

PIGMENTS  
FOR COATINGS

SCHLENK 

# World of Metallics

A L U M I N I U M   &   G O L D B R O N Z E   P I G M E N T S





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# World of Metallics

P I G M E N T S





## INTRODUCTION - TECHNICAL INFORMATION

# Metallic Pigments for Coatings

Metallic pigments are utilized in the coatings industry for numerous and differing applications. Besides creating the typical "metallic effect", they are also used to fulfill functional requirements such as corrosion protection, conductivity, and others:

### Automotive Coatings

- OEM
- Refinish
- Parts and Accessories

### Plastic Coatings (ex. Consumer Electronics)

- TV Cabinets, cell phones, cameras, computer housings, etc.

### Coil Coatings

### Can Coatings

### Powder Coatings

### General Industrial Coatings

### Anti-Corrosion Coatings

### Watercraft Primer Coatings

### Roof Coatings

### Decorative Coatings (including aerosol)

and many more

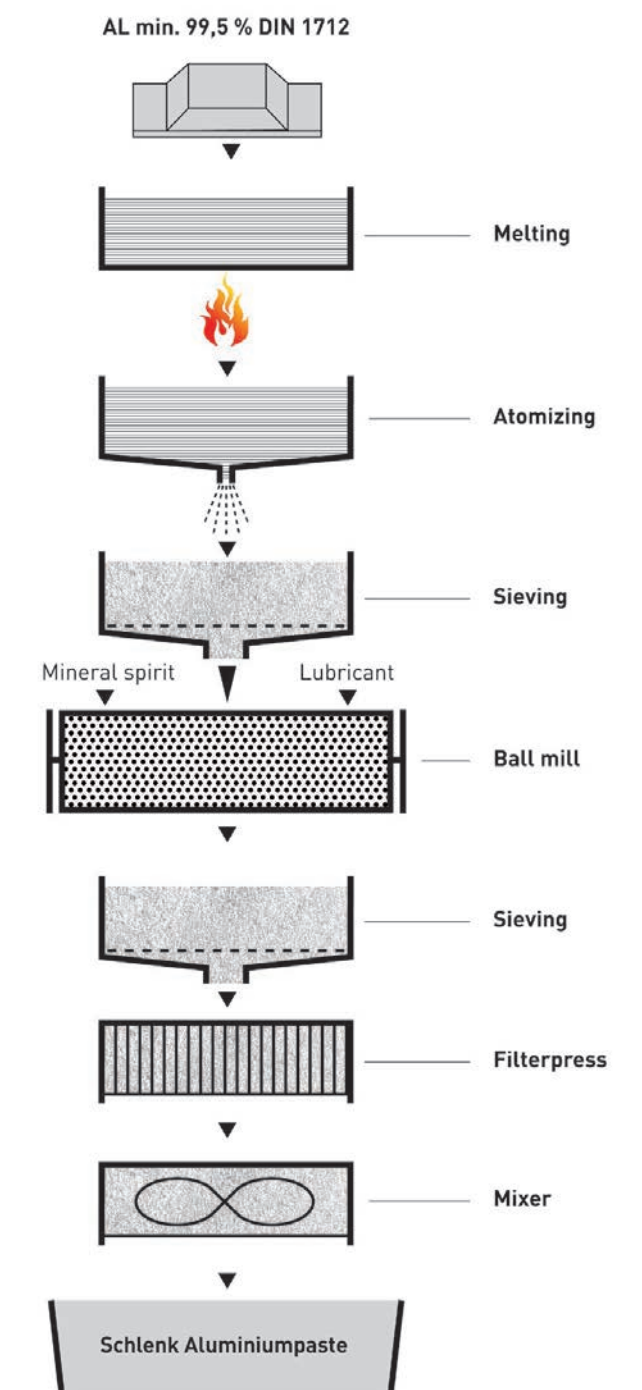
The flakes particle size ranges from 5 to >50 µm in diameter and a thickness of 20 nm (VMP) to 1µm. These metal pigments are composed of aluminium and brass alloys, commonly referred to as gold bronze pigments.

## The Manufacturing process of Aluminium Pigments

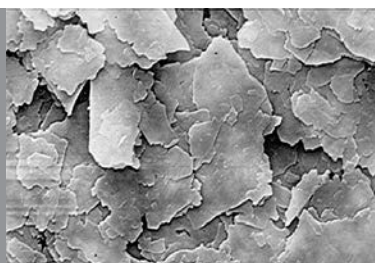
Modern aluminium pigments are produced in a wet milling process in ball mills (Hall Process), whereas gold bronze pigments are produced in a dry milling process (Hametag Process).

The manufacturing process begins with milling atomized aluminium powder to the desired particle size and form in white spirit / mineral spirits with the addition of lubricating additives. After a screening and classification process, the pigment suspension in the mixer is pressed out and the "press cake" is adjusted with solvents to a metal content of typically 65 %.

