



ALMATIS

PREMIUM ALUMINA



Global Product Data

# Calcined Aluminas for Polishing



Think alumina, think Almatris.

GP-RCP/007/R13/1218/SDS 387



# Calcined Aluminas for Polishing

| Product / Properties                         |      | PG feinst | P 815/P 816 | A 13 LS  | A 13 – 325 |
|--|------|-----------|-------------|----------|------------|
| Unground                                     | Unit | typ.      | typ.        | typ.     | typ.       |
| Calcination degree                           |      | very low  | very low    | low      | low        |
| Primary crystal size                         | µm   | < 0.1     | < 1         | < 1      | < 1        |
| α - Al <sub>2</sub> O <sub>3</sub> content   | %    | 0         | > 70        | > 70     | > 70       |
| <b>Chemical Analysis</b>                     |      |           |             |          |            |
| Na <sub>2</sub> O                            | %    | 0.5       | 0.3         | 0.1      | 0.1        |
| Fe <sub>2</sub> O <sub>3</sub>               | %    | 0.03      | 0.02        | 0.02     | 0.02       |
| SiO <sub>2</sub>                             | %    | 0.03      | 0.02        | 0.02     | 0.02       |
| <b>Particle Size</b>                         |      |           |             |          |            |
| > 150 µm / 100 mesh                          | %    |           |             | 4        |            |
| > 71 µm / 200 mesh                           | %    |           |             | 60       |            |
| > 45 µm / 325 mesh                           | %    |           | 0.8         | 85       | 6          |
| > 20 µm / 635 mesh                           | %    | < 3       |             |          |            |
| d10 Cilas / Compacite                        | µm   | 0.7       | 1.2         |          | 0.6        |
| d50 Cilas / Compacite                        | µm   | 3.4       | 6           | 80       | 4.5        |
| d90 Cilas / Compacite                        | µm   | 14        | 20          |          | 28         |
| Specific surface area / BETm <sup>2</sup> /g |      | 45 – 80   | 5 – 12      | 6.5 – 15 | 8 – 17     |
| Loose bulk density                           | g/l  | 450 – 600 |             |          | 650        |
| Oil absorption                               | %    | 35 – 50   | 53          | 52       | 30         |
| Cutting effect                               |      | 1         | 1           | 2        | 2          |
| Polishing effect                             |      | 10        | 10          | 7        | 9          |

All data are based on Almatix test methods, measured with Cilas 1064 and published as typical or rang limits.

produced in North America

produced in Europe

#### General information:

- Al<sub>2</sub>O<sub>3</sub>: min. 99%
- specific gravity: 3.98 g/cm<sup>3</sup>

