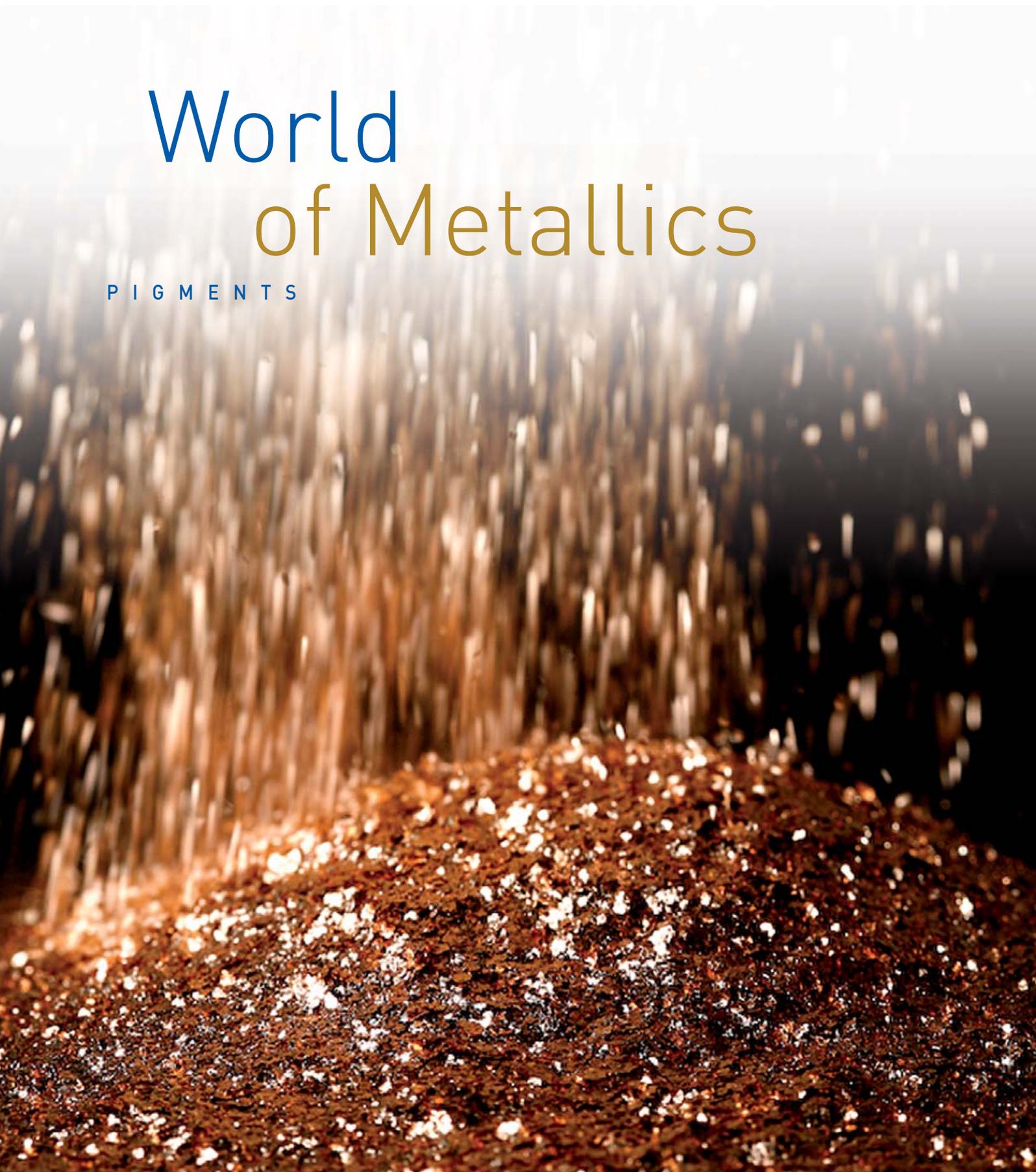


PIGMENTS
FOR PRINTING INKS

SCHLENK 

World of Metallics

P I G M E N T S



PIGMENTS FOR PRINTING INKS

Pigments for Lithographic Printing Inks

08 /09 Aluminium Pigments

08 /09 Vacuum Metallized Pigments

08 /09 Goldbronze Pigments

Pigments for Gravure & Flexographic Printing Inks

10 /11 Aluminium Pigments leafing

12 /13 Aluminium Pigments non leafing

12 /13 Vacuum Metallized Pigments

14 /15 Goldbronze Pigments

World of
Meta

P I G M E N T S

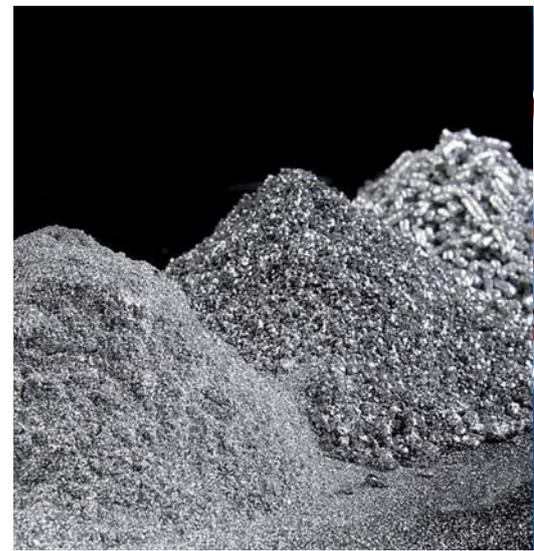


Pigments for Screen Printing Inks

- 16 /17** Aluminium Pigments leafing
- 16 /17** Aluminium Pigments non leafing
- 18 /19** Vacuum Metallized Pigments
- 18 /19** Goldbronze Pigments

ulics





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

Metallic Pigments for Printing Inks

Metallic pigments are utilized in all state-of-the-art printing processes in order to impart high quality gold or silver metallic effects.

