

CALDE™ CAST LA 50 SZ

PRODUCT TYPE	: Alumina - Silica product Low cement castable
Maximum recommended temperature	: 1650°C
Main component	: Andalusite, AZS
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 6 months
Installation method	: Vibrating
Maximum grain size	: 6 mm
Material required	: 2.70 T/m³
Drinking water required for mixing on site	: 4.5 / 5.5 litres per 100 kg of dry material
Observation	: Alkali resistant
Guidelines	: Installation Nr 6

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
Al ₂ O ₃	EN ISO 1927-3	50.0	%
SiO ₂	EN ISO 1927-3	27.5	%
SiC	EN ISO 1927-3	9.7	%
ZrO ₂	EN ISO 1927-3	9.4	%
CaO	EN ISO 1927-3	1.2	%
PHYSICAL PROPERTIES			
<u>Measured on samples prepared according to</u>	EN ISO 1927-5	-	-
<u>Bulk density</u>			
after firing at 800 °C	EN ISO 1927-6	2.70	g/cm ³
<u>Open porosity</u>			
after firing at 800 °C	EN ISO 1927-6	16	%
<u>Cold crushing strength</u>			
after firing at 800 °C	EN ISO 1927-6	80	MPa
after firing at 1200 °C	EN ISO 1927-6	100	MPa
after firing at 1500 °C	EN ISO 1927-6	130	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.1	%
after firing at 1200 °C	EN ISO 1927-6	+0.0	%
after firing at 1500 °C	EN ISO 1927-6	+0.5	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	2.42	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	2.34	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	2.32	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.67	%

Commercial Code : MAL40027

Version : 11

Date : 15/11/2013

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ CAST LF 40

PRODUCT TYPE	: Alumina - Silica product Low cement castable
Maximum recommended temperature	: 1450°C
Main component	: Chamotte
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 6 months
Installation method	: Vibrating
Maximum grain size	: 6 mm
Material required	: 2.25 T/m³
Drinking water required for mixing on site	: 6.2 / 7.4 litres per 100 kg of dry material
Observation	: Alkali resistant
Guidelines	: Installation Nr 6

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
SiO ₂	EN ISO 1927-3	54.0	%
Al ₂ O ₃	EN ISO 1927-3	42.0	%
CaO	EN ISO 1927-3	2.2	%
Fe ₂ O ₃	EN ISO 1927-3	1.2	%
PHYSICAL PROPERTIES			
Measured on samples prepared according to	EN ISO 1927-5	-	-
<u>Bulk density</u>			
after firing at 800 °C	EN ISO 1927-6	2.20	g/cm ³
<u>Open porosity</u>			
after firing at 800 °C	EN ISO 1927-6	18	%
<u>Cold crushing strength</u>			
after firing at 800 °C	EN ISO 1927-6	80	MPa
after firing at 1000 °C	EN ISO 1927-6	70	MPa
after firing at 1200 °C	EN ISO 1927-6	70	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.1	%
after firing at 1000 °C	EN ISO 1927-6	-0.2	%
after firing at 1200 °C	EN ISO 1927-6	-0.3	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	1.19	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	1.24	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	1.38	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.61	%

Commercial Code : MAL40031

Version : 11

Date : 15/11/2013

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ CAST LF 45 S

PRODUCT TYPE	: Alumina - Silica product Low cement castable
Maximum recommended temperature	: 1500°C
Main component	: Chamotte
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 6 months
Installation method	: Vibrating
Maximum grain size	: 10 mm
Material required	: 2.30 T/m³
Drinking water required for mixing on site	: 6.0 / 6.8 litres per 100 kg of dry material
Guidelines	: Installation Nr 6

