Low-VOC solutions in automotive and protective coatings.

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SPEAKERS:-

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CONTENT

- VOC
- PROBLEM STUDY
- MARKET STUDY
- SOLUTION

a. Water Borne coating

b. Powder coating

- CONCLUSION
- REFERENCES

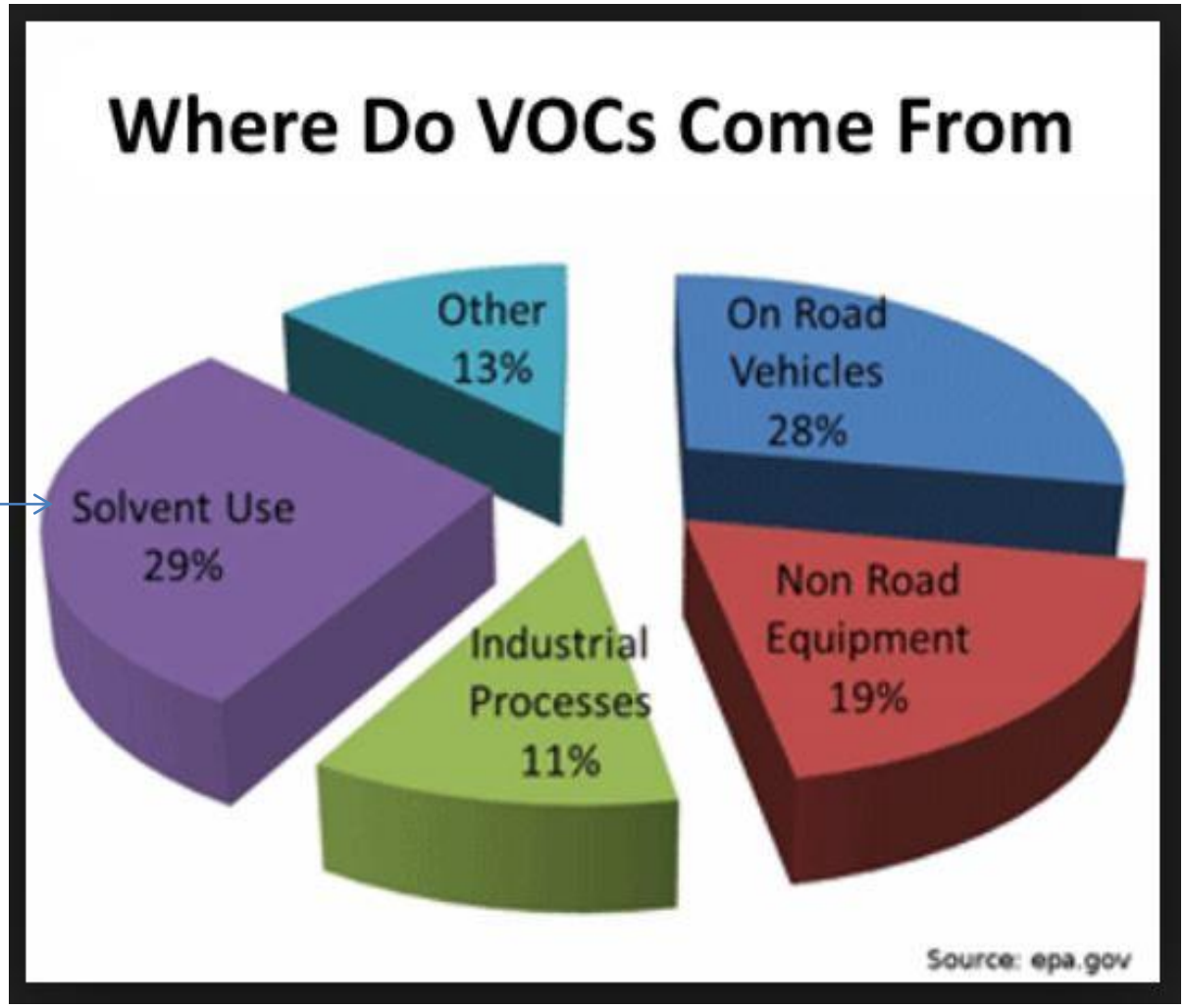
WHAT IS VOC?????

VOC- VOLATILE ORGANIC COMPOUND

Solvents in Paints e.g.

Aliphatic hydrocarbons, ethyl acetate, glycol ethers, and acetone, MTO, Xylene, Toluene, Formaldehyde

SOURCES OF VOC



Our solutions

AN INCIDENT…

Particulate matter which contributes to smog < 5µg/m3

Solvents used in Paint contributes to high smog levels

MARKET STUDY (1/2)

- "***Environmental regulations*** for sustainable raw materials with less environmental impact are driving rapid change and innovation in all segments of the coatings market,". "The trend continues to move forward in Europe and the U.S. but is quickly growing in Asia driven by China's regulations for ***improved air quality*** and ***reduced VOC emissions***".
- ***Powder coatings*** contain no solvents and, as such, emit ***zero volatile organic compounds*** (VOCs). 100% Re-use of any over-spray powder.
- Powder coating enables ***greater design freedom,*** since it can be applied even on unusual shapes, edges, hollows and contours, allowing ***imaginative new substrate designs*** and semi-assemblies that could not easily be finished with liquid coatings.

MARKET STUDY (2/2)

- The global powder coatings market can be divided into four segmentations by substrate*: metal, wood, glass and plastics.*
- Growing support for the use of powder coatings in comparison to conventional liquid paints by regulatory agencies such as *EPA* and *REACH* on account of negligible VOC emissions is expected to be a key driver for market growth.
- The global *powder coatings market* is expected to reach $12.48 billion by 2020.
- The *global automotive paint market* is expected to be valued at over $29 billion by 2024, growing at an estimated CAGR of 6.2% from 2017 to 2024.

WATER BORNE COATING

- **Resin system**

  . Hybrid water based resin.

- **SOLVENT**

  . Water as a solvent.

- **Some drawback**

  . Not durable as powder coating.

