

*The Facts on PVC
&
the Environment*

What do the following have in common?



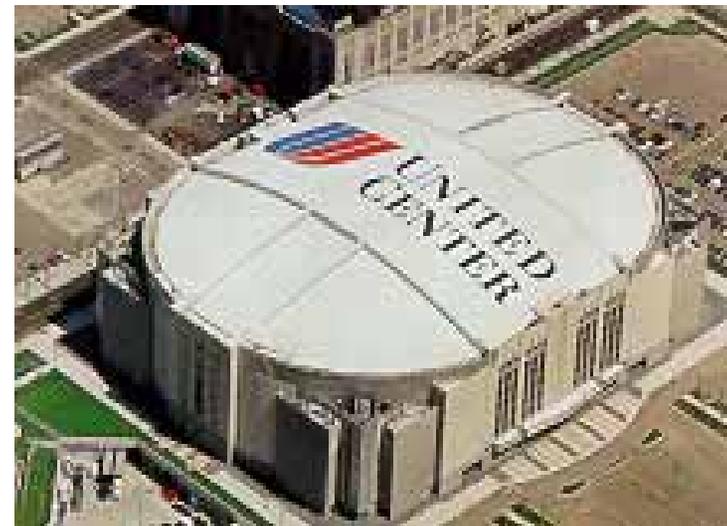
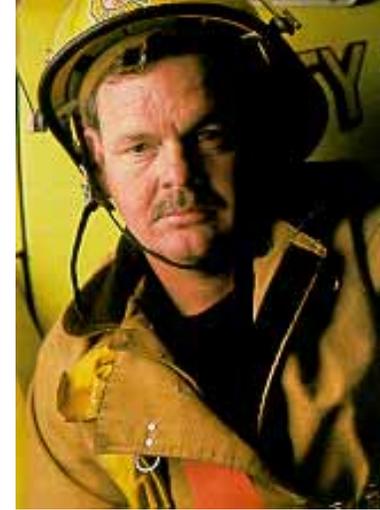
What do the following have in common?



What do the following have in common?



What do the following have in common?



*All are made of, or are
produced, using chlorine*

Chlorine....

- Is the 11th most common of the 107 elements
- Is found in:
 - Rocks
 - Plants
 - Animals
 - Humans

Chlorine is the building block for PVC materials

Crude Oil

Rock Salt

Hydroxide

Ethylene

Chlorine

Vinyl Chloride Monomer

Polyvinyl Chloride

Polyvinyl chloride (PVC) is...



- The second most commonly used plastic in the world (after polyethylene)
- The most widely used plastic in construction applications

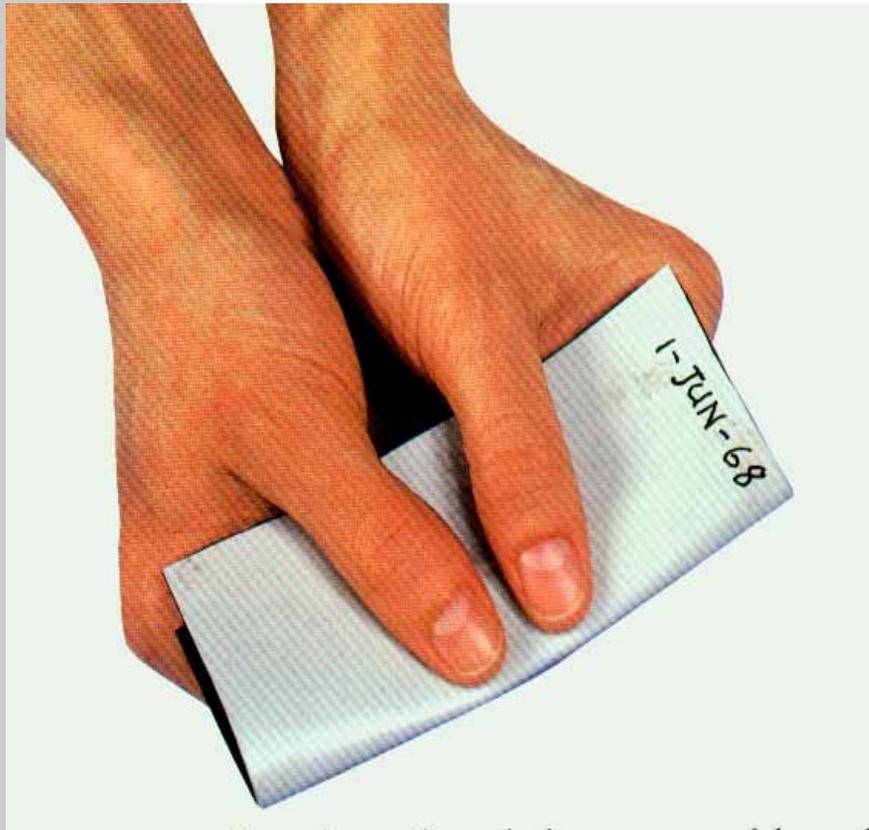
*Over more than half a century,
PVC has established itself as
one the most versatile materials
known to man.*

Unfortunately, Greenpeace has mounted a misguided and misinformed attack on PVC

Greenpeace alleges that PVC:

- Plasticizers are a health hazard
- Is a major source of dioxins
- Cannot be recycled
- Is a hazard in building fires
- Has been banned in Europe

PHTHALATES



- Also known as “plasticizers”
- Phthalates are a family of products used to make PVC flexible

Blue Ribbon Panel

- American Council on Science and Health
- 17 experts from the USA, Canada, Europe
- Led by Dr. C. E. Koop, past Surgeon General
- Primarily baby toys, medical devices (e.g. IV bags)



The panel was unequivocal in their conclusions...

