



ICO Powder Coating Materials

Thermoplastic coating powders from Icopolymers

Coatings protecting metals against corrosion

Jean-François Blaise



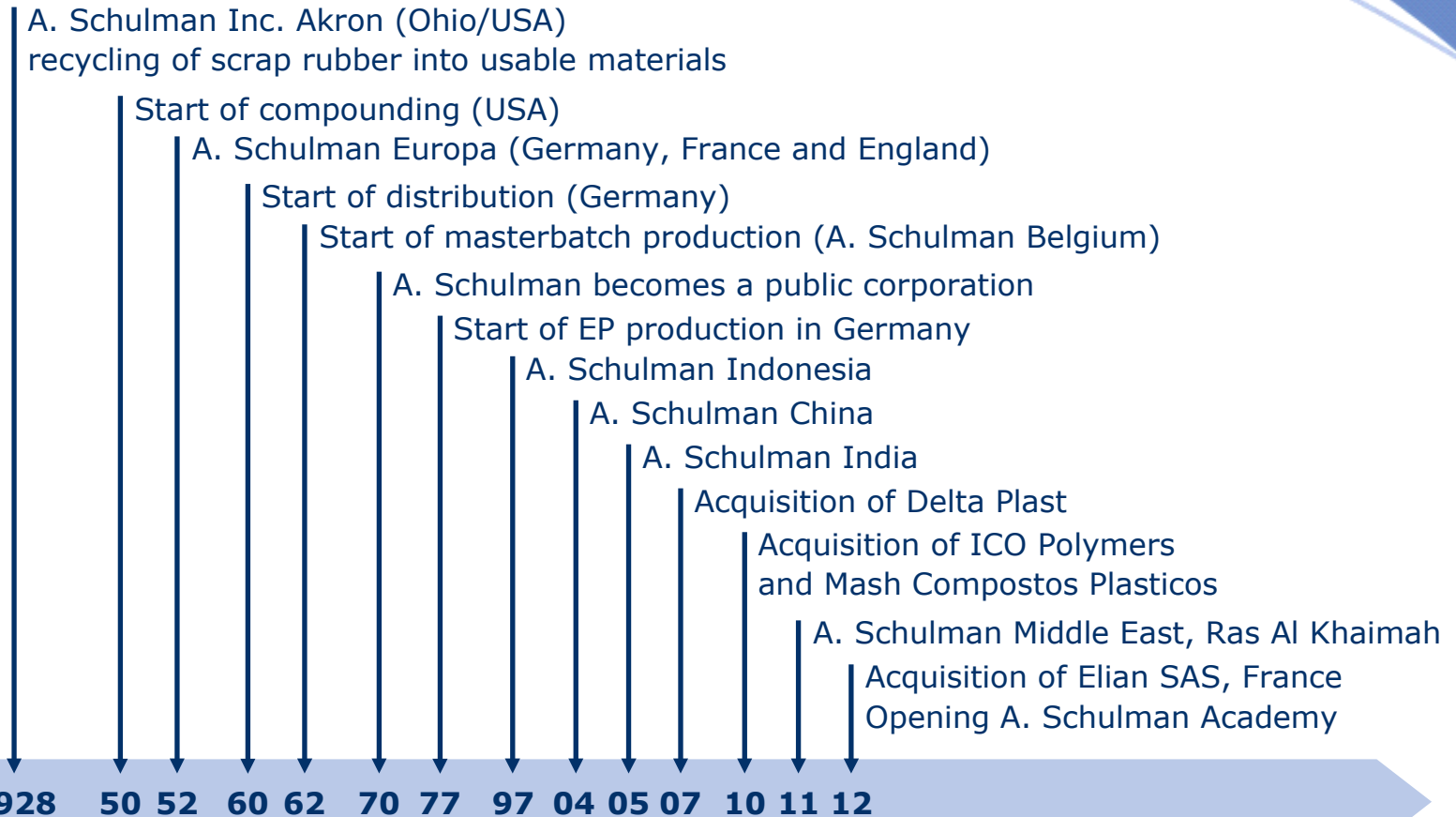
ICO & A. Schulman – The Company

ICO Powders for Metal Coating

Our mission statement

History

Alex Schulman
Alex Schulman
is born in Minsk
(Russia)



A. Schulman today

- One of the largest global compounders in the world
- Five Business Units
 - Engineering Plastics
 - Masterbatch MBS – White, black and additives
 - Masterbatch CPC – Colours
 - Distribution Services
 - Specialty Powders – **ICO Polymers**
- **Global turnover above 2 billions dollars**
- A Schulman is on stock exchange**