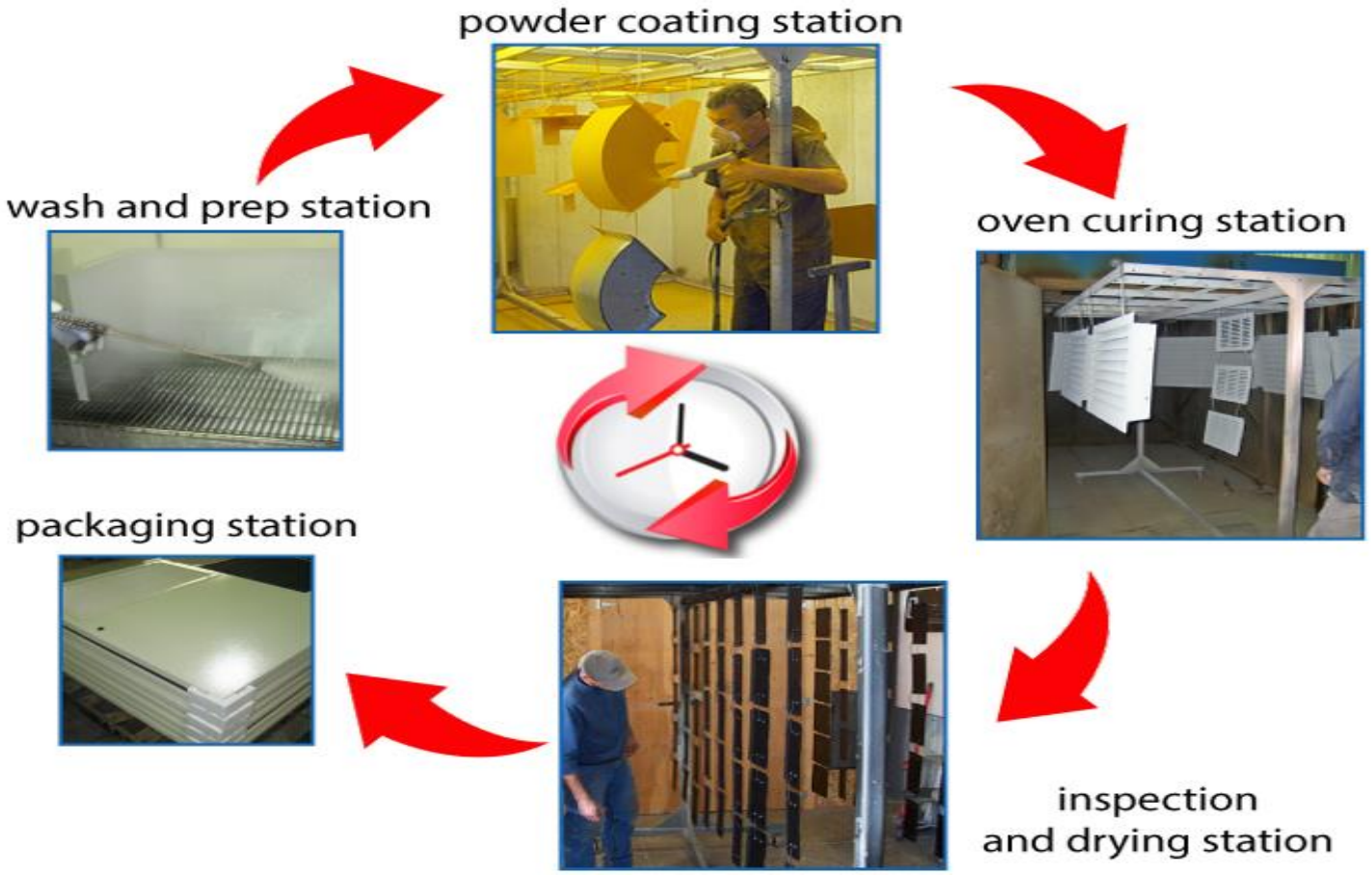
  . Multiple coat to get the desired finish.

POWDER COATING (1/18)