# Calcined Aluminas for Polishing

| Product / Properties<br>Unground             | Unit | P 10<br>typ. | P 6<br>typ. | P 02<br>typ. | P 2<br>typ. | P 2 FR<br>typ. | P 30<br>typ. | P 2 S<br>typ. | P 730<br>typ. | P 10 feinst<br>typ. |
|--|------|--------------|-------------|--------------|-------------|----------------|--------------|---------------|---------------|---------------------|
| Calcination degree                           |      | low          | low         | low          | low         | low            | low          | low           | low           | low                 |
| Primary crystal size                         | µm   | < 1          | < 1         | < 1          | < 1         | < 1            | < 1          | < 1           | < 1           | < 1                 |
| α - Al <sub>2</sub> O <sub>3</sub> content   | %    | > 70         | > 70        | > 70         | > 70        | > 70           | > 70         | > 70          | > 70          | > 70                |
| <b>Chemical Analysis</b>                     |      |              |             |              |             |                |              |               |               |                     |
| Na <sub>2</sub> O                            | %    | 0.4          | 0.4         | 0.4          | 0.4         | 0.4            | 0.4          | 0.4           | 0.4           | 0.4                 |
| Fe <sub>2</sub> O <sub>3</sub>               | %    | 0.02         | 0.02        | 0.02         | 0.02        | 0.02           | 0.02         | 0.02          | 0.02          | 0.02                |
| SiO <sub>2</sub>                             | %    |              |             |              |             |                |              |               |               |                     |
| <b>Particle Size</b>                         |      |              |             |              |             |                |              |               |               |                     |
| > 200 µm / 65 mesh                           | %    | < 0.1        |             |              |             |                |              |               |               |                     |
| > 125 µm / 115 mesh                          | %    |              | < 5         |              |             |                |              |               |               |                     |
| > 90 µm / 170 mesh                           | %    |              |             | < 1          | < 0.5       | < 0.5          | < 0.1        |               |               |                     |
| > 71 µm / 200 mesh                           | %    |              |             |              |             |                |              | < 0.1         |               |                     |
| > 63 µm / 250 mesh                           | %    | 25 – 50      | 15 – 40     | 1.0 – 15     | 0.1 – 5     | < 1.5          | 0.1 – 3      | 0.1 – 3       |               |                     |
| > 56 µm / 270 mesh                           | %    |              |             |              |             |                |              |               | < 0.1         |                     |
| > 40 µm / 400 mesh                           | %    |              |             |              |             |                |              |               | < 3           | < 0.1               |
| > 20 µm / 635 mesh                           | %    |              |             |              |             |                |              |               |               | < 3                 |
| d10 Cilas                                    | µm   | 1.6          | 1.5         | 1            | 0.8         | 1.2            | 0.7          | 0.7           | 0.6           | 0.5                 |
| d50 Cilas                                    | µm   | 38           | 33          | 16           | 11          | 24             | 8,3          | 9             | 3,7           | 3                   |
| d90 Cilas                                    | µm   | 100          | 90          | 48           | 40          | 45             | 36           | 34            | 19            | 14                  |
| Specific surface area / BETm <sup>2</sup> /g |      | 9 – 17       | 9 – 17      | 9 – 17       | 9 – 17      | 9 – 17         | 9 – 17       | 9 – 17        | 9 – 17        | 10 – 17             |
| Loose bulk density                           | g/l  | 700 – 1000   | 700 – 1000  | 640 – 740    | 500 – 800   | 650 – 850      | 500 – 800    | 500 – 800     | 400 – 600     | 350 – 550           |
| Oil absorption                               | %    | 38 – 50      | 37 – 47     | 36 – 46      | 35 – 45     | 40 – 50        | 30 – 40      | 35 – 45       | 30 – 40       | 30 – 40             |
| Cutting effect                               |      | 2            | 3           | 2            | 2           | 2              | 2            | 2             | 2             | 2                   |
| Polishing effect                             |      | 7            | 8           | 8            | 9           | 9              | 9            | 9             | 9             | 10                  |

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produced in North America

produced in Europe

#### General information:

- Al<sub>2</sub>O<sub>3</sub>: min. 99%
- specific gravity: 3.98 g/cm<sup>3</sup>



