

REFERENCES

YARA	Rostock, Germany	Fosfertil	Uberaba, Brazil
YARA	Glomfjord, Norway	ABF	Bintulu, Malaysia
Kemira	Uusikaupunki, Finland	Grand Paroisse	Mazingarbe, France
Kemira GrowHow	Siilinjärvi, Finland	Lovochemie	Lovosice, Czech Republic
KRIBHCO	Hazira, India	PFI	Kavala, Greece
IFFCO	Phulpur, India	Agrolinz	Linz, Austria
SKW	Lutherstadt Wittenberge, Germany	Azot Cherkassy	Cherkassy, Ukraine
Incitec	Brisbane, Australia	Azomures	Tirgu Mures, Romania
BASF	Ludwigshafen, Germany	Agrium	Carseland, Canada
BASF	Antwerp, Belgium	Kali GmbH	Sehnde, Germany
DSM Agro	Ijmuiden, Netherlands	Scotts	Marysville, USA

APPLICATIONS

Ammonium Nitrate (AN, CAN, LDAN)
 Urea Prills & Granules
 NPK & PK Fertilizers
 Phosphate Fertilizers (MAP, DAP, TSP)
 Ammonium Sulphate
 Ammonium Sulphate Nitrate
 Potassium Nitrate
 Potassium Sulphate
 Scotts® Turf Builder®
 Sulphur Coated Urea

Heating Fertilizers:

There are special applications where there is a need to heat fertilizers. The Solex ALPHA series heater can be used in the following types of applications:

- heating urea prills/granules before coating
- preheating ammonium sulphate crystals before blending



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World leaders in the science of heating and cooling fertilizers.



We make the science of heating and cooling fertilizers look easy.

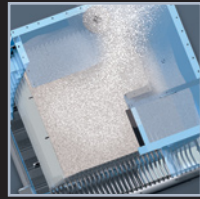
When it comes to heating and cooling fertilizers, Solex is the trusted leader.

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WHAT MAKES SOLEX TECHNOLOGY BETTER FOR HEATING AND COOLING FERTILIZERS?

A simple design, with remarkable benefits.

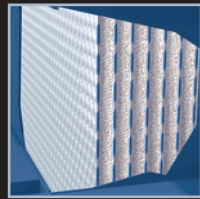


Design Feature: SLOW & CONTROLLED PRODUCT FLOW

How it Works: Fertilizer granules pass slowly downward between a series of vertical hollow heat exchange plates.

Why it's Better:

The slow and controlled movement of fertilizer through the heat exchanger produces a superior final product. It prevents product abrasion and degradation ensuring that the product characteristics are not changed in the heat exchange process. The low velocity of the product also makes this design suitable for handling abrasive materials.



