

Lechler Automated BAF Inner Cover Cleaning

By Lechler India Pvt. Limited | Category: Most Innovative Supplier

Batch annealing is when FHCR (full hard cold rolled) coils are annealed to make CRCA (cold rolled close annealed) and wherein the cold rolled sheets get stress relieved through mechanisms of recovery, recrystallization and grain growth. Coils are stacked over the top of each other upto three to four levels, separated by convector plates. The inner cover is placed over the coils and its volume is filled with the protective gas to prevent the steel surface from getting oxidized under the high temperature. After this, the heating hood is placed in position. Burners of the hood are lit and the resultant heat causes the inner cover to heat up. Heat from the cover is radiated to the steel coils causing them to heat up. Heat is also transferred through convection to the coil's inner surface by the circulating the protective gas. The steel coils are then held or soaked at a temperature aimed for annealing.

The Innovation

During the heating process, the oil residue that is present between the coil yields a carbonaceous product and gets stick to the inside surface of the inner cover. Proper cleaning of the inner cover of the BAF is key for the process to ensure improved productivity, quality, safety and maintenance. Lechler, with Tata Steel, studied the existing manual process and devised an efficient, robust, safe and automated system Lechler BAF Master Cleaner for automatic cleaning of the inner cover.



Cleaning Cycle Time
(Per Inner Cover)

35 minutes
70% time saving

Size of the inner cover: 2.45m diameter and 7.375m height

Problem: Tata Steel was initially cleaning the inner cover with a hydraulic arrangement of brooms and water spraying that was manually operated, and which had deficiencies like complexity in operation, manual interference, safety hazard, improper cleaning, time and water consuming.

The Lechler BAF Cleaner: A special stand was designed with fixtures for up and down movement and two high pressure Lechler nozzles with 360° auto-rotatable gear-driven nozzle. The high-efficient jet nozzles were mounted such that they could cover all the side walls of the inner cover and ensure a complete efficient cleaning.

Cleaning quality and operation excellence:

A bright finish is desired and obtained. The innovative Lechler BAF MASTERCLEAN has proven potential to improve existing inner cover cleaning system to improve performance, safety, operation cost and reliability.

The parameters below detail the basis of design:

- Safe and hazard-free cleaning
- Completely automated without any manual interference
- Cleaning cycle with 360° coverage with no blind spots
- Complete removal of shoots from BAF inner cover surface
- Less consumption of water
- Short cleaning cycle with water pressure of 5-6 bars

Overcoming Challenges

- Designing a complete tower with movement arrangement
- Proper foundation and erection of the high tower arrangement inside the shop floor
- Placement of the high-pressure nozzles for complete coverage
- Connection of the piping

Impact of the Innovation

human interference

zero

cleaning cycle time reduced by

1½ hours

water consumption reduced by

60%