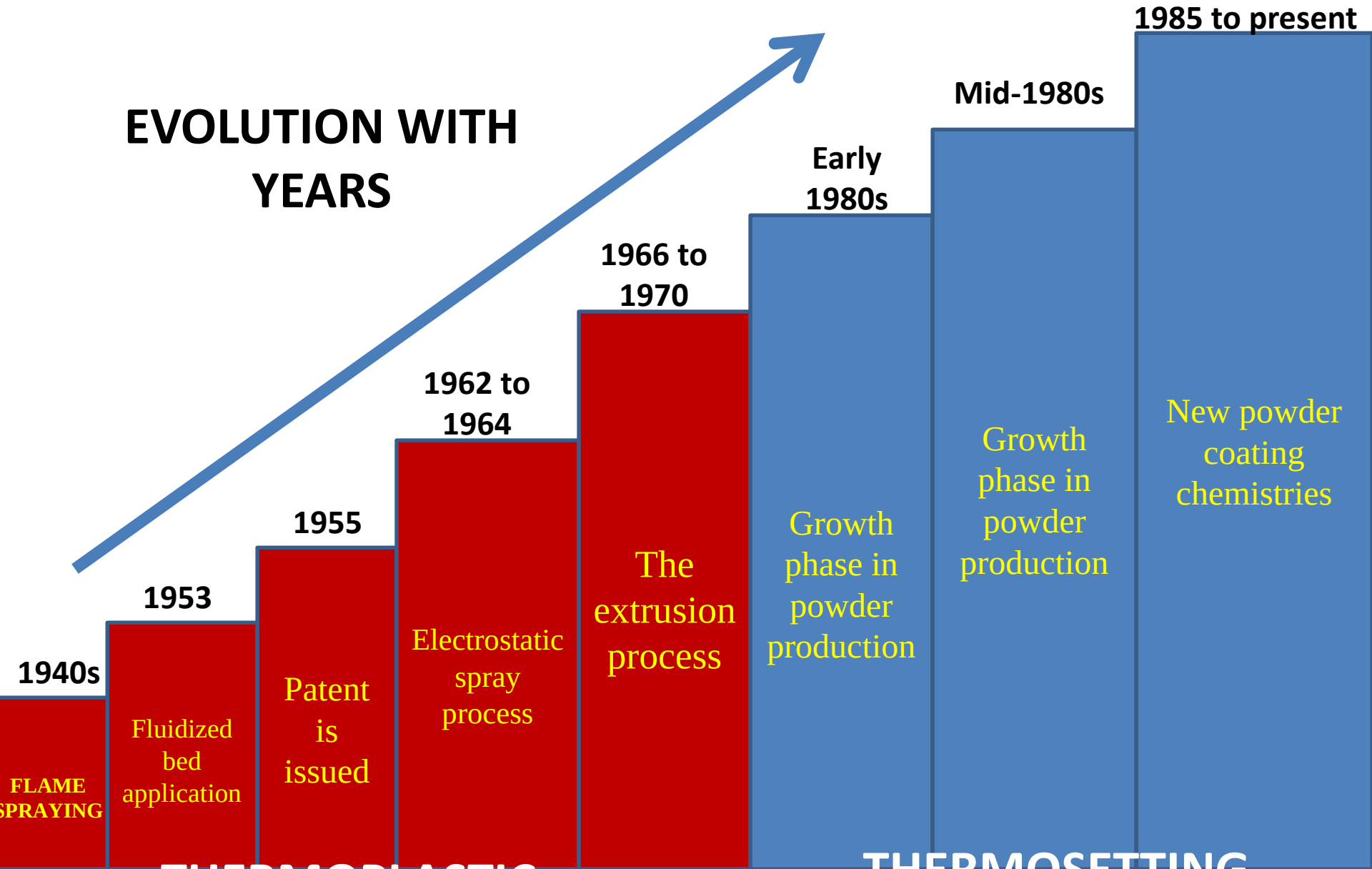
Powder coating is increasing in popularity in comparison with wet painting, especially in industrial applications due to its durability [3]

POWDER COATING (2/18)

PROCESS FLOW



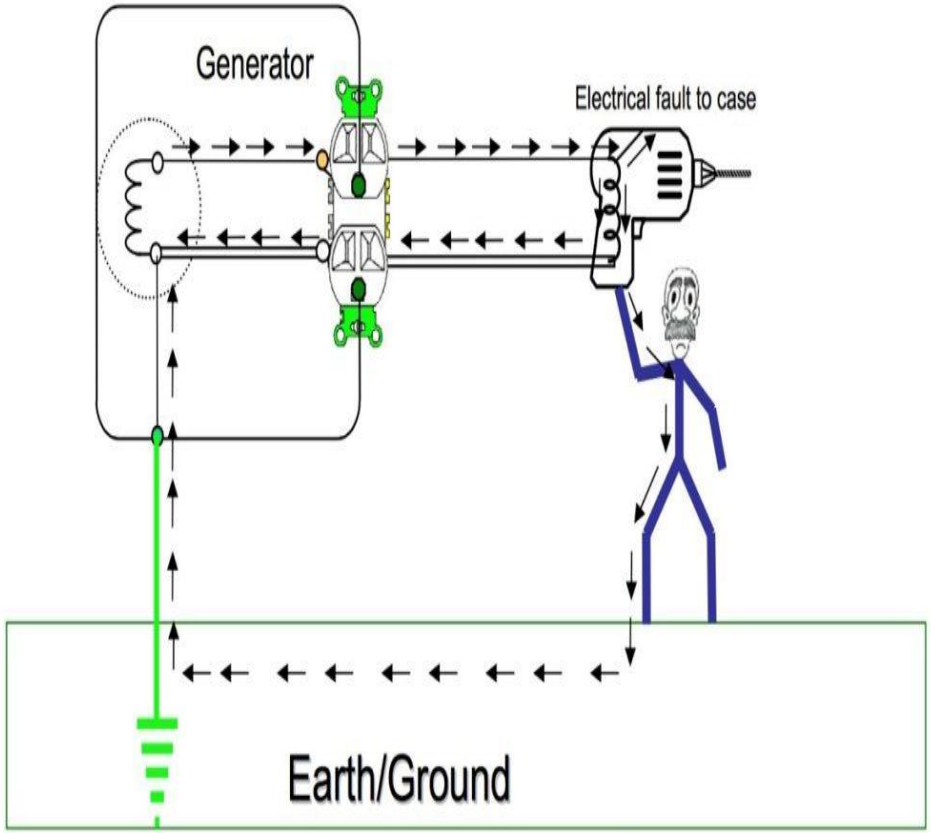
POWDER COATING (3/18)



POWDER COATING (4/18)

