

# Fons Delta Cooler



**FONS** technology



# Dealing with Challenges

New thinking requires a level-headed approach. At Fons Technology International we base the innovative process on a sharp and objective analysis of what our customers actually need. We believe that brilliant solutions spring from the will to go beyond the limits of what you imagine is technically possible.

The Fons Delta Cooler sets new worldwide standards for clinker coolers. Our improved technology has solved a number of problems often experienced with clinker coolers, which are crucial to the efficiency and economy of the process. Our new Fons Delta Cooler has:

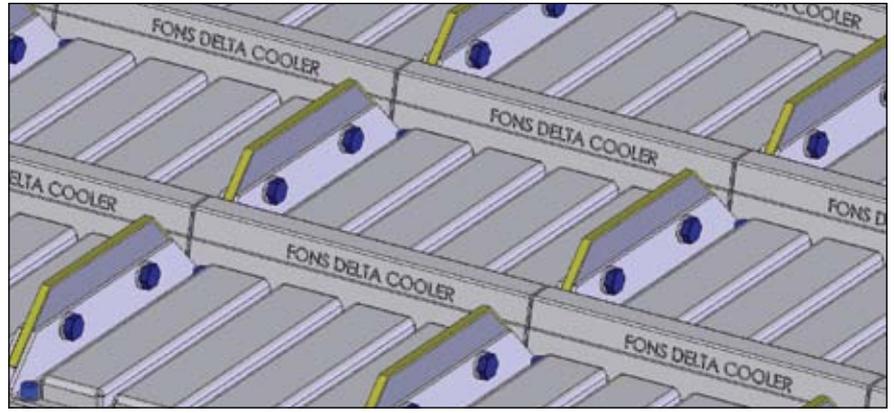
- Improved transport efficiency
- Improved heat exchange
- Reduced wear on expensive parts.

A Fons Delta Cooler deals with the challenges of working under extreme conditions because,

at Fons Technology International, we deal with quality in an uncompromising way. A Fons Delta Cooler is assembled for testing at our factories before we send it out into the world.

We also engineer and produce the hydraulic station, including the electrical panels to ensure that the PLC control matches our standards. This enables us, via the internet or by telephone, to download information used for the predictive maintenance. The status reports are of course supplied to you for your planning of the entire cement plant operation.

To Fons Technology International, quality is determined by what can be named the human factor. The people working at our factories are all dedicated to their work and have been chosen for their jobs because they are extremely good at what they are doing.



Everybody working at our factories has detailed knowledge of all stages of the production of a Fons Delta Cooler, from concept to testing, prototype, manufacturing, assembling, erection and maintenance. That is how we are able to take all input from our customers into consideration and bring it straight to the drawing board.

Fons Technology International has more than 20 years of outstanding experience, innovations and well proven technologies serving the industry.

For driving the Fons Delta Cooler's shuttle floor, we have developed a patented system, which works by rotation only in four joint mechanisms. The Fons Delta Cooler's ingenious floor ensures transport efficiency starting at 90%.