# Calcined Aluminas for Polishing

| Product / Properties                          | Unit | WRA         | P 66 M      | WRA FG      | PSG 100    | PSG 125    | PSG 150   | PSG 300     |
|---|------|-------------|-------------|-------------|------------|------------|-----------|-------------|
| Unground                                      |      | typ.        | typ.        | typ.        | typ.       | typ.       | typ.      | typ.        |
| Calcination degree                            |      | medium high | medium high | medium high | high       | high       | high      | high        |
| Primary crystal size                          | µm   | 2.5         | 2.5         | 2.5         | 3          | 3          | 3         | 3           |
| α - Al <sub>2</sub> O <sub>3</sub> content    | %    | 99          | 99          | 99          | 99         | 99         | 99        | 99          |
| <b>Chemical Analysis</b>                      |      |             |             |             |            |            |           |             |
| Na <sub>2</sub> O                             | %    | 0.12        | 0.2         | 0.12        | 0.15       | 0.15       | 0.15      | 0.15        |
| Fe <sub>2</sub> O <sub>3</sub>                | %    | 0.02        | 0.02        | 0.02        | 0.03       | 0.03       | 0.03      | 0.03        |
| SiO <sub>2</sub>                              | %    | 0.01        | 0.02        | 0.02        |            |            |           |             |
| <b>Particle Size</b>                          |      |             |             |             |            |            |           |             |
| > 200 µm / 65 mesh                            | %    | < 5         |             |             | < 1        |            |           |             |
| > 125 µm / 115 mesh                           | %    |             | < 5         |             |            | < 4        | < 0.1     |             |
| > 63 µm / 250 mesh                            | %    | 50 – 95     | < 15        |             | 50 – 95    | 30 – 60    | < 3       |             |
| > 45 µm / 325 mesh                            | %    |             |             | < 3         |            |            |           |             |
| > 40 µm / 325 mesh                            | %    |             |             |             |            |            |           | < 3         |
| d10 Cilas / Compacite                         | µm   |             | 0.3         | 0.4         |            | 17         | 0.2       | 0.6         |
| d50 Cilas / Compacite                         | µm   | 70          | 5           | 4           | 86         | 65         | 5         | 4.9         |
| d90 Cilas / Compacite                         | µm   |             | 40          | 14          |            | 100        | 26        | 17          |
| Specific surface area / BET m <sup>2</sup> /g |      | 0.5 – 0.7   | 0.6 – 1.5   | 0.6 – 1.1   | 0.4 – 0.55 | 0.4 – 0.55 | 0.4 – 0.6 | 0.55 – 0.75 |
| Loose bulk density                            | g/l  | 700 – 1100  | 760 – 950   | 600 – 900   | 800 – 1050 | 800 – 1050 | 700 – 950 | 550 – 900   |
| Oil absorption                                | %    | 40 – 60     | 14 – 25     | 12 – 25     | 41 – 54    | 35 – 50    | 12 – 25   | 12 – 22     |
| Cutting effect                                |      | 6           | 4           | 4           | 9          | 8          | 7         | 6           |
| Polishing effect                              |      | 3           | 4           | 5           | 3          | 3          | 3         | 4           |

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produced in North America

produced in Europe

#### General information:

- Al<sub>2</sub>O<sub>3</sub>: min. 99%
- specific gravity: 3.98 g/cm<sup>3</sup>

# Calcined Aluminas for Polishing

| Product / Properties                          | Unit | A 2<br>typ. | A 267<br>typ. | A 2 – 325<br>typ. | A 2–325 CR<br>typ. | A 35 – 325<br>typ. |
|---|------|-------------|---------------|-------------------|--------------------|--------------------|
| Calcination degree                            |      | high        | high          | high              | high               | very high          |
| Primary crystal size                          | µm   | 3           | 3             | 2.5               | 2.5                | 2.5                |
| α - Al <sub>2</sub> O <sub>3</sub> content    | %    | 99          | 99            | 99                | 99                 | 99                 |
| <b>Chemical Analysis</b>                      |      |             |               |                   |                    |                    |
| Na <sub>2</sub> O                             | %    | 0.25        | 0.25          | 0.25              | 0.25               | 0.11               |
| Fe <sub>2</sub> O <sub>3</sub>                | %    | 0.02        | 0.02          | 0.02              | 0.02               | 0.02               |
| SiO <sub>2</sub>                              | %    | 0.02        | 0.02          | 0.021             | 0.03               | 0.02               |
| <b>Particle Size</b>                          |      |             |               |                   |                    |                    |
| > 150 µm / 100 mesh                           | %    | 3           |               |                   |                    |                    |
| > 71 µm / 200 mesh                            | %    | 58          |               |                   |                    |                    |
| > 45 µm / 325 mesh                            | %    | 83          | 20 – 40       | < 5               | < 1                | < 5                |
| d10 Cilas                                     | µm   | 40          | 4             | 0.6               | 0.4                | 0.9                |
| d50 Cilas                                     | µm   | 73          | 20            | 6                 | 5                  | 5.6                |
| d90 Cilas                                     | µm   | 90          | 42            | 14                | 12                 | 17                 |
| Specific surface area / BET m <sup>2</sup> /g |      | < 0.8       | 0.5 – 1.5     | < 1.1             | < 1.1              | < 1.1              |
| Loose bulk density                            | g/l  | 825         | 875           | 925               | 950                | 925                |
| Oil absorption                                | %    | 50          | 50            | 20                | 15                 | 20                 |
| Cutting effect                                |      | 9           | 8             | 7                 | 6                  | 7                  |
| Polishing effect                              |      | 3           | 3             | 3                 | 4                  | 3                  |