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
SiO ₂	EN ISO 1927-3	46.0	%
Al ₂ O ₃	EN ISO 1927-3	44.0	%
SiC	EN ISO 1927-3	5.0	%
CaO	EN ISO 1927-3	1.5	%
Fe ₂ O ₃	EN ISO 1927-3	1.2	%
PHYSICAL PROPERTIES			
<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	2.32	g/cm ³
after firing at 800 °C	EN ISO 1927-6	2.30	g/cm ³
<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	75	MPa
after firing at 800 °C	EN ISO 1927-6	95	MPa
after firing at 1200 °C	EN ISO 1927-6	100	MPa
after firing at 1400 °C	EN ISO 1927-6	100	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	-0.5	%
after firing at 1400 °C	EN ISO 1927-6	+0.0	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	1.55	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	1.50	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	1.63	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.63	%

Commercial Code : MAL40032

Version : 11

Date : 15/11/2013

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ CAST LR 45

PRODUCT TYPE	: Alumina - Silica product Low cement castable
Maximum recommended temperature	: 1350°C
Main component	: Acidic chamotte
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks or big bags
Shelf life	: 6 months
Installation method	: Vibrating
Maximum grain size	: 6 mm
Material required	: 2.30 T/m³
Drinking water required for mixing on site	: 7.0 / 8.0 litres per 100 kg of dry material
Guidelines	: Installation Nr 6

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
SiO ₂	EN ISO 1927-3	48.0	%
Al ₂ O ₃	EN ISO 1927-3	44.0	%
CaO	EN ISO 1927-3	2.2	%
Fe ₂ O ₃	EN ISO 1927-3	0.2	%
PHYSICAL PROPERTIES			
<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	2.30	g/cm ³
after firing at 800 °C	EN ISO 1927-6	2.27	g/cm ³
<u>Cold crushing strength</u>			
after drying at 110 °C	EN ISO 1927-6	95	MPa
after firing at 800 °C	EN ISO 1927-6	100	MPa
after firing at 1200 °C	EN ISO 1927-6	135	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	-0.6	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	1.35	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	1.38	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	1.50	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.61	%

Commercial Code : MAL40030

Version : 11

Date : 15/11/2013

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ CAST XL 106 C/G

PRODUCT TYPE	: Alumina - Silica product Insulating castable
Maximum recommended temperature	: 1060°C
Main component	: Vermiculite
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 12 months
Installation method	: Hand compaction, Gunning
Maximum grain size	: 3 mm
Material required	
casting	: 0.51 T/m³
gunning	: 0.73 T/m³ (Rebound included)
Water required for mixing on site	
casting	: 96.0 / 116.0 litres per 100 kg of dry material
gunning	: Added at the nozzle
Guidelines	: Installation Nr 9

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES		UNITS
		Cast	Gunned	
CHEMICAL ANALYSIS				
SiO ₂	EN ISO 1927-3	31.0		%
Al ₂ O ₃	EN ISO 1927-3	30.0		%
CaO	EN ISO 1927-3	16.5		%
Fe ₂ O ₃	EN ISO 1927-3	9.0		%
PHYSICAL PROPERTIES				
<u>Measured on samples prepared according to</u>	-	EN ISO 1927-5	CALD010	-
<u>Bulk density</u>				
after drying at 110 °C	EN ISO 1927-6	0.56	0.66	g/cm ³
after firing at 800 °C	EN ISO 1927-6	0.50	0.60	g/cm ³
<u>Cold crushing strength</u>				
after drying at 110 °C	EN ISO 1927-6	1.2	1.5	MPa
after firing at 500 °C	EN ISO 1927-6	0.9	1.2	MPa
after firing at 800 °C	EN ISO 1927-6	0.9	1.2	MPa
<u>Permanent linear change</u>				
after firing at 500 °C	EN ISO 1927-6	-0.6	-0.6	%
after firing at 800 °C	EN ISO 1927-6	-0.7	-0.7	%
after firing at 1000 °C	EN ISO 1927-6	-2.0	-2.1	%
<u>Thermal conductivity</u>				
at a mean temperature of 500 °C	EN ISO 1927-8	0.14	0.16	W/mK
at a mean temperature of 800 °C	EN ISO 1927-8	0.16	0.19	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.55	0.55	%

Commercial Code : MAI20086

Version : 14

Date : 18/03/2014

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

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 1m³ (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/mm² 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).

