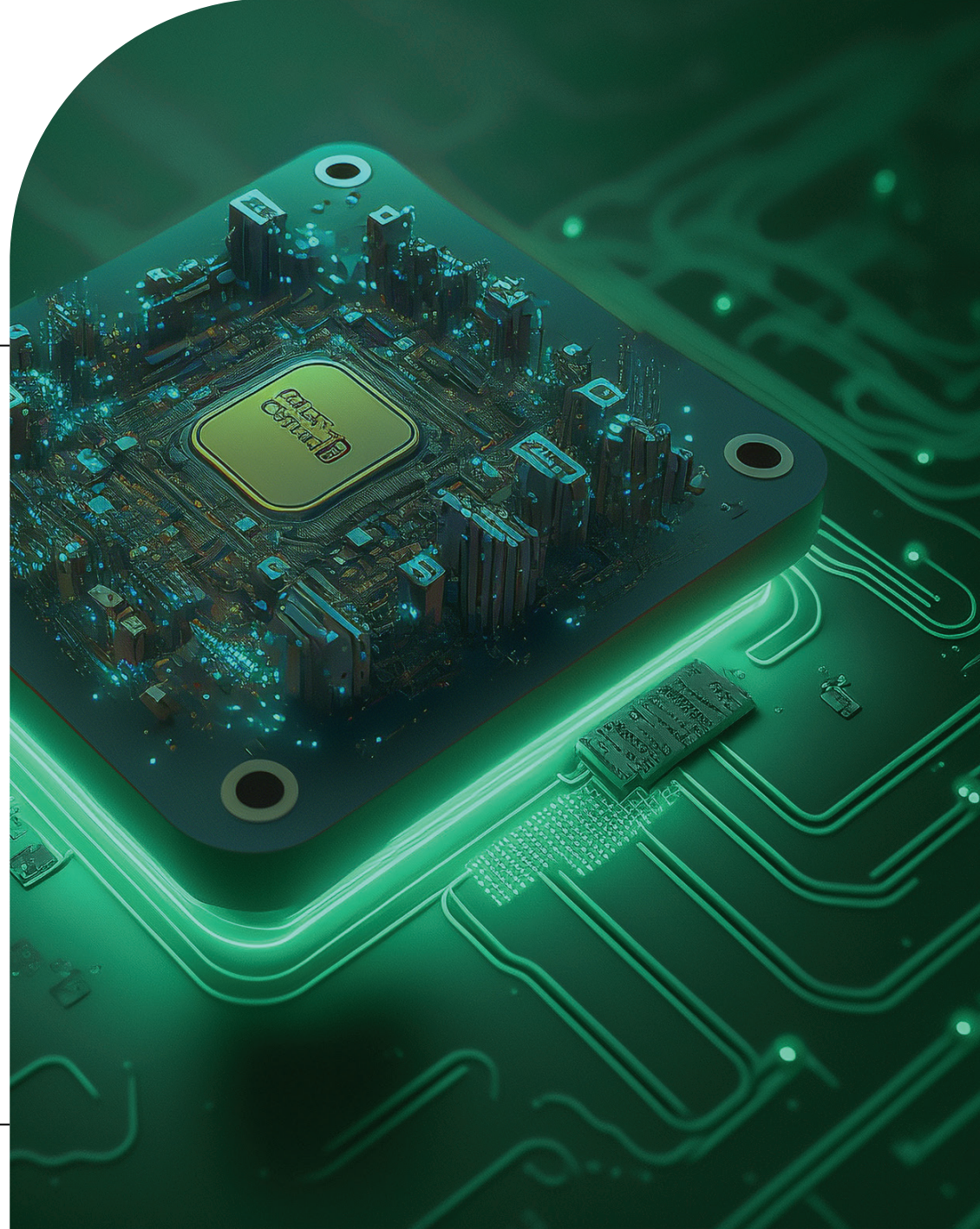


Recycled by Arkema

to regenerate and re-use the material

CAPITAL
MARKETS
DAY 2023

Deep dive
Advanced electronics



Our ambition

Sales

c. **€550m**
in 2028

> +10%/y
CAGR over 2024-28

Our strengths

- Presence across the **entire value chain**, providing us with strong insights of customer needs
- Broadening of our portfolio and strengthening of our positioning with **recent bolt-on** and **PIAM¹** acquisitions
- **Cutting-edge solutions** focused on high-growth emerging applications (5G, flexible screens, datacenter liquid cooling, AR/VR...)