Should the end application require solvents other than hydrocarbons (ex. pastes in water, water solutable solvents, or other types of solvents), the press cake is dried and the powder again is pasted with the required solvents or water.



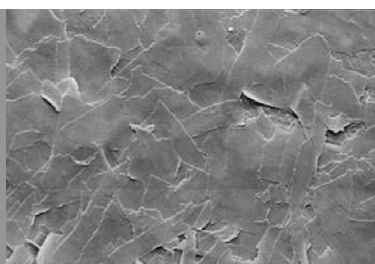
Cornflake



Silverdollar



VMP



So called "Vacuum Metallized Pigments" ("VMP"), our DECOMET series, are produced by releasing aluminium of metallized films. The aluminium is then further processed and the particle size adjusted. These pigments are considerably thinner and offer a surface which is substantially smoother and therefore much more reflective than conventional aluminium flakes.

**Depending on the production process we distinguish between**

- Lamellar flakes (Cornflakes)
- Lenticular flakes (Silver-dollars)
- Vacuum Metallized Pigments (VMP's)

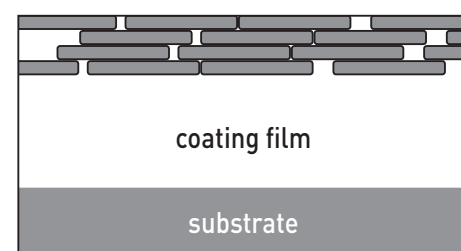
## Leafing/Non leafing

As a result of the wetting behavior of the flakes, the metallic pigments either float on the wet film (leafing), building a layer of pigments on the film surface, or the pigments become fully wetted out and distribute themselves homogeneously in the paint film (non leafing).

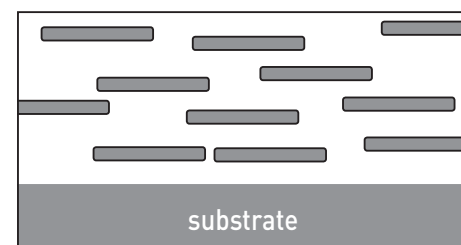
The wetting behavior is determined by the lubricating additives used in the milling process. Leafing pigments are achieved when using stearic acid whereas non leafing pigments can be produced when unsaturated fatty acids (ex. oleic acid) are used.

Leafing pigments create a silver "metallic effect" and are primarily used in corrosion protection coatings, decorative coatings, as well as roof coatings. The disadvantage of the leafing effect is its poor recoatability (either with itself or a clearcoat) and abrasion resistance. Tinted metal effects are not possible because of the pigment orientation.

As non leafing pigments are distributed homogeneously throughout the paint film, these are better protected from abrasion and corrosive influences. They can easily be over-coated.



LEAFING-PIGMENT



NON LEAFING-PIGMENT

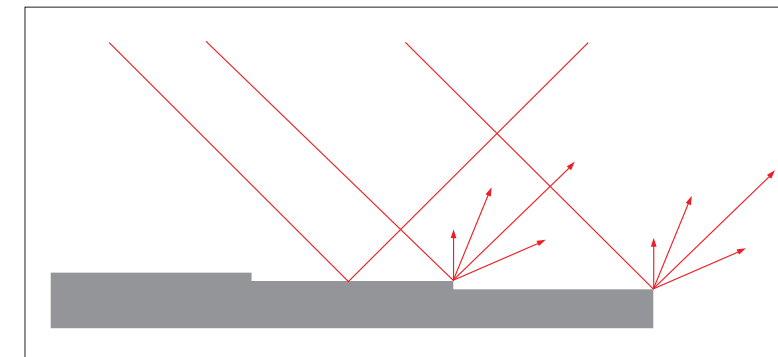
One of the main advantages, however, is the possibility to create tinted "metallic effects" when mixing the metallic pigment with transparent pigment.

Typical applications include anti-corrosion and general industrial coatings.

Non leafing aluminium pigments that meet the quality criteria below are primarily used in automotive coatings (typically used with an additional clearcoat) as well as in high quality industrial coatings for coil, can and plastics applications.

# The "Metallic Effect"

Physically, the "metallic effect" is based on the reflection of light on the smooth surface of the pigment. This reflection however is overlayed by the light scattered at the edges of the flake and by the micro-roughness of the pigment surface. Therefore the "metallic effect" is the sum of the reflection and the scattering of light. The higher the ratio of reflected light, the more intense is the "metallic effect".



light reflection at lamellar smooth surfaces  
light scattering at edges and rough surfaces

**This results in the following quality criteria, which, depending on the application, are to be considered when metallic pigments are selected.**

### Particle Size

The larger the particle (= the reflecting surface), the greater the "metallic effect" (brilliance, "sparkle effect"). The finer the particle, the higher the scattering at the edges. Consequently, the effect becomes more homogenous but also darker.

