

Technical Specification

Low Temperature Disintegration Test Tumbling During Reduction



Type of furnace:	Linder tester
Scope:	Application – Low temperature breakdown test of iron ore, generally in accordance with ISO/DP 4697 (1983)
General principles:	Iron Ore Pellets are placed in a rotating tube and subject to “Tumbling During Reduction”. The samples are then subjected to a sieve analysis to determine the degree of disintegration.
Retort:	A heat resistant Nickel/Chrome alloy rotating reduction barrel containing 4 lifter bars and rotating about its axis within the furnace. The dimensions of the usable section are; 130mm internal diameter x 200mm long.
Atmosphere:	A mixture of CO, CO ₂ , H ₂ and N ₂ .
Maximum operating temperature:	1000°C (Without reduction barrel) 600°C (With reduction barrel)
Furnace zones:	Single control zone.
Heated chamber dimensions:	260mm high x 375mm wide x 260mm deep
Tube axis height:	820mm
Heating elements:	Wire spirals hung on ceramic support tubes mounted parallel with the reduction barrel axis.
Insulation:	Low thermal mass ceramic fibre-board pinned into a 2 piece corrosion resistant sheet steel structure.
Construction:	The insulation structure is fitted with corrosion resistant sheet steel panels and is mounted onto a rigid rolled hollow section steel framework fitted with similar steel panels. The unit is painted with a durable epoxy paint.

Door mechanism:	The front section of the furnace is mounted on a counter balanced parallel link mechanism, which allows easy access for loading and unloading the reduction barrel.
Temperature sensors:	1 of type K thermocouple for control 1 off type K mineral insulated probe thermocouple for the customer's use.
Temperature control:	Eurotherm micro-processor based PID controller with digital display of the measured value and set point.
Power control:	Solid state relays
Speed control:	The reduction barrel is driven from a variable speed electric motor through a toothed rubber belt.
Location of controls:	The controls are located on a panel in the main supporting framework.
Furnace rating:	7 kw
Power supply requirements:	415volts, 50 Hz, 3 phase natural and earth, fused and isolated at 20 amps/phase.
Gas controls, alarms & safety burn-off	<p>Gas inlets are provided for nitrogen, carbon monoxide, carbon dioxide and hydrogen supplies in the form of bulkhead connectors on the control panel suitable for connection 10mm pipe.</p> <p>Each gas line is fitted with a flow meter, complete with control valve, a solenoid valve and non-return valve. After the non-return valve, the gas lines combine and a single pipe feeds the reduction vessel.</p> <p>Maximum gas flows are chosen to cover the requirements of all known testing standards.</p> <p>The maximum rate of flow of nitrogen is 25 litres/min.</p> <p>The maximum rate of flow of carbon monoxide is 12 litres/min.</p> <p>The maximum rate of flow of carbon dioxide is 10 litres/min.</p> <p>The maximum rate of flow of hydrogen is 2000 cm³/min.</p>
Approximate overall dimensions:	1500mm high x 1500mm wide x 1060mm deep (including counter-balance weight).
Additional supply requirements:	<p>CO, CO₂, H₂ and N₂ process gas supplies of adequate purity, isolated and regulated to nominally 5 psi and suitable for connection to 10mm compression fittings.</p> <p>CH₄ (methane) pilot burner gas isolated and regulated to 250mm wg (25mbar).</p>
Exclusions from supply:	The equipment does not include gas purification or drying units. It is the responsibility of the end user to provide the appropriate test gases in the appropriate quantities.

CE compliance

The equipment meets all applicable European Union Directives regarding Low Voltage Equipment and Electromagnetic Compatibility and is 'CE' marked accordingly.

Instruction manuals

Manuals will be provided for the general operating and maintenance procedures. As part of the manuals, a copy of the electrical schematic will be provided along with a list of recommended spare parts. Manuals will be in English and will use metric measurements where appropriate.