



Delivering Technology Beyond
Our Customers' Imagination®

CYTEC.COM

Cytec Specialty Chemicals



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Attractive Growth Markets with Leadership Positions



Aerospace Materials

- Leader in advanced composites and structural adhesives
- Increasing composite usage across all aerospace markets
- Positive outlook for long-term growth in air travel and air freight traffic leading to significant order backlog



Industrial Materials

- Leader in composites and process materials for industrial applications
- Markets include high performance automotive, motorsports, wind energy, marine
- Large longer-term opportunity in serial automotive



In Process Separation

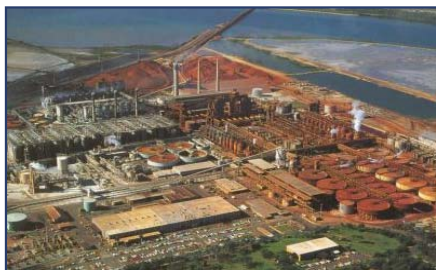
- 100 years of innovation in the mining industry
- Developing unique and innovative reagent solutions and bringing expertise to improving recovery and throughput
- High focus on innovation and strong pipeline of new products
- Phosphine growth opportunities in mining, fumigation, electronics



Additive Technologies

- Global supplier Light Stabilizers which protect plastics from UV radiation; markets include automotive and agricultural film
- Global supplier of specialty surfactants used in adhesives, paints, textiles, paper coatings, inks, pharmaceuticals

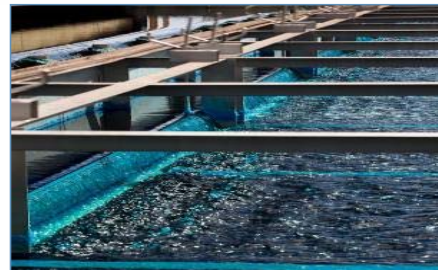
In Process Separations: Business Overview



Alumina



Mineral Processing



Metal Extraction Products



Phosphine Specialties

Alumina

Specialty reagents (e.g. flocculants and antiscalants) to the refining industry that produces alumina from bauxite. Focused on delivering **innovative breakthrough technology** and **greenfield expansions**

Mineral Processing

Drive sustainable growth from our position as the technology leader in mineral processing (e.g. copper, gold, molybdenum, phosphate) reagents. Maximize the performance of our customer's operations through **optimum reagent selection** and **application expertise**

Metal Extraction Products

Maintain our leadership position in copper **hydrometallurgical separation**, and expand into **other metals**, such as nickel, cobalt, molybdenum and rare earths

Phosphines Specialties

Be the premier supplier of phosphine gas and phosphine-based chemicals by exploiting **unique technology** platform through **breakthrough innovations, application knowledge** and **global presence**

