ANSYS solutions to Lead Free Process & Design Challenges

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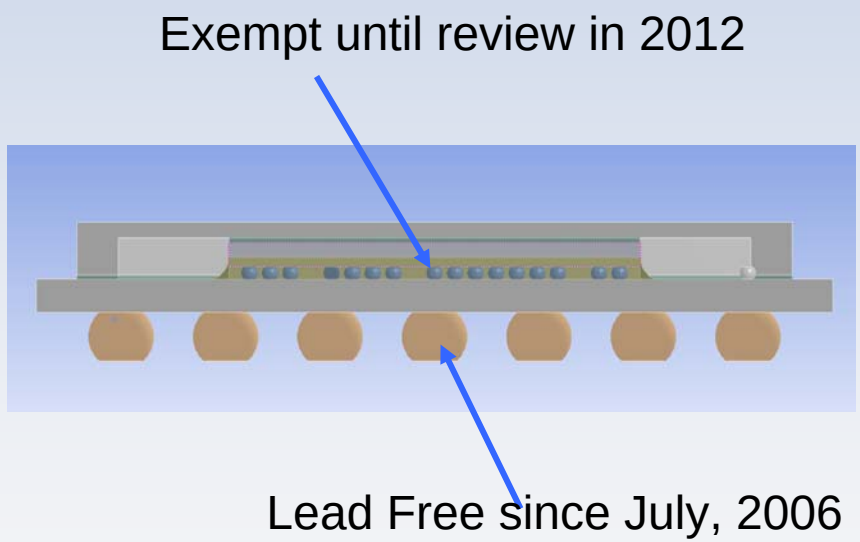
The Lead Free Challenge

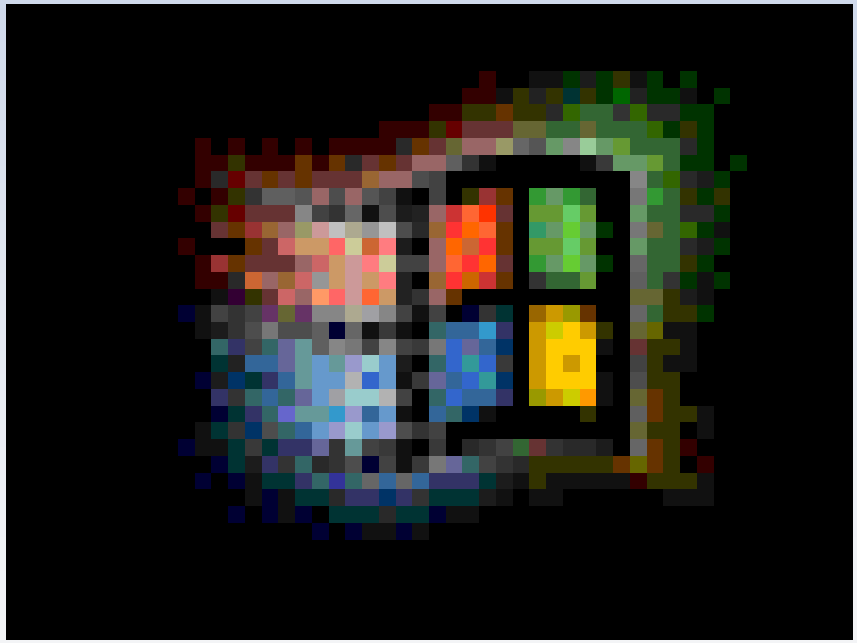
- **From Wikipedia:**
  http://en.wikipedia.org/wiki/Restriction_of_Hazardous_Substances_Directive
  - The RoHS directive took effect on 1 July 2006, restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.
  - *Final Report* recommended that Category 8 and 9 products remain exempt from the RoHS directive until 2012 or 2018 depending upon specific product sub-categories and applications.
    - "Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages."



Classification of Lead Free Challenges

- **Design Challenges**
  - Design rules derived for leaded solder may not be for lead free solder alloys
- **Processing Challenges**
  - Higher reflow temperatures
  - Quality of the reflowed joints depend the heating profile.
    - What is an appropriate heating profile?
    - Design of Oven operating parameters to ensure that profile

http://en.wikipedia.org/wiki/Thermal_profiling



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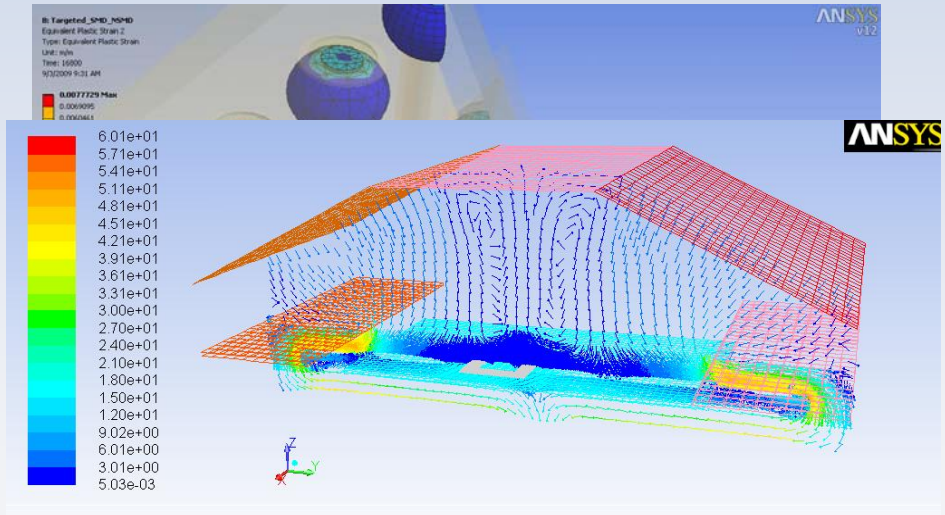
- **Part I:**
  - ANSYS Solutions to Product Design Challenges
- **Part II:**
  - ANSYS Solutions to Process Design Challenges



Overall Conclusions

- **ANSYS Inc**
  - Your partner for comprehensive solutions to your real world engineering problems in electronics design, manufacturing and quality control:
    - High order non-linear physics modeling capabilities
    - Multi physics coupling for cross disciplinary collaboration
    - Flexibility and solver access through UDF/APDL
    - CAD Neutrality for cross-organizational collaboration
    - Workbench platform brings all the above together
    - Pro-active, electronics savvy customer support