

Automatic Coke Reactivity Index And Coke Strength After Reaction Cri Csr Tester

Item Number: KT-JT4



Introduction

Streamline metallurgical coke quality testing with this automated system delivering high precision thermal control advanced mass flow regulation and full standard compliance to determine reactivity index and post reaction strength with unmatched operational safety and data integrity.

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Application	Description	Key Benefit
Integrated Blast Furnace Operations	Routine evaluation of delivered and stockpiled metallurgical coke to determine high-temperature degradation kinetics and abrasion resistance under simulated blast furnace environments.	Prevents blast furnace permeability loss, reduces excessive coke consumption, and optimizes gas distribution within the ironmaking stack.
Commercial Coking Plant Quality Assurance	Verification of coal-blend carbonization recipes and coking battery operating parameters by benchmarking resultant coke CRI and CSR performance values.	Enables precise formulation of coking coal blends, directly lowering raw material procurement expenses without compromising coke strength.
Coal Import and Trading Quality Verification	Independent third-party validation and commercial settlement testing of export/import merchant coke against contractual quality specifications and international trading grades.	Eliminates trade disputes through certified compliance with GB/T 4000-2008 standardized analytical procedures and traceable digital logs.
Carbon Materials and Electrode Research	Scientific investigation into advanced carbonaceous reducing agents, bio-coke composites, and synthetic graphite materials subjected to reactive gas atmospheres at 1100°C.	Delivers high-repeatability dynamic kinetic data across customized heating ramps and gas-switching reaction protocols.
Academic Metallurgical Pyrolysis Studies	Rigorous academic and industrial laboratory research analyzing the microstructural carbon matrix degradation caused by high-temperature carbon dioxide gas diffusion.	Provides precise programmable control over thermal ramping, isothermal soaking, and abrasive tumble degradation in one unified platform.

Specification Parameter	Technical Detail / Value (KT-JT4)
Base Equipment Identifier	KT-JT4
Compliance Standards	GB/T 4000-2008
Furnace Heating Architecture	6 Silicon Carbide (SiC) heating elements arranged in a circular configuration
Heating Power Capacity	7 kW
Uniform Temperature Zone	≥ 150 mm isothermal central hot zone
Maximum Operational Temperature	Up to 1400°C (Reactor structural capacity)
Controlled Temperature Precision	1100°C ± 5°C
Thermocouple Sensor Specifications	Type N thermocouple, Class 0.5 accuracy rating
Thermocouple Protective Sheath	GH3030 high-temperature oxidation-resistant alloy steel
Temperature Transmitter Architecture	Dual-wire solid-state modules with auto-compensation and hardware linearization
Temperature Control Methodologies	Fully automated closed-loop digital control; programmable open-loop stepped control

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Reaction Vessel Material	GH3044 high-temperature nickel-base superalloy
Reaction Chamber Dimensions	Inner diameter $\varnothing 80$ mm $\times$ Length 500 mm
Reactor Handling Mechanism	Bottom-loading electromechanical transmission drive
Atmospheric Flow Metering	Automated dual Mass Flow Controllers (MFC) with digital computer interface
Nitrogen (N ₂) Flow Rate Range	0 to 10 L/min (continuously adjustable)
Carbon Dioxide (CO ₂) Flow Rate Range	0 to 10 L/min (continuously adjustable)
Gas Switching Mode	Fully independent manual and programmatic automated switching
Gas Valve Switching Velocity	0.1 s response
Gas Mass Flow Accuracy	$\pm 1\%$ of Full Scale (FS)
Mass Flow Linearity	$\pm 0.5\%$ of Full Scale (FS)
Mass Flow Repeatability	$\pm 0.2\%$ of Full Scale (FS)
Dynamic Response Performance	Gas characteristics: 1-2 s; Electrical loop characteristics: 10 s
Pneumatic Pressure Rating	3.0 MPa maximum pressure tolerance
Standard Sieve Complement	Circular hole test sieves: 21 mm, 23 mm, 25 mm, and 10 mm
Post-Reaction Tumbler Type	Type I standard abrasion drum
Tumbler Drum Geometry	$\varnothing 140$ mm inner diameter $\times$ 700 mm length; 6 mm cylinder wall thickness
Tumbler Rotational Parameters	600 revolutions over 30 min $\pm$ 1 min; automated digital revolution counter
Safety & Interlock Systems	Over-temperature auto power-cutoff, over-pressure venting, thyristor burnout protection, CO ₂ supply starvation alarm, integrated automatic toxic gas exhaust
Data Communications Protocol	Direct Ethernet data transmission compliant with TCP/IP network protocol
Simulation Capabilities	Full-cycle dry-run software simulation for pre-test subsystem diagnostic checks
Power Supply Requirements	AC 220V $\pm$ 10%, 50 Hz $\pm$ 5%, Three-Phase Five-Wire configuration
Operating Altitude Threshold	$\leq$ 2000 m above sea level
Environmental Operating Conditions	Ambient temperature: 5°C to 40°C; Relative humidity: $\leq$ 85%; Free of vibration, dust, and magnetic fields
System Physical Dimensions	1000 mm (W) $\times$ 500 mm (D) $\times$ 1800 mm (H)
Total System Mass	500 kg