CALDE™ GUN F 40 A

PRODUCT TYPE	: Alumina - Silica product Regular Castable
Maximum recommended temperature	: 1450°C
Main component	: Chamotte
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 12 months
Installation method	: Gunning
Maximum grain size	: 6 mm
Material required	: 2.28 T/m³ (Rebound included)
Drinking water required for mixing on site	: Added at the nozzle
Observation	: Alkali resistant
Guidelines	: Installation Nr 23

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
SiO ₂	EN ISO 1927-3	53.5	%
Al ₂ O ₃	EN ISO 1927-3	42.0	%
CaO	EN ISO 1927-3	2.2	%
Fe ₂ O ₃	EN ISO 1927-3	0.8	%
PHYSICAL PROPERTIES			
<u>Measured on samples prepared by gunning</u>	CALD 010		-
<u>Bulk density</u>			
after drying at 110 °C	EN ISO 1927-6	2.18	g/cm ³
after firing at 800 °C	EN ISO 1927-6	2.08	g/cm ³
<u>Cold crushing strength</u>			
after drying at 110 °C	EN ISO 1927-6	30	MPa
after firing at 800 °C	EN ISO 1927-6	30	MPa
after firing at 1200 °C	EN ISO 1927-6	35	MPa
after firing at 1400 °C	EN ISO 1927-6	65	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.1	%
after firing at 1200 °C	EN ISO 1927-6	-0.2	%
after firing at 1400 °C	EN ISO 1927-6	-0.6	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	1.03	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	1.09	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	1.24	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.62	%

Commercial Code : MAG40065

Version : 11

Date : 31/10/2013

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ GUN MM 55 S5

PRODUCT TYPE	: Alumina - Silica product Regular Castable
Maximum recommended temperature	: 1500°C
Main component	: High alumina raw materials
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 12 months
Installation method	: Gunning
Maximum grain size	: 6 mm
Material required	: 2.60 T/m³ (Rebound included)
Drinking water required for mixing on site	: Added at the nozzle
Guidelines	: Installation Nr 23

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
Al ₂ O ₃	EN ISO 1927-3	57.0	%
SiO ₂	EN ISO 1927-3	30.0	%
SiC	EN ISO 1927-3	5.0	%
CaO	EN ISO 1927-3	4.1	%
Fe ₂ O ₃	EN ISO 1927-3	0.8	%
PHYSICAL PROPERTIES			
<u>Measured on samples prepared by gunning</u>	CALD 010	-	-
<u>Bulk density</u>			
after drying at 110 °C	EN ISO 1927-6	2.46	g/cm ³
after firing at 800 °C	EN ISO 1927-6	2.35	g/cm ³
<u>Cold crushing strength</u>			
after drying at 110 °C	EN ISO 1927-6	90	MPa
after firing at 800 °C	EN ISO 1927-6	80	MPa
after firing at 1200 °C	EN ISO 1927-6	75	MPa
after firing at 1400 °C	EN ISO 1927-6	60	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.3	%
after firing at 1200 °C	EN ISO 1927-6	-0.4	%
after firing at 1400 °C	EN ISO 1927-6	+0.3	%
<u>Thermal conductivity</u>			
at a mean temperature of 500 °C	EN ISO 1927-8	1.43	W/mK
at a mean temperature of 800 °C	EN ISO 1927-8	1.43	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	1.44	W/mK
<u>Carbon monoxide resistance</u>	EN ISO 12676	A/B	-
<u>Abrasion resistance</u>			
after firing at 815°C	EN ISO 16282	< 8 cm ³	cm ³
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.67	%

Commercial Code : MAG50105

Version : 11

Date : 31/10/2013

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

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 1m³ (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/mm² 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).