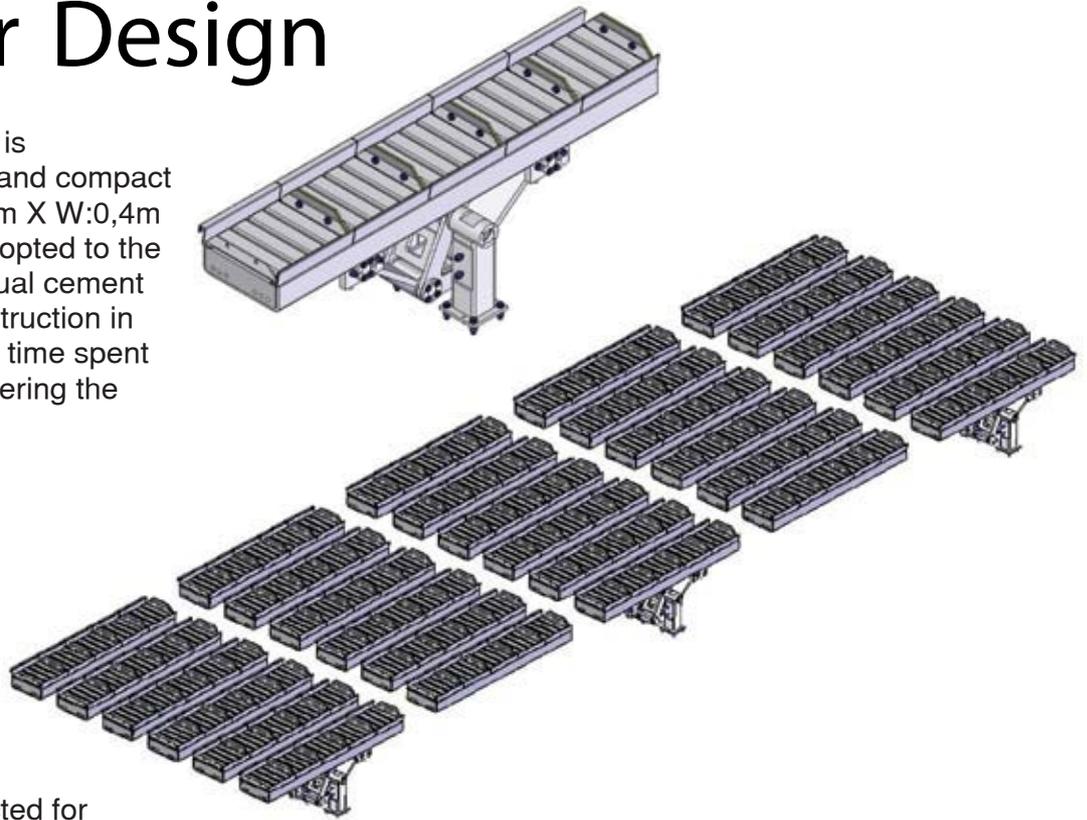
STAFF-Stepped Air Flow Function sets completely new standards for what can be considered optimal heat exchange.

## Features

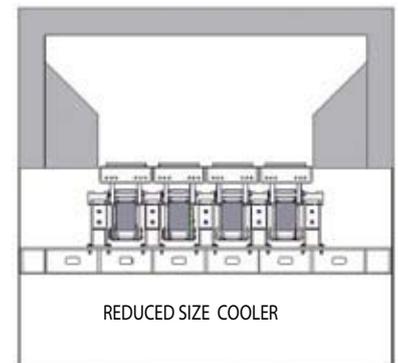
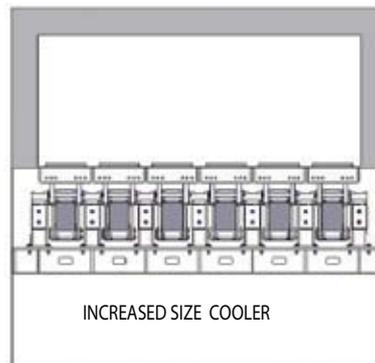
- Both for new coolers and retrofit
- Modular Design
  - Easy to erect
- Easy maintenance
- Low electrical energy consumption
  - Fan power consumption low due to STAFF
  - Hydraulic power consumption low due to no clinker crushing and grinding between machine elements
- Side Clinker distribution
  - Due to 100% programmable shuttle floor motion pattern
- Snowman Eliminator
  - Iso kinetic clinker motion at inlet
- Shuttle Floor
  - Horizontal transport
  - Optimal transport efficiency
  - No through fall of clinker
- Four Joints Mechanism
- STAFF Optimal heat exchange by Stepped Air Flow Function

# Modular Design

The Fons Delta Cooler is constructed in elegant and compact design in sections (L:2m X W:0,4m H:0,6m) that can be adopted to the demands of the individual cement plant. The flexible construction in modules minimizes the time spent on erecting and engineering the Fons Delta Cooler.



The cooler can be erected for one production capacity having additional casing width. Later the cooler can be up-graded both in width direction and in length direction, by adding modules.