The selection of particle size is primarily determined by the manufacturing technology and is described by the d50-value (average particle size). Typical metal pigments range from approximately 3 µm (offset printing) to over 50 µm ("high sparkle effect"). The aluminium pigments used for automotive coatings, consumer electronics, coil coatings, powder coatings and other applications offer a d50 range of approximately 8 – 25 µm.

### Particle shape – Pigment Morphology

With the development of the "Silver-dollar Pigments", new spheres in "metallic effects" could be created. As a result of the coin-like particle form and the

smooth surface, the reflection is maximized and the amount of scattered light is significantly reduced. The "metallic effect" becomes more intense and the brilliance and brightness is clearly enhanced when compared to similar size "cornflake pigments". Silky luster effects can be achieved with fine "Silverdollars". This pigment class (d50: 8 – 20 µm) is presently the most utilized aluminium in metallic automotive coatings and high quality industrial coatings.

### Particle Size Distribution

Also here the same rule applies: the higher the portion of fine and very fine pigments particles, the higher the scattering of light, resulting in the loss of the metallic appearance. However, particles that are too coarse, have a detrimental effect in the application process and visual effects (surface gloss, "DOI-value", opacity etc.). Therefore, in recent years R&D efforts have focused on pigments that have excellent morphology and are tightly classified within the required particle size category.



Pigment Orientation

In addition to the above described characteristics: particle size, particle size distribution and pigment morphology, the orientation of pigment particles when applied is of extreme importance.

The more parallel the metallic flakes are oriented in the coating film, the better the level of light reflection and thus the better the "metallic effect". Depending on the end use, the formula and application conditions play a decisive role here.

Flop Effect

The "Flop Effect" (also known as "two-tone or travel ") must also be addressed. Besides brilliance, gloss, and "sparkle", it is one of the most characteristic criteria of the "metallic effect". Flop considers the brightness in relationship to the viewing angle. Close to the gloss angle one can measure maximum brilliance; whereas when viewing from a different angle, the effect appears considerably darker. Three dimensional objects, as for example car bodies, appear much more sculpted and of higher quality. This surely contributed strongly to the success of such "metallic effects" in automotive coating applications.

Metal Pigments for Environmentally Friendly Coating Systems

One essential requirement of the environmentally conscious coatings industry is the reduction of volatile organic compounds or VOC's.

This can be achieved by reducing the solvent content step by step, even to the extent of making completely solvent free coatings, such as powder coatings

| Low solids | Medium solids | High solids | Powder coatings |
|------------|---------------|-------------|-----------------|
| 10-30 %    | 30-50 %       | 50-80 %     | 100 % solids    |

Low or no VOC can also be achieved when organic solvents are replaced with water in so called "water borne coatings"

In energy cured coatings systems (UV or EB) solvents are replaced with monomers, which are chemically integrated into the dry film through polymerization and are therefore also considered "VOC free".

Also, improved application processes with better efficiency (ex. electrostatic spray) or complete solvent recycling via incineration (ex. coil coating) help to protect our environment.

In any of these modern applications metallic pigments are widely used.

These as well as other special applications make it necessary to customize these pigments with special chemical treatments (ex. organic or inorganic surface coatings).

Water Borne Coating Systems

The primary problem with water borne coating systems is the gassing stability of the metal pigments, which has an impact on storage stability.

The underlying chemical reaction of aluminium and water, which creates hydrogen gas can be prevented either by utilizing suitable inhibitors (e.g. organic phosphorus compounds) or by coating the surface with silica.

Powder Coatings

Metallic powder coatings should not be produced in a co-extrusion process. The high shear forces, especially in the milling process, would destroy the flakes and severely influence the effect. However, if it still desired to utilize metallic pigments in this process, it is recommended to use pigment-binding agent compositions, such as pellets (GRANDAL for aluminums, GRANDOR for bronzes).

Metal pigments are primarily used in the Dry Blend Process or are bonded to the powder resin in a special bonding process to assure the reuseability of overspray.

Effect, electric chargeability, as well as chemical resistance of the pigment are all positively influenced through special surface coatings of the pigments.

As an example with Powdal XT, new technology made it possible to fulfill the stringent requirements of the construction industry such as certain AAMA specifications (hydrochloric acid, nitric acid, and mortar testing) and GSB-Norm.

With modern surface treatments also other requirements are achieved:

- humidity resistance and intercoat adhesion for automotive OEM
- circulation resistance for automotive OEM
- "shock-proof" TV-cabinet coatings
- chemical resistance for consumer electronics, appliances, and automotive interior
- weather resistance for external use (powder coating, coil coating)

Additional information is provided under the individual special product categories.

Guideline-formulations, technical information as well as our competent technical service are available globally.

