Stay Competitive and in Compliance with UV/EB

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RADTECH
THE ASSOCIATION FOR UV&EB TECHNOLOGY

RadTech International

- Environmental Health & Safety Committee
  - Providing information about UV/EB to federal, state and local government
  - Ensuring a place for UV/EB in legislation
  - Provide industry added tools to make a case for UV/EB

Enduser subjected to various regulations

- Federal level: Title V
- State level
- Local level: Local rules and regulations
  - Southern California typically has the most stringent emission requirements
- Volatile Organic Compounds (VOCs); Toxics,
- Greenhouse Gases; Energy Efficiency

Command and control vs. incentives

- Command and control rules
  - Technology forcing
  - Mandate a specified VOC limit
- Incentives
  - Exemptions from rules
  - Regulatory relief

UV/EB's role

- Avoid applicability
  - Staying below thresholds through VOC reduction
- No need to install air pollution control devices
- UV/EB enables facilities to stay in compliance
- Drastic emission reductions (near zero emissions)
- No secondary adverse impacts (greenhouse gases, combustion contaminants, hazardous waste)

Federal regulations

- Title V- Facility Permit vs. permit unit approach
  - Applies to major sources, definition varies by region
  - Public notification
- How can UV/EB help me comply?
  - Avoiding applicability
    - "De minimus" facility <= 19,184 gallons/year of UV/EB materials with VOC content < 50 grams/liter
- EPA Control Techniques Guidelines for Flat Wood Paneling Coatings (2006)
    - "This technology is gaining greater acceptance and, where applicable, achieves a near 100 percent reduction of VOC emissions".

State regulations

- California Air Resources Board
  - Air Toxics Control Measure for composite wood products
    - Reduction of formaldehyde emissions from particle board, medium density fiberboard, hardwood plywood, composite veneer
    - Third-party certifier
- ARB estimates
  - 2.5 billion square feet of composite wood products sold in CA annually
  - 400 tons of formaldehyde generated
- ARB Suggested Control Measure for wood coatings
  - 275 grams per liter limit, mirrors SCAQMD rule

Examples of requirements

- SCAQMD Rule 1136
  - Applies to:
    - Clear & Pigmented Sealers
    - Clear & Pigmented Topcoats
    - Pigmented Primers & Undercoats
  - VOC limit is 275 grams/liter
  - Shutters
    - Clear Topcoat ……..680 g/l
    - Pigmented topcoat……600 g/l

End User ?--Do UV/EB materials comply with limits?

- Yes, typical VOC content of a UV/EB formulation is < 50 grams/liter
  - Generally UV/EB materials do not contain any VOC's
  - Fluctuations in VOC content can be attributable to test methods
  - Measurement of VOC content difficult with low VOC materials

SCAQMD Findings

- **"UV coating on wood substrate is a viable option to regulatory compliance and coating performance for a wide variety of products."**
- "Supercompliant materials (eg., UV and EB cured materials) typically dry/cure more quickly, using less energy than conventional drying methods which typically use natural gas as a fuel source" [RadTech Report Article became part of Rule 1130-- Graphic Arts]

Pollution prevention in lieu of add-on-controls

- Lowest Achievable Emission Rate/Best Available Control Technology (Major Sources)
  - UV/EB defined as "Superclean" (< 5% by wt. VOC)
  - BACT/LAER for:
    - Wood & plastic coatings
    - Printing

Less regulatory hassles with UV/EB

- Reduced SCAQMD recordkeeping for UV/EB
  - Monthly recordkeeping: Materials < 50 grams/liter at all facilities
  - Total exemption from recordkeeping: Materials <50 grams/liter at facilities <4 TPY
- Added flexibility with emission averaging option Rule 1136 (c)(1)(D)(i)
- Permit exemption - Rule 219

SCAQMD plan

- UV/EB identified as an "advanced technology" to help SCAQMD achieve its clean air goals (Chapter 4, page 68)
- "UV and EB curing products can be used on virtually all substrates, from metal and wood to glass and plastic."
- "Other advantages include the attainment of very high gloss levels, reduction of VOC emissions and solvent odors, and reduced energy consumption."
- New 2016 AQMP now includes UV/EB as control strategy.

SCAQMD and EPA policy

- Superclean materials equivalent to add-on-controls
- Superclean materials comply with source specific rules and BACT/LAER

- San Joaquin District concludes that UV technology is **more** cost effective than add-on controls

Impact of Regs. on Enduser

- Rulemakings and regs can shape business decisions.
- Spark enduser interest in UV/EB
- Provide the perspective of an “impartial” third party rather than that of a “vendor”
- Real life Anecdotes

Cost savings to Customers

- Less permit costs
  - Permit processing fee for coating/drying
    = $3,359
  - Annual Operating Fee
    = $1,087

Cost savings Cont'd

Example: Facility using 20 gallons/day @ 275 g/l

20 gal/day x 2.3 lb/gal = 46 lb/day

46 lb/day x 5 day/week x 52 weeks/year = 11,960 lb/yr

11,960 lb/yr x 1 ton/2,000 lb = 2.99 tpy

Annual emission fees =5.98 tpy x $535.33/ton

= $3,201.27/year

- Emission Reduction Credits **$5,000/Pound VOC**

[46 lb/day – 22 lbs/day*] x 1.2(off set factor) x $5,000/lb

= $ 144,000

*Free offsets of 22 lbs/day

Conversion to UV/EB

- =Facility using 20 gallons/day @ 50 g/l

20 gal/day x .42 lb/gal = 8.4 lb/day

8.4 lb/day x 5 day/week x 52 weeks/year = 2,184 lb/yr

2,184 lb/yr x 1 ton/2,000 lb = 1.09 tpy

= $ 0 /year (facilities under 4 TPY do not pay emission fees)

- Emission Reduction Credits (free offsets for processes under 4 TPY)

= $ 0

Savings from conversion selected air quality fees only

- Savings in permitting fees = $ 3,359
- Savings in operating fees (annual) = $ 1,087
- Savings in emission fees (annual) = $ 3,201
- Savings in ERCs (one time fee) = $ 144,000
- Savings = $151,647
- Does not include additional fees (Title V ; public notice and other)

Policy change = savings

- Example: Emission factor for UV/EB materials reduced from 5% VOC to 2% VOC
- For 20 gallon/day facility
- 20 gallon/day x .25 lb/gallon x $5,000/lb

  = $ 25, 000
- Example: GCMS testing v. ASTM testing
  - GCMS = $1,500 PER sample
- Example: Marine Coatings rule

Future Trends

- Lower VOC limits
- Regulators will need new test methods to measure very low VOC levels
  - SCAQMD Graphic Arts Rule adopted 5/2/14 includes RadTech spomsored method ASTM D7767
  - Supercompliant definition in R1130 is 10 grams/liter
- Energy Efficiency
- Greenhouse gases
- Toxic Air Contaminants
- "Indirect Sources"

Conclusion

- UV/EB can offer end users:
  - Less regulatory burdens and help industry stay in compliance and in business.
  - Increased production and VOC reduction can go hand in hand
  - Process advantages, controls simply destroy VOC's
  - No secondary pollutants (NOx, SOx, CO, greenhouse gases) generated with UV/EB
- Conversion may equal $$$$ SAVINGS

THANK YOU

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- Regulatory resources
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