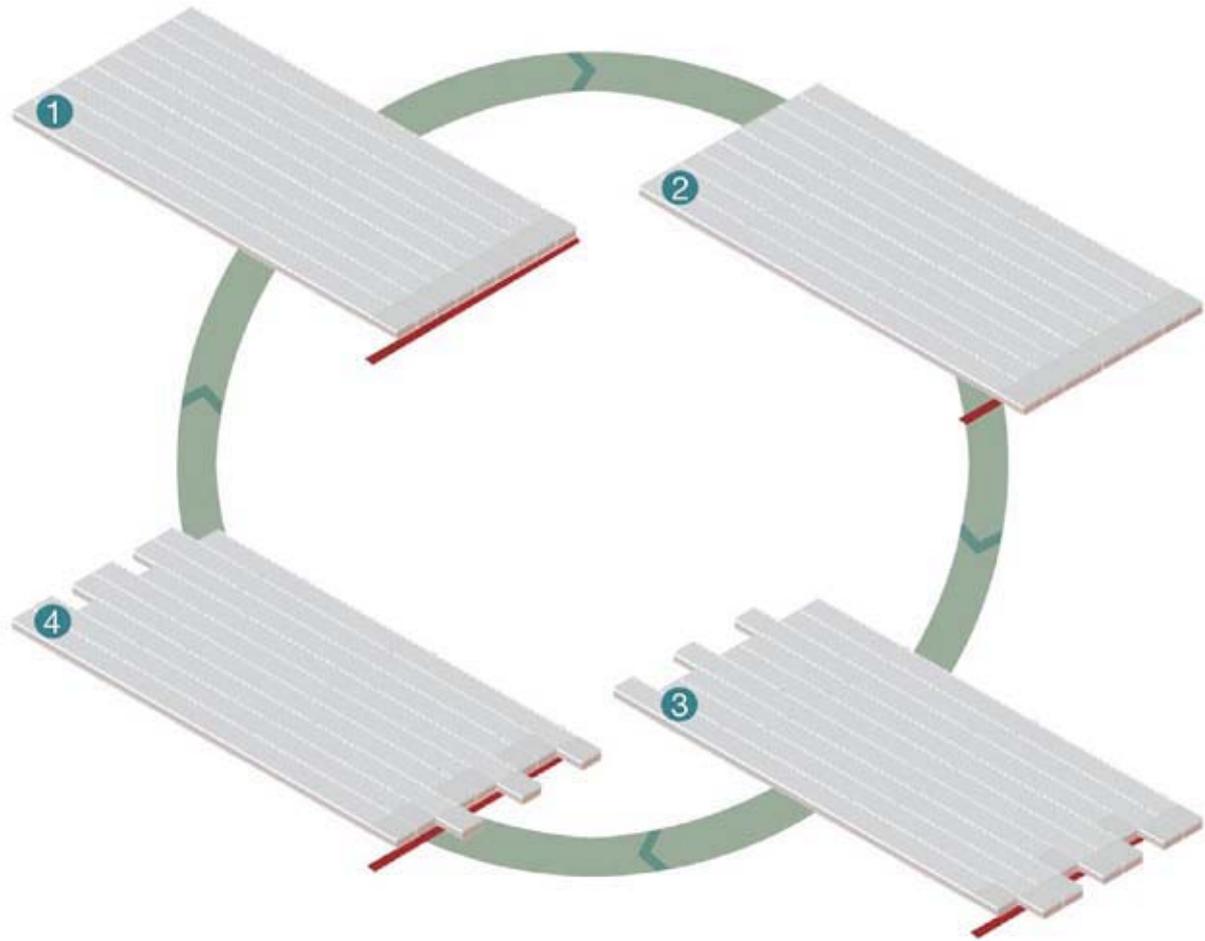


# Iso-kinetic Inlet

The design of the Fons Delta Cooler's Iso-kinetic inlet is based on quite simple laws of physics related to friction. These laws we have exploited to perfection to ensure:

- Even transport of clinker through the entire layer. This way we also create optimal heat exchange on the inlet.
- The iso-kinetic inlet reduces the problem of so-called "snowmen" that often cause production to stop.