# 1 Aluminium Pigments leafing

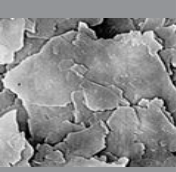












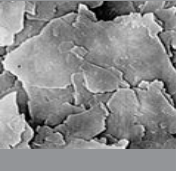









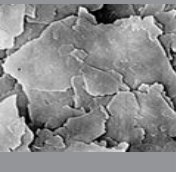


















**Leafing pigments** provide a bright metallic – almost white – appearance and are available in powder and paste form.

**EM** Solventborne pastes

**PP** Powders

**Aquasilber LPW** Waterborne pastes

# Aluminium Pigments leafing

| Morphology  | Product Denomination  | non-volatile content % | Solvent      | D50-value approx. µm | Applications  | Outstanding Features                                    |
|---|-----------------------|------------------------|--------------|----------------------|---|---|
|    | EM / 70               | 65 ± 2                 | white spirit | 20                   |             | standard white spirit pastes                            |
|   | EM / 90               | 65 ± 2                 | white spirit | 17                   |             |   |
|   | EM / 110              | 65 ± 2                 | white spirit | 13                   |     |   |
|   | EM / 130              | 65 ± 2                 | white spirit | 10                   |     |   |
|   | PP / 770              | 100                    | –            | 20                   |     | powders – free of any solvent                           |
|   | PP / 970              | 100                    | –            | 17                   |     |   |
|   | PP / 1170             | 100                    | –            | 13                   |     |   |
|   | PP / 1370             | 100                    | –            | 10                   |     |   |
|   | Metaface 2150         | 100                    | –            | 13                   |    |   |
|  | Aquasilber LPW / 780  | 65 ± 2                 | water        | 20                   |      | stabilized leafing pastes for <b>waterborne</b> systems |
|   | Aquasilber LPW / 980  | 65 ± 2                 | water        | 17                   |     |   |
|   | Aquasilber LPW / 1180 | 65 ± 2                 | water        | 13                   |     |   |
|   | Aquasilber LPW / 1380 | 65 ± 2                 | water        | 10                   |     |   |
|   | Aquasilber LPW / 2150 | 65 ± 2                 | water        | 13                   |      |   |

## 2 Aluminium Pigments non leafing

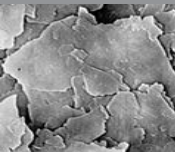










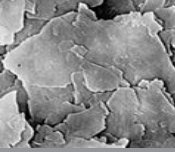
















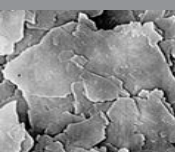













### 2.1 Cornflakes for solventborne systems

**POLYTOP** Economy cornflake series

**ALUMET** Standard cornflake series

**ALUCAR** Premium cornflake series

# Aluminium Pigments non leafing

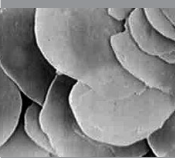






















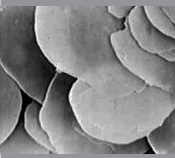




















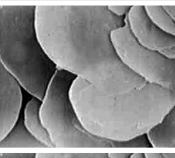










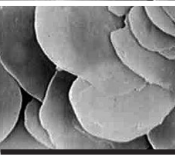



| Morphology  | Product Denomination | non-volatile content % | Solvent                 | D50-value approx. µm | Applications  | Outstanding Features   |
|---|----------------------|------------------------|-------------------------|----------------------|---|--|
|    | Polytop 1050         | 65 ± 2                 | white spirit /aromatics | 22                   |    | wide particle size distribution, excellent hiding power                          |
|   | Polytop 1060         | 65 ± 2                 | white spirit /aromatics | 20                   |    |  |
|   | Polytop 1070         | 65 ± 2                 | white spirit /aromatics | 18                   |    |  |
|   | Polytop 0900         | 65 ± 2                 | white spirit            | 14                   |      |  |
|   | Polytop 0130         | 65 ± 2                 | white spirit            | 11                   |      |  |
|   | Polytop 0160         | 60 ± 2                 | white spirit            | 8                    |    |  |
|  | Alumet 1500          | 65 ± 2                 | white spirit /aromatics | 22                   |         | narrower particle size distribution, good hiding power, good metallic appearance |
|   | Alumet 1600          | 65 ± 2                 | white spirit /aromatics | 20                   |     |  |
|   | Alumet 1700          | 65 ± 2                 | white spirit /aromatics | 18                   |     |  |
|   | Alumet 1800          | 65 ± 2                 | white spirit /aromatics | 14                   |     |  |
|  | Alucar 2600          | 65 ± 2                 | white spirit /aromatics | 24                   |      | very narrow particle size distribution, bright metallic appearance               |
|   | Alucar 2650          | 65 ± 2                 | white spirit /aromatics | 20                   |      |  |
|   | Alucar 2700          | 65 ± 2                 | white spirit /aromatics | 17                   |      |  |
|   | Alucar 2900          | 65 ± 2                 | white spirit /aromatics | 11                   |     |  |

