

Special Committee on Nanotechnology  
WI State Legislature  
Legislative Council  
September 30, 2010

## Nanotechnology

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**WisCon** WI State Laboratory of Hygiene  
Occupational Safety and Health  
Consultation Program

**WSLH** WISCONSIN STATE  
LABORATORY OF HYGIENE

## WisCon Program

- WI State Laboratory of Hygiene  
UW Madison
- Federal OSHA funding
- Voluntary small business assistance  
program

**We assist employers in identifying and  
controlling workplace hazards**

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## Passage of OSH Act

- In 1970 Congress passed the  
Occupational Safety & Health Act  
creating the Occupational Safety &  
Health Administration-OSHA.
- Chorus of complaints from small  
businesses across the country stating  
they did not have the money or the  
expertise to comply with these complex  
standards.

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## 29 CFR 1908 Regulations

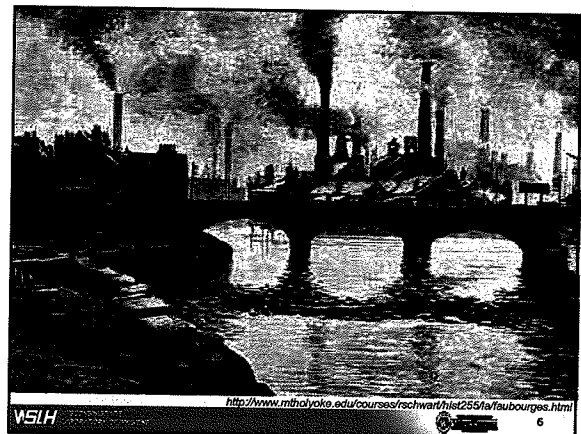
- Congressman Bill Steiger (R-Oshkosh) was  
instrumental in working with the Nixon  
Administration to develop an assistance  
program for small business in every state,  
the OSHA Consultation Program.
- This voluntary program was codified as  
29CFR1908.
- Funding was a 90% OSHA funded grant to  
participating states matched by 10% state  
dollars.
- These consultations are confidential.

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## 29 CFR 1908 Regulations

- Only allowed assistance to small  
companies in the private sector.
- Small is <250 employees at one site  
and <500 employees corporate wide.
- Expected to spend most resources on  
companies with <50 employee.
- Services must be requested by  
management.

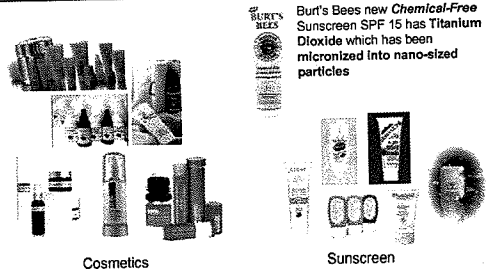
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## Nano-Revolution

- Nanotechnology-the next (current) industrial revolution
- Projected to be a trillion dollar market by 2015
- Enormous promise in diverse areas from medicine and semiconductors to cosmetics and food stabilizers

## Health



Cosmetics

Sunscreen

[http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health\\_products/health/](http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health_products/health/)

## Clothing



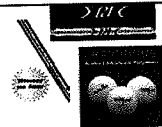
Odor Resistant Socks



Stain Resistant Pants

[http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health\\_products/health\\_products/clothing/](http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health_products/health_products/clothing/)

## Sporting Goods



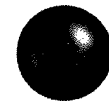
Golf, Shafts / Balls



Bicycles



Tennis Racquets



Bowling Balls

[http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health\\_products/health\\_products/sporting\\_goods/](http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health_products/health_products/sporting_goods/)

## Food Storage



Beer Bottle Plastics



Silver Nano Baby Milk Bottle



Freshet Longer  
More Food Storage  
Food Storage Containers

[http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health\\_products/food\\_beverage/food\\_storage/](http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health_products/food_beverage/food_storage/)

## Food



Canola Active Oil



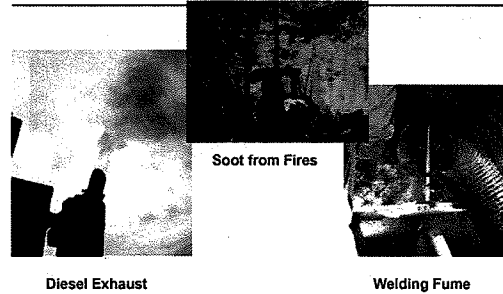
Nanocentials™  
Slim Shake Chocolate

Woodrow Wilson Center [http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health\\_products/food\\_beverage/food/](http://www.nanotechproject.org/inventories/consumer/brands/sunscreen/health_products/food_beverage/food/)

## Nanotechnology Revolution

- R&D and Manufacturing already responsible for hundreds of nano-products on the consumer market
- Science on health & environmental effects lagging
- Actual long-term effects not yet known
- Regulation almost non-existent
- How to address?