These metallic effects enhance the appearance of printed articles and give the impression of "added value".

In addition to their application in established solvent systems these products are also extensively used in environmentally-friendly water-based or uv curable systems.

Using the major print processes: Offset (sheetfed, heatset), Flexo- (narrow web, wide web, tower coaters), Gravure and Screen Printing (rotary and flat bed), a wide range of materials can be printed such as paper, carton, cardboard, tissues, plastic films as well as metals, textiles, leather, etc.

The most important end applications for metallic pigments include labels, packaging (tobacco products, foodstuff, non-food articles, etc.), wrapping papers, wallpapers, magazines, as well as high-quality art prints and advertising prints.

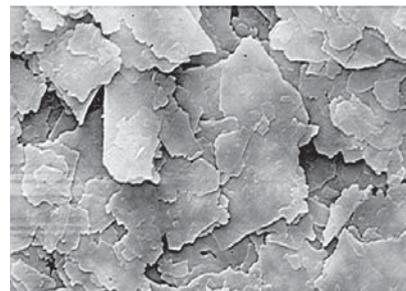


A P P L I C A T I O N S

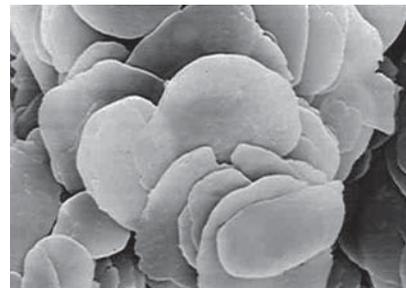
The classic metallic pigments are produced by ball milling, this process produces irregularly shaped, metallic flakes (referred to as "cornflakes"). More sophisticated ball milling produces round pigment particles having smooth surfaces ("Silverdollars"). Another process uses vapour deposited aluminium foils, whereby the extremely thin, highly-reflective metallized film is removed from the substrate and processed into pigment dispersions ("Vacuum Metallized Pigments" or "VMP's").

During the ball milling process organic lubricants are added in order to avoid the agglomeration of pigment particles. Leafing or non-leafing pigments are thus produced, depending on the lubricant chosen.