Global presence ICO & A. Schulman

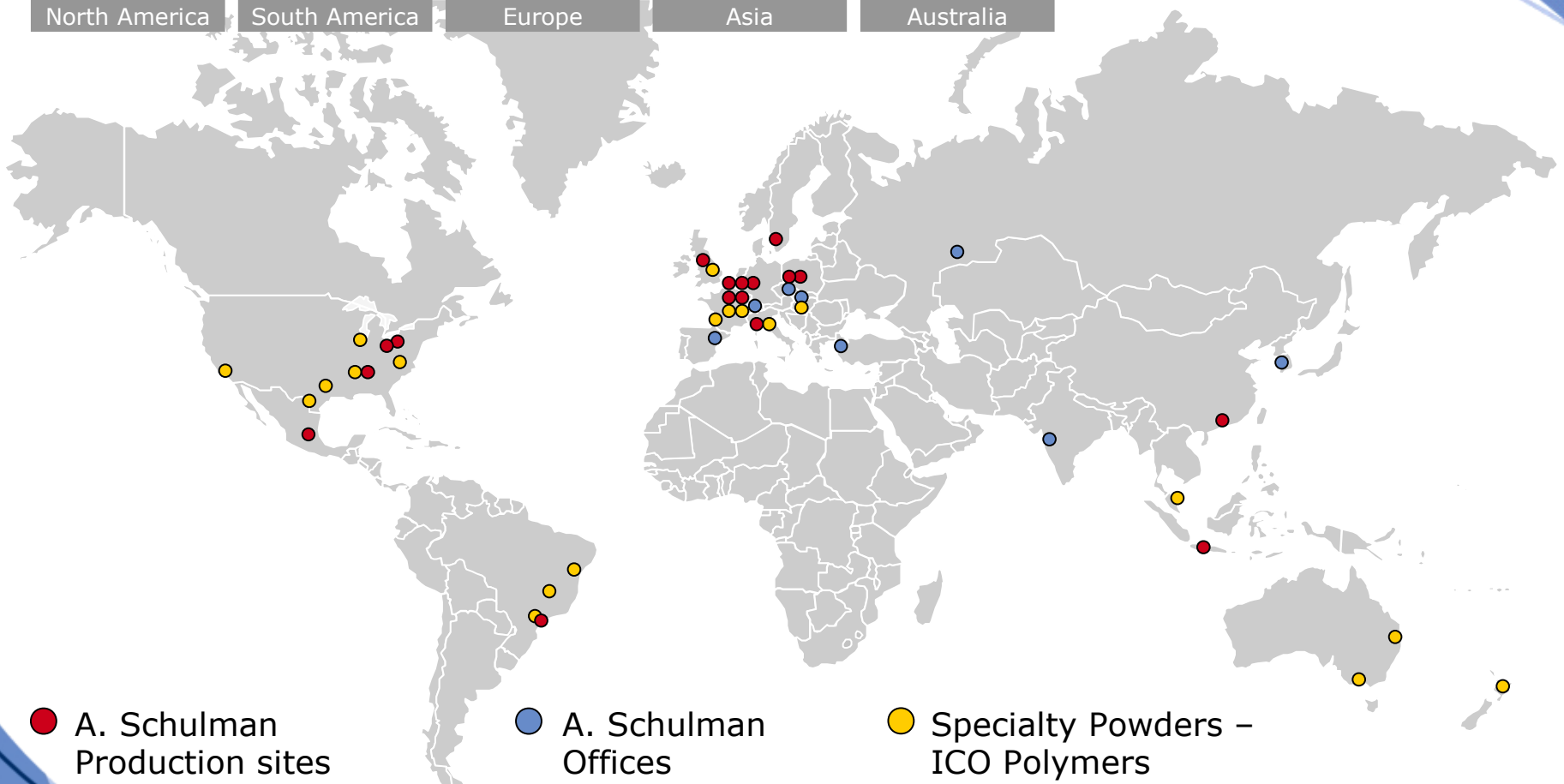
North America

South America

Europe

Asia

Australia



● A. Schulman
Production sites

● A. Schulman
Offices

● Specialty Powders –
ICO Polymers

ICO Europe – some significant figures

- 5 production sites, in France (2), UK, Italy, Netherlands
- Sales > 120 000 000 €
- Processed volumes > 100 000MT per year
- Compounding and size reduction, Icorene[®] powder sales
- Markets : Automotive, infrastructures, pharmacy, textile, carpet backing, general industry, chemistry, leisure and gardening
- Tolling : size reduction, compounding, powder fine tuning
- European leader in rotomoulding and rotolining powders

