Innovation in Spray Technologies to Reduce Emissions

Reduce Waste with Spray Technique Training
in painting & coating operations

Sue Schauls
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Topics to cover today:
• STAR® Program
• Upcoming Auto Body MACT Standards
• New Tools
• Spray Techniques to Reduce Waste
Spray Technique Analysis and Research

STAR® Training Program

- Developed spray technique training to reduce waste in paint operations
- Equipped and trained 41 STAR schools in 25 states in 10 years
- Development of two new tools:
  - LaserPaint™ targeting device
  - VirtualPaint™ virtual reality training system
Upcoming Auto Body MACT Standard

- Due out for review by June 2007
- Met at RTP EPA office July 24, 2006
- No draft has been available
- Final Rule December 31, 2007
- MACT standard to will cover HAPs (not VOCs)
MACT STANDARD MAY INCLUDE:

• Painter certification and training
  – Training on spray technique
  – Written certification
  – No skill certification - so no minimum transfer efficiency
  – No point of sales restrictions

• Required filtered exhaust from painting area or booth
  – May or may not require booth

• Reporting requirement
  – Certification proof for painters
  – Paint booth maintenance records such as filter change out schedule
  – Certification of compliance
  – Annually or semi-annually
New Tools

- LaserPaint™ targeting device
  [www.LASERPAINT.us](http://www.LASERPAINT.us)
- VirtualPaint™ virtual reality paint training system
  [www.VirtualPaint.us](http://www.VirtualPaint.us)
- Mobile Outreach for Pollution Prevention (MOPP)
LaserPaint™ Targeting Device has three major functions:

- Distance Control
- Overlap
- Targeting
LaserPaint™
(shameless sales plug)

- $295.95 [www.LaserPaint.us](http://www.LaserPaint.us)
- Invented at Iowa Waste Reduction Center
- 319-273-8905
LaserPaint™

laser pointer

Always watch your materials first and use your side vision to watch the laser pointer!
VirtualPaint™

Changing the dynamics of traditional hands-on painter training

www.VirtualPaint.us
VirtualPaint™
virtual reality paint training system

• Highly accurate representation of spray patterns & coating accumulation
• Realistic application technique simulation
  – Realistic stand-off distance
  – Spray gun orientation
  – Traverse speed
  – Spray gun triggering
  – Spray pass overlap
• Accumulation mode gives immediate feedback
• Practice time without clean up

www.virtualpaint.us
Spray Technique Analysis and Research

STAR®

Spray Techniques

1) Spray gun distance to part
2) Perpendicular to surface
3) Spray angle
4) Consistent 50% overlap
5) Banding and edging
6) Reduce lead and lag
7) Spray pattern size & shape
8) Targeting – plan of attack
9) Transfer Efficiency
10) Build Efficiency
11) Practice time
Spray Techniques

Spray gun distance to part

Spray gun distance to part should follow recommendations from paint sheet & gun set up from manufacturer.

- Keep gun distance at optimal distance
- Be consistent – varied distances leads to an inconsistent film build
- HVLP guns 4” to 6” for auto body
- Use a LaserPaint® targeting tool for distance control
- Paint performs best at optimal spray distance
Spray Techniques

Spray gun distance to part

Spray gun distance to part at optimal distance
Spray Techniques

Perpendicular to surface

- Keep the spray pattern perpendicular to the surface
- No arcing or wrist rotation
- Use a fluid motion when you spray to reduce material consumption
Spray Techniques
Perpendicular to surface

Keep the spray pattern **Perpendicular to surface**

Incorrect

Coating will be light at this point
Coating will be heavy at this point

Correct

5”-7”
Move gun in straight line

Keep wrist flexible
Spray Techniques

Spray Angle

- Avoid wrist rotation
- Pitch (wrist up and down) or (heel & toeing)
Spray Techniques

Overlap

Consistent 50% Overlap
Banding & Edging

- Technique used to reduce overspray on a flat panels.
- Can be used on edges of parts.
Spray Techniques

Reduce Lead and Lag

- Excessive lead and lag wastes paint
- Adds to toxicity of paint-related waste such as paper and masking
Spray Techniques

Pattern Size & Shape

- Always keep as much of the spray pattern on the part as possible.
- Shape the pattern to the part
Spray Techniques

Pattern Size & Shape

Slender pieces should be coated with a narrow horizontal or vertical pattern

- For a vertical pattern, the gun speed should be increased to account for the added time the part is in the pattern.
- Gun motion should always be lengthwise to the part.
Spray Techniques

Plan of Attack

- Study the geometry of the part to be sprayed and visualize size and shape of spray pattern.
- The sequence should feel comfortable and be consistent throughout the job.
- Use partial trigger, edging and full fan banding when appropriate.
Spray Techniques

Plan of Attack

• Adjust your plan of attack
Spray Techniques

Transfer Efficiency

• The amount of paint that is applied to the part.
• Even good painters can have a transfer efficiency (TE) of 50% or less.
• 10% increase in TE can have dramatic effects on costs and air emissions
Spray Techniques

Transfer Efficiency

- 10% increase in TE can have dramatic effects on costs and air emissions
Spray Techniques

Build Efficiency

• The amount of part surface that has the optimal mil build or target mil build on it.
• Very high TE can still produce low quality of work if the target mil build is not achieved.
• Consistency is the key to build efficiency.
Spray Techniques

Build Efficiency

• Consistency is the key to build efficiency.
Spray Techniques

Practice Time

- Wet paint in booth
- Virtual reality training system
Spray Techniques

Practice Time

VirtualPaint training system

• Instrumented HVLP spray gun
• Wide range of spray gun settings
  – Coating flow rate
  – Air pressure
  – Fan pattern size
• Visual and statistical feedback
  – Overspray
  – Mil build average
  – Coating accumulation mode
  – Transfer efficiency
  – Paint consumption
  – Elapsed time
Spray Techniques

Practice Time

**STAR training**
- Actual in booth training plus classroom lecture
- New STAR schools can be set up
New Tools

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