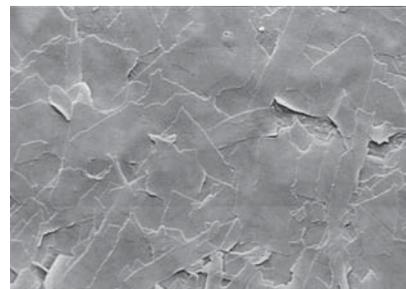
Cornflake

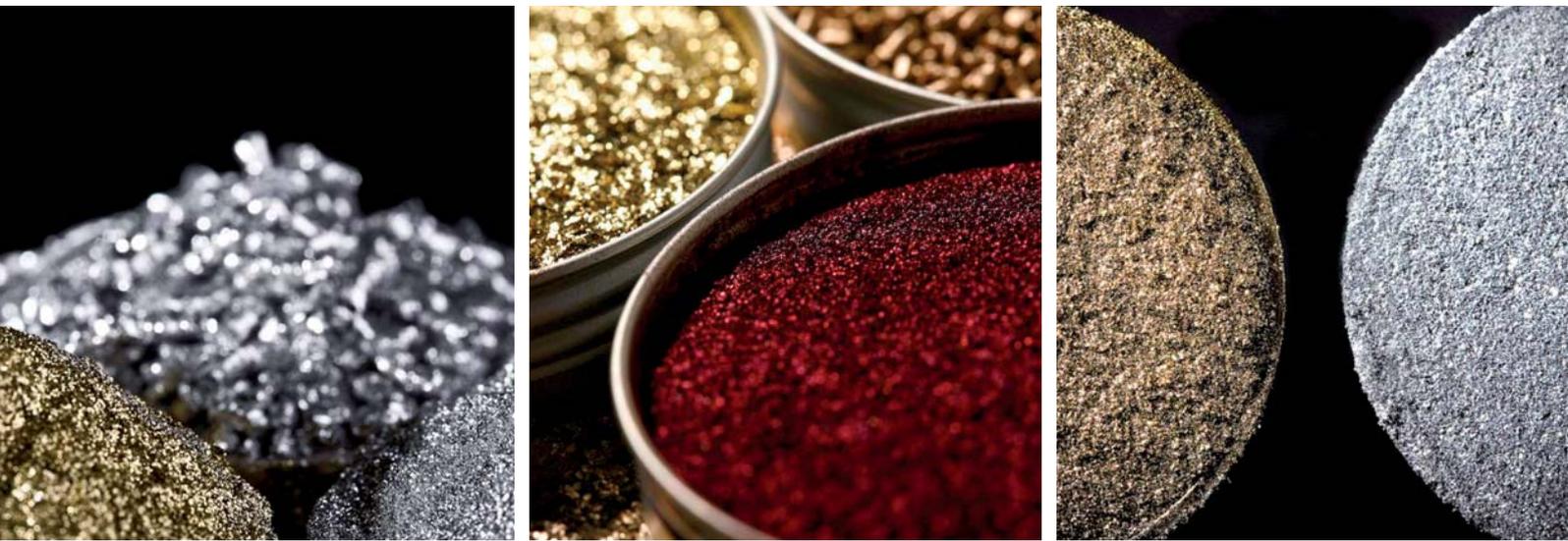


Silverdollar



VMP

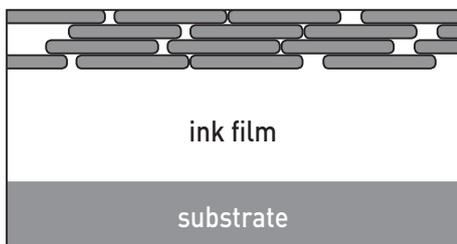




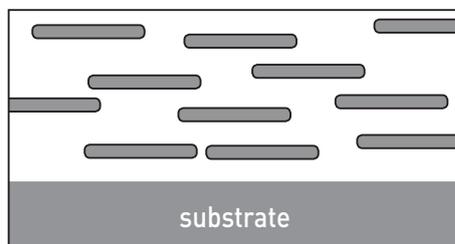
A L U M I N I U M & G O L D B R O N Z E P I G M E N T S

Leafing pigments orientate to the surface of the ink film and create a continuous metallic surface having high reflectivity and thus a highly brilliant effect. A disadvantage can be the lack of resistance to abrasion and the lack of tape adhesion. Due to their improved wetting properties, non-leafing pigments disperse evenly in the ink film, thus providing a more abrasion-resistant and strongly tape resistant coating which can be overprinted and laminated. Non-leafing pigments (especially aluminium pigments) can also be used for producing coloured metallic effects through the addition of transparent coloured pigments.

The metallic effect is achieved through specular reflection of light from the pigment surface. Light scattering occurs at the flake edges and on a rough surface. The rule is: the larger the pigment and the smoother the surface – the more metallic and brilliant the effect will be. Finer pigments – give a darker effect but have the advantage of superior opacity and higher gloss. For many modern applications, the finer pigments are to achieve the optimum performance in application.



LEAFING-PIGMENT



NON LEAFING-PIGMENT

Aluminium pigments are achromatic (has no individual colour), goldbronze pigments are available in typical standard colours according to the alloy compositions utilized:

Richgold	(Cu/Zn approx. 70/30)
Richpalegold	(Cu/Zn approx. 80/20)
Palegold	(Cu/Zn approx. 90/10)
Copper	(100% Copper)

These “natural shades” can be intensified (deepened) through controlled oxidation and are available in coarse pigment compositions, for example: Ducat-gold, Englishgreen, Lemon, Firered, etc.

The Pantone® colour range, frequently used in printing, is produced by adding red, orange or yellow toners during the ink manufacturing processes.

The precise pigment properties for each application are largely dictated by the printing process and this also determines the final visual effect.

The use of dust free pastes and/or pellets is usual for aluminium pigments (due to the safety risks of handling aluminium powders). The selection of solvent to be used in the pigment paste is determined by the printing process or the ink formulation and can generally be freely chosen. A widely compatible resin is used in the popular pellets (GRANDAL and GRANDOR) for gravure and flexo-printing.

For water based ink systems, we recommend the use of our special, stabilized VOC free pastes (AQUADOR, AQUASILBER, AQUAMET) or water dispersible solvent free pellets (GRANDOR W or GRANDAL W).

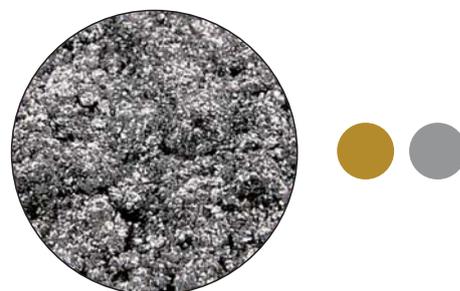
Specially formulated powder, paste and granule forms are also available for uv curable systems, which can be individually tailored for specific application areas.

Metal pigments in aluminium and goldbronze are available in various delivery forms:

Powder



Pastes



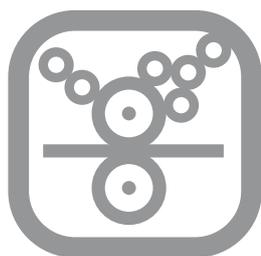
Pellets



VMP Suspensions



Pigments for Lithographic Inks



The offset process is the most widely used printing process in the graphic arts industry and is used to achieve brilliant metallic effects in brochures, labels, packaging, and advertising.

