FERTILIZER
INNOVATIVE SOLUTIONS FOR THE CROP NUTRIENT INDUSTRY
The fertilizer industry has experienced significant change due to factors affecting the production, distribution and use of crop nutrients. New capacities across the globe have led to more fertilizer being shipped further than ever before. Port investments and trade flow changes have created different pathways for fertilizer to travel from the site of manufacture to the point of use. Increased regulatory pressure has focused greater attention on emissions management and worker protection. Tightening margins have forced the supply chain to deliver products faster with minimal interruption. Growers today are demanding products that meet their goals for crop quality, yield, resource stewardship and profitability.

In order to help you compete and succeed in the marketplace, ArrMaz offers a wide range of fertilizer process aids, coatings and services to enable you to optimize your process performance, maximize production efficiency and produce superior fertilizer products for your customers. We recognize that no one solution fits every customer’s needs, so we work closely with you to select or develop the best product to meet your specific requirements. Our global footprint has provided us with unique insight into how different fertilizer characteristics are valued by varying geographies and stakeholders, enabling us to successfully collaborate with our partners to produce the right product for the market.

As a global market leader in the provision of specialty chemicals to the fertilizer industry, ArrMaz is the preferred supplier to many of the world’s largest fertilizer producers. We can provide you with a complete product and equipment package designed to help you succeed.
At ArrMaz, we do not provide one-size-fits-all product offerings — when developing coatings, we complete a thorough evaluation of your fertilizer as well as environmental and market factors to ensure our coatings meet your specific needs and deliver the results you want.

**DUSTROL® | GALORYL® | Microstickers™**

## COATING & COLORANT FACTORS WE EVALUATE

<table>
<thead>
<tr>
<th>FERTILIZER TYPE</th>
<th>ENVIRONMENTAL CONDITIONS</th>
<th>LOGISTICS</th>
<th>END USER REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Particle size and shape</td>
<td>• Temperature max/min and frequency of cycles</td>
<td>• End-to-end product handling</td>
<td>• Visual appearance</td>
</tr>
<tr>
<td>• Porosity of the granule</td>
<td>• Humidity max/min and frequency of cycles</td>
<td>• Product delivery method – bulk, container or bag</td>
<td>• Water soluble</td>
</tr>
<tr>
<td>• Particle hardness</td>
<td>• Exposure to air movement</td>
<td>• Downstream blending operations</td>
<td>• Biorenewable</td>
</tr>
<tr>
<td>• Trace element analysis</td>
<td>• Expected length in storage</td>
<td></td>
<td>• On-farm application equipment</td>
</tr>
<tr>
<td>• Moisture content</td>
<td>• Bulk storage configuration</td>
<td></td>
<td>• Micronutrient demand</td>
</tr>
<tr>
<td>• Efficiency and capabilities of the coating system</td>
<td></td>
<td></td>
<td>• Regulatory requirements (OMRI, REACH, GRAS)</td>
</tr>
</tbody>
</table>

## ADVANCED FERTILIZER COATINGS

**KEY BENEFITS**

**BETTER QUALITY**
- Improved air quality in the workplace
- Supports compliance with regulatory requirements
- Differentiated fertilizer color and appearance

**BETTER HANDLING**
- Easier application in the field
- Reduced pile set in bulk storage
- Less problematic for bulk blending
- Compatible with liquid systems

**BETTER ECONOMICS**
- Improved nutrient efficiency
- Reduced loss of valuable product
- Reduced risk of customer claims
- Faster fertilizer loading / unloading

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[OMRI Listed for Organic Use](https://www.omri.org/)

[REACH Compliant](https://reacch.eu/)

[GRAS Generally Recognized As Safe](https://gras.com/)

[Environmentally Friendly](https://greenplanet.com/)
PHOSPHORIC ACID PRODUCTION

**UAN MANUFACTURING**
- Corrosion Inhibitors
  - Reduced maintenance costs
  - Increased on-stream time

**REACTION**
- Defoamers
  - Better recirculation, better reaction, better recoveries
  - Reduced losses to scrubbing systems

**FILTRATION**
- Filtration Aids
  - Improved throughput
  - Better recoveries

**CLARIFICATION**
- Clarification Aids
  - Improved throughput and acid grade
  - Reduced impurities
  - Reduced capital investment

**EVAPORATION**
- Defoamers
  - Reduced losses to scrubbing systems
  - Improved throughput
  - Reduced capital investment

**GRANULATION**
- Granulation Aids
  - Increased production rate
  - Improved fertilizer quality

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BLENDING
Dust Control & Anti-Caking Coatings
• Improved throughput
• Better blend consistency
• Reduced worker health and safety risks
Micronutrient Binders
• Differentiated product offering