- "...the expert panel could find no solid scientific support for such a claim"
- "...is not harmful for children in the normal use of these toys..."
- "...as used in medical devices, is not harmful to humans even under chronic or higher than average conditions of exposure"

CPSC Upholds Use of DINP in Children's Vinyl Toys!

- "...no demonstrated health risk..."
- "...exposure to DINP would not pose a risk to children..."
- "...voted unanimously to deny an activist petition to ban vinyl from products for children ages 5 and under."



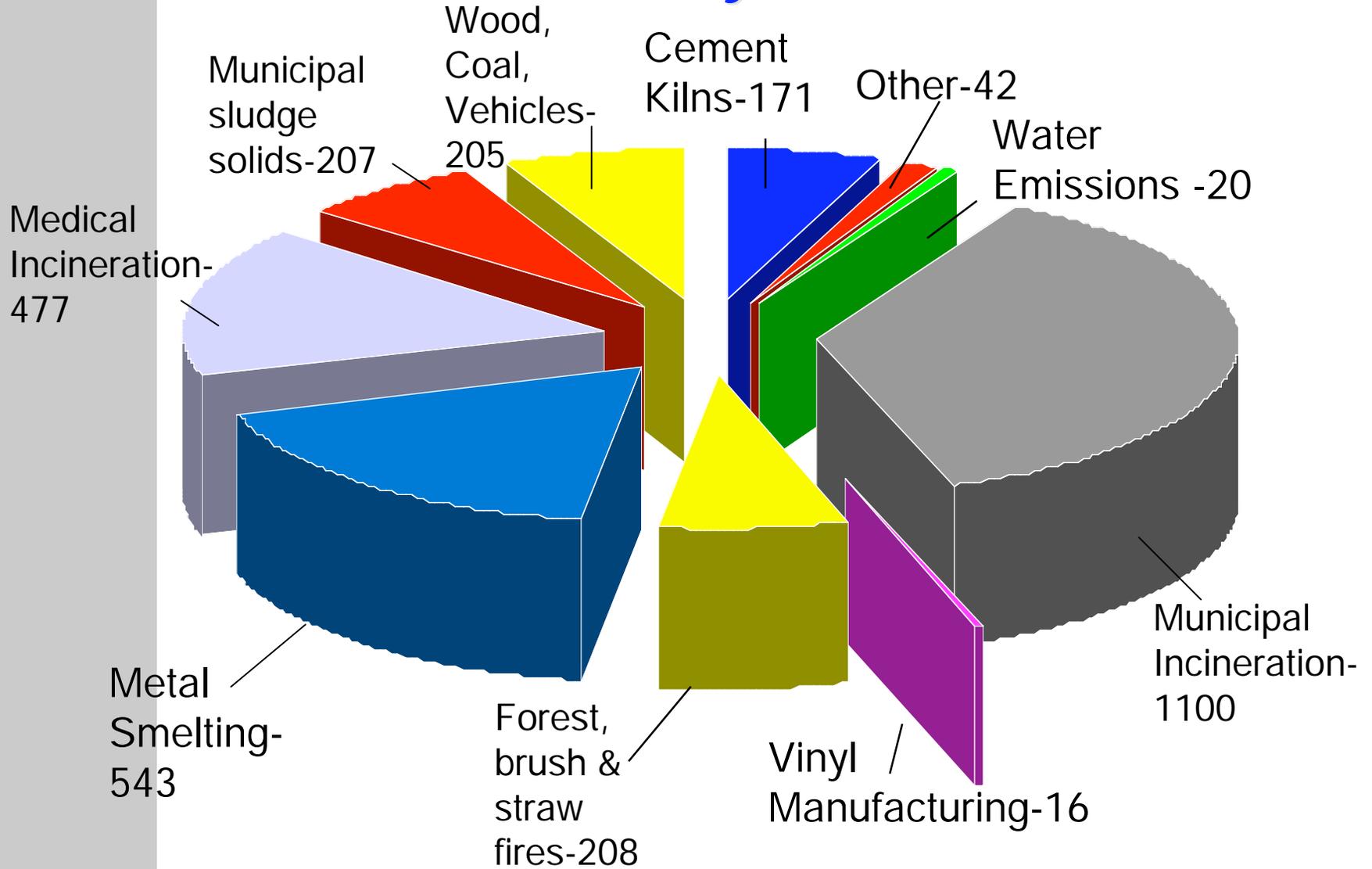
Plasticizers in Medical Devices

- "...the risk in connection with plasticizers is clearly exaggerated . . ."
- DEHP has been removed from the list of "possibly carcinogenic for humans" materials
- "...a clear green light for the use of PVC products in medical applications"

Swedish National Board of Health and Welfare,
January, 2001

PVC, a major source of dioxins?