Icorene[®] Powders

Thermoplastic powders : Rotomoulding, metal coating, master batches, other specialty powder business



ICO Thermoplastic Coatings

Brief history

Manufacturing of coating powder under Icorene[®] tradename in our Italian facility

- White coating powders, typically for white goods, household articles (refrigerator grills, freezer baskets, vegetable racks, cloth dryers, bath room soap racks etc ...)
- Colours for various coatings on wire work
- Internal lining of tubes, pipes, tanks, reservoirs etc ...
- Products manufactured in Gorla Maggiore (Milano) within A Schulman / Ico Polymers premises



Technical thermoplastic coatings from ICO

Development of new grades backed up by other BU of A Schulman

Target : To create high technical coating powders based on new polymers chemistries

Supported by our chemist and plastic experts based in :

Akron (USA), Kerpen (D), Bornem (B), Oyonnax (F)

Extension of product range

Extension of color range

Major investments made by the Group :

Compounding, cryogenic grinding,

Sieving, control,

Human resources



Coating powders on metal

Current range :

- **Wirework**

- | | | |
|-------------------------|------------------|---------------------------------------|
| • Icorene® N7130 | Fluid bed | Low powder pick up, low energy |
| • Irene® N7020 | Fluid bed | Standard PE coating powder |

- **Corrosion protection**

- | | | |
|------------------------|----------------------|--|
| • Cotene® M1108 | Fluid bed | Street furniture, fan guards, foundry ... |
| • Cotene® M1208 | Electrostatic | Fencing, pipes, constructions |
| • Icorene® 1869 | Rotolining | Tanks, pipes ... |

Why shall one use a thermoplastic coating ?

Barrier properties

- Vapours
- Liquids
- Chemicals

- No COV's, plasticizers, halogens, phtalates, hardeners, iso-cyanates
- No TGIC (where still used)
- No BPA (bisphenol A)

Target is to apply a seal proof highly adherent coating in order to protect any metal subject to corrosion and exposed to harsh environments : sea side, tropical areas, deserts (sand winds), arctics (cold, salt sprays, aggressive soils), chemical industry, offshore structures etc ...

Corrosion effects on sea side

Thermoset powder paints



Corrosion in urban area



Wet paint



Thermoplastic coating

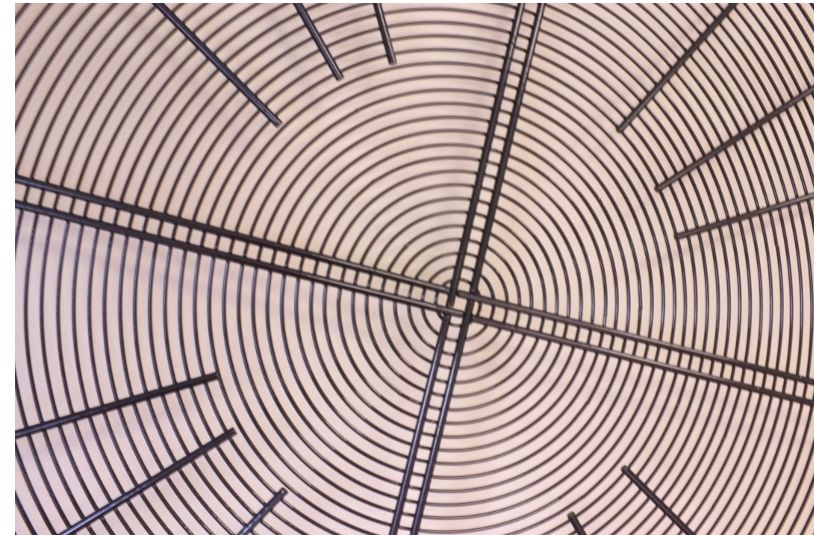


Introduction to Cotene M1108 et M1208 powders

- Formulated and manufactured by A. Schulman Specialty powders BU
 - Leaders in plastic industry with global manufacturing and sales facilities
 - Backed up by lab research equipped with latest technologies in Europe and in US
 - Knowledge of polymers formulation
 - Master batches
 - Additives
 - Pigments
 - Unique techniques of compounding and grinding technologies
 - Ambient and cryogenic
 - French manufacturing, Montereau Fault Yonne, Seine et Marne



