



World leaders in the science of heating and cooling bulk solids.

## When it comes to the science of bulk solids heat exchange, we stand alone.

When it comes to cooling, heating or drying bulk solids - whether its sugar, chemicals, fertilizers, or plastics - Solex is the trusted leader. Utilizing our patented technology, Solex coolers and heaters are engineered to use up to 90% less energy than competing technologies, while offering unprecedented reliability and guaranteed thermal performance.

- **SIGMA SERIES BULK SOLIDS COOLERS**
- **ALPHA SERIES BULK SOLIDS HEATERS**
- **DELTA SERIES BULK SOLIDS DRYERS**



# WHAT MAKES SOLEX TECHNOLOGY BETTER?

A simple design, with remarkable benefits.

1

## Solex Design Feature

### SLOW & CONTROLLED PRODUCT FLOW

The slow and controlled movement of the bulk materials produces a superior final product. It prevents product abrasion and degradation so that there is no change in particle characteristics or crystal shape.

2

## Solex Design Feature

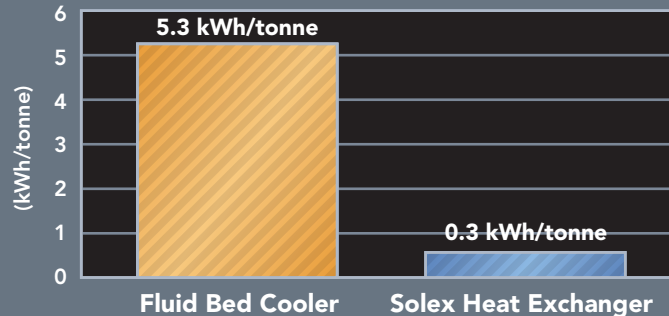
### INDIRECT PLATE COOLING

The indirect plate cooling design means air is not used in the cooling process. This design is superior because:

- It is ultra efficient, using up to 90% less energy than technologies requiring the use of air.

#### Typical Energy Requirements

Basis: 100 tph heat exchanger



- Emissions, dust, fines and odors are eliminated because air is not used to directly cool 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, risks of bacterial contamination, odor contamination, and 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 accessed, repaired or replaced.

3

## Solex Design Feature

### MASS FLOW TECHNOLOGY

Mass flow design means the product 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 product temperatures.

4

## Solex Design Feature

### VERTICAL CONFIGURATION

The vertical configuration makes this design both compact and modular.

- The compact installation footprint makes this design easy to integrate in 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 cooling capacity is required in the future.

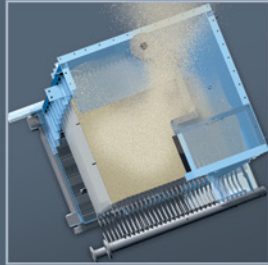
# SIGMA SERIES BULK SOLIDS COOLER

## HOW IT WORKS

1

### SLOW & CONTROLLED PRODUCT FLOW

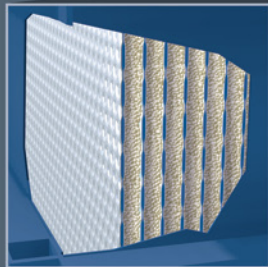
Bulk solid materials pass slowly downward between a series of vertical hollow heat exchange plates.



2

### INDIRECT PLATE COOLING

Cooling water flows through the plates to cool the material by conduction.