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produced in Europe

#### General information:

- Al<sub>2</sub>O<sub>3</sub>: min. 99%
- specific gravity: 3.98 g/cm<sup>3</sup>



# Calcined Aluminas for Polishing

| Product / Properties                               | Unit | CT 19<br>typ. | PBC<br>typ. | PB<br>typ. | P 20<br>typ. | P 25<br>typ. | Gilox 63<br>typ. | Gilox 125<br>typ. | A 10 5 µm<br>typ. | A 10 – 325<br>typ. |
|--|------|---------------|-------------|------------|--------------|--------------|------------------|-------------------|-------------------|--------------------|
| <b>Calcination degree</b>                          |      | very high     | very high   | very high  | very high    | very high    | very high        | very high         | very high         | very high          |
| <b>Primary crystal size</b>                        | µm   | 4.5           | 4.5         | 4.5        |              | 22           | 15               | 12                | 5                 | 5                  |
| <b>α - Al<sub>2</sub>O<sub>3</sub> content</b>     | %    | 99            | 99          | 99         | 99           | 99           | 99               | 99                | 99                | 99                 |
| <b>Chemical Analysis</b>                           |      |               |             |            |              |              |                  |                   |                   |                    |
| <b>Na<sub>2</sub>O</b>                             | %    | 0.06          | 0.1         | 0.1        | 0.35         | 0.35         | 0.35             | 0.35              | 0.08              | 0.08               |
| <b>Fe<sub>2</sub>O<sub>3</sub></b>                 | %    | 0.03          | 0.03        | 0.03       | 0.03         | 0.03         | 0.03             | 0.03              | 0.02              | 0.02               |
| <b>SiO<sub>2</sub></b>                             | %    | 0.03          | 0.03        | 0.03       | 0.03         | 0.03         | 0.03             | 0.03              | 0.03              | 0.04               |
| <b>Particle Size</b>                               |      |               |             |            |              |              |                  |                   |                   |                    |
| <b>&gt; 150 µm / 100 mesh</b>                      | %    | <10           | < 5         | < 3        |              |              |                  |                   | 1                 |                    |
| <b>&gt; 125 µm / 115 mesh</b>                      | %    |               |             |            |              |              |                  | < 1               |                   |                    |
| <b>&gt; 71 µm / 200 mesh</b>                       | %    |               |             |            |              |              |                  |                   | 57                |                    |
| <b>&gt; 63 µm / 250 mesh</b>                       | %    | 50 – 95       | 40 – 90     | 40 – 90    | 50 – 80      | 55 – 90      | 0.1 – 3          | 5 – 12            |                   |                    |
| <b>&gt; 45 µm / 325 mesh</b>                       | %    |               |             |            |              |              |                  |                   | 87                | < 5                |
| <b>d10 Cilas</b>                                   | µm   |               |             |            | 4*           | 5*           | 2.5              |                   | 50                | 1.2                |
| <b>d50 Cilas</b>                                   | µm   | 65            | 68          | 65         | 18*          | 25*          | 17               | 21.5              | 82                | 8.3                |
| <b>d90 Cilas</b>                                   | µm   |               |             |            | 55*          | 70*          | 45               |                   | 130               | 20                 |
| <b>Specific surface area / BET m<sup>2</sup>/g</b> |      | 0.2 – 0.45    | 0.3 – 0.45  | 0.3 – 0.45 | 0.15         | 0.15         | 0.2              |                   | 0.2 – 0.6         | 0.4 – 0.9          |
| <b>Loose bulk density</b>                          | g/l  | 750 – 1050    | 800 – 1100  | 750 – 1050 | 600 – 1100   | 600 – 1100   |                  |                   | 950               | 800                |
| <b>Oil absorption</b>                              | %    | 40 – 50       | 40 – 46     | 37 – 44    | 20 – 60      | 25 – 65      | 10 – 25          | 15 – 30           | 35                | 15                 |
| <b>Cutting effect</b>                              |      | 8             | 8           | 8          | 9            | 9            | 8                | 8                 | 8                 | 7                  |
| <b>Polishing effect</b>                            |      | 2             | 3           | 3          | 1            | 1            | 1                | 1                 | 2                 | 3                  |

