



Reliable WHR Solutions for the Cement Industry

To provide a cost-effective and eco-friendly WHR solution for the cement industry, SON Srl partnered with Kawasaki in 2023. Based on the successful boiler designs of both companies, they have joined their strengths to develop a Thermal Oil Heat Exchanger now tailored for Thermal Oil Circuits powering ORCs.

■ Kawasaki

Combined STRENGTHS

Expertise in Efficient Primary Heat Exchangers with stable, long-term power output

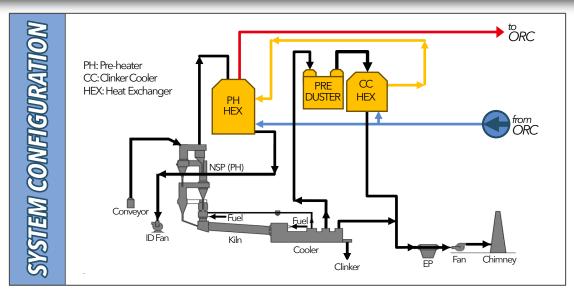
+ 40 years of Heat Recovery experience in the Cement Industry

776 WHR BOILERS supplied for dust-laden cement flue gas

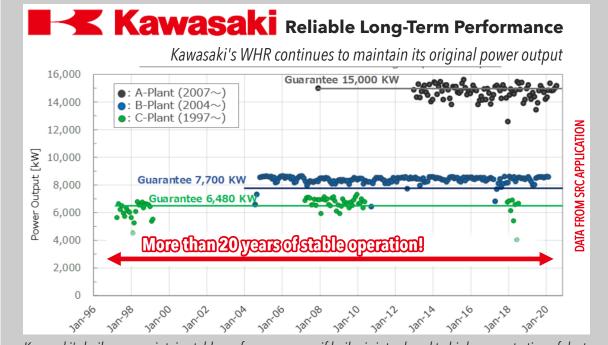
Experience in Heat Exchangers for Thermal Oil Systems and Steam Generators

Expertise in WHR systems across diverse industries in the EU

Manufacturing and Dedicated After Sales support based in Italy



Selection of the most efficient configuration of PH and Clinker Cooler (series, parallel, partial parallel) to be done according to the operating conditions.



Kawasaki's boiler can maintain stable performance even if boiler is introduced to high concentration of dust in PH gas ($10 \sim 100$ times more than other waste gases.)

www.son-energy.com info@son-energy.com

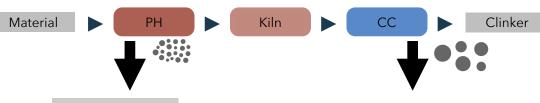




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Understanding dust characteristics is crucial for designing HEX for CEMENT APPLICATION





Dust in PH GAS

Concentration: HIGH (>100g/Nm³)

Grain Diameter: SMALL($1\sim10\mu m$)

Dust accumulation on heating tubes

Dust in **CC GAS**

Concentration: LOW (<10g/Nm³⁾ Grain Diameter: LARGE (>100 µm)

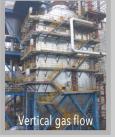
Heating tube erosion caused by hard & large grain dust

PH HEX

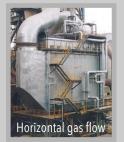
Key Technology

Effective Dust Removal

from heating tubes by hammering equipment



VEGA® Boiler



Conventional PH Boiler

CC HEX

Key Technology

Dust Removal Upstream of CC HEX



Pre Duster

Sedimentary Type pre-duster for very low draft loss

CC Boiler

Efficient **Heat Recovery**

■ Upstream Installation to prevent tube erosion





Draft Loss Drop Flue Gas Side

Optimized Structure

- **Easy Installation** A MODULAR BLOCK DESIGN for easy transportation and installation.
- Lightweight & Compact Compared to a conventional PH boiler the VEGA® is 40% smaller and weighs 32% less.
- **Effective Dust Removal** Stable operation and Easy maintenance!

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