In-Process Separations Business Unit

Minerals/Metals Separation, Processing and Recovery

Core Competencies

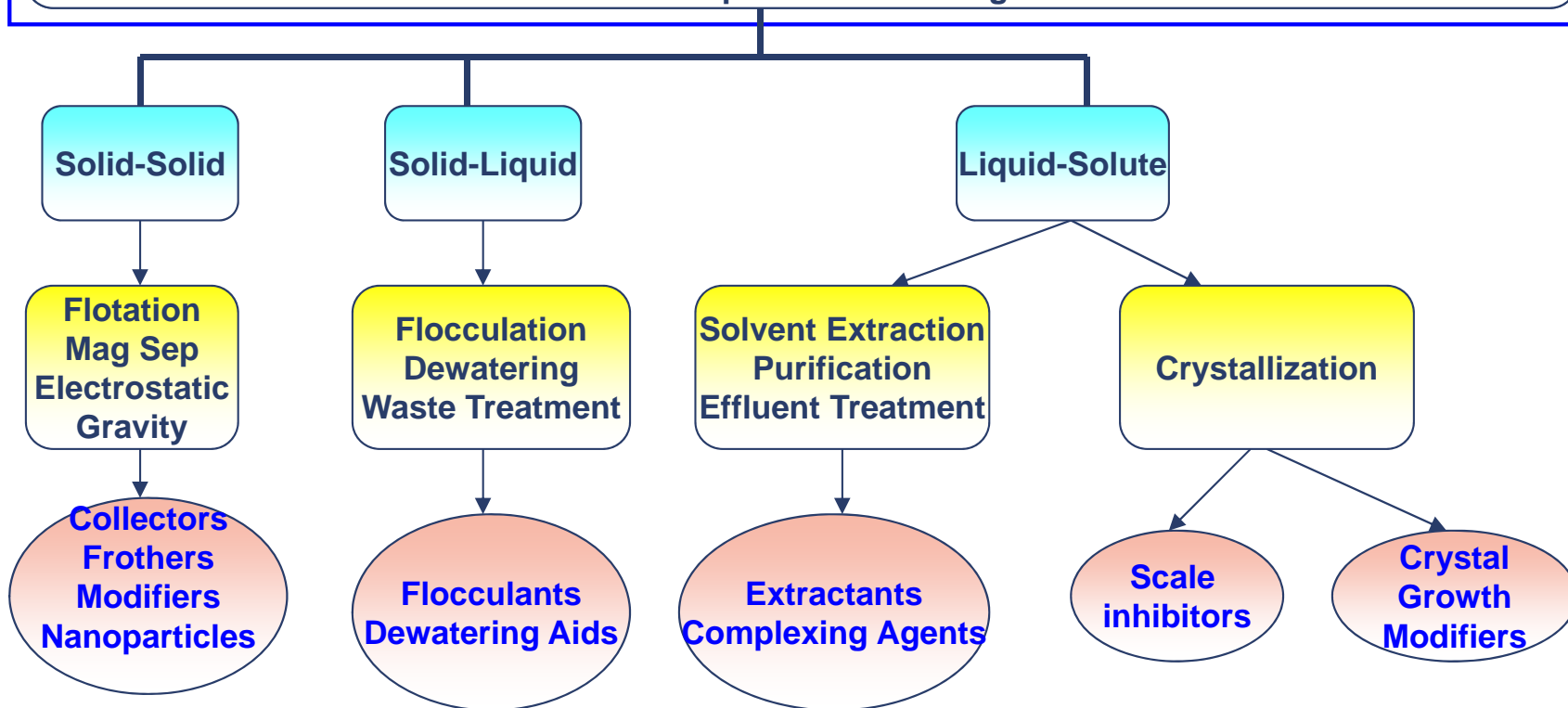


- Designing Chemicals with targeted mineral/metal selectivity and Molecular Architecture to modify interfacial properties, Facilitate selective transport/separation, and/or influence crystal growth
- Developing application knowledge for Mineral Industry Needs
- Scale-up & Manufacturing

