



Chain System Before Retrofit

LIME RECOVERY KILN CHAIN SYSTEMS



Chain System After Retrofit

CHAIN SYSTEM Retrofits Increase Efficiency and Production

CUSTOMERS ESTIMATE SAVINGS OF MORE THAN \$500,000 IN ONLY 6 MONTHS!

- ▶ Reduce fuel consumption by .5 to 1mm BTU/Ton of kiln product
- ▶ Reduce kiln dust losses by 10%
- ▶ Increase kiln production by 5-40%

PROBLEMS

- Mill needed improved operational efficiency • High kiln dust loss • Optimized pulp mill operations required additional lime to support increased capacity • Existing kiln chain system was outdated; not designed for dust suppression inside the kiln, nor high efficiency and/or increased capacity.

SOLUTION

- Evaluated existing system and designed, supplied, installed and warranted chain system retrofit

RESULTS

5% Kiln production increase
 10-15% fuel consumption decrease
 10-15% kiln dust loss
 100% CUSTOMER SATISFACTION

CUSTOMER INVESTMENT and ROI

\$250-\$300,000 USD investment for complete design, supply and installation of chain system retrofit.

RETURN ON INVESTMENT

Fuel savings and improved system efficiency
 Customer gain of 10-40 tons per day of kiln production
 Estimate savings of \$1000.-\$2000. USD per day (fuel and/or lime costs)
 Realize payback in 130-300 days



HIGH DENSITY CHAIN SYSTEM

In the Metso Minerals chain system, zone 1 contains feed spirals. Their height has been calculated to handle higher capacities and to minimize backspill, due to dam effects; as the mud meets the very dense curtain chain in zone 2. Input material moisture content works with the chain density to capture entrained dust. Chains in zones 2 and 3 are hung from a spiral pattern of hangers and are suspended only at one end (all curtain design). Varying densities in these zones, help remove dust, while minimizing process gas velocity and maximizing heat transfer, without significantly

increasing pressure drop. Zone 4 is a free space to allow the dust and process gas velocities to minimize, before entering the dust curtain chain zones. Zone 5 chains, also hung from one end only (all curtain design) and suspended from a spiral pattern of hangers, transport the material toward the discharge end and complete its drying before reaching zone 6. As the chains continue to the discharge end of the chain system, the mud is preheated to approximately 400°F (204°C) before exiting the chain system.

High Density Chain System Promotes optimum heat transfer, minimum dust lost and homogenization of mud for uniform product quality with a narrow band of residual carbonate.

All Curtain Chain Suspended in Spiral Pattern Effective heat transfer and efficient material transport saves fuel and increases production.

Minimal Dust Loss Chain densities and computer-aided patterns are expertly engineered.

FEATURES and BENEFITS

Feed Spiral Height Calculated to help prevent backspill and handle higher capacity.

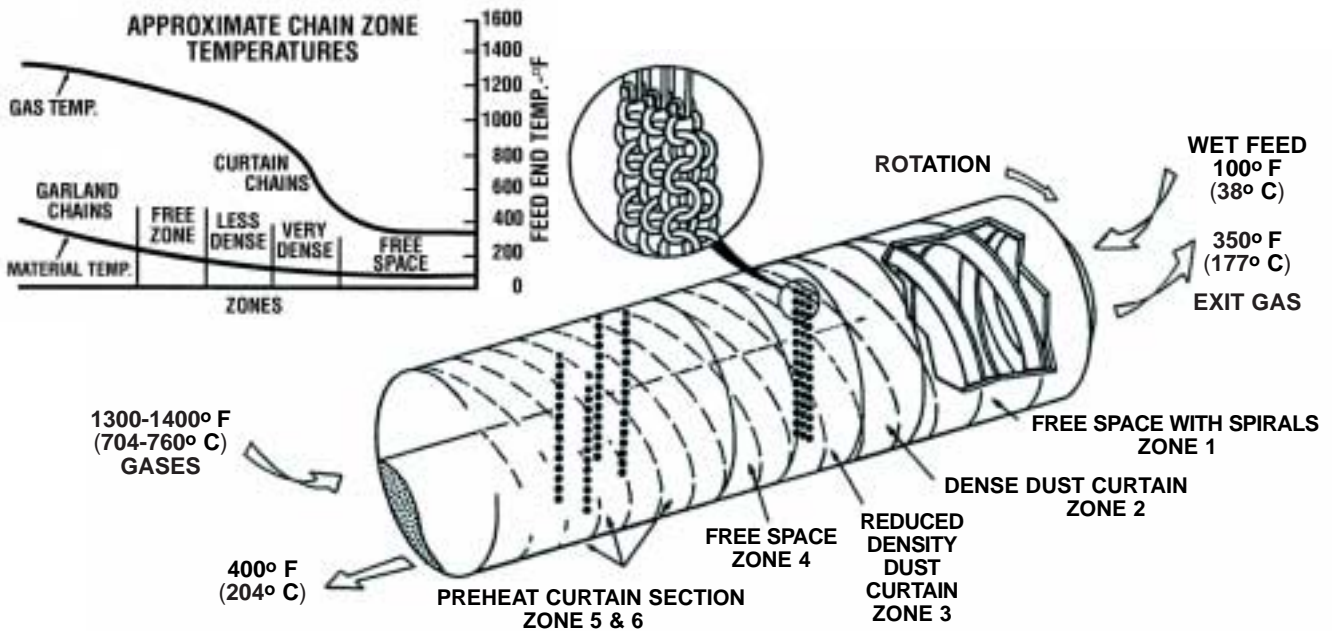
Curtain Chain=Effective Dust Suppression and Minimized "Dam Effect" are achieved through pattern design and selected densities.

Deep Stainless Steel Heat Shield Maximizes protection of chain system discharge end.

All Austenitic Stainless Steel and Mild Steel (no alloy) Chain Hanger Metallurgy Maximizes security of hanger-to-kiln shell attachment.

Proven Experience With over fifty successful installations worldwide, and all warranties met or exceeded; Metso Minerals, Inc. is the proven choice for your Chain System Retrofit project.

Material vs. Gas Temperature



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