FIELD APPLICATION
Dust Control & Anti-Caking Coatings, Micronutrient Binders
• Precise nutrient placement for optimizing input cost and yield
• Faster application rates to reduce equipment and labor costs
• Reduced risk of missing fertilizer application windows

SCRUBBING SYSTEMS
Defoamers
• Better recirculation
• Reduced $P_2O_5$ losses

FIELD APPLICATION
• Reduced loss of valuable product
• Reduced risk of customer claims
• Environmental / regulatory compliance
• Reduced worker health exposures
• Lower-cost alternative to scrubbing / baghouses etc.

STORAGE & DISTRIBUTION
Dust Control Coatings
• Reduced loss of valuable product
• Reduced risk of customer claims
• Environmental / regulatory compliance
• Reduced worker health exposures
• Lower-cost alternative to scrubbing / baghouses etc.

Anti-Caking Coatings
• Reduced loss of valuable product
• Reduced risk of customer claims
• Environmental / regulatory compliance
• Reduced worker health exposures
• Faster fertilizer loading / unloading
• Improved worker safety

Micronutrient Binders
• Differentiated fertilizer appearance
• Consistent customer experience

Shipping
• Reduced loss of valuable product
• Reduced risk of customer claims
• Environmental / regulatory compliance
• Reduced worker health exposures
• Lower-cost alternative to scrubbing / baghouses etc.

Coloring Agents / Micronutrient Binders
• Differentiated fertilizer appearance
• Consistent customer experience

Storage & Distribution
• Reduced loss of valuable product
• Reduced risk of customer claims
• Environmental / regulatory compliance
• Reduced worker health exposures
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We work closely with our customers to understand their needs, and our research scientists work tirelessly to develop better and more cost-effective process aids to improve your profitability. Our technical experts work with our customers on an ongoing basis to continually improve their processes with our defoamers, flocculants, granulation aids, antiscalants and corrosion inhibitors.

**PROCESS AIDS**

**Defoamers | Flocculants | Granulation Aids | Antiscalants | Corrosion Inhibitors**

**PROCESS AID FACTORS WE EVALUATE**

**PROCESSING CONDITIONS**
- Phosphate concentration and impurities of ore processed
- Production approach
- Site operating conditions
- Production rates
- Process variability
- Clarifier operating concentrations

**PROCESSING EQUIPMENT**
- Type, size and residence time
- Equipment condition
- Operational complexity
- Degree of automation
- Number of evaporator effects and concentrations
- Pollution control equipment and configuration

**SITE-SPECIFIC ECONOMICS**
- Current and desired recoveries
- Current rate and desired production increases
- Energy costs
- Capital investment strategy

**DOWNSTREAM IMPACTS**
- Downstream processes
- Water management constraints
- Regulatory compliance requirements
- Impurity disposal processes

**PROCESSING CONDITIONS**

**PROCESSING EQUIPMENT**

**SITE-SPECIFIC ECONOMICS**

**DOWNSTREAM IMPACTS**

**KEY BENEFITS**

**BETTER THROUGHPUT**
- Faster filtration rates
- Faster solids settling
- Increased granulation rates

**BETTER RECOVERIES**
- More efficient reaction kinetics
- Improved separation of phosphoric acid from gypsum
- Reduced loss of product to scrubbing systems

**BETTER ECONOMICS**
- Reduced capital investment requirements
- Lower operating expenses and increased throughput
- Increased customer loyalty and revenue

**APPLICATION EXPERTISE**

ArrMaz provides safe, operator-friendly and effective application systems designed to work within the physical and economic constraints of each customer. New applications require design, engineering, construction and installation of equipment systems. Depending on the objective, systems can range in complexity from managing a single transfer point to supporting product delivery across the globe. Existing systems may benefit from new equipment and controls; adjusting spraying, heating and transfer equipment; or modifying operating practices.

From initial assessment to engineering design, equipment installation, product selection and application, training, and technical support, our technical experts are with you every step of the way.
Since 1967, ArrMaz has been a trusted partner to fertilizer manufacturers and distributors worldwide, delivering innovative chemical solutions for process improvement with superior responsiveness, expert technical advice and outstanding customer support. Each year, we treat millions of tons of fertilizer for some of the world’s largest fertilizer producers. Let us do the same for you.
CONTACT ARRMAZ

Contact ArrMaz today to discover how our high-quality custom fertilizer solutions can improve your product and process.

Email Fertilizer@ArrMaz.com for further information.