# 2 Aluminium Pigments non leafing

## 2.2 Silverdollars for solventborne systems

- ALUBRIGHT 3000**   **Standard series** – Coarse to medium fine silverdollar grades
- ALUSHINE 6000**   **Standard series** – Medium to fine silverdollar grades
- ALUSHINE 7000**   **Premium series** – Medium to fine silverdollar grades
- ALUSTAR 8000**   **Premium series** – Thin silverdollar grades

# Aluminium Pigments non leafing

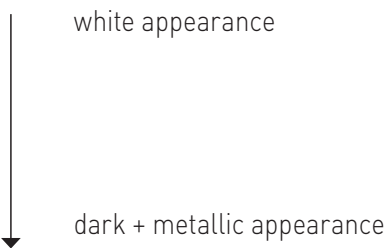
| Morphology  | Product Denomination | non-volatile content % | Solvent                 | D50-value approx. µm | Applications  | Outstanding Features   |
|---|----------------------|------------------------|-------------------------|----------------------|---|--|
|    | Alubright 3100       | 70 ± 2                 | white spirit /aromatics | 75                   |    | narrow particle size distribution, coarse grades show high sparkle effekt  |
|   | Alubright 3200       | 70 ± 2                 | white spirit /aromatics | 56                   |      |  |
|   | Alubright 3250       | 70 ± 2                 | white spirit /aromatics | 47                   |      |  |
|   | Alubright 3400       | 70 ± 2                 | white spirit /aromatics | 34                   |      |  |
|   | Alubright 3600*      | 70 ± 2                 | white spirit /aromatics | 31                   |      |  |
|   | Alubright 3700*      | 70 ± 2                 | white spirit /aromatics | 29                   |      |  |
|   | Alubright 3800*      | 65 ± 2                 | white spirit /aromatics | 27                   |     |  |
|   | Alubright 3900*      | 65 ± 2                 | white spirit /aromatics | 24                   |      |  |
|  | Alushine 6200        | 70 ± 2                 | white spirit /aromatics | 24                   |     | silverdollars standard; narrow particle size distribution  |
|   | Alushine 6400        | 70 ± 2                 | white spirit /aromatics | 22                   |     |  |
|   | Alushine 6600        | 70 ± 2                 | white spirit /aromatics | 18                   |     |  |
|   | Alushine 6600 XB     | 70 ± 2                 | white spirit /aromatics | 18                   |     |  |
|   | Alushine 6900        | 70 ± 2                 | white spirit /aromatics | 15                   |     |  |
|  | Alushine 7400        | 70 ± 2                 | white spirit /aromatics | 18                   |      | thick silverdollars premium; very narrow particle size distribution; strong and dark flop recommended for circulation resistance |
|   | Alushine 7600        | 70 ± 2                 | white spirit /aromatics | 13                   |      |  |
|   | Alushine 7800        | 60 ± 2                 | white spirit /aromatics | 8                    |     |  |
|  |                      |                        |                         |                      |   | thin silverdollar; superb hiding power + liquid metal effect   |
|   | Alustar 8500         | 60 ± 2                 | white spirit /aromatics | 15                   |      |  |

\*special pigments morphology



# 3 Vacuum metallized pigments (VMPs)

- DECOMET 1000 Economy series
- DECOMET 2000 Standard series
- DECOMET 3000 Premium series
- DECOMET 4000 High end series
- DECOMET 5000



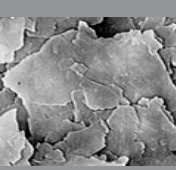






























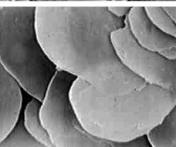









| Morphology | Product Denomination | non-volatile content % | Solvent                            | D50-value approx. µm | Applications | Outstanding Features                         |
|------------|----------------------|------------------------|------------------------------------|----------------------|--------------|--|
|            | Decomet 2687 / 30    | 30 ± 0,5               | methoxypropyl acetate/white spirit | 10 - 11              |              | leafing grade; outstanding mirror effect     |
|            |                      |                        |                                    |                      |              |  |
|            | Decomet 1008 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 12 - 15              |              | light metallic; white appearance             |
|            |                      |                        |                                    |                      |              |  |
|            | Decomet 2008 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 12 - 15              |              | chrome like metallic effect                  |
|            | Decomet 2108 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 10 - 11              |              |  |
|            | Decomet 3008 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 11 - 14              |              | dark metallic, good opacity; stainless steel |
|            | Decomet 3108 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 10 - 11              |              |  |
|            | Decomet 4008 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 11 - 14              |              | very dark metallic, superb opacity; platinum |
|            | Decomet 5008 / 10    | 10 ± 0,5               | methoxypropyl acetate              | 11 - 14              |              |  |
|            |                      |                        |                                    |                      |              |  |

+ Slurries including different solvents (ethyl acetate & isopropyl acetate) are available upon request