The offset printing process requires extremely fine metallic pigments, with an average particle size of 2-5µm. Larger pigment particles do not transfer properly, and are difficult to print. Larger particle size pigments give higher brilliance and clearer colour. Smaller particle size pigments give higher gloss and

→ Aluminium Pigments for Lithographic Inks

PRODUCTS		CHARACTERISTICS	
oilbased paste		D 50 value	Particle Shape
Offset FM/1380		10	Cornflake
Offset FM/4500		4	Cornflake
Offset FM/6500		4	Cornflake
Offset FM/9900		7,5	Silverdollar

oilbased paste typically with 65% metal content

→ Vacuum Metallized Pigments for Lithographic Inks

PRODUCTS		CHARACTERISTICS	
oilbased paste	uv curable uv paste	D 50 value	Particle Shape
Decomet 2791/30	Decomet UV 2794/30	10	VMP
	Decomet UV 2795/50	10	VMP

oilbased paste typically with 30% metal content

uv curable monomer paste with 30-50% metal content

→ Goldbronze Pigments for Lithographic Inks

PRODUCTS			CHARACTERISTICS
oilbased powder	oilbased paste	uv curable paste	D 50 value
Offset 6129	Offset FM/6129		2,5
Offset 6229	Offset FM/6229		2,7
Offset 6234	Offset FM/6234		2,3
Offset 6327	Offset FM/6327	Offset UV/6327	3
Offset 6340	Offset FM/6340		2

100% fine goldbronze powder

mineral oil paste typically with 88% metal content

uv curable monomer paste with 85% metal content

Available Colour Shades: Richgold; Richpalegold; Palegold. Special colour shades upon request

coverage and best high speed printability. For high speed printing presses, it is recommended to use pigments between 2-2,5µm for goldbronze and 4-5µm for aluminium.

It is also possible to use high brilliance VMP's in Offset printing, special leafing grades are used to give maximum metallic effect. These VMP pigments give the highest brilliance and metallic effect of any metallic pigments. For this process it is possible to use VMP pigments with a particle size between 10-11µm – this is due to the extremely thin shape of these special pigments.

The SCHLENK product range for offset applications offers powders, pastes and dispersions to meet all the requirements of the ink manufacturer.

The preferred delivery forms for the offset printing process are powders for goldbronze pigments and pastes in high boiling solvents for aluminium and goldbronze pigments. For the uv printing process stabilized pastes are available in special solvents and/or monomers.

Outstanding features

coarse economy grade bright leafing pigment

slightly larger particle size than FM6500 giving a „whiter“ appearance - the best choice for polychromatic blends

the finest offset aluminium available, outstanding coverage and superb gloss the best choice for high speed printing

non leafing Silverdollar pigment for inks with outstanding overprintable properties

Outstanding features

mirror effect pigment available in oilbased and uv compatible slurry

mirror effect pigment for uv systems supplied in photoinitiator based paste

Outstanding features

economical offset pigment with good all-round performance

excellent offset pigment with very good all-round performance

excellent offset pigment with very good optical performance

best brilliance, combined with outstanding intense and clear colour strength

the finest goldbronze offset available, outstanding coverage and superb gloss - the best choice for high speed printing

Pigments for Gravure & Flexographic Printing Inks

The flexo & gravure printing processes are used to achieve the highest quality metallic effects on printed items. The gravure printing process is primarily used for labels, carton boards, flexible packaging and wall coverings etc. Gravure printing is preferred for very high volume print runs and where achieving the most brilliant metallic effect is of high importance. The flexographic printing process is more suitable for shorter print runs than gravure and is used mainly for film and paper packaging, wrapping paper, tissues, cardboards and wallpaper etc.

For the technology of flexo & gravure printing, medium to fine metallic pigments are recommended. Typical particle size are 5-9µm for goldbronze

pigments, 6-18µm for cornflake aluminium pigments and 10-17µm for silverdollar aluminium pigments. Recent trends in narrow web flexographic printing call for extremely fine pigments suitable for high definition printing, for these applications goldbronze pigments with a particle size of 3-5µm and aluminium pigments with a particle size of 6-10µm are recommended.

The printing of VMP's by the gravure process gives the possibility of achieving true mirror effects (dependent on substrate). The low viscosity of gravure inks allows the VMP to achieve its highest potential. Reverse printing on polyester film will deliver a mirror finish and printing VMP's on paper

