Heraeus Noblelight Fusion UV West Coast Office

Torrance, CA (near LAX)

- 5000 Sq feet (464 Sq meters)
- Laboratory
- Service Center
- Demo Equipment Location
Agenda

- UV/EB vs. conventional technologies
- Process and production advantages
- UV/EB equipment types
- Markets and applications
- What to see at UV/EB West
Acrylates in Photocure coatings

Solvent Based Systems

Physical drying
Solvent evaporation

• Solvent
• Polymer

Final Film

V.O.C.
Water-based Systems

Physical drying: evaporation and particles coalescence

- Water
- Coalescing agent
- Polymer

Final Film
Acrylates in Photocure coatings

Radiation Curing

Crosslinking

Final film

Oligomer

Reactive diluent

Photoinitiator
Components of a UV formulation

- **ADDITIVES**
- **OLIGOMER**
  - key coating characteristics
- **MONOMER**
  - viscosity control
- **PIGMENTS**
- **UV CURABLE INK / COATING**
- **PHOTOINITIATOR**
  - absorbs UV light
Formulation Comparisons

UV Systems

Oligomer 0-75%

Monomer 25-100%

Conventional

Resin 10-60%

Solvent 40-90%

Photoinitiator 0.5-10%

Additives 0-2%

Pigments 0-50%

Catalyst 0-6%
Environmental Advantages

- Environmentally friendly – "Green Technology"

- Reduce or eliminate solvent emissions
  - Acrylate monomers are used as reactive diluents to lower viscosity for application
  - Potential for 100% solids coating system
  - Low or no Volatile Organic Compound’s (VOC)
Production Advantages

- Reduce or eliminate solvent recovery costs
- Reduce cleaning costs: no need to switch off and clean the machines
- UV or EB energy sources cost less than gas-fired ovens or driers
- Smaller production space for energy curing systems

Increased Productivity and Output

- Immediate curing (less than 1s) – Time is money!
- Moderate temperature increase during the curing process
  - Immediate processing of the object after curing
  - No need to cool down before stacking

Technology easily adaptable to existing production lines
UV/EB CURING

An alternative to watching paint dry
Optimize Spectral Output for Maximum Process Performance
UV/EB Equipment

- Linear (Web, sheet and flat parts)
- Flood (3D curing)
- Spot Cure (Small area)

- ARC
- Microwave
- LED
- Pulsed Xenon
- EB
ELECTRODE LAMP

- Ceramic Spools for Support
- Electrode
- Quartz Envelope
- Electrode
- Fixed Wire
ELECTRODELESS LAMP BULB

QUARTZ MOUNTING STUB
Microwave-Powered (Electrodeless) Lamp
UV LED

- Low Heat to substrate
- No mercury/ozone
- Narrow UV wavelength output
Electron Beam (EB)
Converting - Siliconizing
Release liners, papers, film

Converting - Narrow Web
Labels, flexible packaging, silicone release

Web Offset Printing
Packaging, business forms, direct mail

Converting - Coating
Flexible packaging, film

Converting - Flooring
Vinyl sheets and tiles
Pressure Sensitive Adhesives
Tapes and labels

Plastic - Functional Coating, Non-Automotive
Construction materials, office furniture, and leisure craft

Automotive
Interior & exterior plastic, metal, and glass

Wide Web Printing
Flexible packaging, wrappers

Sheetfed Offset Printing
Commercial & plastic sheet printing
CD/DVD “lacquering,” printing, and bonding

Metal-Flat Sheet Deco
Aerosol, food cans

Metal Pipe Coating
Metal tubes

Plastic Container Decoration
Cosmetic, toothpaste, food containers

Metal-2-Piece Cans
Beverage containers-decoration and rim coating
Wood Coating - Profiles
Molding, picture frames

Fiber, Ribbon & Cable
Optical fiber, coloring, ribbon, wire marking

Wood Coating - Flat Sheet
Particle board, sheets, doors

Wood Coating - 3D Objects
Case goods, chairs, furniture

Glass Coating
Bottles, tumblers, mirrors
**Consumer Products**
Eyeglass lenses, pen bodies, tools, golf balls

**Medical Devices**
Manufacturing and assembly

**Flat Sheet Screen Printing & Decorating**
Posters, signs, vehicle advertising

**Electronics**
Marking, encapsulation, conformal coating

**Lab/Development Units**
Conveyors, static cure, process research lab equipment for coating evaluation
You walk on it

You talk on it

You drive it

You watch it
UV/EB West

- Raw material suppliers
- Formulators
- UV equipment suppliers
- LED equipment suppliers
- EB equipment suppliers
- Material dispensers/coaters/mixing equipment
- UV measurement and testing equipment
- UV cleaners
- Technology publications
UV/EB: So Much More!!!