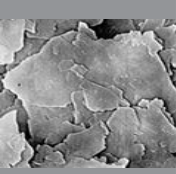




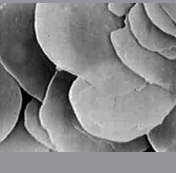







| Morphology | Product Denomination | non-volatile content % | Solvent                      | D50-value approx. µm | Applications | Outstanding Features  |
|------------|----------------------|------------------------|------------------------------|----------------------|--------------|---|
|            | Decomet 1050 / 10    | 10 ± 0,5               | water                        | 12 - 15              |              | passivated for waterborne systems<br>not recommended for rim coating                                |
|            | Decomet 2057 / 10    | 10 ± 0,5               | tripropylenglycolmethylether | 12 - 15              |              | excellent humidity resistance; perfect intercoat<br>adhesion recommended for rim and glass coatings |
|            |                      |                        |                              |                      |              |   |

# 4 Waterborne systems non leafing

**AQUAMET NPW**      phosphor organic treated  
**AQUAMET WPO**      phosphor organic treated (modified)

| Morphology  | Product Denomination    | non-volatile content % | Solvent | D50-value µm | Applications  | Outstanding Features   |
|---|-------------------------|------------------------|---------|--------------|---|--|
|    | Aquamet NPW / 2600      | 60 ± 2                 | water   | 24           |          | no VOC content;<br>specially recommended for <b>mono-coat systems</b>                            |
|   | Aquamet NPW / 1500      | 60 ± 2                 | water   | 22           |          |  |
|   | Aquamet NPW / 1700      | 60 ± 2                 | water   | 18           |          |  |
|   | Aquamet NPW / 2900      | 60 ± 2                 | water   | 11           |          |  |
|   | Aquamet NPW / 3200      | 60 ± 2                 | water   | 56           |          |  |
|   | Aquamet NPW / 3400      | 60 ± 2                 | water   | 34           |          |  |
|   | Aquamet NPW / 6200      | 60 ± 2                 | water   | 24           |       |  |
|   | Aquamet NPW / 6400      | 60 ± 2                 | water   | 22           |    |  |
|   | Aquamet NPW / 6600      | 60 ± 2                 | water   | 18           |    |  |
|   | Aquamet NPW / 6900      | 60 ± 2                 | water   | 15           |    |  |
|  | Aquamet WPO / 2600      | 60 ± 2                 | water   | 24           |    | no VOC content;<br>good intercoat adhesion;<br>specially recommended for <b>two-coat systems</b> |
|   |                         |                        |         |              |   |  |
|   | Aquamet WPO / 3200 / 65 | 65 ± 2                 | water   | 56           |    |  |
|   | Aquamet WPO / 3400 / 70 | 70 ± 2                 | water   | 34           |    |  |

Aluminium  
Pigments non leafing

| Morphology  | Product Denomination      | non-volatile content % | Solvent      | D50-value µm | Applications  | Outstanding Features  |
|---|---------------------------|------------------------|--------------|--------------|---|---|
|    | Aquamet CP-BG / 2600      | 60 ± 2                 | butyl glycol | 24           |    | good circulation resistance;<br>non-conductive setup offers<br>excellent chemical resistance;<br>recommended for plastic coatings |
|   | Aquamet CP-BG / 1500      | 60 ± 2                 | butyl glycol | 22           |    |   |
|   | Aquamet CP-BG / 1700      | 60 ± 2                 | butyl glycol | 18           |    |   |
|   | Aquamet CP-BG / 2900 / 50 | 50 ± 2                 | butyl glycol | 11           |    |   |
|   | Aquamet CP-BG / 3200      | 60 ± 2                 | butyl glycol | 56           |    |   |
|   | Aquamet CP-BG / 3400      | 60 ± 2                 | butyl glycol | 34           |    |   |
|   | Aquamet CP-BG / 6600      | 60 ± 2                 | butyl glycol | 18           |   |   |
|   | Aquamet CP-BG / 6900      | 60 ± 2                 | butyl glycol | 15           |  |   |
|   | Aquamet CP-BG / 8500 / 50 | 50 ± 2                 | butyl glycol | 15           |  |   |
|  | Aquamet CP-BG / 7600      | 60 ± 2                 | butyl glycol | 13           |  |   |

# Aluminium Pigments non leafing



# 5 Powder Coatings

All Powdal grades are recommended for dry blend as well as bonding applications.  
For extrusion we recommend Grandal pellets (see 6.2).

