

# ACIDLOOP

**Sustainable production through  
market penetration of closed  
loop technologies in the metal finishing industry.**



## Green technologies for metal finishing SMEs

Technology Suppliers Roundtable & Fair, Mumbai 8 Oct 2014

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**switchasia**  
PROGRAMME

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**SIAM**



## Motivation

- Use of such technologies result in
  - Resource (energy, water, chemicals) savings
  - Cleaner environment
  - Uniform product quality
- Less or no use observed in metal finishing SMEs due to
  - Lack of awareness
  - High cost
  - Lack of proper technical design and maintenance support

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# Electroplating & powder-coating

| Technology             | Benefits                                                         | Challenges                                                       |
|------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
| Cold degreasing        | Provides cleaning effect without heating bath                    | Cost and shelf life                                              |
| Oil separator/ skimmer | Improves efficiency of degreasing chemical                       | Compatibility with process chemicals                             |
| Polypropylene balls    | Reduces heat loss and energy consumption in heated process baths | Balls require cleaning to remove oil that coats its undersurface |
| Foam blankets          | Reduces heat loss and energy consumption in heated process baths | Not easily available                                             |

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# Electroplating & powder-coating

| Technology                                                                           | Benefits                                                  | Challenges                                 |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------|
| pH, conductivity and TDS meters                                                      | To monitor, maintain and standardize process conditions   | Lack of awareness about available options  |
| Instruments (e.g. clamp on meters, tong testers) for measuring electrical parameters | To monitor, maintain and standardize process conditions   | Lack of awareness about available options  |
| Temperature meters (contact/non-contact type)                                        | To monitor operation temperature (and identify heat loss) | Availability, technical knowledge and cost |

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# Electroplating & powder-coating

| Technology                                            | Benefits                                                                  | Challenges           |
|-------------------------------------------------------|---------------------------------------------------------------------------|----------------------|
| Non fuming acid                                       | Improves working environment and reduces corrosion of operating equipment | Cost                 |
| Chemical dosing apparatus based on process parameters | Maintains constant bath conditions and product quality during operation   | Reliability and cost |

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## Electroplating & powder-coating

| Technology                              | Benefits                                  | Challenges                                            |
|-----------------------------------------|-------------------------------------------|-------------------------------------------------------|
| Energy efficient drum dryers            | Energy savings and better product quality | Lack of awareness                                     |
| Variable frequency drives               | Electricity savings                       | High cost and lack of supplier interest               |
| Energy efficient motors                 | Electricity savings                       | High cost and lack of supplier interest               |
| Eductors                                | Energy savings and improved operation     | Lack of suppliers and material compatibility          |
| Air knives                              | Energy savings                            | Lack of suppliers and suitable off-the-shelf products |
| Heat pump                               | Energy savings                            | Lack of technical knowledge and proven case studies   |
| Vapor absorption machines (VAM) systems | Energy savings                            | Lack of technical knowledge and proven case studies   |

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# Electroplating & powder-coating

| Technology                                 | Benefits                                                                       | Challenges                                               |
|--------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------|
| LED lighting and light efficient equipment | Energy savings                                                                 | Cost                                                     |
| Personal protective equipment              | Reduces adverse health impacts of harsh working environments                   | Lack of awareness and enforcement                        |
| Low-end automation equipment               | Helps maintain product quality standard and optimizes consumption of resources | Availability of suppliers, technology awareness and cost |

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# Powder-coating

| Technology                             | Benefits                                      | Challenges                                    |
|----------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Transvector nozzles                    | Energy savings and improved process operation | Supplier and availability                     |
| Low pressure spraying gun              | Energy and raw material savings               | Lack of technical knowledge among suppliers   |
| Scrubber and powder recovery apparatus | Powder saving in powder coating               | Proper technical design and supplier for same |
| Air, PP or rubber curtains             | Material & energy savings                     | Suitability to specific process               |

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# Re-rolling, coil-rolling and hot dip galvanizing

| Technology                       | Benefits                           | Challenges                               |
|----------------------------------|------------------------------------|------------------------------------------|
| Furnace insulation               | Fuel savings                       | Lack of awareness and technical know-how |
| High emissivity ceramic coatings | Fuel savings and uniform annealing | Cost & availability                      |

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# Re-rolling, coil-rolling and hot dip galvanizing

| Technology                      | Benefits                                              | Challenges                               |
|---------------------------------|-------------------------------------------------------|------------------------------------------|
| Oxygen sensors                  | Continuous monitoring of combustion characteristics   | Lack of awareness and technical know-how |
| Oxygen sensors with VFD control | Maintaining optimal air-to-fuel ratio                 | Lack of awareness and technical know-how |
| Oxygen trim control             | Controlling and maintaining optimal air-to-fuel ratio | Lack of awareness and technical know-how |
| Flue gas analyzer               | Monitoring of combustion characteristics              | Lack of awareness and technical know-how |

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# Re-rolling, coil-rolling and hot dip galvanizing

| Technology                                  | Benefits                                         | Challenges                           |
|---------------------------------------------|--------------------------------------------------|--------------------------------------|
| Hot air blowers                             | Efficient pickling                               | Handling the excess fumes            |
| Gas flow meters for individual applications | Continuous online measurement of gas consumption | Lack of awareness regarding benefits |

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## Follow-up

- Showcasing select technologies
- Facilitate implementation in SMEs
- Updated suppliers list on project website

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