## Not so new: Historical Materials



## Safety: Fire and Explosion

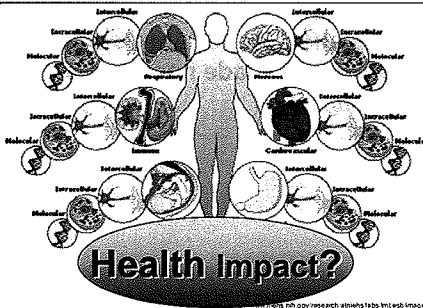


- Nano-scale combustible material could present a higher risk than coarser material of similar quantity given its unique properties [HSE 2004]
- In the case of some metals, explosion risk can increase significantly as particle size decreases.

## Safety: Fire & Explosion

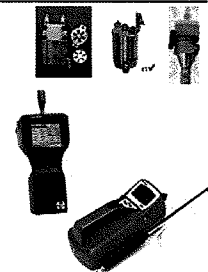
- Depending on their composition and structure, some nano-materials may initiate catalytic reactions and increase their fire and explosion potential that would not otherwise be anticipated from their chemical composition alone [Pritchard 2004].

## Unique Properties

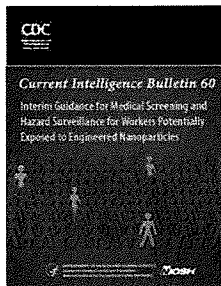
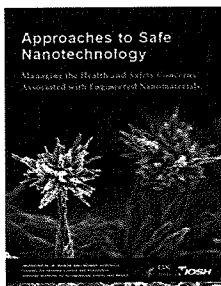


## Measurement Difficulties

- Particle sizing
- Both chemical composition and particle structure are important
- Background levels of particles present
- Nanoscale materials can be more potent, what is the appropriate measure for determining hazard
  - mass, surface area, count



## Controls

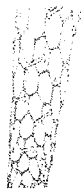


## Primary Recommendations (NIOSH)

- **Take Prudent measures to Control Exposures to Engineered Nanoparticles**
  - Engineering controls
  - Respiratory protection
  - Training
- **Conduct Hazard Surveillance**
- **Continue Established medical Surveillance Approaches**

## Assist in Identification

- **Are companies**
  - knowingly obtaining nanoscale materials?
  - intentionally creating nanoscale materials?
  - unknowingly creating nanoscale materials?
  - unknowingly obtaining nanoscale materials?
- **How do we detect and quantify materials?**



## Why is “knowingly” important?

- **Workers such as custodians could take simple protective measures but must know hazard is present**
  - Wet cleaning
  - N-95 respirator if needed
  - Gloves
  - HEPA vacuum

## Knowingly-downstream users

- **Powder, liquid or embedded nano-material?**
- **Under what conditions can “inert” materials be released?**
- **Traditional Material Safety Data Sheets or MSDS,s under the OSHA Hazard Communication Standard do not provide the needed information on nano-scale materials.**

## How to address “knowingly”

- **One method is a registry of entities that manufacturer or are down stream users of man-made nano-scale materials.**

## How to control poorly defined occupational health hazards?

### Exposure factors working with nano-materials

- Liquids without PPE
- Liquids with high agitation
- Gas generation in non-enclosed systems
- Handling powders
- Equipment maintenance
- Spill clean-up
- Cleaning dust collection systems
- Mechanical disruption causing aerosolization

## Comprehensive Safety & Health Program Management

- **Total Quality Management for workplace safety & Health**
  - Management commitment
  - employee involvement
  - Hazard anticipation & detection
  - Hazard prevention & control
  - Administration & supervision
  - Planning & evaluation
  - Training

## Risk Management for Engineered Nanomaterials

- **Hierarchy of exposure controls**
  - Elimination
  - Substitution
  - Engineering
  - Administrative
  - Personal Protective equipment
    - Including respirators

## SHARP Program

- **Safety & Health Achievement & Recognition Program**
- **Superlative companies that have a fully developed and effective comprehensive safety & health management system in place.**
- **Workplace Safety & Health is on an equal footing with product quality and profit.**

## SHARP Requirements

- **Form 33, no score lower than 2 for any attribute**
- **Injury & Illness rates below national average for past 2 years**
- **Wall-to-wall safety & health consultation**
- **Correct all hazards found**
- **Consultation program manager walk through inspection**
- **Letter from top company management requesting to be part of SHARP program**
- **Approval from Region V OSHA**

## WI SHARP Companies

- Edstrom Industries-Waterford
- Schoenick Containers-New Berlin
- Menasha Packaging-Hartford
- Inland Label & Marketing Services-La Crosse
- Menasha Packaging-Green Lake
- Jensen Metal Products-Racine
- Rehrig Pacific-Pleasant Prairie
- Scot Forge-Clinton
- WASCO-Milwaukee
- Moor's Salvage & Recovery-Keeler
- Rotating Equipment Repair-Sussex
- Portage Plastics-Portage



**Dr. John Howard, Director of NIOSH**

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- NIOSH continues to consider nanotechnology research "...extremely important....We have to do this research very quickly now and in the beginning of this emerging technology...We can't do it towards the middle or end, as it was with asbestos."



**Dr. John Howard**


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- NIOSH also recently entered into an interagency agreement with OSHA on nanotechnology.  
"We want to prevent an entire work force from suffering the same kind of issues as the asbestos work force suffered in the 20th century," Howard said. "That's our motivation."



**Questions / Contact Information**

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