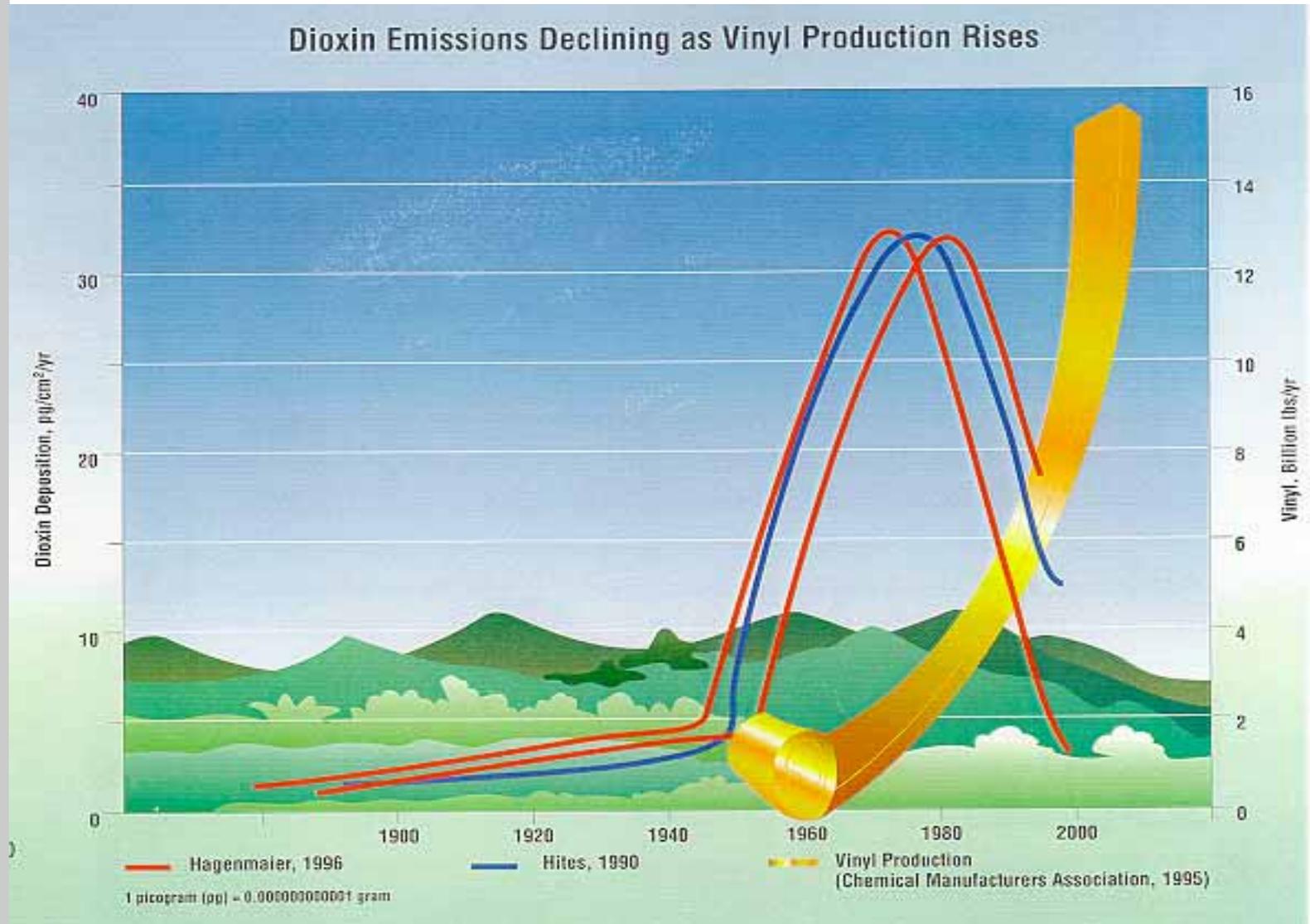
*Dioxin-Like Compound Emissions, 1995
Grams, TEQ, 1995
Source: EPA, Vinyl Institute*



Dioxins from the incineration of PVC?

- ASME study
- 1,900 sets of data
- 169 incinerators worldwide
- Conclusion:
 - "there is no statistical relationship between chlorine in waste streams and dioxin emissions'

Conflicting trends?



