

# **CALDE® FLOW LF 45**

|  |   |
|--|---|
| <b>PRODUCT TYPE</b>                        | : Alumina - Silica product<br>Low cement castable |
| Maximum recommended temperature            | : 1400°C  |
| Main component                             | : Chamotte  |
| Type of bond                               | : Hydraulic                                       |
| Appearance                                 | : Dry, for addition of water                      |
| Packaging                                  | : Sacks   |
| Shelf life                                 | : 6 months  |
| Installation method                        | : Self-flowing                                    |
| Maximum grain size                         | : 6 mm  |
| Material required                          | : 2.20 T/m <sup>3</sup>                           |
| Drinking water required for mixing on site | : 7.5 / 9.0 litres per 100 kg of dry material     |
| Guidelines                                 | : Installation Nr 7                               |

| PRODUCT PROPERTIES  | STANDARD      | AVERAGE VALUES | UNITS             |
|---|---------------|----------------|-------------------|
| <u>CHEMICAL ANALYSIS</u>                                      |               |                |                   |
| SiO <sub>2</sub>  | EN ISO 1927-3 | 50.0           | %                 |
| Al <sub>2</sub> O <sub>3</sub>                                | EN ISO 1927-3 | 45.0           | %                 |
| CaO   | EN ISO 1927-3 | 1.6            | %                 |
| Fe <sub>2</sub> O <sub>3</sub>                                | EN ISO 1927-3 | 1.5            | %                 |
| <u>PHYSICAL PROPERTIES</u>                                    |               |                |                   |
| <u>Measured on samples prepared according to</u>              | EN ISO 1927-5 |                | -                 |
| <u>Bulk density</u>   |               |                |                   |
| after drying at 110 °C  | EN ISO 1927-6 | 2.25           | g/cm <sup>3</sup> |
| after firing at 800 °C  | EN ISO 1927-6 | 2.20           | g/cm <sup>3</sup> |
| <u>Open porosity</u>  |               |                |                   |
| after firing at 800 °C  | EN ISO 1927-6 | 16             | %                 |
| <u>Cold crushing strength</u>                                 |               |                |                   |
| after drying at 110 °C  | EN ISO 1927-6 | 60             | MPa               |
| after firing at 800 °C  | EN ISO 1927-6 | 75             | MPa               |
| after firing at 1200 °C                                       | EN ISO 1927-6 | 70             | MPa               |
| after firing at 1400 °C                                       | EN ISO 1927-6 | 90             | MPa               |
| <u>Permanent linear change</u>                                |               |                |                   |
| after firing at 800 °C  | EN ISO 1927-6 | -0.2           | %                 |
| after firing at 1200 °C                                       | EN ISO 1927-6 | -0.2           | %                 |
| after firing at 1400 °C                                       | EN ISO 1927-6 | -0.4           | %                 |
| <u>Thermal conductivity</u>                                   |               |                |                   |
| at a mean temperature of 800 °C                               | EN ISO 1927-8 | 1.27           | W/mK              |
| at a mean temperature of 1000 °C                              | EN ISO 1927-8 | 1.30           | W/mK              |
| at a mean temperature of 1200 °C                              | EN ISO 1927-8 | 1.44           | W/mK              |
| <u>Reversible thermal expansion after firing [20-1000 °C]</u> |               | 0.63           | %                 |

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The data are current production averages. They cannot be used as limits for a specification.



# Comments on the TDS (Technical Data Sheet)

This product is a composition of different raw materials.

**Exceptions mentioned, all indications given below are linked to the different parts of the last EU regulation EN ISO 1927.**

## 1-PRODUCT TYPE

## 2-MAXIMUM RECOMMENDED TEMPERATURE:

The given temperature is a summary of:

- RUL (Refractoriness Under Load) – measurements
- PLC (Permanent Linear Change) of test samples fired at elevated temperatures.
- Visual appearance of the fired test sample.
- Practical experiences

The temperature is based on the product being heated on one face only, in a non-corrosive atmosphere.

Heating on more than one face, mechanical load, or the presence of dust, gases, slag or metal can decrease the maximum recommended service temperature.

## 3-MAIN COMPONENT(s)

## 4-TYPE OF BOND

Where several bonds are used together, the bond is designated according to the nature of that bond which plays the principal part during hardening.

## 5-SHELF LIFE:

The period indicated begins with the date of production and is based on the storage under cool, dry, frost-free conditions. If this period is exceeded, material does not necessarily become useless. In this case, it is recommended that the material should be checked after consulting Calderys. A bad storage conditions may affect the storage life of the material.

## 6-INSTALLATION - METHOD:

In some cases, Calderys products can be applied by different installation methods.

All figures on this Technical Data refer to the installation method mentioned hereunder. For other installation methods, see "remarks".

## 7-MAXIMUM GRAIN SIZE

## 8-MATERIAL REQUIRED (Yield):

The figure refers to the material as delivered for placing 1m<sup>3</sup> (volume) by applying the installation technique as mentioned. For gunning materials, the figure includes compensation for rebound under standard conditions. For no standard conditions, for instance gunning of thin layers or overhead gunning may increase the amount of material required.

In some cases, if the rebound is not included, the information is written near the "material required" (yield) value.

## 9-DRINKING WATER REQUIRED FOR MIXING ON SITE:

The consistency of the products can be adjusted within the specified range of liquid addition. In case of water, potable one has to be used (see the Installation Guideline).

**10-GUIDELINES:** The "Installation Guidelines", written by CALDERYS, are dedicated to each known case, when possible. Those documents have to be carefully read before preparing, installing and drying the product.

The information given in our Installation Guidelines linked to the well-known phenomena of "Carbonation" with efflorescence is a general problem, when hydraulic bond (based on cement) is used. It is not a CALDERYS specific problem.

## 11-CHEMICAL ANALYSIS

## 12-BULK DENSITY

## 13-OPEN POROSITY

## 14-COLD CRUSHING STRENGTH

## 15-PERMANENT LINEAR CHANGE

## 16-THERMAL CONDUCTIVITY:

For the determination of the thermal conductivity figures, laboratory tests and results achieved under practical conditions were taken into consideration. For the determination of the thermal conductivity figures, laboratory tests and results achieved under practical conditions were taken into consideration. Measurements are made according to the **EN ISO 1927 (8)** and **EN 993-15**.

**17-CARBON MONOXIDE RESISTANCE:** Determined according to **EN ISO 12676** (ASTM C-288)

**18-ABRASION RESISTANCE AFTER FIRING AT...:** Determined according to **EN ISO 16282** (ASTM C-704 )

**19-REVERSIBLE THERMAL EXPANSION AFTER FIRING [20-1000°C]:** The figure is measured by RUL test according to the **EN ISO 1893:2009** (with a maximum load of 0,02 N/mm<sup>2</sup> for dilatation).

**20-THERMAL SHOCK RESISTANCE:** When available, according to **EN ISO 1927-8** but also **EN 993-11** and CALDERYS CALD 022 (linked to CALDERYS internal methods CALD 007 and CALD 012).