→ Aluminium Pigments leaving for Gravure & Flexographic Inks

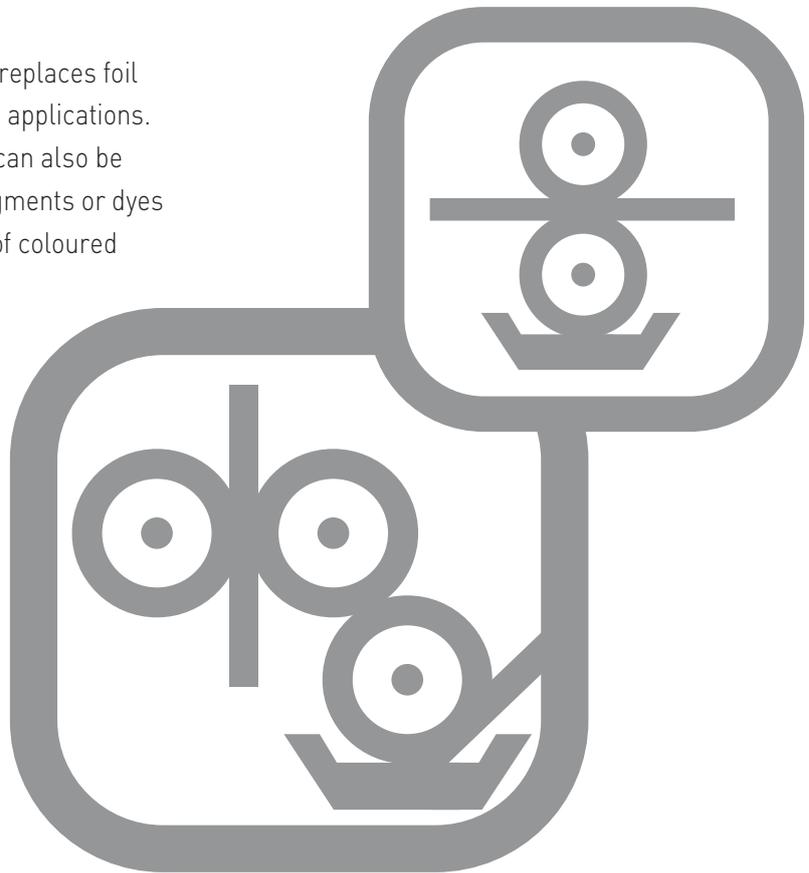
PRODUCTS

solvent based			water based		uv curable
powder	paste	pellet	paste	pellet	pellet/paste
PP/980	PM/990		Aquasilber LPW/980		
PP/1180	PM/1190	Grandal 1180	Aquasilber LPW/1180		
PP/1380	PM/1390	Grandal 1380	Aquasilber LPW/1380		
		Grandal 170		Grandal W/170	Grandal 170
Metaface 2140	PM/2140	Grandal 2140	Aquasilber LPW/2140		Metaface UV-TE/2140
	methoxypropanol paste with 65% metal content	pellet with 95% metal content and 5% resin	stabilized water based paste containing 65% metal content	water solutable pellet with 80% metal content	

All metallic pigments in powder form are available as pastes as well different solvents are possible on request.

and board by gravure now regularly replaces foil board and foil blocking in many print applications. Attractive coloured metallic effects can also be achieved by blending transparent pigments or dyes with VMP's to achieve a wide range of coloured metallic shades including excellent imitation gold effects.

SCHLENK offers a complete range of powders, pastes, dispersions and pellets for solvent based, water based and uv curable systems.



CHARACTERISTICS

D 50 value	Particle Shape	Outstanding features
17	Cornflake	large particle size for extra metallic brilliance
13	Cornflake	good coverage and printability from mid sized particle
10	Cornflake	fine pigment grade gives high coverage and printability
6	Cornflake	extra fine aluminium pellet for exceptional coverage and transfer but retaining excellent brilliance
13	Cornflake	refined pigment for high brilliance, coverage and print performance

→ Aluminium Pigments non leafing for Gravure & Flexographic Inks

PRODUCTS

	solvent based		water based	
	paste	pellet	paste	pellet
Alumet	ET/1700	Grandal 1700	Aquamet NPW/1700	
Alumet	ET/1800	Grandal 1800		
Metaface		Grandal 140		
Alucar	ET/2900	Grandal 2900	Aquamet NPW/2900	
Alushine	ET/6900	Grandal 6900		
Alushine	ET/7600	Grandal 7600		
Alushine	ET/7800	Grandal 7800		Grandal W/7800
Alustar	ET/8500	Grandal 8500	Aquamet NPW/8500	Grandal W/8500
Alustar	ET/8600			
	ethylacetate paste with 60% metal content also available as methoxypropyl-alcohol paste	pellet with 95% metal content and 5% resin	stabilized water based paste	stabilized water based pellet

different solvents upon request

→ Vacuum Metallized Pigments for Gravure & Flexographic Inks

PRODUCTS

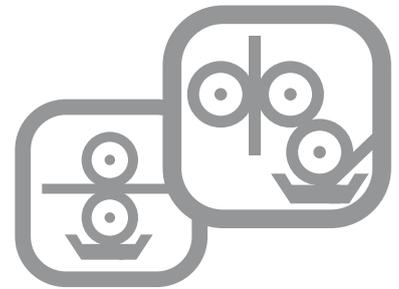
CHARACTERISTICS

solvent suspension	water based suspension	uv curable suspension	D 50 value	solvent
	Decomet 1050/10		12-15	water
Decomet 1002/10			12-15	isopropanol
Decomet 1004/10			12-15	ethyl acetate
Decomet 2004/10			12-15	ethyl acetate
Decomet 2008/10			12-15	methoxypropyl acetate
Decomet 2104/10			10-11	ethyl acetate
Decomet 2108/10			10-12	methoxypropyl acetate
		Decomet UV 2794/30	10	txib
		Decomet UV 2795/50	10	photoinitiator
Decomet 3004/10			11-14	ethyl acetate
Decomet 3008/10			11-14	methoxypropyl acetate
Decomet 3104/10			10-11	ethyl acetate
Decomet 3108/10			10-11	methoxypropyl acetate
Decomet 3109/10			10-11	n-propyl acetate
Decomet 4004/10			11-14	ethyl acetate
Decomet 4008/10			11-14	methoxypropyl acetate

