



# MECHANICAL TESTERS OF CATALYSTS AND ABDSORBENTS

VERSATILE CATALYST CRUSHING STRENGTH TESTER



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## VERSATILE CATALYST CRUSHING STRENGTH TESTER

Vinci Technologies is pleased to introduce its **new generation versatile catalyst crushing strength testers**:

- The single Catalyst Pellet Crushing Strength **ASTM method D4179 and D6175**, for spherical catalyst grains and for extrudates
- The Bulk Crushing Strength of catalysts **ASTM method D7084 and SMS-1471**.

## "NEW GENERATION, VERSATILE CATALYST CRUSHING STRENGTH TESTERS"

### ASTM D4179 & ASTM D6175 GCS-SINGLE-GRAIN CRUSHING STRENGTH

When used for single grain crushing strength test, the device works with **single pellets** and/or with **extrudates radial grains**.

The grain is placed on the anvil of a transducer and a mobile piston crushes the grain. An electronic device, connected to the computer, measures the peak value at which the grain breaks and displays it on the computer screen. The test results and calculations are produced as part of a comprehensive analytical report.

The **measuring device is provided** with several sets of Hammer-Anvil and **Hammer-Holding showing** standardized dimensions and made of stainless steel. The tester complies with the ASTM D4179 and 6175 methods.

- Single pellet crushing strength **ASTM D4179**:  
A sample of 50 to 100 g of catalyst is dried for 3 hours in an oven at 400 °C. After cooling the catalyst is placed in a dessicator and 20 to 50 grains are **selected/obtained?**

Each grain is subjected to an increasing force until breaking point (max load value is 100daN).

- Extrudate radial crushing strength **ASTM 6175**:  
A sample of 50 to 100 g of catalyst is dried for 2 hours in an oven at 300 °C. After cooling the catalyst is placed in a dessicator and 20 to 50 samples are **selected/obtained?**

Each extrudate is subjected to an increasing load up to breaking point (max load value 100daN).

### VCS-VERSATILE CATALYST CRUSHING STRENGTH TESTER

The mechanical strength of industrial catalysts and absorbents is of outstanding importance for their manufacturing, packaging, loading and performance in reactors. Two mechanical characteristics are measured to determine this mechanical strength: crush resistance and attrition/abrasion resistance.

In compliance with the three ASTM methods, the versatile catalyst crushing strength tester (VCS) is delivered with several sets of stainless steel Hammer-Anvil and Hammer-Holding, labeled standardized dimensions. This helps determine the resistance to compressive force of catalysts or catalyst carrier samples of various shapes. The equipment consists of an accurate force sensor controlling an automated press.

The measuring device is user-friendly and allows access to useful data such as:

- The catalyst sample diameter (nominal & crushing diameter)*
- The crushing Strength (daN)*
- The crushing Slope (daN/mm)*
- Applying Force rate (daN/s)*
- The minima, maxima and standard deviation for the data sample.*

### ASTM D7084-4 & SMS-1471 BCS-BULK CRUSHING STRENGTH

When used for bulk crushing strength test, the device determines the resistance to crushing of a bed of grains **whose maximum dimension is 6mm**. The equipment complies with the **ASTM D7084-18** and **SMS-1471 methods**.

**SMS** Test results and calculations are produced as part of a comprehensive analytical report.

After a representative catalyst sample has been dried in an oven at 300 °C for 1 hour and sieved; 20 cm<sup>3</sup> of the catalyst are placed in the **cell** :

- The catalyst is covered with 5 cm<sup>3</sup> of steel balls of diameter 3 to 6 mm depending on the size of the grains of catalyst, and placed on the stress **transducer's** anvil.
- Increasing force is applied to the catalyst in 3 minutes increments.
- The fines obtained at each pressure stage are sifted and weighed: particles smaller than 420 µm (ASTM sieve n° 40) are considered *"fines"*.

