



RoHS Compliance

The New RoHS Environmental Standards and What They Mean to Your Business



RoHS Compliance

Presentation Outline

- 1) The EU Directives and Other Restrictions**
- 2) How The Directives Apply to Your Finishing Needs**
- 3) Comparisons Between Compliant and Non-Compliant Finishes**
- 4) Working With Your Finisher**
- 5) What's Next**
- 6) Open Forum**



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The EU Directives and Other Restrictions

- 1) ELV
- 2) WEEE
- 3) RoHS
- 4) REACH
- 5) California SF Bill No. 20
- 6) IBM Packaging Spec



St. Paul Metalcraft & RoHS Compliance

End of Life for Vehicles (ELV)

- EU Directive 2000/53/EC
- Went into effect July 1st, 2003
- Exemption for Cr+6 expires July 1st, 2007
- Restricted the content by weight of certain chemicals (Pb, Cd, Hg and Cr+6)
- First of Directives Restricting This List



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Waste Electrical and Electronic Equipment **(WEEE)**

- Directive 2002/96/EC
- Establishes Requirement to Recycle Certain
Electrical/Electronic Equipment
- Effective 1 July, 2006
- Extensive List of EEE Covered



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WEEE Continued

- Small Household Appliances
- IT, Telecommunications Equipment
- Consumer Equipment
- Lighting Equipment
- Electrical and Electronic Tools (Except Stationary Industrial)
- Toys, Leisure and Sports Equipment
- Medical Devices (Except Implanted and Infected Products)
- Monitoring and Control Instruments
- Automatic Dispensers



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Restrictions on Hazardous Substances (RoHS)

- EU Directive 2002/95/EC
- Effective Date 1 July, 2006
- Restricted Substances are: Pb, Cd, Cr+6, Hg, PBB and PBDE (Flame Retardants for Plastics)
- Pb, Cr+6, Hg Tolerated Up To 0.1% w/w In Homogeneous Material (Cd, 0.01% w/w), Provided Not “Intentionally Added”



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RoHS, Continued

- Establishes Financial Liability Authority for Violations
- Supplier Declarations Can Be Used To Demonstrate Compliance – HOWEVER – Not Protected If You “Did Not Take Adequate Steps To Confirm RoHS Compliant Status”.



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Registration, Evaluation and Authorization of Chemicals (REACH)

- Proposed Regulation 29 October, 2003
- Scheduled Effective Dates Vary From 2007 to 2014
- Requires Producers Shipping Chemical Products Into EU to Disclose Formula (Trade Secret Issues)
- American Chemistry Council Representative States EU “wants to set global trade policy” through all these ‘environmental’ directives.



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California SF Bill 20

- Effective 1 January, 2007
- Similar to WEEE But Less EE Covered (Those With CR Tubes or Flat Screens or Video Displays > 4 inches on Diagonal)
- Adapts RoHS
- Prohibits An Electronic Device From Being Sold or Offered For Sale ...”if the electronic device is prohibited from being sold in the EU ...due to the presence of certain heavy metals.”



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IBM Spec

- Restrictions on the Presence of Cr+6 in Skids
- Includes Chromated Nails and Screws



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How Does WEEE/RoHS Affect Your Finishing Needs?

- Liability Issue If Non-Compliance
- Cannot Use Some Familiar, Common Finishes
- Cost Issues
- Introduces Potential Quality Issues
 - Appearance
 - Performance



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Various Chromium (Cr) Compounds

- **Chromium Metal – Cr(0)**
Zero Valence, RoHS Compliant Coating
- **Chromates and Dichromate's – Cr+6**
Hexavalent
CrO₄= and Cr₂O₇= Conversion Coatings Are Non-Compliant
- **Chromous Compounds – Cr+3**
Trivalent
Cr(Cl)₃, Cr(NO₃)₃, Cr₂(SO₄)₃ Conversion Coatings Are Compliant



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Comparison Between Complaint VS Non-Compliant Finishes

- Zinc Plated
- Electroless Nickel
- Conversion Coatings On
 - Aluminum
 - Zinc Die Cast
 - Magnesium



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Zinc Plated

- **Hexavalent Clears Are Almost Not Used**
Gave 12-20 Hrs Salt Spray (SS) Protection (ASTM B 117)
- **Hexavalent Yellows Are Standard In Industry**
Give 96 Hrs SS
Relatively Long Bath Life
- **Both Yellow and Clear Are:**
Self healing
Excellent Bases for Paint
Passivate's Uncoated Steel Surfaces (inside tubing)
Relatively Inexpensive and Easy to Use
Non-Compliant



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Zinc Plated, Continued-1

- **Standard Trivalent Clears Are Standard in Industry For Past 5-7 Years**
 - Not Self Healing**
 - Good Base for Paint**
 - No Passivation of Uncoated Surfaces**
 - Give 20 to 50 Hrs SS**
 - Thin Films Are Blue-Bright in Color**
 - Relatively Inexpensive and Easy to Operate**
 - Compliant**
- **High Corrosion Trivalent Clears Now Available**
 - Same as Above Except**
 - Give 100+ Hrs SS**
 - When Run to Increase Corrosion Protection Are Iridescent**
 - Shorter Bath Life and More Expensive (4X) Standard Trivalent**
 - Compliant**



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Zinc Plated, Continued -2

- Trivalent Yellows Without Dyes

Ugly

Forget About Them

- Trivalent Clears With Yellow Dye

Corrosion Protection Depends On Type Trivalent Used

Same Properties of Trivalent Clears

Two Process Are Available

One-Step (Dye in Bath)

Expensive (13X Cr+6 Yellow, 3X Standard Trivalent)

Bath Life Difficult to Maintain

Color May Fade Over Time



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Zinc Plated, Continued –3

Trivalent Clear With Dye, Two Step Process (Clear , Then Dye)

Same As One Step Except:

Dye May Interfere With Paint Adhesion

Bath Life More Stable

- **Black Chromate**

Duller Than From Hexavalent Bath

More Expensive Than From Hex Bath (2X?)

- **Olive Drab**

No Commercial Substitute



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Electroless Nickel

- **Standard Baths Are Non-Compliant**

Use Pb and Cd “Intentionally Added” As Stabilizer and Brightener,
Respectively

Well Known Operating Parameters and Costs

- **Compliant Baths Are Available**

Pb and Cd free

Bath Life slightly less than current processes

About 30% More Expensive at Make Up

Appearance Similar to Standard Baths



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Conversion Coatings

- **On Aluminum alloys**

Trivalent Clears are Available

Appearance Similar, Slightly Duller

No Trivalent Yellows

Permanganate Process Can Produce a “Brownish” Color

(Not Yet Approved By Specification)

- **On Zinc Die Cast alloys**

Trivalent Clears are Available

- **On Magnesium alloys**

Trivalent Clears are Available



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Working with Your Finisher

- Require Certification of Compliance
- May Need to Go back to OEM to Change Specification / Prints



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What's Next

- Just the Beginning of Bath Development
- New Processes Will Come On Line
- Old Finishes Will Eventually Disappear – Too Expensive to Maintain Both
- New Regulations??