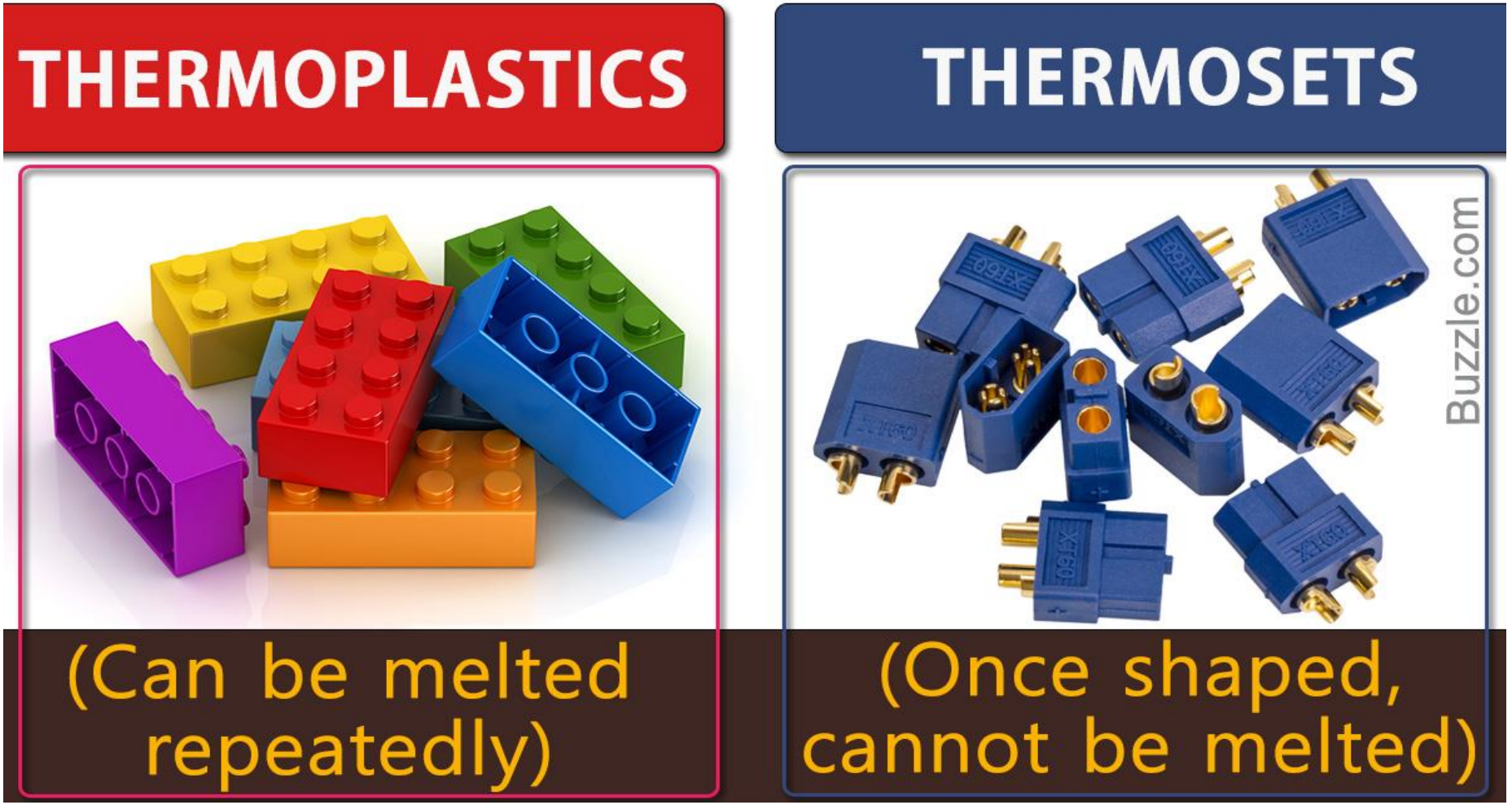
SAFETY PROCEDURES TO BE FOLLOWED

MATERIAL DATA SAFETY SHEETS



POWDER COATING (5/18)

- **POWDER COATING CHEMISTRY**



POWDER COATING (6/18)