Recycling PVC, Walkway Pads



Recycling PVC, Pavement Patch

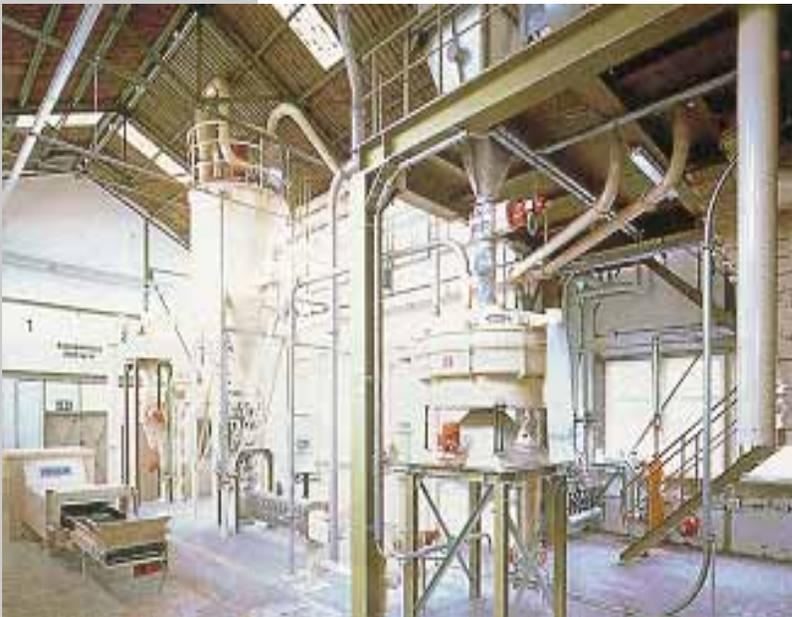


Recycling at the end of the life cycle

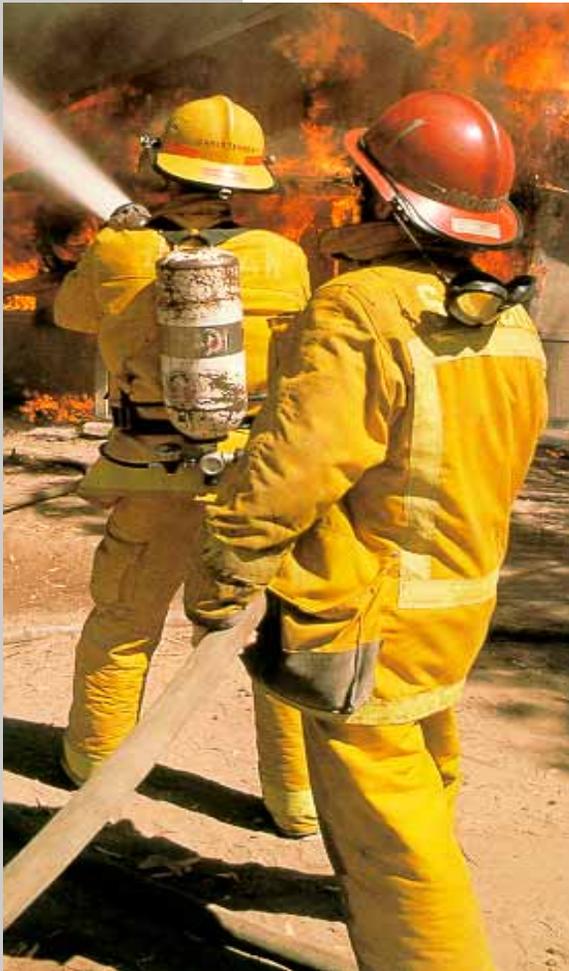


CFFA

AfDR, Germany



PVC generates toxic HCL in fires?



- Harvard U/ Boston FD
- Southwest Research Inst./ San Antonio FD
 - Real building fires generate < 3% HCL estimated to be required to cause incapacitation/ death
- CO is the killer in fires
- No known deaths related to PVC in building fires

CFFA

National Fire Protection Agency



- Fires involving vinyl are no more toxic than any other building fires

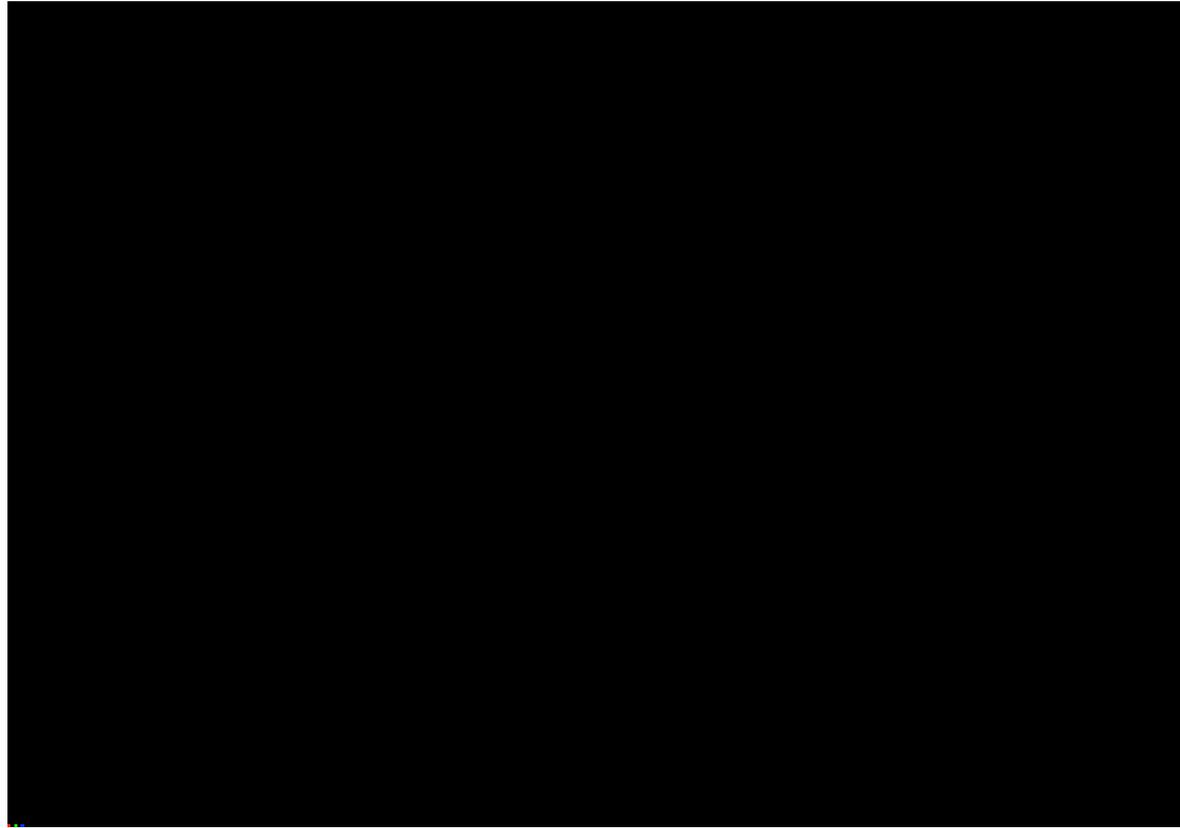
Fact: PVC is the top performing material in fire situations