1. Subject to the approval of relevant legal authorities, closing expected end-23

Market trends

CAGR over 2022-30 (%/y)

c. **7%**

Chip & PCB
manufacturing

c. **5%**

Device
manufacturing

- Development of personal electronic devices (smartphones, smartwatches, AR/VR...)
- Rapid deployment of 5G technology
- Emergence of flexible displays
- More powerful datacenters
- Challenging technical requirements linked to miniaturization

Source: McKinsey

A wide One Arkema offering across the entire value chain

Chip and PCB manufacturing

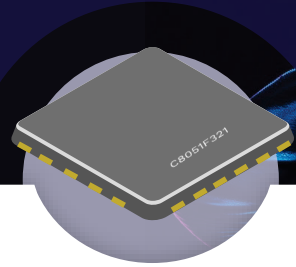
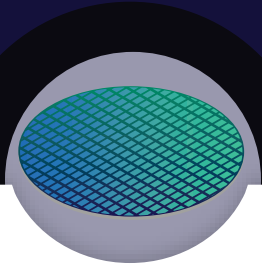
Device manufacturing

Chip and PCB processing

Display materials

Device components

Device assembly



- E-Pure MSA® for PCB **electroplating**
- Hydrogen peroxide for **etching**
- PVDF for ultra-purity water piping for **chip manufacturing**

- Permanent antistatic additives for semicon **packaging**
- UV/LED curing resins and bio-based specialty hot melts for **chip encapsulation** and **PCB protection**

- Polyamide elastomers for flexible screens to improve **impact resistance** and **flexibility**
- UV/LED curing resins to **protect** foldable displays

- PA11 for light and durable **frames** and **casings**
- PVDF for longer lasting **batteries**
- Piezotech for touch **sensors** and **haptic** feedback
- UV/LED curing resins for **optical sensors** encapsulation

- Fast sealing and gasketing solutions for **waterproofing**
- Engineering adhesives for **high-strength** assembly
- Anaerobic adhesives for screws **threadlocking**
- UV/thermal cure adhesives for components **bonding**

One Arkema ● Adhesive Solutions ● Advanced Materials ● Coating Solutions

Non exhaustive

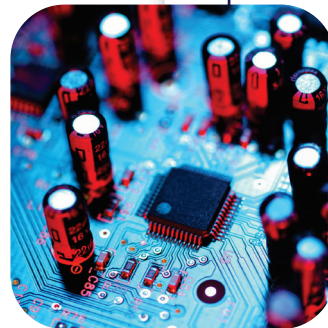
Broadening of our portfolio and strengthening of our positioning in electronics thanks to recent acquisitions



PMP

Reactive **hot melt adhesives** for smart devices assembly in Asia

Polytec PT
Electrically and thermally conductive adhesives for electronics components



PI Advanced Materials¹

Superior sales growth expected at **13%/y**

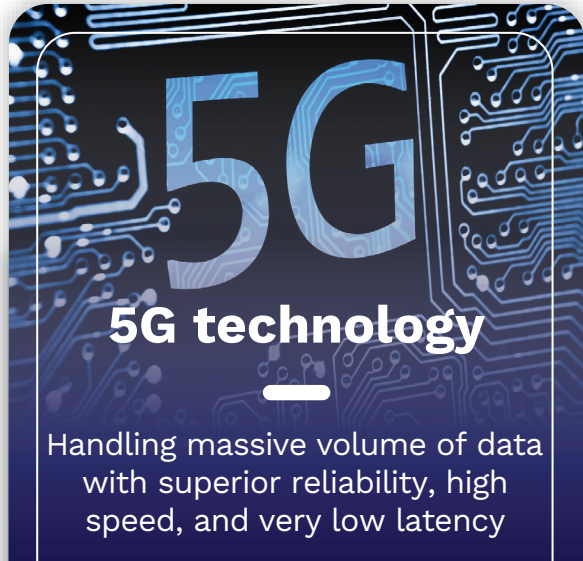
PI films and varnishes for increasingly demanding applications

- FPCB and graphite sheets
- Li-ion batteries
- 5G antennas
- OLED displays
- flexible screens

GLOBAL #1 Polyimide films

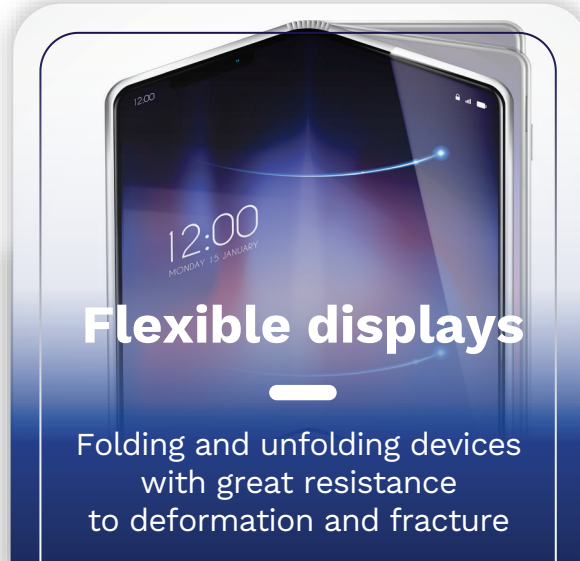
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Cutting-edge solutions focused on high-growth emerging applications