- **RAW MATERIAL FOR POWDER COATING**

A. POLYMERIC BINDER

B. HARDNER

C. PIGMENTS

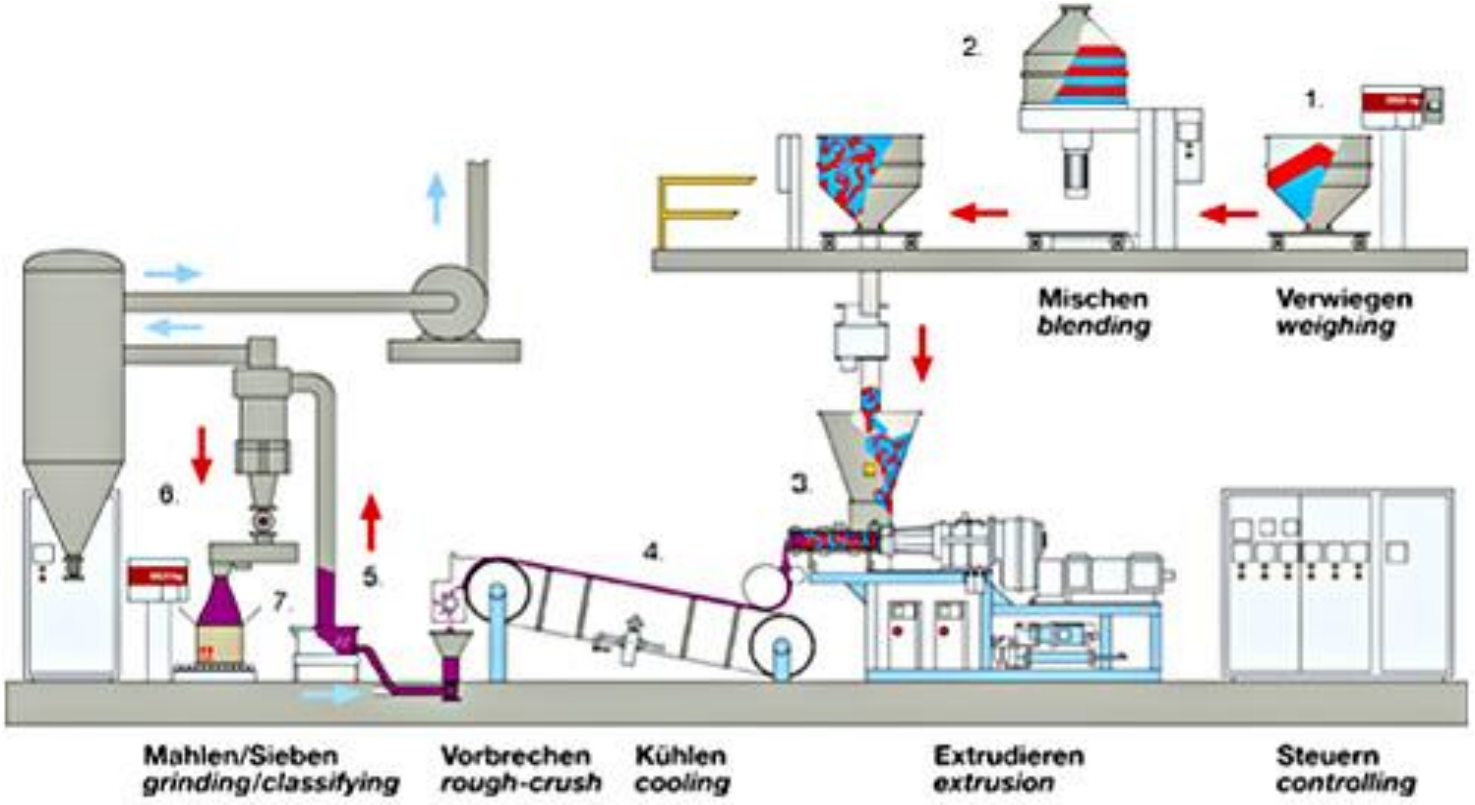
D. EXTENDERS

E. ADDITIVES

OUR INORGANIC PIGMENTS-
3097, Thermellow YO,473
Mostly organic pigments are used.

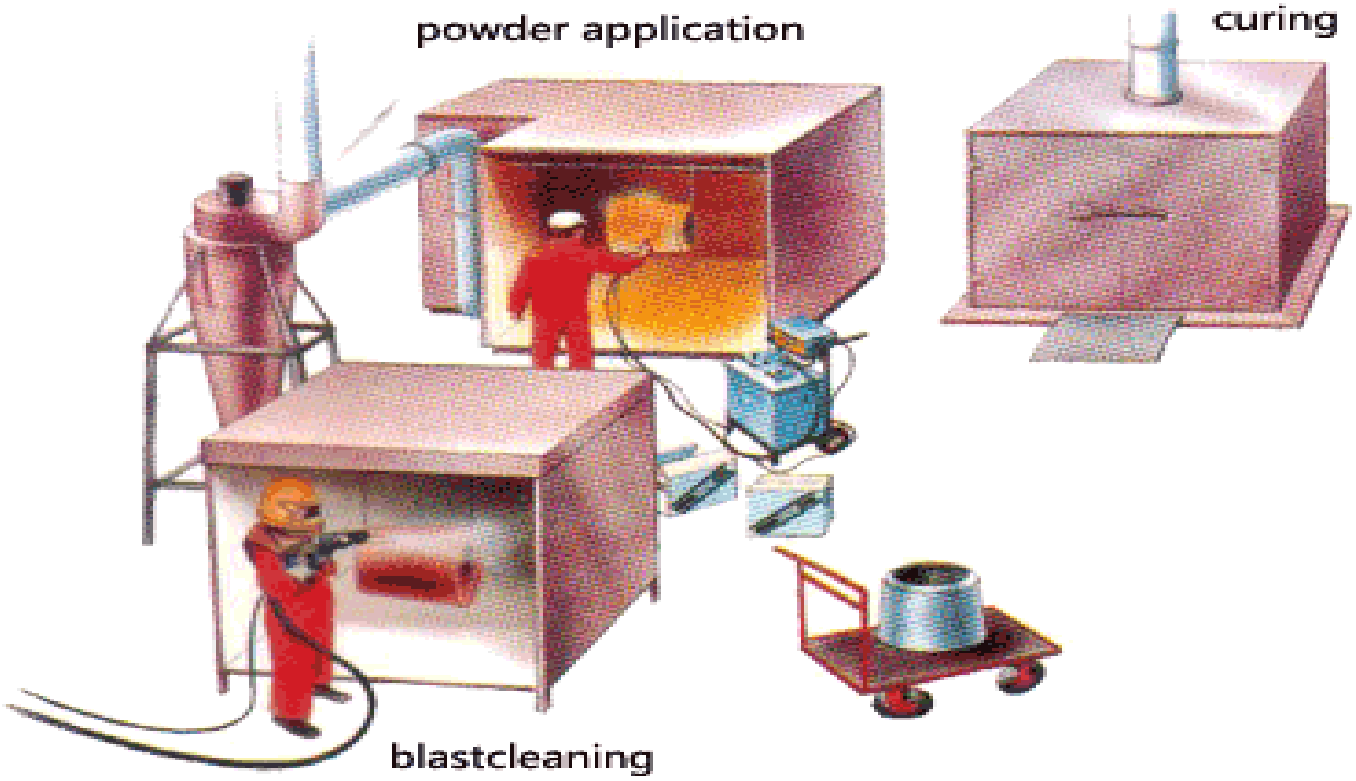
POWDER COATING (7/18)

- **Powder Coating manufacturing process**



POWDER COATING (8/18)

