FULLER®

HOTDISC® REACTOR

The best way to substitute calciner fuel with coarse alternative fuels.

ENJOY UNSURPASSED FUEL FLEXIBILITY

Benefit from easily using coarse alternative fuels

KEY BENEFITS

01

Reduce fuel costs and emissions

02

Unsurpassed fuel flexibility

03

High energy efficiency

04

Proven technology

05

For new builds and retrofits

06

Designed for long-term uninterrupted performance

Proven performance

The HOTDISC's use of clinker cooler tertiary air and preheated raw meal, along with alternative fuel, ensures virtually 100% energy efficiency. The HOTDISC is designed to achieve a calciner substitution rate in the range of 50% to 80% - or even higher - of the calciner fuel. Results vary by the specific plant conditions and fuel specification. With over 20 years of documented results, we can confidently predict the performance you can expect at your plant.

Take full control of fuel combustion
The variable speed drive provides the ability to have a fuel retention time of 3 to 45 minutes inside the HOTDISC. This reduces the adverse effects of unburned fuel in the kiln inlet and provides complete control of the process.

HOTDISC® Reactor in operation

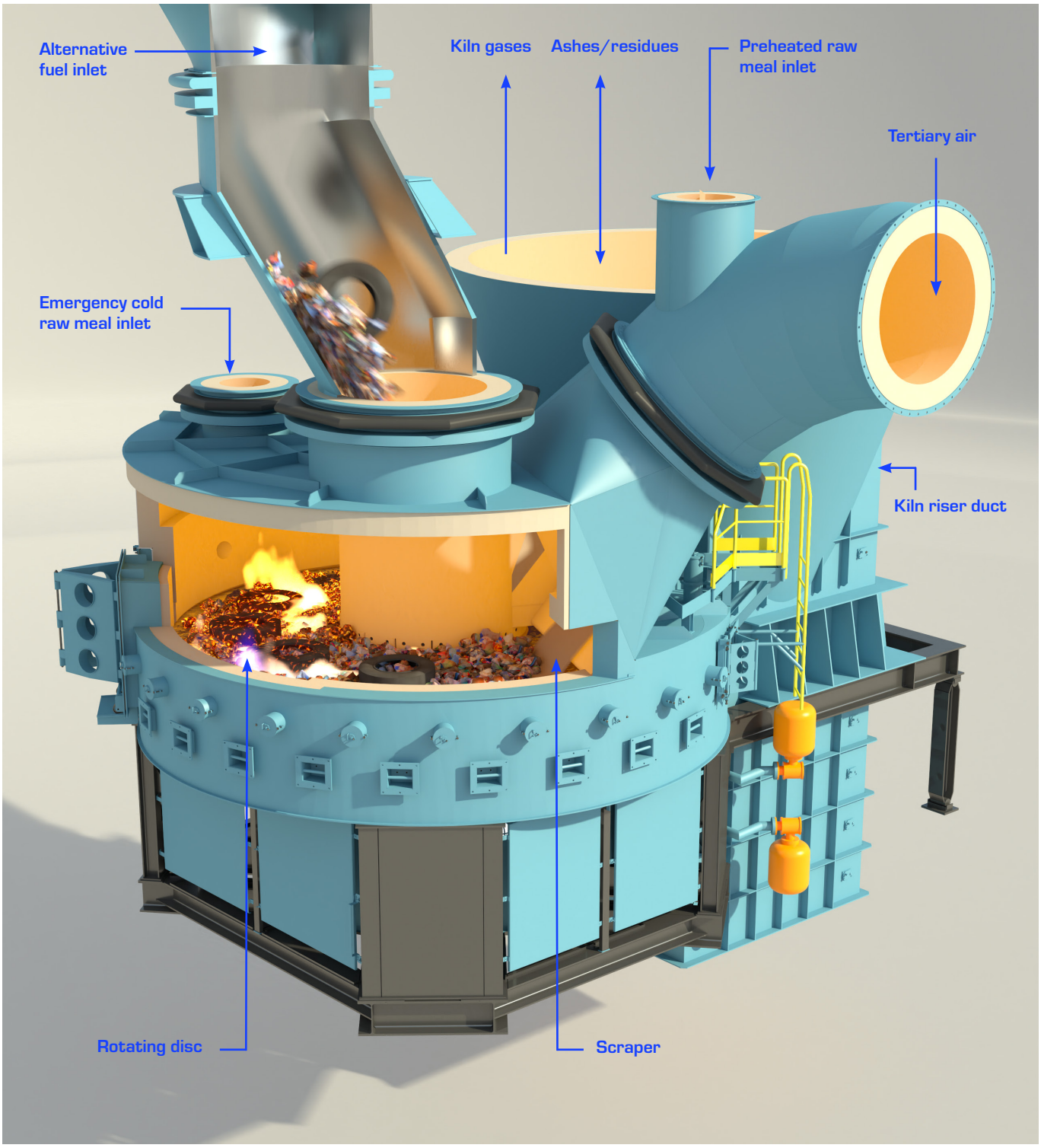
Refuse Derived Fuel (RDF)