3

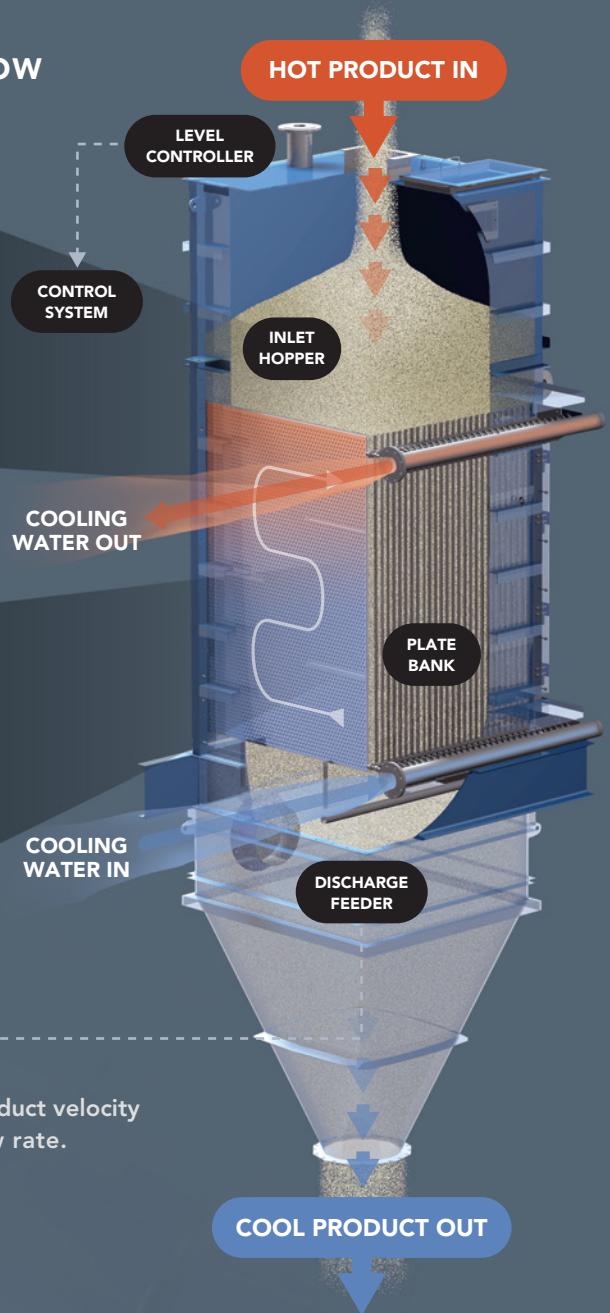
### MASS FLOW TECHNOLOGY

The mass flow discharge feeder creates uniform product velocity through the cooler and regulates the product flow rate.

4

### VERTICAL CONFIGURATION

The vertical configuration makes this design both compact and modular.



## SIGMA<sup>400</sup> SERIES COOLER

Flow Rates: 1 t/hr - 150 t/hr  
Product Inlet Temperature: up to 400°C (750°F)

## SIGMA<sup>1000</sup> SERIES COOLER

Flow Rates: 1 t/hr - 150 t/hr  
Product Inlet Temperature: 400°C - 1,000°C (750°F - 1800°F)

# ALPHA SERIES BULK SOLIDS HEATER

## HOW IT WORKS

### 1 SLOW & CONTROLLED PRODUCT FLOW

Bulk solid materials pass slowly downward between a series of vertical hollow heat exchange plates.

### 2 INDIRECT PLATE HEATING

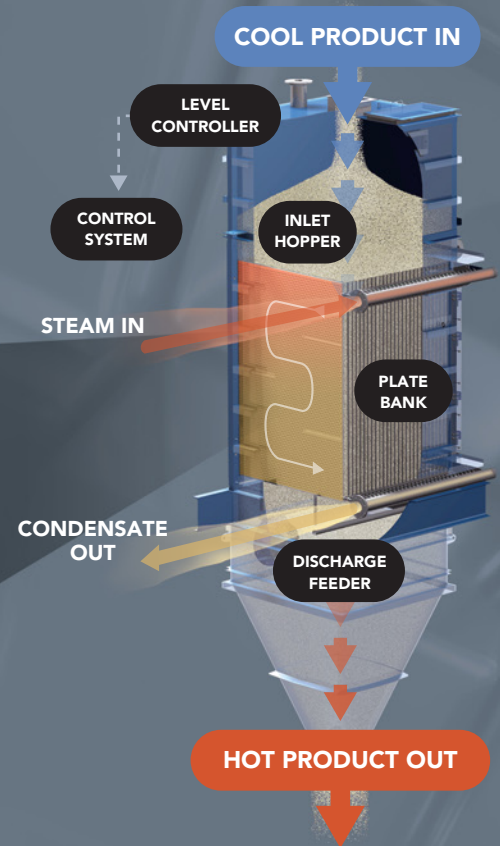
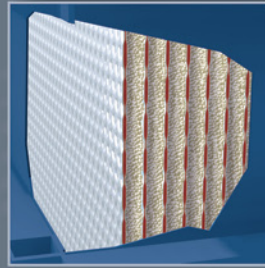
Heat transfer media, such as steam, hot water, or thermal oil passes through the plates to heat the material by conduction.

### 3 MASS FLOW TECHNOLOGY

The mass flow discharge feeder creates uniform product velocity through the heater and regulates the product flow rate.

### 4 VERTICAL CONFIGURATION

The vertical configuration makes this design both compact and modular.



# DELTA SERIES BULK SOLIDS DRYER

## HOW IT WORKS

### 1 SLOW & CONTROLLED PRODUCT FLOW

Bulk solid materials pass slowly downward between a series of vertical hollow heat exchange plates.