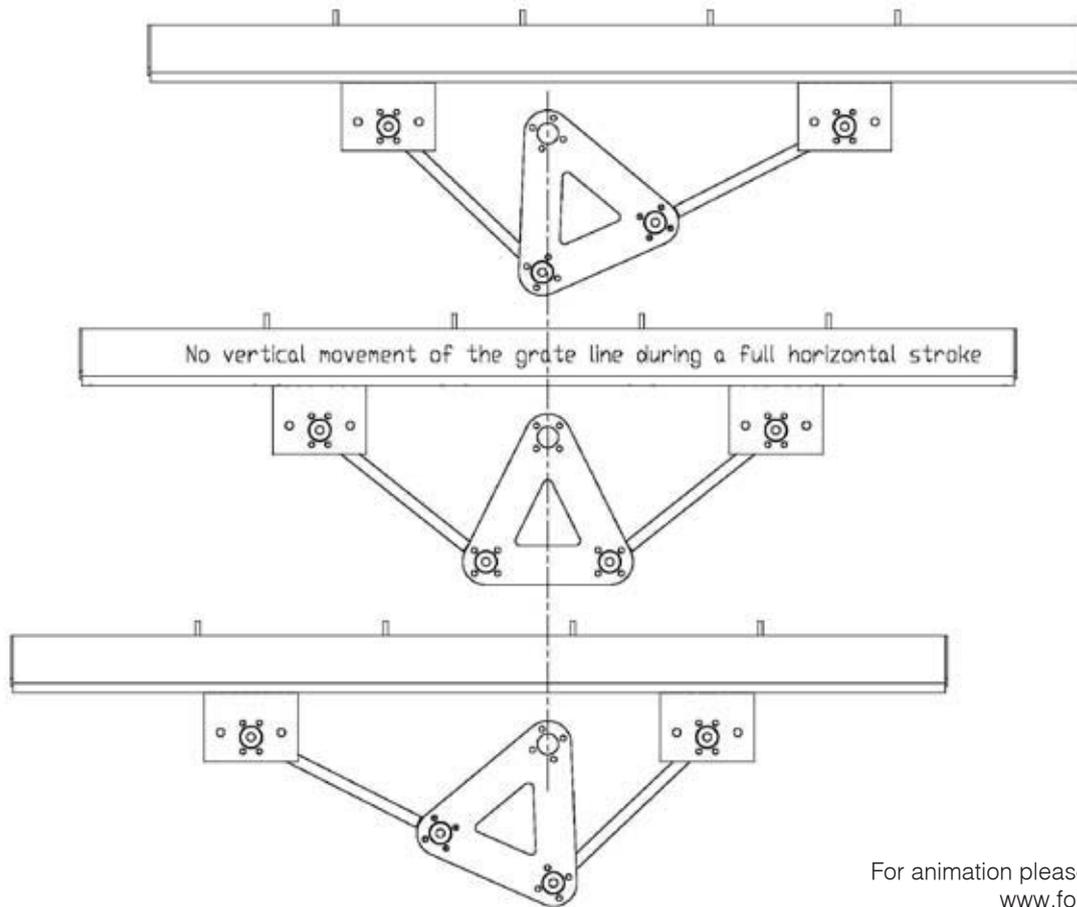


For animation please visit the website:  
[www.fonstechnology.com](http://www.fonstechnology.com)

# Shuttle Floor

Our use of the four joints mechanism for the Fons Delta Cooler's shuttle floor is ground breaking. By redefining the use of a well-documented, historical technology we have developed a patented system that is be radically different from all known methods of driving reciprocating movement of the modular grate line. At the same time we set new standards for the protection of the cooler's rotating bearings from particles and dust.

During the development of the Fons Delta Cooler we have, naturally, also been focusing on lowering other costs related to building cement plants. Here the Fons Delta Cooler's compact design and horizontal clinker transport plays a significant role because of the building height that can be saved when erecting the entire kiln system.



