

## Safety Highlights for Future Engineers

- Unintentional injuries are the leading cause of death among children. During 2007-2009, the Consumer Product Safety Commission (CPSC) had reports of 341 deaths due to nursery products among children under age 5. In 2011, there were an estimated 74,100 emergency room treated injuries associated with nursery products among children under the age of 5.
- The Consumer Product Safety Improvement Act (CPSIA) of 2008 imposed new safety regulations, though some products still don't have standards or testing requirements.
- Mandatory standards even when they exist can't address all hazards. We look to our future engineers to enter the workforce with a greater consciousness of designing for safety and the importance of product testing.
- In design stage, considerations include: potential hazards of a product, if/how the design addresses the hazard, and if product failure and subsequent injury are possible. Can the product be designed better? Engineers must ask these questions so parents won't have to.
- Standards and hazard analysis must account for human factors. How will the product be used? What are its intended use, likely use, foreseeable use, and possible misuse?
- Product design must consider foreseeable use, along with the manufacturer's suggested use. Parents often are looking for convenience, looks, or status of a product—which does not always imply safety. Product design must work to account for curious, growing children and distracted parents, who will both push the boundaries of intended use.
- Designing a safer product includes looking to anthropometric data, developmental information from pediatricians, injury data from similar products, and research by testing labs to consider all dimensions of use and risk.
- Testing standards assure both conformity and safety, but can be voluntary or mandatory. Standards encompass both performance requirements and test methods. However, they represent minimum requirements only, and must keep up with new types of products.
- Testing methods must be very specific and address specific problems. Consider what problems may arise, and test for that issue. In-house testing and independent testing are viable options, along with the appropriate testing means, methods, and questions.
- When designing for safety— should you find a flaw, determine if you can 1) design the flaw out, 2) guard against the flaw, or 3) use labels and warnings—as a last option. When flaws are overlooked, a product recall may be issued. Recalls fail to reach over 80% of a product's consumers, leaving unsafe products in the home.
- In summary, designing for safety means designing for efficient manufacturing, assembly, robustness, environment, real life use, and profit.

## Resources

- Regulations, Laws & Standards as well as injury data  
[www.cpsc.gov](http://www.cpsc.gov)  
[www. saferproducts.gov](http://www.saferproducts.gov)
- Code of Ethics for Engineers  
<https://www.nspe.org/sites/default/files/resources/pdfs/Ethics/CodeofEthics/Code-2007-July.pdf>
- Basic Elements of Product Safety Engineering  
<http://www.hazardcontrol.com/factsheets/pdfs/basic-elements-of-product-safety-engineering.pdf>
- Design Hazard Analysis  
<http://www.intertek.com/risk-management/design-hazard-analysis/>
- ASTM International- Students page  
<http://www.astm.org/studentmember/index.html>