Cotene coatings on metallic parts



Faraday cage effect

Excellent penetration into corners and cavities



Range of colours

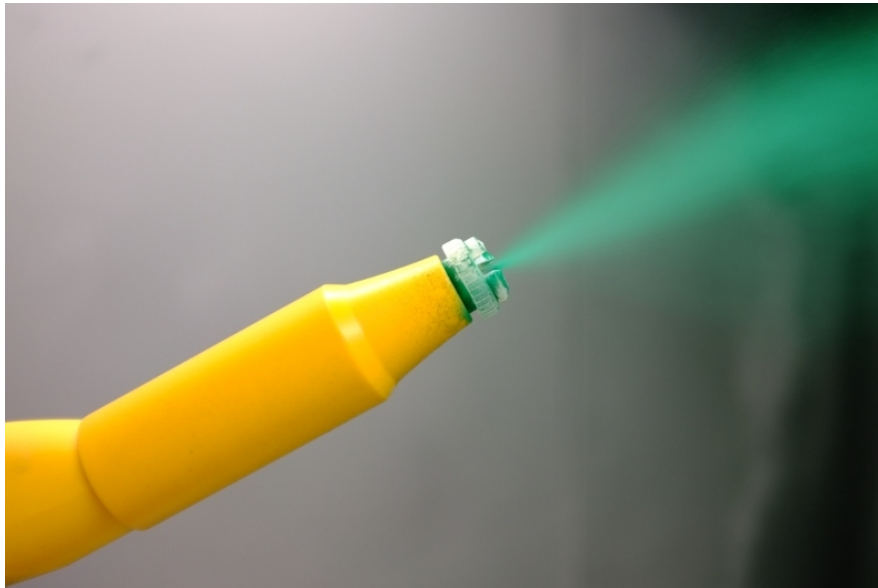
- Standard range : 15 to 20 colours
- On medium term => small batches on demand of special colours
- Available today (RAL)

- Black 9005
- Grey 7016
- Grey 7035
- Green 6005
- White 9016
- Blue 5005 : superior hardness and improved abrasion resistance, potable water applications
- Packaging
 - Easier lifting and handling
- 15 kgs boxes
- 600 Kgs pallets

**Looking for new concepts in
anti corrosion thermoplastic
coatings**

What our customers like in our powders

- Fluidity and exceptional powder transport properties
- Excellent powder transfer properties on coated part
- Excellent wrap around
- Excellent charge pick up
- Excellent recycling properties on automatic equipments



Cotene M1108 and M1208 : features and benefits

- Formulated for long term corrosion protection
- Excellent adhesion onto metal
- Excellent UV resistance
- Fluid bed grade
 - Reduced powder pick up => economical gain
 - Excellent fluidization properties
- Electrostatic
 - Very good surface finish
- Graffiti proof
- Can be easily repaired
- Flock spraying
 - Very nice finish, smooth and glossy



Attractive pricing



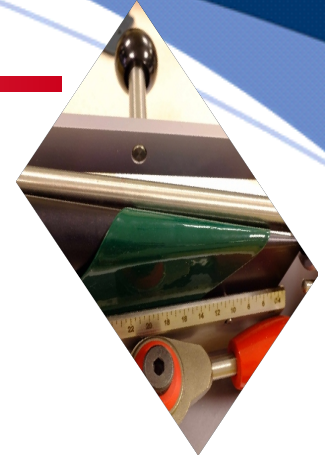
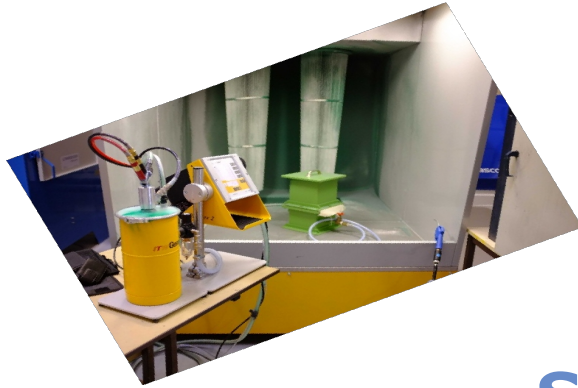
Graffiti proof coating