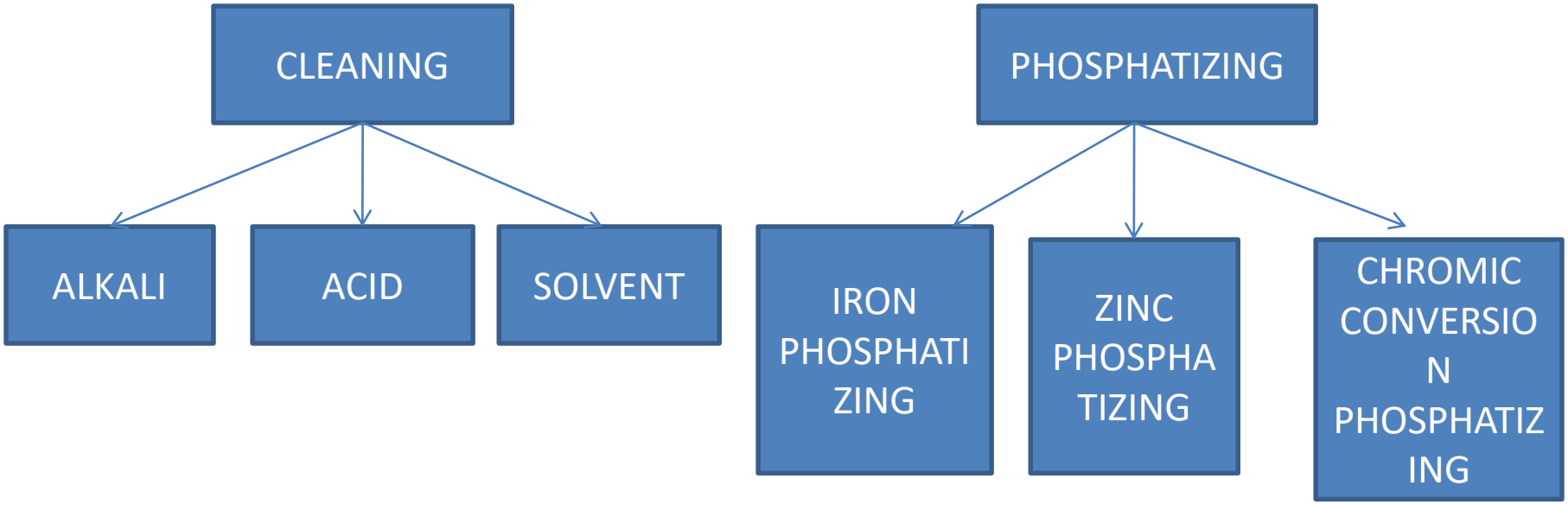
- **APPLICATION PROCESS**



POWDER COATING (9/18)

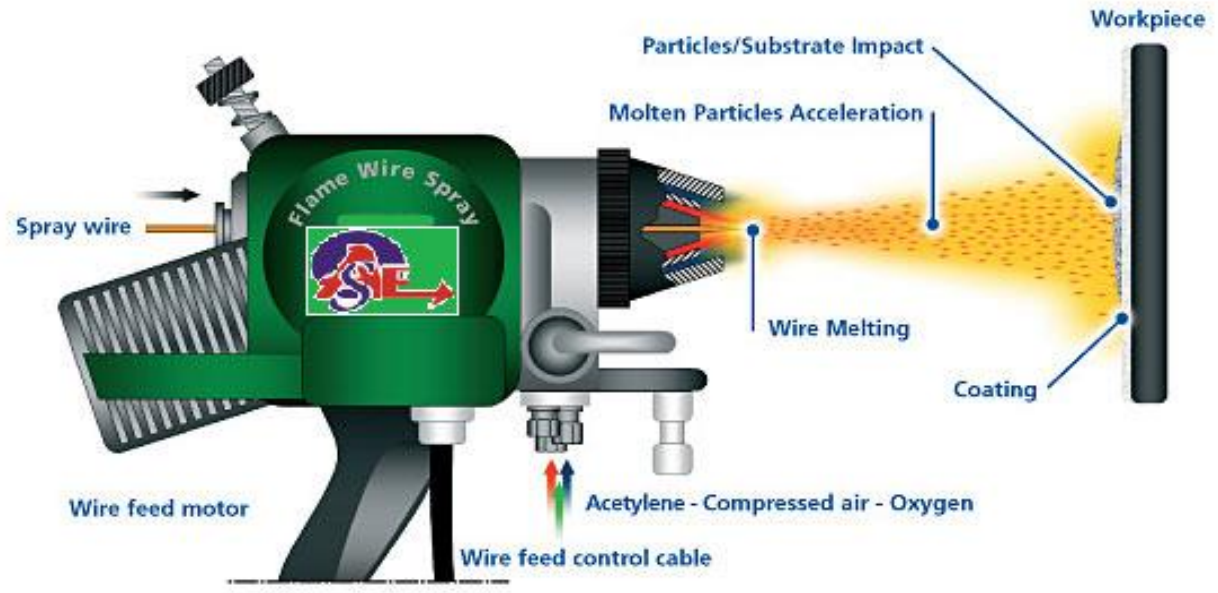
- **PRETREATMENT**

  -> CLEANING AND PHOSPHATIZING



POWDER COATING (10/18)

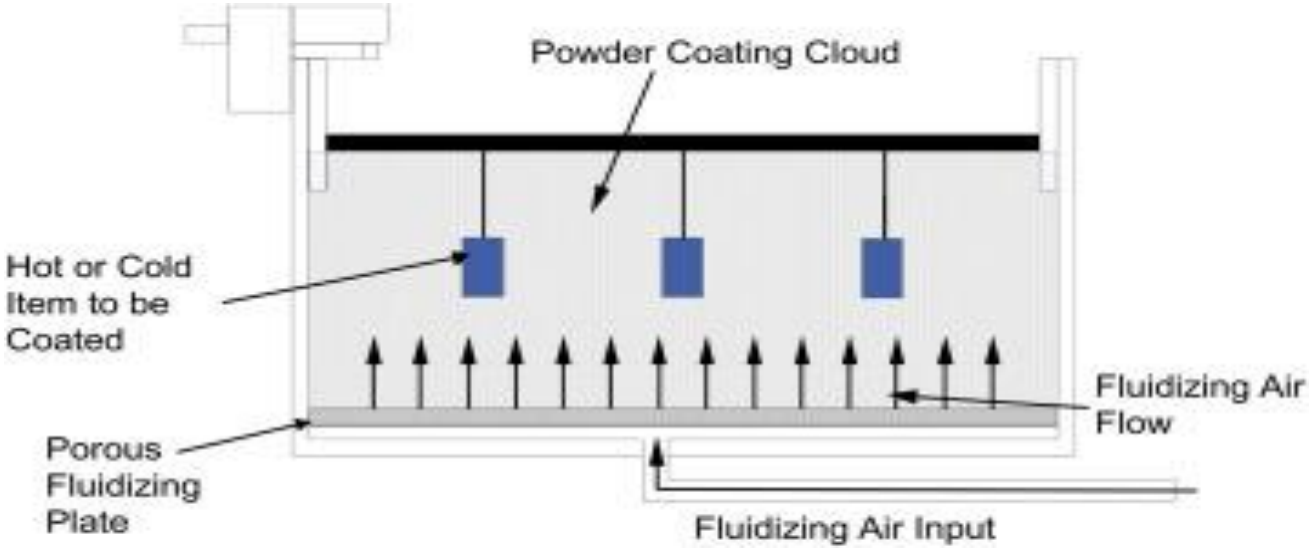
- **COATING TYPE - METHOD 1**



Flame Spray PROCESS

POWDER COATING (11/18)