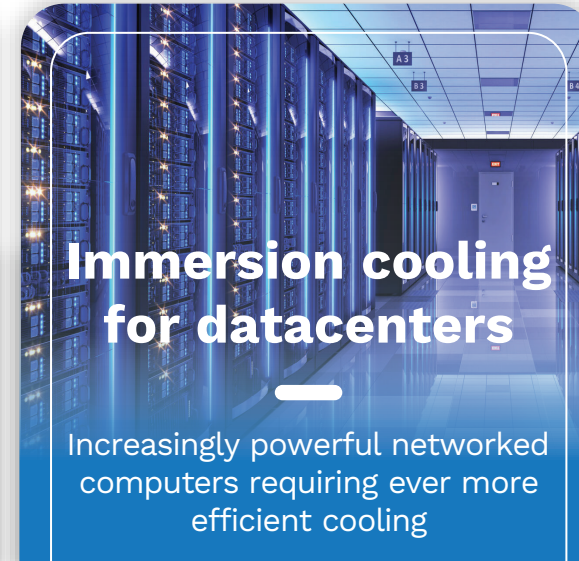
5G technology

Handling massive volume of data with superior reliability, high speed, and very low latency



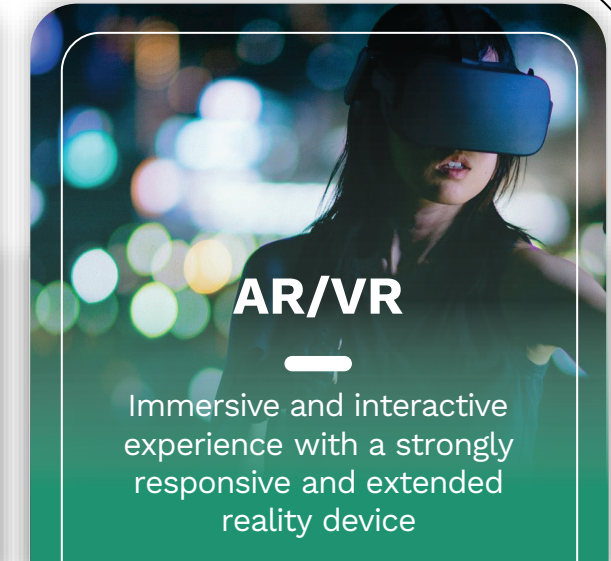
Flexible displays

Folding and unfolding devices with great resistance to deformation and fracture



Immersion cooling for datacenters

Increasingly powerful networked computers requiring ever more efficient cooling



AR/VR

Immersive and interactive experience with a strongly responsive and extended reality device

- UV curable resins with **ultra-low dielectric loss**
- Modified polyimide films¹ for 5G **antennas**

c. **+15%/y**
CAGR 23-27

- Bio-based elastomers as a substrate for **improved screen resistance**
- Polyimide films¹ for flexible screens **protection**

c. **+30%/y**
CAGR 23-27

- 100% bio-based solutions for **dielectric cooling liquid**
- 100% bio-based PA11 for **liquid cooling lines**

c. **+25%/y**
CAGR 23-27

- Piezotech® electroactive polymers for **control panel haptics**
- Engineering adhesives for **frame and components assembly**

c. **+14%/y**
CAGR 23-27

1. Subject to the approval of relevant legal authorities, closing expected end-2023

Market growth estimations

The information disclosed in this document may contain forward-looking statements with respect to the financial condition, results of operations, business and strategy of Arkema. In the current context, where the world economy and the consequences of the Russian offensive in Ukraine on geopolitical equilibriums remain uncertain the retained assumptions and forward looking statements could ultimately prove inaccurate.

Such statements are based on management's current views and assumptions that could ultimately prove inaccurate and are subject to material risk factors such as among others, changes in raw material prices, currency fluctuations, implementation pace of cost-reduction projects, development of the Russian offensive against Ukraine, and changes in general economic and business conditions. These risk factors are further developed in the 2022 Universal Registration Document.

Arkema does not assume any liability to update such forward-looking statements whether as a result of any new information or any unexpected event or otherwise.

Further information on factors which could affect Arkema's financial results is provided in the 2022 Universal Registration Document and other documents filed with the French *Autorité des marchés financiers*.

Financial information since 2006 is extracted from the consolidated financial statements of Arkema. The business segment information is presented in accordance with Arkema's internal reporting system used by the management.

Besides its IFRS accounts, Arkema also uses alternative performance indicators to provide a more consistent and comparable analysis of the Group's financial performance. Such indicators are defined in the 2022 Universal Registration Document. In this presentation, the Group uses in particular the following indicators:

EBITDA margin: corresponds to EBITDA as a percentage of sales, EBITDA equaling recurring operating income (REBIT) plus recurring depreciation and amortization of tangible and intangible assets

CAGR over 24-28: corresponds to the compound annual growth rate over the 5-year period 2024-28

This document contains forward looking information, which describe expectations, strategies, future events or intentions. Forecasts and financial objectives are defined in normalized macroeconomic and market conditions, among other EUR/USD exchange rate of 1.1, GDP of 3% and oil price at US\$80/bbl. The achievement of these forecasts and financial objectives is therefore subject to uncertainties regarding these economic factors, as well as regarding changing market conditions, competitive landscape, regulatory evolutions, and other unplanned events. As a consequence, results may differ from those expressed or implied in this document.