different solvents and/or plasticizers upon request

CHARACTERISTICS

D 50 value	Particle Shape	Outstanding features
18	Cornflake	large particle size gives higher metallic effect
14	Cornflake	good coverage and printability from mid sized particle
13	Cornflake	high coverage and nice metallic effect for non leafing cornflake pigment
11	Cornflake	fine pigment grade gives higher coverage and improved printability
15	Silverdollar	mid sized Silverdollar pigment with high brilliance and full non leafing properties
13	Silverdollar	thick Silverdollar with very white appearance but low hiding power
8	Silverdollar	very fine Silverdollar provides the best combination of effect and printability
15	Silverdollar	very good tinting behavior, high in brilliance and coverage
12	Silverdollar	not suitable for tinting, highest coverage



Outstanding features

foil replacement pigment giving mirror-like results, whiter shade

Vacuum Metallized Pigment with extra white appearance

Vacuum Metallized Pigment with extra white appearance

standard grade foil replacement pigment for mirror-like results

standard grade foil replacement pigment for mirror-like results

standard grade foil replacement pigment for mirror-like results, classified for improved print performance

standard grade foil replacement pigment for mirror-like results, classified for improved print performance

mirror effect pigment available in uv compatible slurry

mirror effect pigment for uv systems supplied in photoinitiator based paste

increased coverage, deeper metallic look foil replacement pigment for mirror-like results

increased coverage, deeper metallic look foil replacement pigment for mirror-like results

increased coverage, deeper metallic look foil replacement pigment for mirror-like results classified for improved print performance

increased coverage, deeper metallic look foil replacement pigment for mirror-like results classified for improved print performance

increased coverage, deeper metallic look foil replacement pigment for mirror-like results classified for improved print performance

extra high coverage, dark „Chrome“ effect Vacuum Metallized Pigment

extra high coverage, dark „Chrome“ effect Vacuum Metallized Pigment

→ Goldbronze Pigments for Gravure & Flexographic Inks

PRODUCTS

powder	solvent based		water based		uv curable
powder	paste	pellet	paste	pellet	paste
Multiprint 4117	ET/4117		Aquador 4117		
Multiprint 4120	ET/4120		Aquador 4120		
Multiprint 4160	ET/4160		Aquador 4160		UV/4160
Multiprint 4220	ET/4220	Grandor 4220	Aquador 4220	Grandor W/4220	UV/4220
Multiprint 4270		Grandor 4270			
Multiprint 4310			Aquador 4310		
Multiprint 4320	ET/4320	Grandor 4320	Aquador 4320	Grandor W/4320	
Multiprint 4330	ET/4330	Grandor 4330	Aquador 4330	Grandor W/4330	
Multiprint 4350	ET/4350	Grandor 4350	Aquador 4350	Grandor W/4350	
Multiprint 4360		Grandor 4360	Aquador 4360		UV/4360
		Grandor 426 nl		Grandor W/426 nl	
	ethylacetate paste with 88% metal content; different solvents like isopropanol upon request	pellet with 95% metal content and 5 % resin	stabilized water based paste containing 70% metal content	stabilized water based pellet	uv curable paste