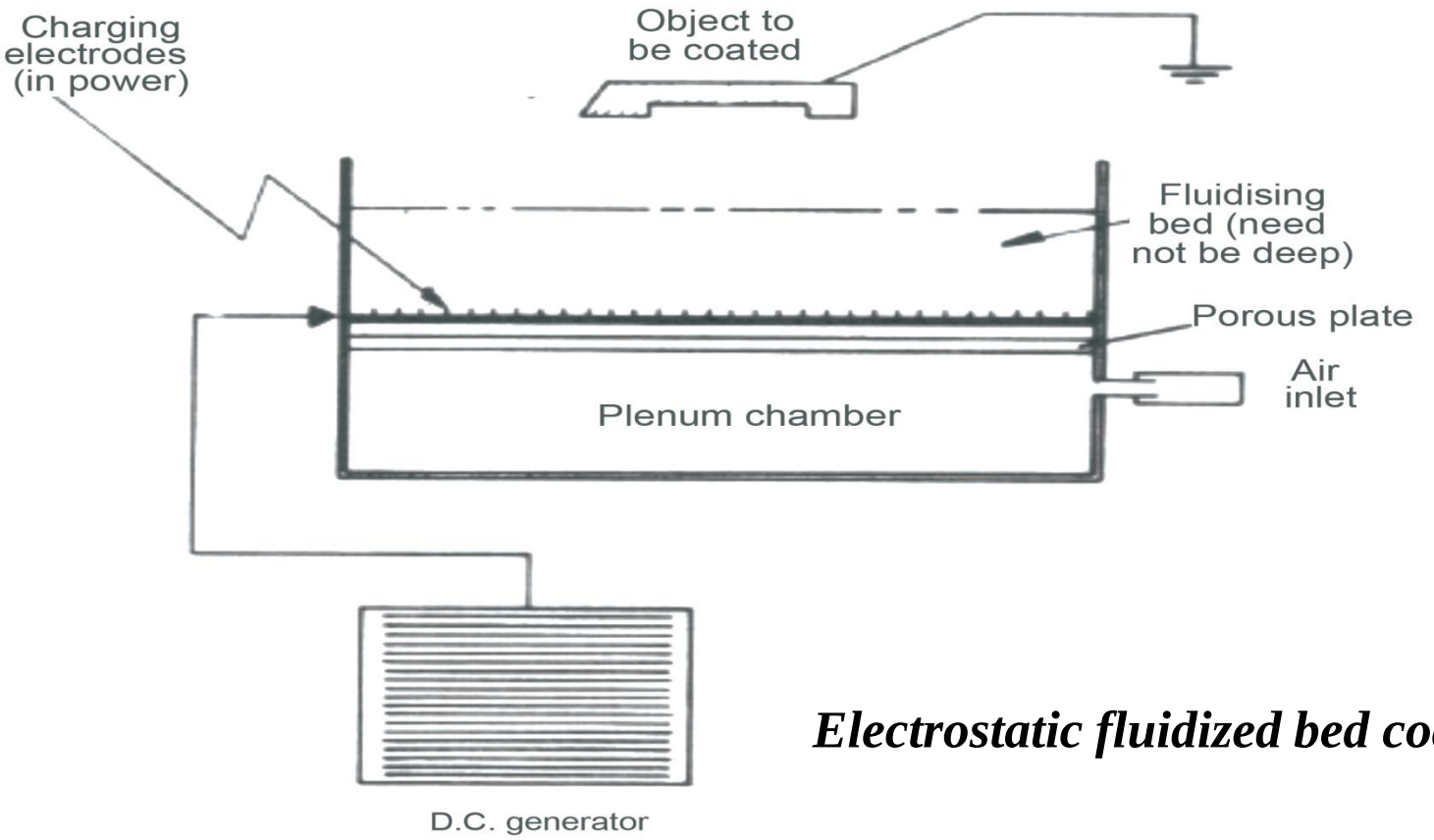
- **COATING TYPE - METHOD 2**



Fluidized Bed coating

POWDER COATING (12/18)

