

Instruments for Physical Testing of Coke

Coke Reactivity Index and Coke Strength after Reaction - CRI CSR Test System



The CRI CSR Test System is an automatic device for determination of the Coke Reactivity Index (CRI) and Coke Strength after Reaction (CSR).

This test device is fully compliant with the specifications in the International Standards ASTM D 5341 and ISO 18894.

Both indexes C.R.I. and C.S.R. are most important parameters used for assessment of the quality of metallurgical coke.

Many coke plants and blast furnaces use CSR as a specification just as important as cold strength, size, and chemistry.

CRI and CSR test results reliability greatly depends on temperature and reaction gas flow rate accuracy in terms of:

- **Accuracy of test temperature (1100 °C) during all reaction time.**
- **Isothermal temperature distribution in the coke sample.**
- **Accuracy of CO₂ reacting gas flow rate (5.0 l/min).**

To obtain best test reproducibility, systems must be designed according to ASTM D 5341 and ISO 18894 standard to include:

- **High accuracy temperature programmers and controllers,**
- **Multi-zone ovens with temperature independent controls for best sample isothermal distribution,**
- **High accuracy automatic mass flow meter and control device for CO₂ gas.**

The RB Automazione electric vertical oven is constituted of 5 separate heating zones with 3 individual temperature control systems and are driven by means of solid state power units.

Reaction tubes are made in high temperature alloy and include multiple thermocouples.

The Gas flow control system consists of an automatic electronic mass flow meter for CO₂ (reacting gas), and of a rotameter, with manual flow rate adjust, for N₂ (purge gas).

As an option, a mass flow meter can be supplied for N₂ flow control. Complete automation of the tests is obtained by automatic gas supply to the reaction tube. The oven can optionally be equipped with a continuous monitoring weighing device with digital display and recording of weight change of the sample during the test. A video graphic recorder data logger, also equipped with Ethernet connection and software, provides local and remote recording of test data.

According to the ASTM and ISO standards a double drum tumbler device with automatic counter is supplied for CSR test

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