

## Data Sheet

# Carbon Regeneration Kilns

## MODELS

- WCC 50D – 50 kg/hr Dry Carbon Output
- WCC 250D – 250 kg/hr Dry Carbon Output
- WCC 500D – 500 kg/hr Dry Carbon Output

The WCC D series of Carbon Reactivation Kilns are in use in some of the world's toughest gold mining areas and will operate in some very harsh environmental conditions including remote locations with saline water, organically fouled open cuts and tailings loaded with frothers and collecting agents.



Early carbon reactivation kilns were of the rotary or rabble arm design; because of the severe operating environment and presence of chloride ions at elevated temperatures the constant stress reversal on the rotating elements made these kilns prone to stress corrosion cracking. Further, the inability to measure and control carbon temperature in the reaction zone gave less than satisfactory activity levels. Single shaft verticals, carbon resistance and fluid beds have been developed and found wanting. The WCC series of kilns has proved to set the new industry standard.

While capital investment in a WCC kiln is very attractive due to its low capital cost, it is the long term savings gained from carbon reactivation that is the major factor in considering a purchase; fuel consumption, corrosion resistance, availability and carbon attrition can account for over 80% of the total cost of ownership, servicing of capital is less than 20%.

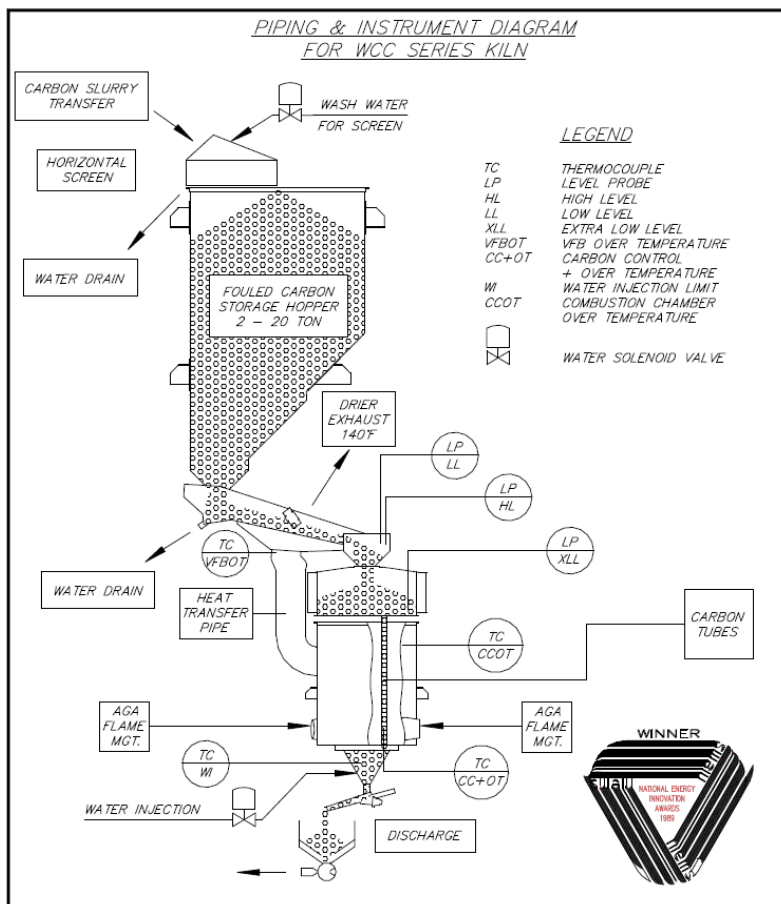
## MAJOR ADVANTAGES

- No moving parts and no stress on alloys at elevated temperatures or attrition of carbon.
- Condensing flue at 60°C gives unmatched economy at 1.0 Kw/Kg (1550 Btu/lb) fuel consumption.
- No oxidising gases in contact with carbon above 70°C.
- Precise measurement and control of carbon temperature (not alloy or gases) gives consistent high activity.
- Compact floor area.
- Immediate start up without run through eliminates recycling.
- Precise injection of water also allows immediate and effective dry screening of carbon at the kiln exit at a dry 250°C.
- No need for water wash or dump.
- Carbon off screen at 120°C.
- Zoned furnace with no inclined or horizontal surfaces with carbon above 200°C giving excellent corrosion resistance.

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- Avesta 253 MA construction.
- High rate change turndown 4:1.
- Total tube seal with full collar.
- Adjustable high/low/off burner with P.I.D. Control gives flexible throughput at constant temperature.
- Stable, high turndown burner equipment eliminates the need for cooling fans and offers precise digital temperature control.
- Shock resistant, low thermal mass ceramic insulation eliminates refractory cracking and maintenance. No initial curing or progressive heat-up after shutdown are needed.
- Ability to Hot Stop without damage.
- Should corrosion occur, tube plate and tubes can be replaced within 1 hour.
- Programmable Logic Controller gives flexibility and complete annunciation to control centre.



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The Furnace Industries WCC Kiln is an indirect fired multiple tube vertical design.

The 'D' series is able to operate from 10 to 500 kg/h dry output. Drained, pre dried carbon, 25% by weight is fed from the VFB pre-drier to the choked kiln hopper. Product advances gently through the kiln by the action of gravity and the setting of discharge choke and vibratory feeder. Carbon temperatures range from 70°C at the ambient exposed face to 100°C at the tube plate where the tube section begins. The remaining 25% water vapour is driven off at the top of the kiln tubes giving an inert seal above and dry carbon for the temperature elevation.

The temperature of carbon is raised from 100°C to 750°C in the first 1300mm of tube. In the final 1000mm of tube operating temperature up to 800°C is achieved in the soak zone causing the gasification of pyrolytic residue through controlled chemical reaction with water vapour. Water is injected to the bottom cone in a precise manner with pyrolysis gases entering the combustion chamber for integral incineration. The control of temperature and water injection at this stage is the key to effective reactivation. The WCC Kiln, with high turndown burner and temperature controlled water injection gives just that. Carbon exits the kilns at 250°C via the discharge nozzle onto the vibratory screen. As the injection of water in the furnace zone vaporises and forms the inert atmosphere under which regeneration takes place; an effectively dry carbon screen allows granular flow immediately on kiln discharge. Reactivation temperature is situation specific, in circuits with no flotation agents, frothers or organics such as tannic acids, reactivation to within 5% of new carbon can be achieved at 600°C. Carbon fouled by organic agents and vegetation decomposition may require temperatures to 750°C to reactivate.

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