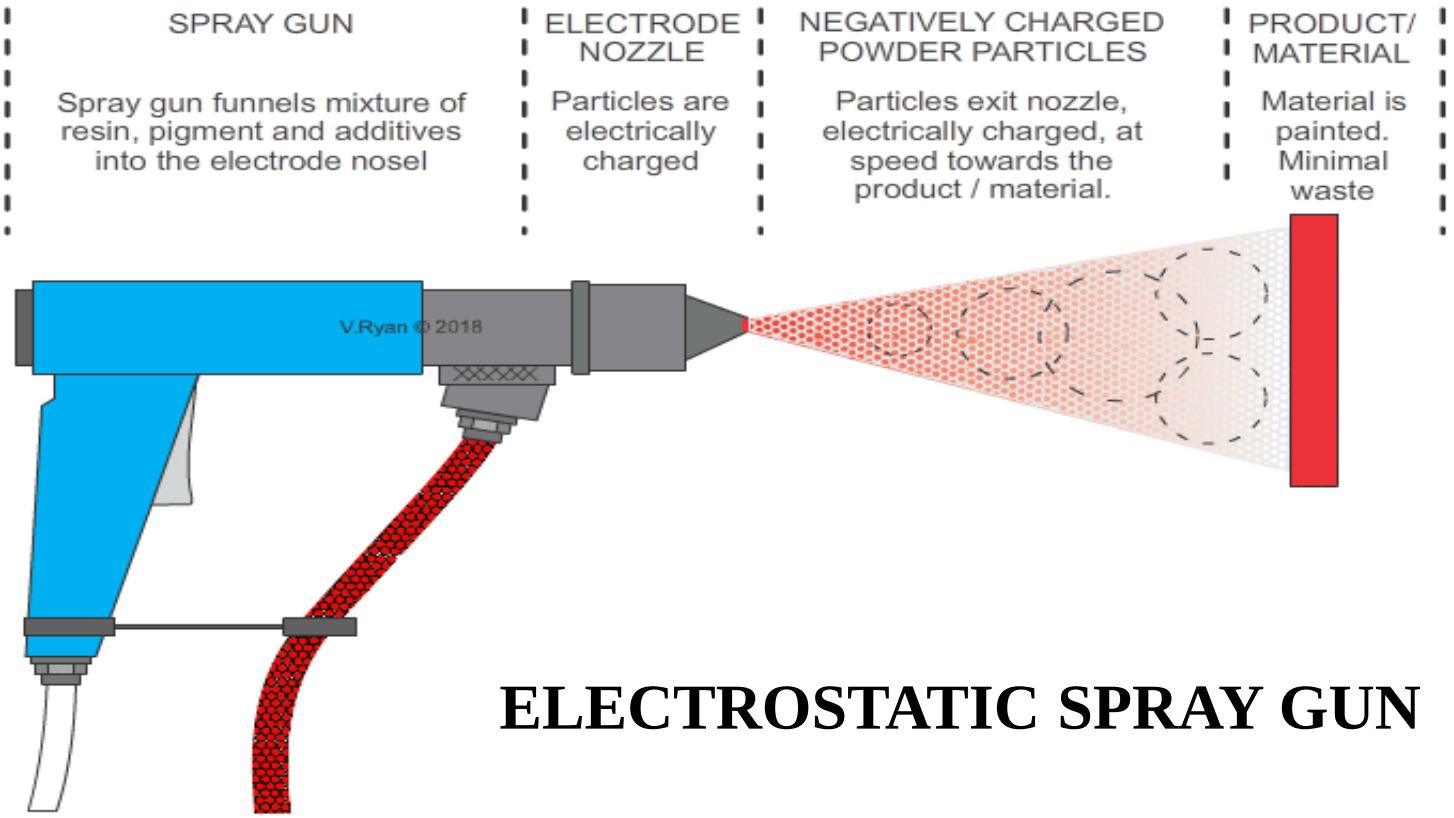
- **COATING TYPE - METHOD 3**



Electrostatic fluidized bed coating. [1]

POWDER COATING (13/18)

- **COATING TYPE - METHOD 4**



ELECTROSTATIC SPRAY GUN

POWDER COATING (14/18)

- **QUALITY CONTROL**

1. GLOSS
2. IMPACT RESISTANCE
3. VISUAL COLOUR
4. PENCIL HARDNESS
5. MANDREL BENT TEST
6. ADHESION
7. SOLVENT CURE TEST

POWDER COATING (15/18)

- SELECTION OF CORRECT PRODUCT

	EPOXY(Indoor coatings)	EPOXY POLYESTER	POLYURETHANE	TGIC POLYESTER
GLOSS (60 deg)	5-95	5-95	20-95	20-95
IMPACT RESISTANCE	> 120	60-120	>100	>100
HARDNESS	>90	>90	>90	>90
FLEXIBILITY	EXCELLENT	VERY GOOD	VERY GOOD	VERY GOOD
ADHESION	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
CHEMICAL RESISTANCE	EXCELLENT	GOOD	GOOD	GOOD
SALT SPRAY	1000 Hrs	1000 Hrs	1000 Hrs	1000 Hrs
WEATHERABILITY	POOR	POOR	EXCELLENT	EXCELLENT
CORROSION RESISTANCE	EXCELLENT	GOOD	GOOD	GOOD

POWDER COATING (16/18)

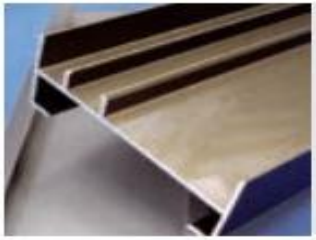
Applications

Appliances
Washers, dryers, refrigerators, freezers, stoves, ranges

Furniture
Patio furniture, office furniture, metal racking, point of sale displays, lockers

Auto Parts and Accessories
Bumpers, wheels, undercarriages, suspension parts, door handles, engine heads, trim, accessories

General Finishing
Plumbing fixtures, faucets, metal and outdoor furniture, fitness equipment, shelving, lighting, tools, toolboxes, racks, bins, displays



Architectural Products
Storefronts, railings, accents, trim, flagpoles, windows, doors, ceiling grids

Heavy-Duty Equipment
Agricultural equipment, construction machinery, forestry, mining, material handling, lawn and garden

Consumer Electronics
Audio and video equipment, small electronics, compact appliances

Transportation
Rails, buses, body builders, trailers, motorcycles, bicycles, scooters and recreational vehicles

POWDER COATING (17/18)

- **CHALLENGES**

1. Thin films are difficult to obtain which is the major factor inhibiting the market growth.

2. Improving the first pass transfer efficiency, that is, the ratio of powder deposited on parts to that sprayed.

POWDER COATING (18/18)

- Few of the dominating players in the Powder Coatings market are *Sherwin-Williams*, *PPG Industries*, *Valspar Corporation*, *RPM International*, *Masco*, *Axalta/Dupont*, *Akzonobel(Rohm and Haas)*, *TIGER Drylac*, *Midwest Industrial Coatings (MICI)*, *Trimite Powders*, *Erie Powder Coatings*, *Nortek Powder Coating*, *3M*, *American Powder Coatings*, *IFS Coatings*, *Allnex*, *Vogel Paint*, *Prismatic Powders*, *Forrest Technical Coatings*, *Hentzen Coatings*.

CONCLUSION

- New Technology advancements and decreasing costs are driving up the popularity of powder coating, especially in industrial applications.

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VIDEO LINK

- https://www.youtube.com/watch?v=ORDnv_iTCjA&authuser=0


Thank you!