- PVC
 - Burns slowly
 - Does not support combustion
 - Extinguishes when source of flame is removed

FIRE TEST VIDEO

To run video, click on black square while PowerPoint is in Slide mode

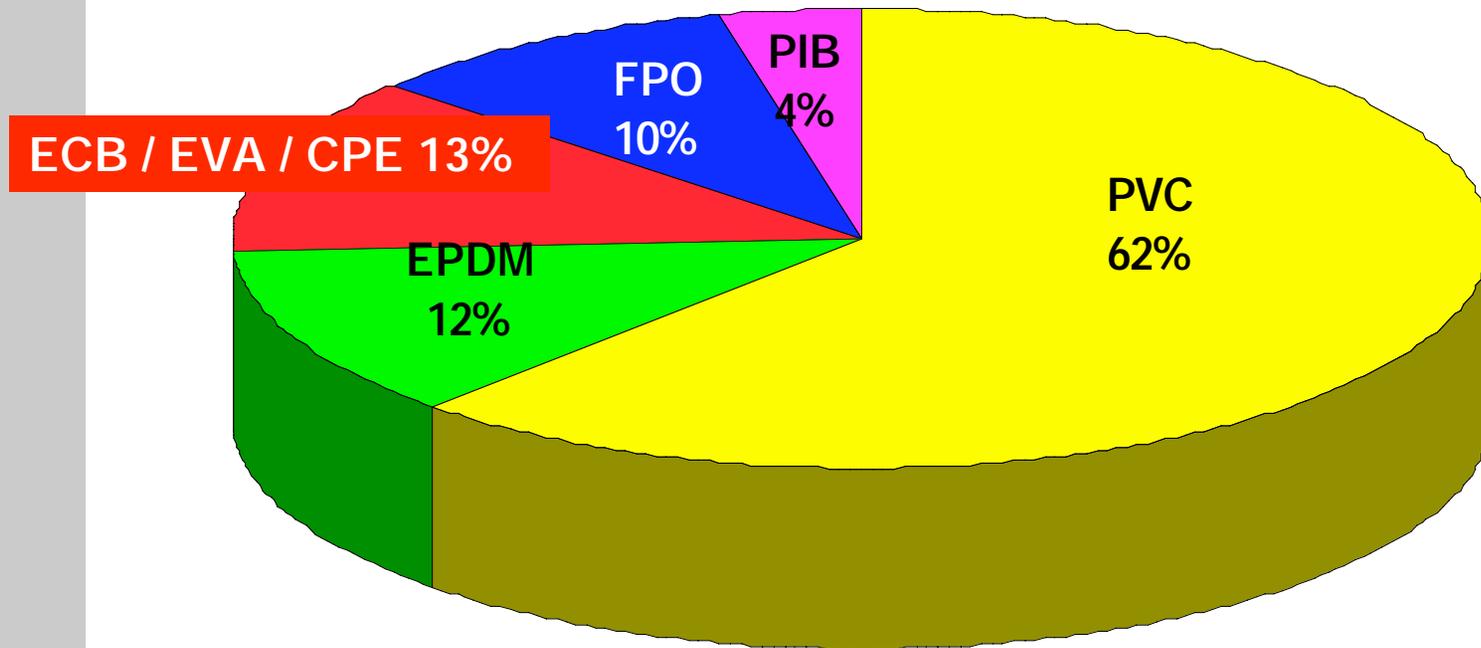


PVC banned in Europe?

- A few high profile cases in the late 1980s and the early 1990s (e.g. Berlin, Germany)
- In all cases bans have been overturned
 - PVC “risks” were found to be exaggerated
 - PVC’s record with regards to safety, performance and environmental profile

Flat Roofing Market Europe Polymeric Membranes in Millions

Total 70 Million



The European Market for Polymeric Single Ply Roofing Membranes and Competitive Products
(2002) AMI Consulting, AMI House 45-47 Stokes Croft, Bristol, BS1 3QP United Kingdom

Polymeric Flat Roofing Market in Europe

"TPOs share has yet to reach 10%, despite a massive build up of capacity by established producers of both polymeric and bitumen systems. There have been some reservations over the material's handling and installation characteristics but with the direct threats to PVC evaporating, the role and position of TPOs is less clear than seemed likely 2-3 years ago."