Incorporating a HOTDISC, as opposed to adding alternative fuels directly to the calciner, eliminates operational disturbances such as cyclone blockages, the need for extra cleaning in the riser duct and emissions of unburned components. These disturbances typically occur if combustion and sulphur circulations from unburned fuels cannot be controlled.

Proven technology for new builds or retrofits
Since the introduction of the HOTDISC in 2002, we've continuously improved the design of the system. The latest generation provides maximum fuel flexibility, process control, capacity and durability. The HOTDISC is available for new kilns and for retrofit onto existing kiln systems.

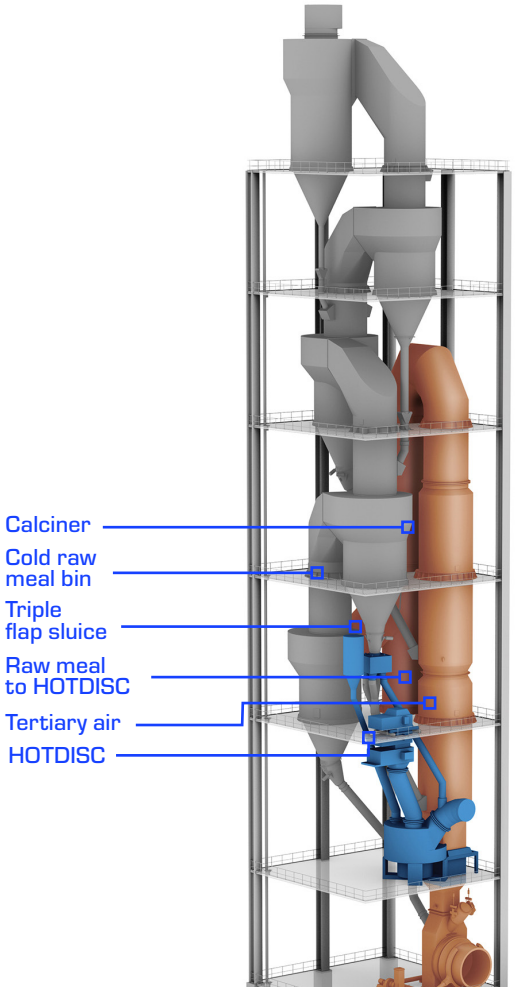
HOTDISC REACTOR

THE INGREDIENTS OF SUCCESSFUL PERFORMANCE



BURNS JUST ABOUT ANYTHING

- Refuse-derived fuel - for example, MSW (municipal solid waste) and SRF (solid recovered fuels)
- Old tyres – whole, shredded or cut into pieces
- Biomass
- Paper sludge
- Sewage sludge
- Lime-stabilised oil sludge (from tanker cleansing)
- Old car fragments (upholstery, dashboards, etc.)
- Impregnated wood waste
- Hazardous waste

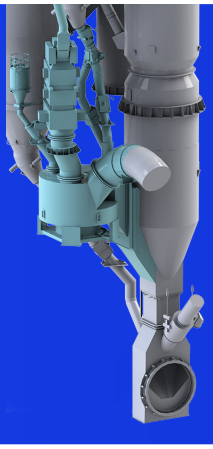


How it works

The HOTDISC is integrated into the pyroprocess below the calciner bottom. Coarse alternative fuels are fed onto a slowly rotating disc. Hot tertiary air is directed into the HOTDISC to provide an oxidizing atmosphere for the alternative fuel to burn. As the alternative fuel slowly travels around approximately 270 degrees on the rotating disc, almost all of it fully combusts. Depending on the nature of the alternative fuel (size, heat content, moisture, etc.), the rotational speed of the HOTDISC can be adjusted to optimize the residence time and combustion rate. In addition, the temperature inside the HOTDISC is controlled by directing a portion of the preheated raw meal into the HOTDISC.

The HOTDISC operation generates a controlled mix of hot gases, combustion residue (ash) and calcined raw meal that exits the HOTDISC. The combustion gases and finer materials are carried with the hot gases into the bottom of the calciner, while the coarser residues meet a scraper at the end of the 270 degrees rotation, where they are directed down into the riser duct. From there, this material falls into the kiln and is incorporated into the clinker. The alternative fuel fired in the HOTDISC will replace a high percentage of the total fuel burned in the calciner; however, some fuel firing in the calciner is still needed to control the bottom stage exit temperature and hence the raw mix calcination percentage.