Industrial Systems

Industrial Processes

Platform Technologies

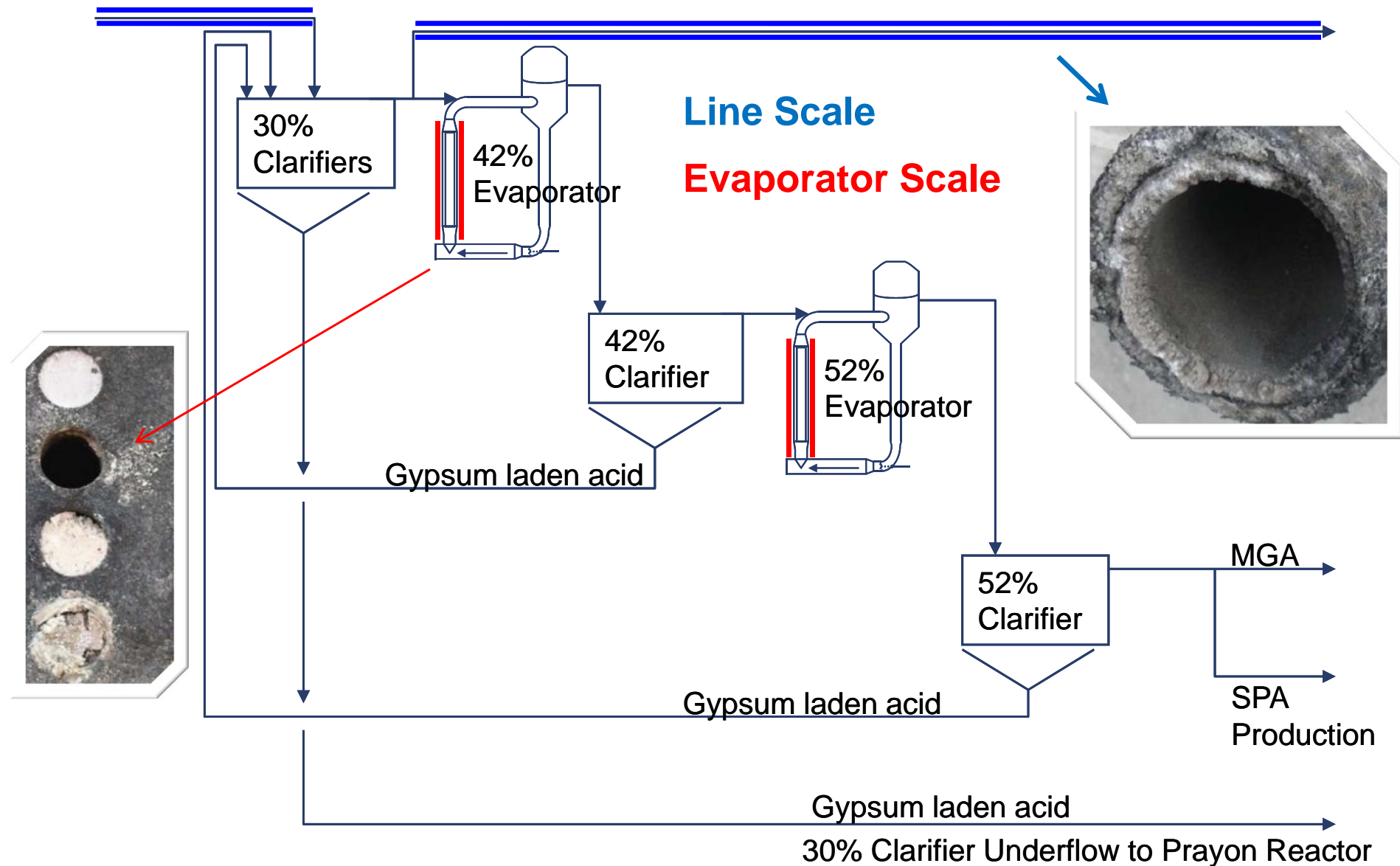


Cytec Technology to Address Sustainability Challenges

- Dealing with *marginal and difficult-to-process reserves*
 - Novel reagents to improve flotation efficiency
- Minimizing *safety, health and environmental impact*
 - Alternatives to hazardous mining chemicals
- *Reducing Energy* consumption and *waste* generation
 - Chemicals to control scale and improve heat transfer
 - Higher efficiency catalysts for petroleum processing
- *Improving Water Efficiency* and resource management
 - Mining chemicals to facilitate processing at high solids and in low quality waters
- Critical materials
 - Enhancing extraction of critical elements

Phosacid Scale Formation

Reactor Product Acid



Scale formation



Cross section of heat exchanger tubes plugged with scale

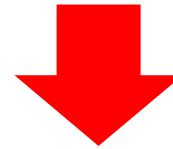


- Na_2SiF_6
- K_2SiF_6
- $\text{CaSiF}_6 \cdot 2\text{H}_2\text{O}$
- CaSO_4
- MgF_2

- $\text{Al}(\text{PO}_3)_3$
- NaK_2AlF_6
- $\text{Ca}_3(\text{AlF}_6)_2 \cdot 4\text{H}_2\text{O}$
- $\text{MgNaAlF}_6 \cdot 2\text{H}_2\text{O}$
- $\text{MgSiF}_6 \cdot 6\text{H}_2\text{O}$

Scale Species

Impact



Reduces

- Flows
- Plant throughput
- Heat transfer
- Evaporation
- Production



Increases

- Energy consumption
- Turnaround time
- Maintenance Costs
- Labor Costs
- Human exposure

QUESTIONS?