CALDE™ GUN MW STRONG LITE

PRODUCT TYPE	: Alumina - Silica product Insulating castable
Maximum recommended temperature	: 1320°C
Main component	: Lightweight chamotte
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 12 months
Installation method	: Gunning
Maximum grain size	: 4 mm
Material required	: 1.60 T/m³ (Rebound included)
Drinking water required for mixing on site	: Added at the nozzle
Guidelines	: Installation Nr 9

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
SiO ₂	EN ISO 1927-3	40.0	%
Al ₂ O ₃	EN ISO 1927-3	39.0	%
CaO	EN ISO 1927-3	12.0	%
Fe ₂ O ₃	EN ISO 1927-3	5.5	%
PHYSICAL PROPERTIES			
Measured on samples prepared by gunning	CALD 010		-
<u>Bulk density</u>			
after drying at 110 °C	EN ISO 1927-6	1.52	g/cm ³
after firing at 800 °C	EN ISO 1927-6	1.38	g/cm ³
<u>Cold crushing strength</u>			
after drying at 110 °C	EN ISO 1927-6	20	MPa
after firing at 800 °C	EN ISO 1927-6	15	MPa
after firing at 1200 °C	EN ISO 1927-6	10	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.20	%
after firing at 1200 °C	EN ISO 1927-6	-0.65	%
<u>Thermal conductivity</u>			
at a mean temperature of 500 °C	EN ISO 1927-8	0.44	W/mK
at a mean temperature of 800 °C	EN ISO 1927-8	0.46	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	0.49	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.60	%

Commercial Code : MAI30070

Version : 11

Date : 13/01/2014

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

CALDERYS

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 1m³ (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/mm² 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).

CALDE™ STIX ZIRKON

PRODUCT TYPE	: Special product Regular Castable
Maximum recommended temperature	: 1350°C
Main component	: Zircon
Type of bond	: Hydraulic
Appearance	: Dry, for addition of water
Packaging	: Sacks
Shelf life	: 12 months
Installation method	: Trowelling , Gunning
Maximum grain size	: 6 mm
Material required	: 3.10 T/m³ (Rebound included)
Drinking water required for mixing on site	: Added at the nozzle
Guidelines	: Installation Nr 23

PRODUCT PROPERTIES	STANDARD	AVERAGE VALUES	UNITS
CHEMICAL ANALYSIS			
Al ₂ O ₃	EN ISO 1927-3	37.0	%
ZrO ₂	EN ISO 1927-3	30.0	%
SiO ₂	EN ISO 1927-3	26.0	%
CaO	EN ISO 1927-3	5.0	%
Fe ₂ O ₃	EN ISO 1927-3	1.1	%
PHYSICAL PROPERTIES			
<u>Measured on samples prepared by gunning</u>	CALD 010		-
<u>Bulk density</u>			
after drying at 110 °C	EN ISO 1927-6	2.94	g/cm ³
after firing at 800 °C	EN ISO 1927-6	2.80	g/cm ³
<u>Cold crushing strength</u>			
after drying at 110 °C	EN ISO 1927-6	40	MPa
after firing at 800 °C	EN ISO 1927-6	48	MPa
after firing at 1000 °C	EN ISO 1927-6	45	MPa
after firing at 1200 °C	EN ISO 1927-6	40	MPa
<u>Permanent linear change</u>			
after firing at 800 °C	EN ISO 1927-6	-0.3	%
after firing at 1000 °C	EN ISO 1927-6	-0.4	%
after firing at 1200 °C	EN ISO 1927-6	-0.6	%
<u>Thermal conductivity</u>			
at a mean temperature of 800 °C	EN ISO 1927-8	0.92	W/mK
at a mean temperature of 1000 °C	EN ISO 1927-8	0.95	W/mK
at a mean temperature of 1200 °C	EN ISO 1927-8	0.97	W/mK
<u>Reversible thermal expansion after firing [20-1000 °C]</u>		0.68	%

Commercial Code : MZC30001

Version : 11

Date : 30/01/2014

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

CALDERYS

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 1m³ (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/mm² 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).