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produced in North America

produced in Europe

#### General information:

- Al<sub>2</sub>O<sub>3</sub>: min. 99%
- specific gravity: 3.98 g/cm<sup>3</sup>
- \* desagglomerated

# Calcined Aluminas for Polishing

## What are polishing aluminas?

Our polishing aluminas are grades of a specially produced oxide. As inorganic products, they have one important advantage over natural materials used for polishing: their physical properties and chemical compositions are constant regardless of the pressure or temperature experienced during use. Aluminum oxide is the most widely used polishing medium. In general, polishing compounds contain approximately 50% alumina. The aluminum oxide is in the form of an agglomerate that consists of numerous primary crystals. The size of these crystals depends on the degree of calcination: as a general rule, the higher the calcination temperature, the larger the primary crystals. Certain grades with larger crystals can be used for grinding and lapping while some with small primary crystals simply equalize and smooth the surface being treated, without removing significant amounts of material. The primary crystals of Almatis polishing aluminas are extremely hard. On the Mohs scale the aluminas rate one degree below diamond.

## What are the properties of Almatis polishing aluminas?

Almatis polishing aluminas are used in many different applications and industrial processes. They give excellent results in lapping and grinding situations. They are successfully used in various lapping processes as precision lapping, final lapping, surface abrasion (hydro abrasion) and polishing (buffing, hydro lapping, barrel polishing resp. tumbling). They can also be used successfully in grinding processes where a certain amount of cutting always takes place leaving a rough surface. Typical applications are in honing, super finishing, fettling and polishing (using polishing wheels). The main benefits of Almatis polishing aluminas are:

- Crushing properties of the agglomerates and primary crystals
- Hardness of the primary crystals
- Shape of the grains in the damaged and the undamaged crystals
- Wide range of working temperature, high melting point and excellent resistance to thermal shock
- Workability and oil absorption
- Homogeneity of the powder low in impurities, hard particles

The balance of cutting and polishing effects, together with the oil absorption rate, indicates where each grade of polishing alumina can be used most effectively. The cutting effect is indicated on a scale of 1 to 10, where 1 represents a low cut and 10 represents a very high degree of abrasion. The polishing effect is classified in the same way, with the scale number 1 indicating a highly reflective surface finish and scale number 10 indicating a lustrous finish achieved by fine, soft aluminas.

## How are they applied?

Almatis polishing aluminas are used alone or as an ingredient of a polishing compound. These compounds are effectively a mixture of a polishing medium with a binder, usually oil or wax. The ratio of binder to a polishing medium varies according to the intended application but is usually in the region of 50% polishing medium, 50% binder. The most common forms in which Almatis polishing aluminas are applied are:

- As is, without any additives
- As a suspension in water or oil
- Mixed with water or oil emulsions
- Mixed with a creamy paste
- Mixed with a solid paste to form a polishing bar

They can be applied manually or in automatic polishing processes, such as airless processes or barrel finishing. Other applications are household cleaners, car cleaners, stone polishes, brake linings and vibro-finishing.



# Calcined Aluminas for Polishing



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