



Vapour Shield -
Reducing environmental
impact

VAPOUR SHIELD

A HIGHLY EFFICIENT FUME RECOVERY SYSTEM TO MINIMISE VOC EMISSIONS AND RECOVER ROLLING OIL

The Vapour Shield is an efficient fume recovery system and economical system which allows you to reduce the rolling coolant content emitted into the exhaust air below the guaranteed value and in addition reuses the recovered rolling coolant for the aluminium cold and foil rolling processes.

The exhaust airflow of rolling mills can have, on average, up to 1000 mgC12/Nm³. Releasing these fumes into the atmosphere has a detrimental impact on the environment. The Vapour Shield (fume recovery system) guarantees that the residual content of rolling coolant (total hydrocarbon) in the cleaned exhaust air will be < 50 mgC12/Nm³.

The rolling oil from the exhaust air can be recovered for reuse. The recovery rate depends on the actual extraction rate (m³/hr) and inlet concentration (mgC12/Nm³). Typically, an aluminium cold mill with a fume extraction rate of 140,000 m³/hr and fume concentration 400 mgC12/Nm³ will generate 49 kg/h of re-usable rolling oil using the Vapour Shield system.

RELIABILITY

The design of all plant components (column, pumps, heat exchanger etc.) is optimised, allowing the plant to run at the most economic conditions with maximised oil recovery.

FEATURES AND BENEFITS

The Vapour Shield

- Highly efficient fume recovery system
- Minimises VOC emissions - Meets current environmental regulations.
- Maximises recovery of rolling oil - reduces operating costs.
- Constant and high efficiency even when changing operating conditions e.g. changes in amount of exhaust air or rolling oil concentration.
- Automatic control with minimal supervision.
- Low pressure drop in the absorption and regeneration columns saves you energy.
- The recovered rolling oil can be reused in the rolling process.

REFERENCES

Although only introduced in 2004, the Vapour Shield (fume recovery system), already boasts a number of references for successful cleaning of mill exhaust fumes and excellent rolling oil recovery.



Vapour Shield - Efficient fume extraction and oil recovery

OPERATING PRINCIPLE

The absorption process is based on a closed washing liquid circuit. The washing liquid absorbs the rolling coolant in the exhaust gas flow passing the absorber column in a counter flow exchange. The inlet concentration of rolling oil will be decreased to the requested concentration in accordance with the limits agreed.

The separation between washing oil and rolling oil happens in the regeneration column under vacuum and increased temperature. The regenerated, cleaned and hot washing liquid will be cooled down afterwards in a recuperator while the recuperated energy is transferred to the cold, enriched washing liquid. Final heating or cooling of the washing liquid circuit to the necessary temperature on hot or cold side is done by plate heat exchangers. The cold washing liquid is then again in the designed condition ready to start the absorption process from the beginning.

The gas flow on the outlet of the regeneration column will be cooled down in such a manner that the rolling coolant condenses. A careful regeneration of rolling coolant is guaranteed by an exact temperature profile over the column. This enables the customer to recover the rolling coolant in such a condition that it can be reused for rolling processes. The design of all plant components (column, pumps, heat exchanger etc.) is optimised and allows the plant to run at the most economic conditions with very limited losses of washing oil per year.

Specifications	
Flow rate:	80,000 - 240,000 m ³ /hr
Inlet concentration:	300 - 1000 mgC12/Nm ³ typically
Mill type:	Cold & foil
Process:	Absorption & distillation
Guarantee level:	<50 mgC12/Nm ³ typically

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