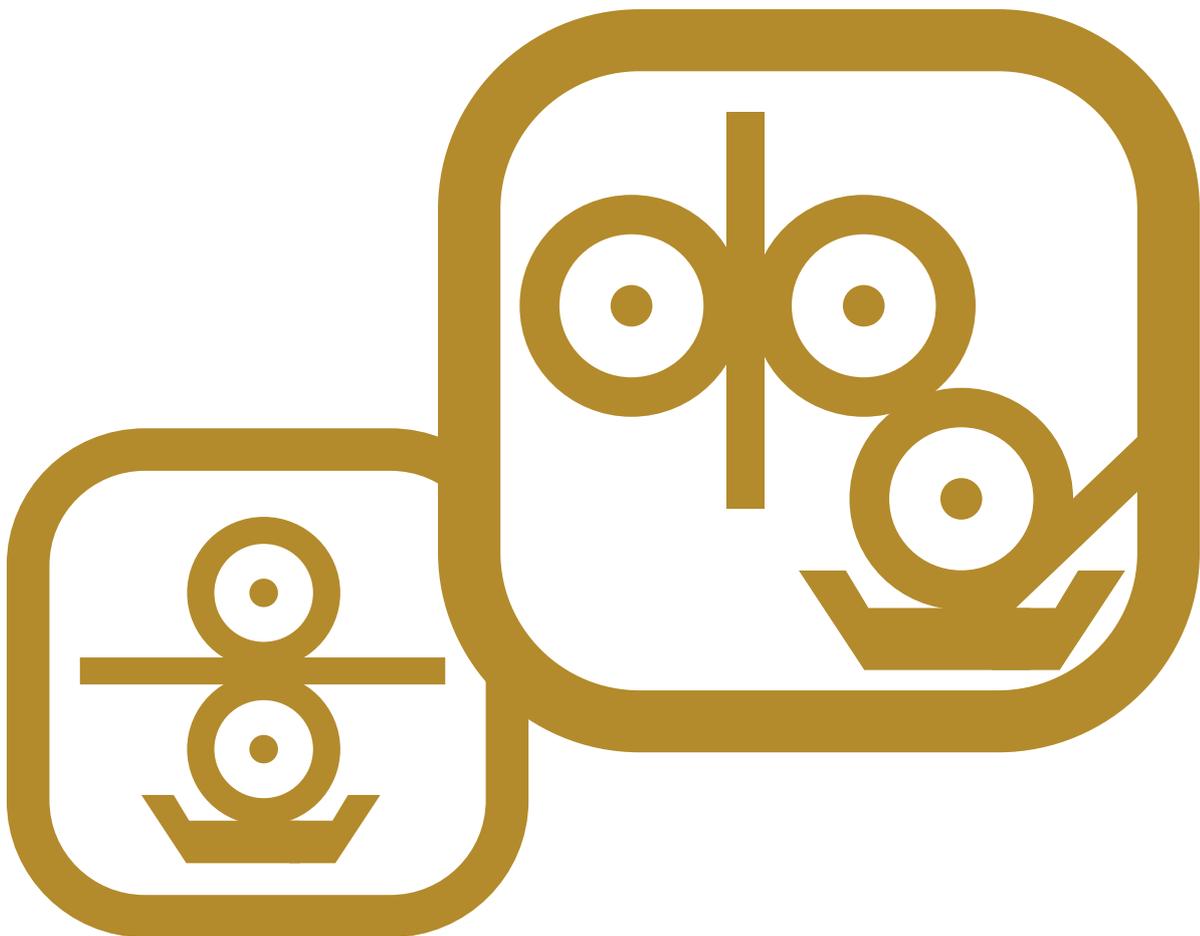
Available Colour Shades: Richgold; Richpalegold; Palegold

4220 also available in special colour shades: Englishgreen, Deepgold, Firered, Maron

4120 also available in copper

CHARACTERISTICS

D 50 value	Outstanding features
9,5	brilliant economy grade for gravure and flexographic printing
8	good all-round performance economy grade for gravure and flexographic printing
5	high coverage, improved transfer economy grade for gravure and flexographic printing
9	improved colour strength, coverage and high brilliance for gravure and flexo printing - also available in outstanding oxidized colour shades!
4	superfine liquid ink grade bronze powder, very high coverage with good metallic effect
10	this pigment offers very clean, bright metallic appearance
9	premium Multiprint grade for outstanding brilliance: sophisticated production controls create superior appearance effects, product consistency and optimized printability
8	premium Multiprint grade for outstanding brilliance: sophisticated production controls create superior appearance effects, product consistency and optimized printability
6	premium Multiprint grade for outstanding coverage/brilliance combination: sophisticated production controls create superior appearance effects, product consistency and optimized printability
5	high coverage and colour strength with superior metallic brilliance
9	non leafing bronze pigment for solvent gravure and flexographic printing, giving lamination properties and high rub resistance





Pigments for Screen Printing Inks

→ Aluminium Pigments leafing for Screen Printing Inks

PRODUCTS			CHARACTERISTICS	
solvent based powder	water based paste	uv curable paste	D 50 value	Particle Shape
PP/780	Aquasilber LPW/780		20	Cornflake
PP/980	Aquasilber LPW/980		17	Cornflake
PP/1180	Aquasilber LPW/1180		13	Cornflake
PP/1380	Aquasilber LPW/1380		10	Cornflake
Metaface 2140	Aquasilber LPW/2140	Metaface UV-TE 2140	13	Cornflake
pure leafing metal pigments	stabilized water based pigment paste with 65% metal content	uv curable paste with 65% metal content		

All metallic pigments in powder form are available as pastes as well different solvents and/or plasticizers upon request

→ Aluminium Pigments non leafing for Screen Printing Inks

PRODUCTS			CHARACTERISTICS	
solvent based paste	water based pellet	water based paste	D 50 value	Particle Shape
Alumet 1500	Grandal 1500		22	Cornflake
Alumet 1700	Grandal 1700	Aquamet NPW/1700	18	Cornflake
Alucar 2600	Grandal 2600	Aquamet NPW/2600	24	Cornflake
Alucar 2900	Grandal 2900	Aquamet NPW/2900	11	Cornflake
Alubright 3250			47	Silverdollar
Alushine 6900	Grandal 6900	Aquamet NPW/6900	15	Silverdollar
Alushine 7600	Grandal 7600		14	Silverdollar
Alushine 7800	Grandal 7800	Aquamet NPW/7800	8	Silverdollar
Alustar 8500	Grandal 8500	Aquamet NPW/8500	15	Silverdollar
paste in white spirit + aromatics 60-70% metal content	pellet with 95% metal content and 5 % resin	stabilized water based paste with 60-65% metal content		

All metallic pigments in powder form are available as pastes as well different solvents and/or plasticizers upon request

Screen printing is one of the oldest known printing processes. One of the main benefits of screen printing is the ability to print on a wide range of substrates, which cannot be printed by other printing methods.

Therefore screen printed metallic products will be met everywhere and include self adhesive films, cardboard packaging, textiles, papers, plastics, leather goods and metals.