Does not need graffiti proof varnish to be applied on top of coating

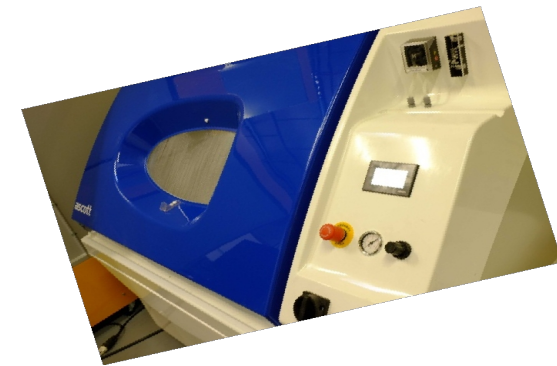
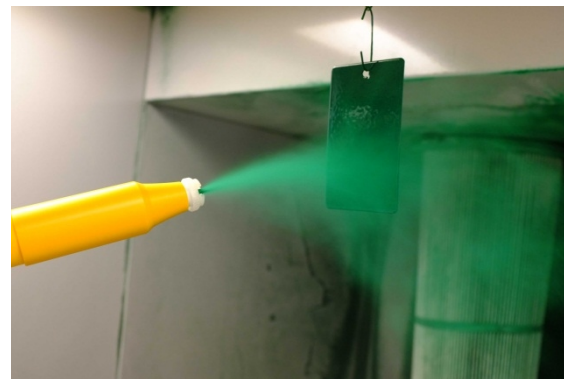
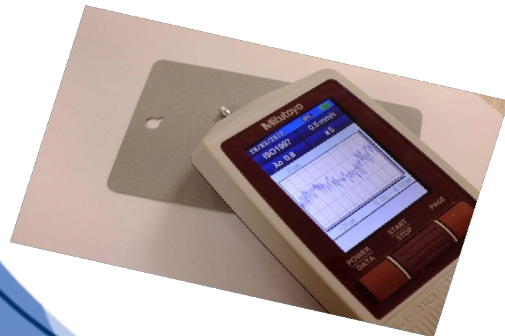
Use standard solvents to remove « artists » paints



European Technical Center Lab(Montereau 77)



State of the art equipment



Some comparative datas

	Cotene M1108/1208	Coating A	Coating B
Adhesion	6 to 8 MPas	4 to 6 Mpas	4 to 6 MPas
Taber abrasion	8 to 9 mg loss	12 to 15 mg loss	15 to 23 mg loss
Shore D hardness	52	44	55
Salt spray 1000h / underfilm corrosion	<2 mm	<5 mm	<4 mm
QUV 2000 h Delta e	1,5	4,5	Not measured
Indirect impact 23°C	>10J	>10J	>10J
Indirect Impact - 40°C	>10J	Not measured	Not measured
Conical mendral - 40°C	No cracking on 4 mm diameter	Not measured	Non measured
Aptitude for spraying (ES)	140	105	132

Some coating technical aspects

- **Coating durability, low permeation**
- **High abrasion resistance, elastomeric behaviour**
 - Will pass the toughest automotive stone chip resistance tests

elongation at break > 500%

very good edge and weld coverage

ideal coating for the harshest environments

- Excellent UV resistance
- High adhesion
- Corrosion resistance
- Limited to none underfilm corrosion

can be used from -70°C up to +60°C

Thermoset powder paint or thermoplastic coating ?

Most of the time thermoset powder paints will do the job

Good quality/price/performance

However some environments will require materials that will have a better fit with weathering constraints

- Sea side
- Chemistry
- Deserts/tropics
- Arctics
- Intense exposure to UV's
- Combination of 2 or more of these parameters will make it even worse

Will substitute a 2/3 layers thermoset/wet paint system by one thermoplastic coating layer

You always thought that thermoplastic coatings were expensive ?

2 layers epoxy-zinc/polyester vs Cotene M1208 ES

Ral 7016

	Thickness μ	Density	Price €/Kg	Cost€/s qm
Rich zinc primer	70	2,5	9,30	1,63
Polyester	80	1,7	5,5	0,75
			Total	2,38
Cotene M1208 ES	180	0,97	12,2	2,13

One pass, one cure, two times productivity !

Coating recommendations

- **Surface treatment is of prime importance**
- Surface treatment and coating properties will make up corrosion resistance of coating in case of damage

tandard coating equipments

lock spraying is possible

- Better thickness pick up
 - Welds
 - Edges
- Will improve smoothness and finish of final coating

lame spray

- Coating on large items or in the field applications
- Mainly oil and gas business – field joints
- Touch up
- Mostly functional

ICO Polymers, your preferred partner for the supply of thermoplastic coating powders

- At last an alternative supply in Europe !
- Knowledge of resins, additives, pigments, backed up by R/D network
- Global network
- Experience in compounding and size reduction
- Size reduction equipment project management
- Permanent informations exchanges between sites
- Experienced people joining the challenge, global commercial and technical network with local implants
- Severe/intense lab and field tests before product launch
- Development of new products concepts using unique Group Expertise
- Very strong finance
- Global priority of A. Schulman

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ICO Powders for Metal Coating

Our mission statement

Our Mission Statement

"We inspire customers through our innovative products and services and generate an added value which safeguards a successful future for them and ourselves."

**Thank you
For your attention.**



