

Dual Furnace Fully Automatic Coke Reactivity Index And Coke Strength After Reaction Determination Apparatus

Item Number: KT-JTA



Introduction

Engineered for high-throughput metallurgy laboratories, this dual furnace fully automatic coke reactivity and post-reaction strength tester delivers precise CRI and CSR determination with independent multi-zone thermal control, automated mechanical extraction, redundant gas switching, and integrated drum tumbling per ISO 18894 standards.

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Application	Description	Key Benefit
Integrated Steel Mill Quality Control	Continuous assessment of metallurgical coke feedstocks destined for large-scale blast furnace operations.	Prevents blast furnace permeability degradation by verifying that CRI and CSR metrics meet stringent hot-strength benchmarks before charging.
Commercial Coking Coal Blending	Empirical evaluation of coking coal blend formulations, coal tar pitch binders, and modified carbon additives.	Empowers carbon chemical engineers to optimize blend recipes, minimizing raw coal procurement costs while sustaining mandatory coke quality.
Merchant Coke Plant Certification	Batch release testing and certificate of analysis (COA) generation for merchant coke producers supplying domestic and export markets.	Assures rapid, audit-ready compliance with both GB/T 4000-2017 and BS ISO 18894:2006 international commercial standards.
Carbon & Refractory R&D	Thermal gasification kinetics research and high-temperature degradation studies of synthetic carbons and pre-formed graphite.	Delivers highly repeatable thermal profiling across independent three-zone chambers with accurate real-time gas flow telemetry.
Third-Party Inspection & Testing Laboratories	High-volume contract laboratory testing of solid mineral fuels, foundry coke, and specialty carbon reductants.	Maximizes sample output through autonomous dual-furnace parallel processing and automated unattended reactor manipulation.

System Subsystem	Parameter Description	Engineering Specification (KT-JTA)
Model Designation	Base Item Number	KT-JTA
Furnace Configuration	Operating Architecture	Dual furnace design; autonomous single-furnace or concurrent dual-furnace operation
Heating Technology	Resistance Wire Heating Structure	Integrated embedded furnace lining; balanced three-phase power supply
Chamber Service Life	Operational Durability	Exceeds 2,000 thermal test cycles
Temperature Range	Maximum Operating Temperature	1250°C
Thermal Uniformity	Constant Temperature Zone (Isothermal)	> 300 mm (exceeds GB/T 4000 >150 mm; compliant with BS ISO 18894:2006)
Thermal Control Accuracy	Steady-State Control Precision	1100°C ± 3°C across three independent heating zones
Thermocouple Specification	Temperature Sensing Element	Three-point S-type thermocouple, Industrial Class II standard
Thermocouple Sheath	Protective Sheathing Material	High-purity Corundum
Heating Program	Standard Ramp Profile	Ambient to 1100°C at 15°C/min; isothermal dwell at 1100°C for 2 hours
Atmosphere Regulation	Flow Control Mechanism	Dual digital Mass Flow Controllers (MFC) equipped with 2 inline drying tubes
Gas Flow Range	Adjustable Range (N2 and CO2)	0 to 10 L/min continuous regulation per channel
Gas Flow Accuracy	Measurement and Delivery Precision	±1.5% Full Scale (F.S.)

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Gas Supply Redundancy	Cylinder Manifold Arrangement	Dual-line setup (1 active, 1 standby) for N2 and CO2 (4 cylinders total)
Gas Switching Response	Automatic Failover Duration	< 10 seconds automatic changeover upon low supply, with acoustic alarm
Gas Purification Option	Optional Secondary Purifier	Upgrades standard industrial N2 and CO2 to ~99% gas purity
Reactor Vessel	Fabrication Material	GH3044 high-temperature nickel-based superalloy
Reactor Dimensions	Internal Geometry	Inside Diameter Ø80 mm × 580 mm length
Handling Mechanism	Reactor Loading / Unloading	Bottom-driven mechanical manipulator utilizing high-precision ball screw
Unattended Operation	Post-Reaction Ejection	Automatic furnace emergence upon cycle completion; cooling alarm at 100°C
Mechanical Drum Unit	I-Type Tumbler Construction	Integrated drum design; charging and discharging without drum removal
Drum Geometry	Tumbler Dimensions & Wall Thickness	Φ140 mm × 700 mm; 5 mm to 6 mm wall thickness
Drum Speed & Revolutions	Rotational Velocity & Cycle Count	20 ± 0.5 rpm; automatic cutoff and counting at 600 total revolutions
Standard Particle Sieves	Round Hole Aperture Set	Φ23 mm, Φ25 mm, and Φ10 mm round hole test sieves (standard configuration)
Optional Particle Sieves	Square Hole Aperture Set (ISO)	19 mm, 22.4 mm, and 10 mm square hole test sieves (ISO-compliant testing)
Safety & Venting	Exhaust Management System	Automatic ventilation startup; thermal waste gas combustion prior to venting
System Protection	Hardware Interlocks & Failsafes	Dual-system protection against SCR breakdown, controller failure, over-temp, over-pressure
Software Interface	PC Communications & Analytics	Real-time logging of 3-zone temp curves and gas flow; data recovery and report printing
Electrical Power Input	Power Supply Requirement	AC 380V, Three-Phase; 7.5 kW (Single Furnace) / 15.0 kW (Dual Furnace Total)
External Dimensions	System Physical Footprint	1400 mm (W) × 900 mm (D) × 2000 mm (H)
Equipment Mass	Net Physical Weight	300 kg