Of all the printing processes, screen printing offers the greatest versatility with metallic pigments and average particle size up to 55µm can be used. The use of relatively coarse metallic pigments enables by far the most brilliant metallic and sparkle effect, however equally pleasing, and more subtle effects can be achieved with finer pigments.

SCHLENK offers a great variety of powders, pastes and pellets for the screen printing process.

Outstanding features

coarse leafing aluminium pigment

coarse leafing aluminium pigment, also suitable for gravure and flexo printing

leafing aluminium pigment, also suitable for gravure and flexo printing

fine leafing aluminium pigment, also suitable for gravure and flexo printing

high brilliant leafing aluminium pigment, also suitable for gravure and flexo printing, cromelike effects

Outstanding features

flake pigment with good metallic appearance

finer flake with good over all performance

light & bright pigment, good tinting properties

fine pigment with a high gloss and metallic appearance

extra coarse pigment for special effects (high sparkle)

medium fine Silverdollar pigment for all high value applications

thick Silverdollar with very white appearance but low hiding power

very fine Silverdollar provides the best combination of effect and printability

exceptional tinting behavior (imitation gold), superior in brilliance

→ Vacuum Metallized Pigments for Screen Printing Inks

PRODUCTS			CHARACTERISTICS	
solvent suspension	water based suspension	uv curable suspension	D 50 value	solvent
	Decomet 1050/10		12-15	water
	Decomet 1055/10		12-15	propylen glykol
Decomet 1008/10			12-15	methoxypropyl acetate
Decomet 2008/10			12-15	methoxypropyl acetate
Decomet 2010/10			12-15	methoxypropanol
		Decomet UV 2794/30	10	txib
		Decomet UV 2795/50	10	photoinitiator
Decomet 3010/10			11-14	methoxypropanol
Decomet 4010/10			11-14	methoxypropanol
Decomet 4033/10			11-14	butyl glycol
Decomet 4077/10			11-14	3-methoxy-3-methyl-butylglycol (MMB)
Decomet 5010/10			11-14	methoxypropanol
Decomet 5033/10			11-14	butyl glycol

different solvents and/or plasticizers upon request

recommended rate of pigmentation for gravure and flexo printing inks: approx. 20-40%

→ Goldbronze Pigments for Screen Printing Inks

PRODUCTS

solvent based powder		coated powder	water based paste	uv curable paste	
Luminor 2210		Constant 2210/N	Aquador 2210		
Luminor 2250		Constant 2250/N	Aquador 2250		
Luminor 2550			Aquador 2550		
Luminor 2580			Aquador 2580		
	Unicoat 3050		Aquador 3050		
		Multiprint 4160	Aquador 4160	UV/4160	
		Multiprint 4220	Aquador 4220	UV/4220	
		Multiprint 4310	Aquador 4310		
standard coarse pigment range	standard pigment range	standard fine pigment range	coated pigments for stability in aggressive binder systems	stabilized water paste with 70% metal content	uv curable paste

All metallic pigments in powder form are available as pastes as well. Different solvents and/or plasticizers upon request
 Available Colour Shades: Richgold; Richpalegold; Palegold; Copper 2210, 2250, 2580 and 4220 also available in oxidized colour shades (Englishgreen, Deepgold, Firered etc.)

Outstanding features

foil replacement pigment giving mirror-like results, whiter shade

foil replacement pigment giving mirror-like results, whiter shade

Vaccum Metallized Pigment with extra white appearance

standard grade foil replacement pigment for mirror-like results

standard grade foil replacement pigment for mirror-like results

mirror effect pigment available in uv compatible slurry

mirror effect pigment for uv systems supplied in photoinitiator based paste

increased coverage, deeper metallic look foil replacement pigment for mirror-like results

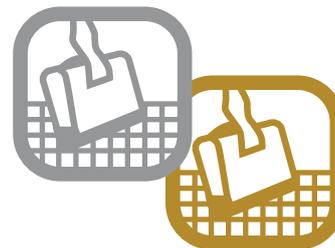
high coverage foil replacement pigment, strong, dark metallic appearance for chrome effect

high coverage foil replacement pigment, strong, dark metallic appearance for chrome effect

high coverage foil replacement pigment, strong, dark metallic appearance for chrome effect

outstanding coverage darkest „Chrome“-effect available for Vaccum Metallized Pigments

outstanding coverage darkest „Chrome“-effect available for Vaccum Metallized Pigments



CHARACTERISTICS

D 50 value	Outstanding features
50	economy grade for very coarse screen printings; very good brilliance and metal effect
35	economy grade for coarse screen printings; good brilliance and metal effect; also available in oxidized colour shades
35	premium grade for coarse screen printings; outstanding brilliance and metal effect
20	premium grade for medium screen printings; outstanding brilliance, colour strength and metal effect; also available in outstanding oxidized colour shades!
11,5	high brilliance standard grade for fine screen printings; better brilliance and colour strength than the finer 4117
5	high coverage, improved transfer
9	high brilliance for very fine screen printings. Increased classification gives improved color strength and print performance. Also available in outstanding oxidized colour shades!
10	this pigment offers very clean, bright metallic appearance

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ITALY:

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