Polymeric Flat Roofing Market in Europe

"PVC remains the overwhelming popular material, accounting for 61.6% of the total. The recent concerns over PVC's environmental credentials have largely been withstood, rebuffed and placed in a more sober context. The material has emerged as the most cost effective and proven single ply option."

***Environmental News
Checklist for Environmentally
Responsible Design & Construction***

MATERIALS

Environmental News

Checklist for Environmentally Responsible Design & Construction

13 Durability



Accelerated weathering tests confirm that satisfactory retention of physical properties is achieved. All available evidence indicates that the PVC Roof Covering System should have a life in excess of 25 years.

Environmental News

Checklist for Environmentally Responsible Design & Construction

Durable Materials: ✓
Low Maintenance:



Environmental News

Checklist for Environmentally Responsible Design & Construction

Durable Materials: ✓

Low Maintenance: ✓

Low Embodied Energy:

PVC requires less energy than other plastics to produce, significantly less than metal and other construction materials

Environmental News

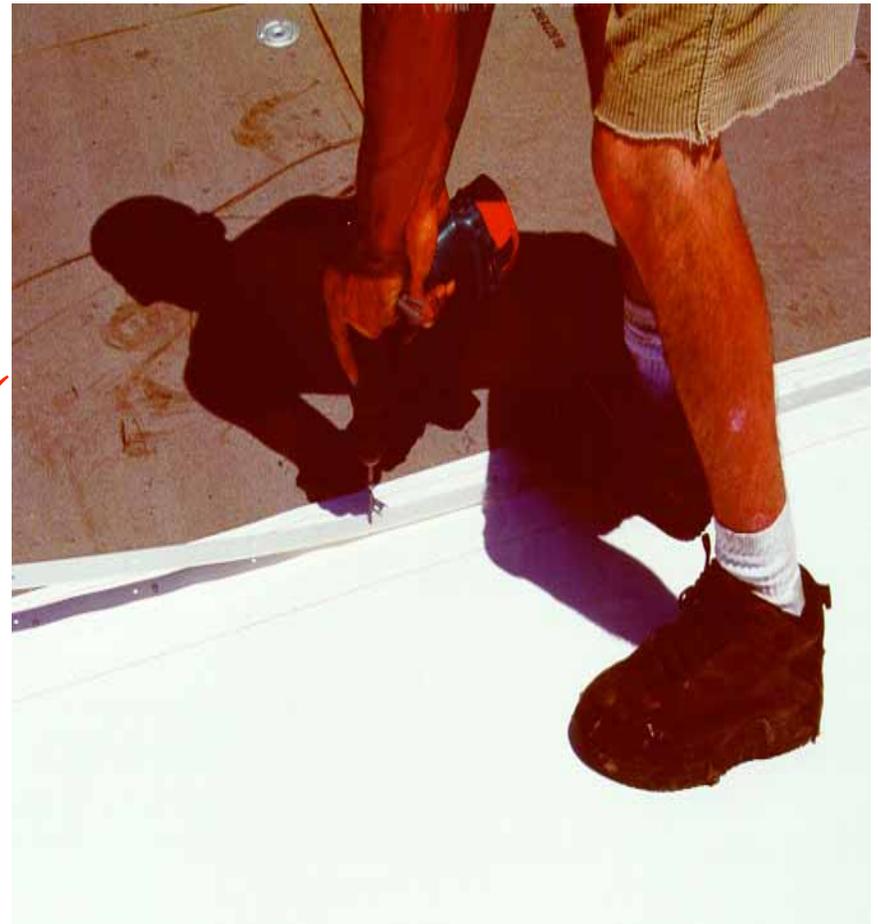
Checklist for Environmentally Responsible Design & Construction

- Durable Materials: ✓
- Low Maintenance: ✓
- Low Embodied Energy: ✓
- Recycling:



Environmental News Checklist for Environmentally Responsible Design & Construction

- Durable Materials: ✓
- Low Maintenance: ✓
- Low Embodied Energy: ✓
- Recycling: ✓
- Avoid VOCs:



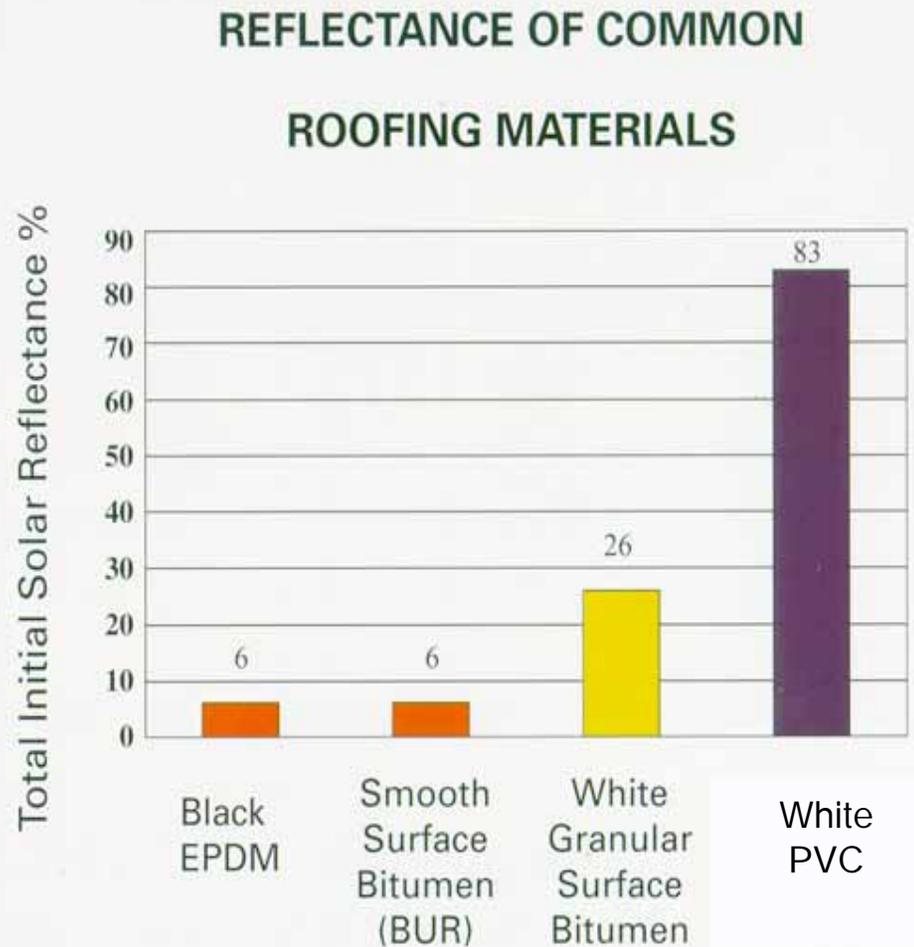
PVC roof membranes stack up well

- Durable Materials: ✓
- Low Maintenance: ✓
- Low Embodied Energy: ✓
- Recycling: ✓
- Avoid VOCs: ✓

PVC roof membranes also....

- uses less non renewable raw materials
- is highly reflective, resulting in energy savings and a reduction in the urban heat island effect

Reflectivity



Source: Cool Roofing Material Database/Lawrence Berkeley National Laboratory
<http://eetd.lbl.gov/CoolRoof/membrane.htm>

What is the reflectivity of some of the most common roofing products on the market today?

ENERGY STAR[®] Products



The DOE and EPA have established an ENERGY STAR Roofs Products Program. ENERGY STAR is an innovative government/industry partnership that makes it easy for businesses to save substantially on their bills and protect the environment. In the year 2000, these savings equaled more than \$5 billion dollars.

Leadership in Energy and Environmental Design (LEED)

- All Energy Star rated materials contribute one point
- If the project is within 500 miles of PVC membrane manufacturers, that will contribute towards another point
- PVC roofing membranes have been used on many LEED certified projects

CFFA

*The Donald Bren Center
U of C, Santa Barbara*

Platinum Level Certified



CFFA

*Hewlett Foundation,
Menlo Park, CA*

Gold Level Certified



CFFA

*Ford Motor Company
Premier Automotive Group N.A.
HQ
Irvine, CA*



*Chicago City Hall
Green Roof Pilot
Project*

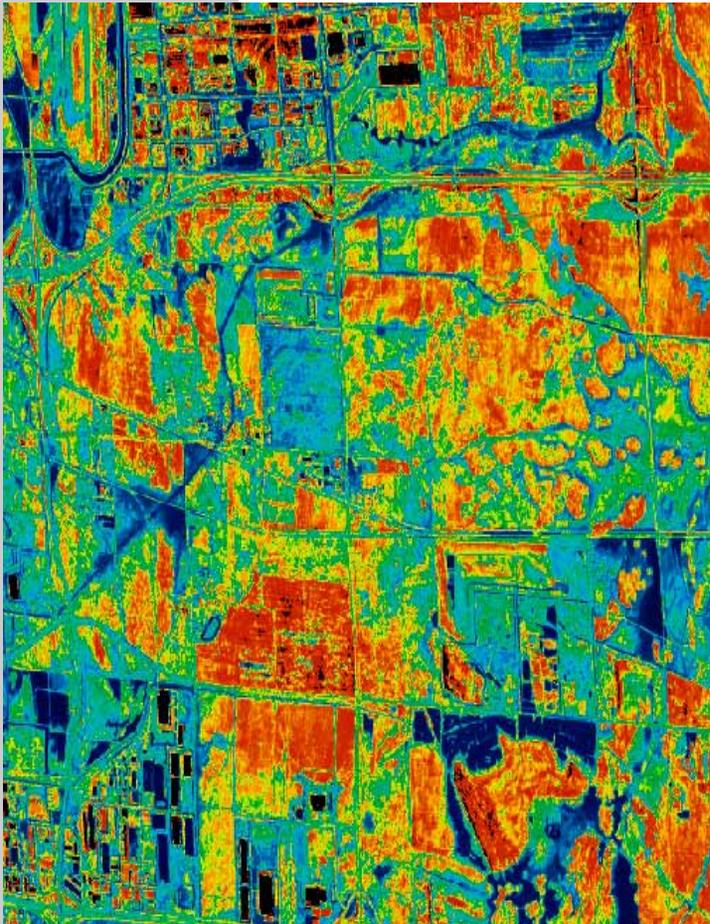


“The Latest Phony Chemical Scare” The Wall Street Journal, 06/22/99

- “This ceaseless obsession with ousting the frequently non-existent bogeyman from our chemical cornucopia does quite a lot to strengthen the ranks of consumer groups, but very little to actually improve the health and quality of our lives”
- “I urge the nation’s consumer watchdogs not to drop their vigilance but to raise their standards”

Dr. C. Everett Koop, former Surgeon General

PVC's future is cooler than ever



Scientists, NASA, the Environmental Protection Agency, the Department of Energy and the U.S. Government are recognizing the benefits of white reflective roofing.