HOTDISC® - HMT (Hot Material Transport) for quicker installation
Introduced in 2021, the HOTDISC - HMT offers the same functionality and benefits as the traditional HOTDISC, just quicker and easier to install for existing plants. Instead of directly integrating the exit of the HOTDISC reactor to the calciner and riser duct, the new approach to layout allows the HOTDISC reactor to be mounted 2 to 5 meters away. Then, it is connected to the calciner and riser duct via a hot material transport chute for gas flows and combustion ashes.



MAINTENANCE AND SAFETY

Internal view

The HOTDISC features various platforms, manholes, doors and clean-out holes to facilitate fast, easy maintenance. The required maintenance is minimal, and is similar to maintenance for other kiln system components. The areas exposed to wear are designed with bolted-on segments for easy replacement. Mechanical maintenance is done during the planned shutdown for the whole plant.

In case of power failure or during other situations where the kiln or ID fan suddenly stops, the fuels on the disc will continue to burn. To stop the combustion process, cold raw meal will be introduced to the HOTDISC from a bin placed above. This makes it possible to quickly extinguish the combustion process at any time and avoids any unacceptable emissions during upset conditions.

In operation

THE HOTDISC®-S

KEY FEATURES

- Optimised design for Separate Line Calciners (SLC)
- Offers the same performance and fuel flexibility
- Waste fuel and tertiary air flow countercurrent
- Non combustibles are cooled in an ABC™ cooling unit (similar to use in clinker coolers) and handled separately
- Completes combustion of coarse fuel particles that fall through from calciner

Unlike the standard HOTDISC, the HOTDISC-S is positioned under the existing calciner. Most of the alternate fuel is fed first into the calciner with any unburnt fuel falling into the HOTDISC-S, where it completes burnout. Any drop-out from the HOTDISC-S is recovered via an ABC cooling unit for cooling and can be transported back into the system or discarded.

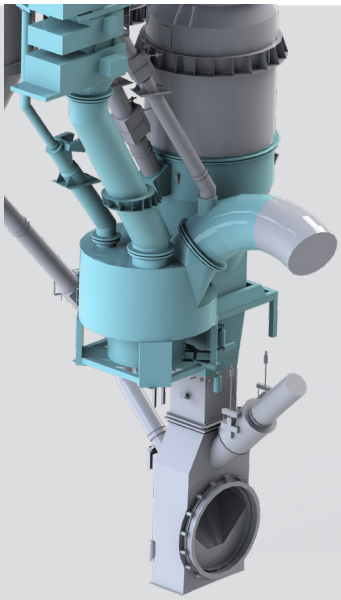
The HOTDISC®-S for separate line calciners

The standard HOTDISC is designed for installation at plants where the calciner is positioned directly above the kiln inlet (in-line calciners, ILCs). But what if you have a separate line calciner (SLC)? Conversion from an SLC to an ILC is unlikely to be a feasible option due to the high expense involved. An alternative solution was needed.

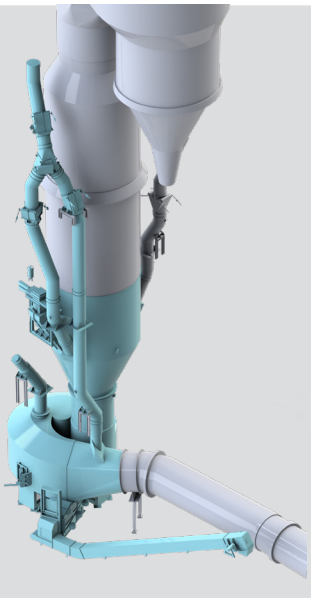
Such was the situation at Ssangyong Cement's Donghae and Yeongwal cement plants in South Korea. But rather than be deterred, Ssangyong agreed to partner with us to modify the standard HOTDISC technology for SLC calciner systems. The result was the HOTDISC-S which was first commissioned in 2020.

"We had seen what the HOTDISC could do, in terms of increasing alternative fuel capacity. We were willing to support Fuller to redesign the system to try to make it work for us. They took on the challenge – and as a result we have been able to significantly increase our alternative fuels utilisation."

SOO-HYOUNG LEE, PROCESS ENGINEER,
PI CONSTRUCTION OFFICE – SSANGYONG CEMENT



HOTDISC conventional configuration



HOTDISC-S configuration

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