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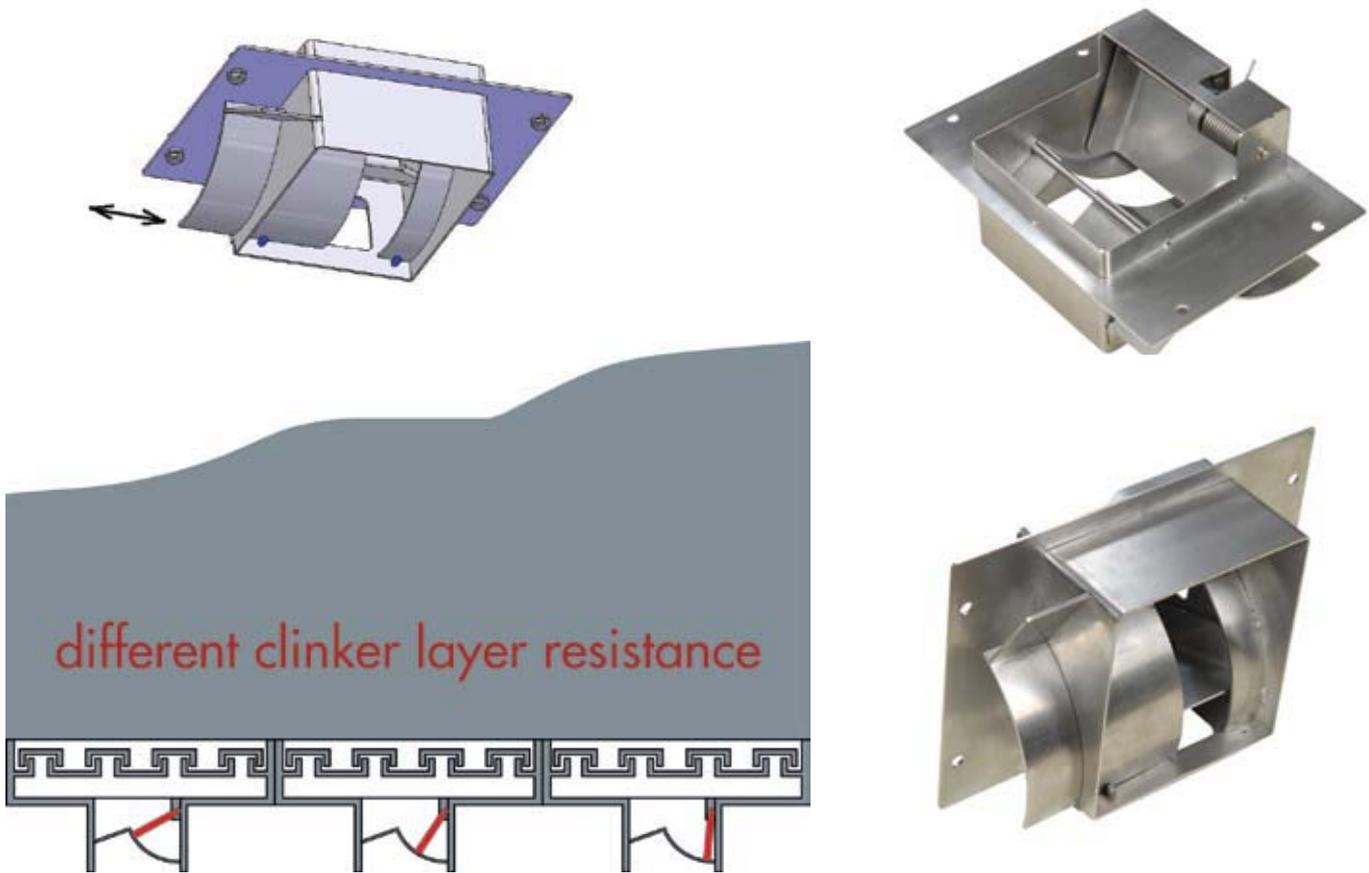
## Four Joints Mechanism

Our way of using the four joints mechanism is groundbreaking because we, via millions of calculations and computer simulations, we have made the mechanism produce a 100% linear movement. This way we have made the four joints mechanism particularly suitable for the shuttle floor. We are now able to generate reciprocal movement using only the rotating bearings of the four joints mechanism, which can be effectively sealed.

The advantages are obvious as it is both uncomplicated and inexpensive during maintenance to replace the bearings after a long lifetime.

The 100,00% linear movement enable a perfect sealing between the moveable lanes.





# Stepped Air Flow Function (STAFF)

Stepped Air Flow Function is a system we have developed and patented, which sets new standards for the efficiency of the heat exchange possible to achieve in a clinker cooler. STAFF is a self-regulating mechanism that generates a "stiff" and at the same time regulated distribution of air adjusted to the clinker layer above.

Any area (0,4m X 0,4m) of cold clinker or any other situation generating unwanted high distribution of cold air through the clinker layer, will activate the STAFF function. This again will cause an increased correction immediately counteracting the unwanted high passage of air.

This way we achieve optimal heat exchange and heat recuperation in the kiln system.

During commissioning (or for long-term production capacity change) the air flow through each STAFF can be adjusted without any spare part by only side sliding the flap and hereby changing the orifice area.

The patented STAFF system has not only transformed our understanding of clinker cooling. By using less fuel and electricity it has also minimized energy consumption.



Pioneer Cement Plant - Pakistan



OYAK - Mardin Cement Plant



Mus Cement Plant

## Pyro Page

Fons Technology International supply complete pyrolines and upgrade of existing pyrolines.

FTI provides complete service from the basic engineering to commissioning of the cement plant.

Upgrades normally include changing of the cooler.

With the complete product program of FTI, the upgrade can be done at one major stoppage or during several minor stoppages - depending upon the client's preference.

The strong modularization of the Fons Delta Cooler enables installation of first one size cooler and later increase width and/or length of the cooler to met the final capacity of the whole.

**FTI**

**Fons Technology International**

Mehmet Akif Cad. 1.Sokak Haydar Akin Is Merkezi 1

No:25 Kat:6 34510 Sirinevler Istanbul/Turkey

Phone: +90 212 551 98 80

Fax:+90 212 639 99 08

[www.fonstechnology.com](http://www.fonstechnology.com)

[info@fonstechnology.com](mailto:info@fonstechnology.com)