- Powdal leafing

Powdal non leafing

Powdal nl SiO<sub>2</sub>

Powdal nl HC

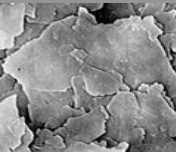





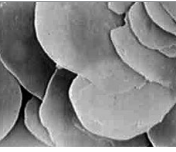



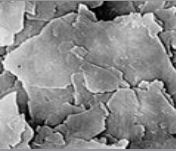




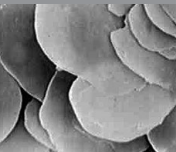







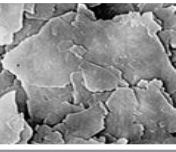

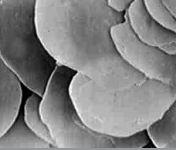




Powdal nl XT
- Untreated – leafing

Untreated – Economy series

Silica encapsulated – Standard series

Silica encapsulated – High Chrome Effect

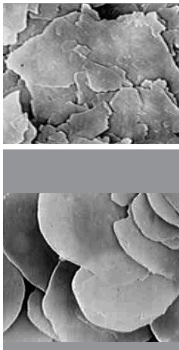
















Silica encapsulated – Premium series

| Morphology  | Product Denomination | Stabilization    | D50-value | Applications<br>approx. µm  | Outstanding Features   |  |
|---|----------------------|------------------|-----------|---|--|--|
|    | leafing              |                  |           |   |  |  |
|   | Powdal 70            |                  | 20        |    |  |  |
|   | Powdal 110           |                  | 13        |    | bright and chrome-like effect<br>appearance combined with excellent hiding power   |  |
|   | Powdal 130           |                  | 10        |    |  |  |
|   | Powdal 170           |                  | 6         |    |  |  |
|   | Powdal 170 XB        |                  | 6         |    | best available hiding power  |  |
|    | non leafing          |                  |           |   |  |  |
|   | Powdal 310 n.l.      |                  | 75        |    |  |  |
|   | Powdal 320 n.l.      |                  | 54        |    | high sparkle series,<br>only for interior applications   |  |
|   | Powdal 340 n.l.      |                  | 34        |    |  |  |
|   | Powdal 2600          | SiO <sub>2</sub> | 24        |    |  |  |
|   | Powdal 2650          | SiO <sub>2</sub> | 20        |   |  |  |
|   | Powdal 1500          | SiO <sub>2</sub> | 22        |  | high cost-effectiveness, for high-end interior applications<br>with certain demand on chemical resistance<br>and excellent metallic appearance |  |
|   | Powdal 1700          | SiO <sub>2</sub> | 18        |  |  |  |
|   | Powdal 2900          | SiO <sub>2</sub> | 11        |  |  |  |
|  | Powdal 3100          | SiO <sub>2</sub> | 75        |  |  |  |
|   | Powdal 3200-01       | SiO <sub>2</sub> | 54        |  |  |  |
|   | Powdal 3250-01       | SiO <sub>2</sub> | 48        |  | high sparkle series with superior surface performance  |  |
|   | Powdal 3400-01       | SiO <sub>2</sub> | 34        |  |  |  |
|   | Powdal 6600          | SiO <sub>2</sub> | 18        |  |  |  |
|   | Powdal 8500          | SiO <sub>2</sub> | 15        |  | superior metallic effect without fingerprints  |  |
|   | Powdal 8500 HC       | SiO <sub>2</sub> | 15        |  | chrome-like effect with strongly improved fingerprint resistance   |  |
|  | Powdal 2600 XT       | SiO <sub>2</sub> | 24        |  |  |  |
|  | Powdal 3100 XT       | SiO <sub>2</sub> | 75        |  |  |  |
|   | Powdal 3200 XT       | SiO <sub>2</sub> | 54        |  | fulfills GSB<br>standard<br>(mortar resistant)   |  |
|   | Powdal 3250 XT       | SiO <sub>2</sub> | 48        |  | excellent<br>chemical<br>resistance<br>especially<br>for exterior<br>usage   |  |
|   | Powdal 3400 XT       | SiO <sub>2</sub> | 34        |  |  |  |
|   | Powdal 6600 XT       | SiO <sub>2</sub> | 18        |  |  |  |

6 Specialities

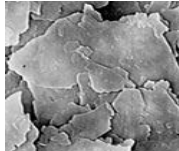






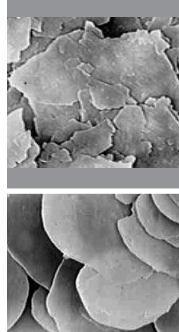


















6.1 Coil / Can Coatings

**SILVERCOIL** Aluminium pigments specially for coil and can coatings. Quality control is done in a coil-coating system ensuring perfect batch to batch consistency.

| Morphology  | Product Denomination | non-volatile content % | Solvent                  | D50-value µm | Applications  | Outstanding Features               |
|---|----------------------|------------------------|--------------------------|--------------|---|------------------------------------|
|  | SilverCoil 2600 CC   | 65                     | white spirit / aromatics | 24           |   | Standard series – not encapsulated |
|   | SilverCoil 1700 CC   | 65                     | white spirit / aromatics | 18           |   |                                    |
|   | SilverCoil 2900 CC   | 65                     | white spirit / aromatics | 11           |   |                                    |
|   | SilverCoil 3200 CC   | 70                     | white spirit / aromatics | 56           |   |                                    |
|   | SilverCoil 3400 CC   | 70                     | white spirit / aromatics | 34           |   |                                    |
|   | SilverCoil 6600 CC   | 70                     | white spirit / aromatics | 18           |   |                                    |
|   | SilverCoil 7800 CC   | 60                     | white spirit / aromatics | 8            |   |                                    |
|   | SilverCoil 8500 CC   | 60                     | white spirit / aromatics | 15           |   |                                    |