### 2 INDIRECT PLATE HEATING

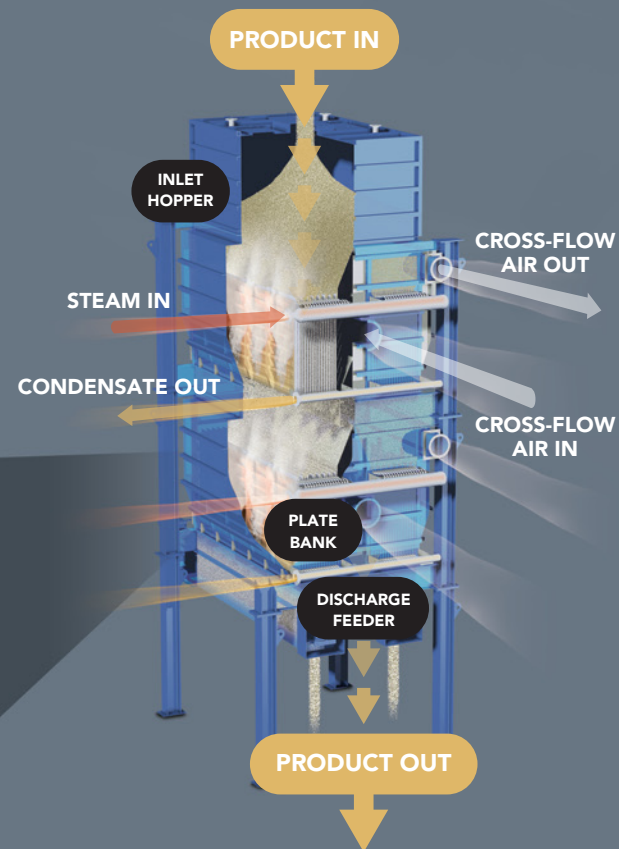
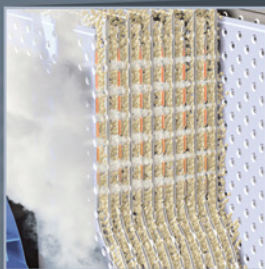
Heat transfer media, such as steam, hot water, or thermal oil passes through the plates to heat the material by conduction. Cross-flow air removes moisture from the product.

### 3 MASS FLOW TECHNOLOGY

The mass flow discharge feeder creates uniform product velocity through the dryer and regulates the product flow rate.

### 4 VERTICAL CONFIGURATION

The vertical configuration makes this design both compact and modular.



## APPLICATIONS

### CHEMICALS

Boric Acid	Calcium Chloride
Potassium Nitrate	Potassium Sulphate
Sodium Bicarbonate	Sodium Bisulphate
Sodium Carbonate	Sodium Chloride (Salt)
Terephthalic Acid (PTA)	Tri-calcium Phosphate



### FERTILIZERS

Ammonium Nitrate (AN, CAN, LDAN)  
Urea Prills & Granules  
NPK & PK Fertilizers  
Phosphate Fertilizers (MAP, DAP, TSP)  
Ammonium Sulphate (Heating & Cooling)  
Sulphur Coated Urea (Heating & Cooling)



### METAL POWDERS, MINERALS & CATALYST

Activated Carbon	Alumina
Calcined Clay	Catalyst
Ceramic Spheres	Coal Fines
Limestone (Calcium Carbonate)	Nickel Dust
Petroleum Coke	Resin Coated Sand
Silica Sand	



### ENGINEERED & COMMODITY PLASTICS

Nylon / Polyamides	ABS
Polyethylene (HDPE & LDPE)	PET
Polypropylene (powder & pellets)	TPU
POM	



### SUGARS & SWEETENERS

Beet Sugar  
Cane Sugar (Refined)  
Powdered Sugar  
Starch Derivatives (Isomalt, Dextrose, etc.)



### OTHER PRODUCTS

Detergent Powders  
Dried Sludge Pellets  
Grains  
Oilseeds (Rapeseed, Canola, Soybean)



## COMPANY REFERENCES

Indian Farmers Fertiliser Cooperative (IFFCO)  
Krishak Bharati Cooperative (Kribhco)  
Asean Bintulu Fertilizer  
Ingenio Tres Valles  
Incitec Pivot  
Cargill  
Nordzucker  
American Crystal Sugar  
Polski Cukier  
BASF  
DSM  
Yara  
Kemira GrowHow  
Procter & Gamble  
Samsung Chemicals  
GAF Materials  
K+S Kali GmbH  
Stamicarbon  
Uhde  
Snamprogetti  
Toyo  
Zeppelin  
Andritz



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