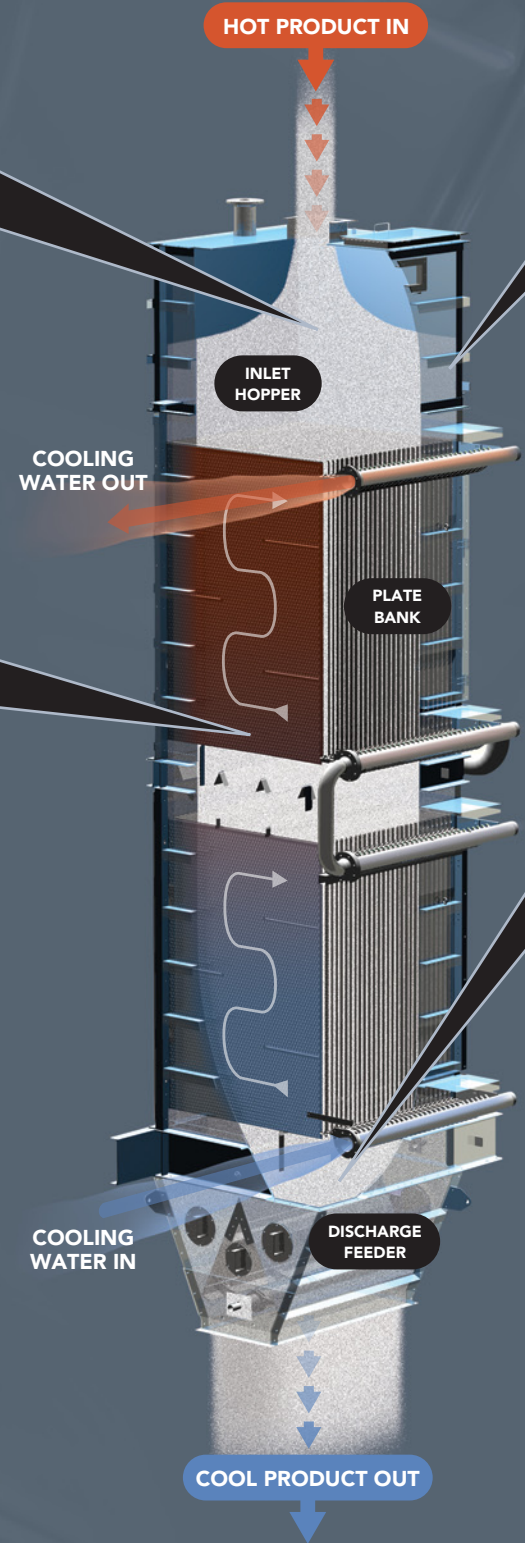
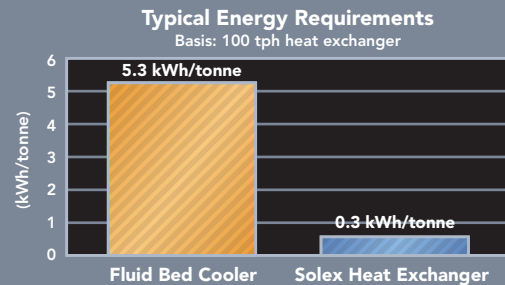
Design Feature: INDIRECT PLATE HEAT EXCHANGE

How it Works: Cooling water (or hot water/steam) flows through the plates to cool (or heat) the material by conduction.

Why it's Better:

The indirect plate heat exchanger design means air is not used in the cooling or heating process. This design is superior and results in many important benefits for cooling and heating fertilizers.

- It is ultra efficient, using up to 90% less energy than technologies requiring the use of air.
- Emissions, dust, fines and odors are eliminated because air is not used to directly cool or heat the product.
- Installed capital costs are reduced due to the elimination of costly and unnecessary air handling equipment such as large diameter air ducting, motors, fans, scrubbers, chillers, and emissions controls.
- A superior final product is produced. Since air is not in contact with the product, risk of product moisture content changes are eliminated.
- The plates are configured to enable easy access for inspection and cleaning. The design makes it possible for single plates to be isolated or replaced.
- Low volumes of dry purge air can be used to prevent condensation in humid climates, which eliminates the potential for product caking.
- Fertilizer can be efficiently cooled to within approximately 10°C of cooling water temperature, which enables lower product storage temperatures.



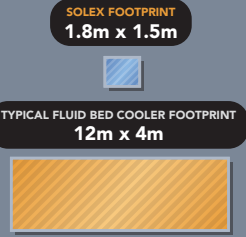
Design Feature: VERTICAL CONFIGURATION

How it Works: Fertilizer granules pass through the vertical heat exchanger by gravity.

Why it's Better:

The vertical configuration makes this design both compact and modular.

- The compact installation footprint makes this design easy to integrate into existing plants and is ideal for de-bottlenecking, revamps and capacity increase.
- The clever modular design means that additional heat exchanger plate banks can be stacked if increased thermal capacity is required in the future.



Design Feature: MASS FLOW TECHNOLOGY

How it Works: The mass flow discharge feeder creates uniform product velocity through the heat exchanger and regulates the product flow rate.

Why it's Better:

Mass flow design means the fertilizer moves with uniform velocity through the heat exchanger. This feature, combined with long residence times (typically 5-10 minutes), enables even temperature distribution as the product passes through the heat exchanger, producing remarkably stable and uniform final fertilizer temperatures.

Technology Comparison:

The Solex heat exchanger offers significant design advantages over other technologies, making it the ideal technology for cooling and heating fertilizers.

	Solex Technology	Fluid Bed Technology	Rotary Drum Technology
Energy Consumption	Low	High	High
Installed Capital Cost	Low	High	High
Maintenance	Low	High	High
Product Degradation	None	High	High
Modular Construction (ease of expansion)	Yes	No	No
Compact Design (small installation footprint)	Yes	No	No
Cooling Air Required	No	Yes	Yes
Air Emissions	None	Yes	Yes