6.2 Aluminium pellets

**GRANDAL** Aluminium pellets based on aldehyde resin

| Morphology  | Product Denomination | metal content % | D50-value µm | Applications  | Outstanding Features     |
|---|----------------------|-----------------|--------------|---|--------------------------|
|  | leafing              |                 |              |   | solventfree easy to dose |
|   | Grandal 770          | ca. 95          | 20           |     |                          |
|   | Grandal 2140         | ca. 95          | 13           |     |                          |
|   | Grandal 170          | ca. 95          | 6            |     |                          |
|  | non leafing          |                 |              |   |                          |
|   | Grandal 2600         | ca. 95          | 24           |    |                          |
|   | Grandal 1050         | ca. 95          | 22           |    |                          |
|   | Grandal 1700         | ca. 95          | 18           |    |                          |
|   | Grandal 2900         | ca. 95          | 11           |    |                          |
|   | Grandal 6600         | ca. 95          | 18           |    |                          |
|   | Grandal 6900         | ca. 95          | 15           |    |                          |
|   |                      |                 |              |   |                          |

# 7 Goldbronze Pigments

## Powders + Waterborne Pastes

- LUMINOR

UNICOAT

GOLDFLITTER
- Powders

– not passivated
- CONSTANT

Powders

– SiO<sub>2</sub> encapsulated
- AQUADOR

Pastes

– stabilized version for waterborne systems
- GRANDOR

Pellet version

# Goldbronze

# Pigments

| Morphology | Product Denomination     | metal content % | D50-value µm | Shades                                  | Applications | Outstanding Features                                |
|------------|--------------------------|-----------------|--------------|---|--------------|---|
|            | Luminor 2210             | 100             | 50           | RG; RPG; PG; CO; DG                     |              | brilliant deep shades                               |
|            | Luminor 2250             | 100             | 35           | RG; RPG; PG; CO; EG; CT; GC; DG; FR     |              |   |
|            | Luminor 2550             | 100             | 35           | RG; RPG; PG; CO                         |              |   |
|            | Luminor 2280             | 100             | 20           | RG; RPG; PG; CO; DG                     |              |   |
|            | Luminor 2580             | 100             | 20           | RG; RPG; PG; CO; EG; CT; GC; DG; FR; MR |              |   |
|            | Luminor 2350             | 100             | 16           | RG; RPG; PG; CO; DG                     |              |   |
|            | Unicoat 3050             | 100             | 11,5         | RG; RPG; PG                             |              | excellent hiding power                              |
|            | Unicoat 3850             | 100             | 6            | RG; RPG; PG; CO                         |              |   |
|            |                          |                 |              |   |              | special non leafing setup                           |
|            | Grandor 426 n.L.         | 95              | 9            | RG; RPG; PG; DG                         |              |   |
|            | Constant 2210 / N        | 100             | 45           | RG; RPG; PG; CO                         |              | silica encapsulated<br>high chemical resistance     |
|            | Constant 2250 / N        | 100             | 33           | RG; RPG; PG; CO                         |              |   |
|            | Constant 2280 / N        | 100             | 28           | RG; RPG; PG; CO; EG; CT; DG; FR         |              |   |
|            | Constant 4117 / N        | 100             | 11           | RG; RPG; PG; CO                         |              |   |
|            | Aquador 2250             | 70              | 35           | RG; RPG; PG; CO; EG; CT; GC; DG; FR     |              | stabilized leafing pastes for<br>waterborne systems |
|            | Aquador 2550             | 70              | 35           | RG; RPG; PG; CO                         |              |   |
|            | Aquador 2580             | 70              | 20           | RG; RPG; PG; CO; EG; CT; GC; DG; FR; MR |              |   |
|            | Aquador 2350             | 70              | 16           | RG; RPG; PG; CO; DG                     |              |   |
|            | Aquador 3050             | 70              | 11,5         | RG; RPG; PG                             |              |   |
|            | Aquador 4350             | 70              | 6            | RG; RPG; PG                             |              |   |
|            | Goldflitter 200          | 100             | 200          | RG; PG; CO                              |              | coarse goldflitter for high<br>sparkle effects      |
|            | Goldflitter 1000         | 100             | 1000         | RG; PG; CO                              |              |   |
|            | Goldflitter Constant 200 | 100             | 200          | RG; PG; CO                              |              |   |

all powders are available in paste and granule form as well

Standard Colors: Rich Gold: **RG**; Rich Pale Gold: **RPG**; Pale Gold: **PG**; Copper: **CO**  
Special Colors: English Green: **EG**; Citron: **CT**; Gold Color: **GC**; Ducat Gold: **DG**; Fire Red: **FR**; Maron: **MR**



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