PVC's future is cooler than ever



In 2000, the U.S. Department of Energy and the Environmental Protection agency conducted a study where a large retail store replaced a 100,000 sq. ft. black EPDM roof with a white PVC roof. The study confirms that the roof membrane reduced average summertime air conditioning peak demand (1-4pm) by 14 percent and the total daily air conditioning energy usage by 11 percent.

Furthermore, researchers estimated the total *annual* air-conditioning savings to be \$7,200 or 7.2 cents per square foot.

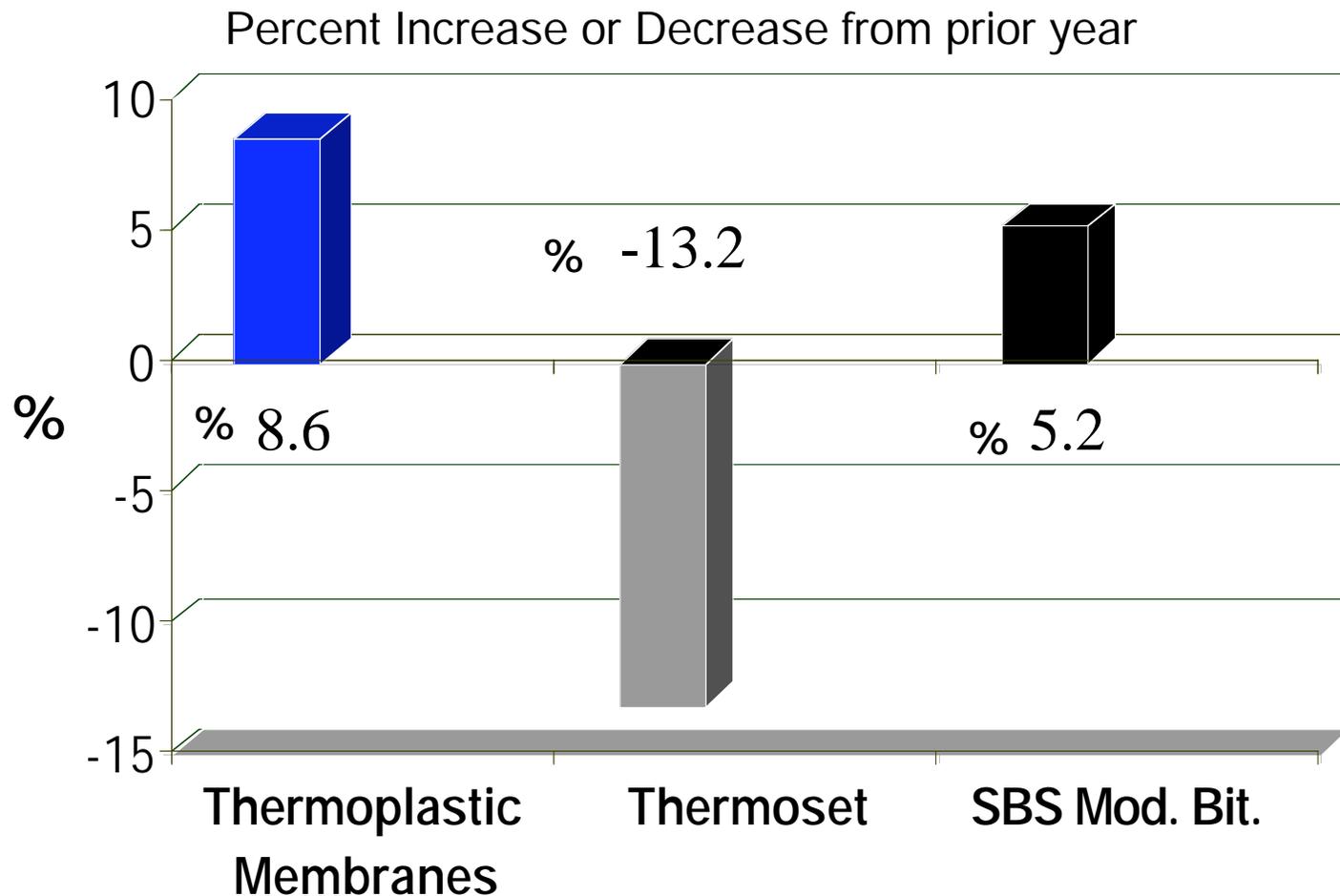
White Reflective Roofs Provide the Following Benefits:

- Provide energy savings to the owner because white roofs reflect heat from building.
- Reduce ambient air temperature (major factor in reducing urban heat islands).
- Improve air quality (reduces smog formation).



Growth which is outpacing the industry and the segment

SPRI 2002 Shipments (Square Footage) SPRI = Single Ply Roofing Institute



PVC, Environmentally Safe and Sound!

- Energy Efficient
- Improves Air Quality
- Long Lasting
- Solvent Free Applications
- Low Maintenance
- Recycling Options

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