

Introduction to VCM

Vinyl chloride monomer (VCM) is a basic chemical building block and is mainly used as a raw material in the production of polyvinyl chloride (PVC). PVC is used to make "vinyl" products such as wallcoverings, upholstery, flooring, house siding, water and sewer pipe, luggage, clothing, automotive parts, medical devices, food wrap, window frames, wire insulation, garden hoses, and phonograph records.

Approximately 13 billion pounds of VCM is manufactured in the United States each year. About five billion pounds of VCM was transported by railroad tank cars in 1992.

VCM Release: Potential Hazards to the Community

Fire and Explosion Hazards

In gaseous form, vinyl chloride is extremely flammable. A gas cloud may form if a release occurs. If ignited, such a cloud could result in an explosion. Also, vinyl chloride vapors, which are heavier than air, may travel along the ground and could be ignited by distant ignition sources. Therefore, if there is a serious leak, the public would be asked to evacuate at least one-half mile from the scene of the incident.

Short-Term Exposure Toxicity

When VCM is present in sufficiently high vapor concentrations - about 10,000 parts per million (ppm) - the vapor has an anaesthetic effect. The odor of VCM can usually be detected when it reaches a concentration of 1000 ppm. Since VCM liquid vaporizes very quickly, the liquid becomes cold. If skin is exposed to the liquid, frostbite will occur.

Long-Term Exposure Toxicity

There should be no long-term or chronic health problems even if any person was exposed to low concentrations of VCM for a number of days. Prior to development of advanced process and emission control technology, long-term exposure to VCM at higher concentrations over a number of years resulted in a rare liver cancer among some workers.

CMA 028411

DRAFT DRAFT DRAFT

VCNet VCM Railroad Tank Car Emergency Response Press Information

PURPOSE:

The purpose of this pamphlet is to provide you with information that can be given to journalists, news and TV reporters at the time of a VCM Tankcar incident.

The news media are the prime transmitters of information during an accident or an incident. They play a critical role in influencing the public's perception and opinions. It is therefore very important to provide the news media with accurate easy to understand information. Below are some guidelines in dealing with the news reporters:

Guidelines:

Use simple, non technical language. Avoid technical jargon.

Avoid distant, abstract, unfeeling language about the accident, particularly if there were injuries due to the accident.

INTRODUCTION TO VCM

Vinyl Chloride Monomer (VCM) is a basic chemical building block and is mainly used as a raw material ~~used~~ in the production of Polyvinyl Chloride (PVC). PVC is used to make "vinyl" products such as wallcoverings, upholstery, flooring, house siding, water pipes, sewer pipes, luggage, clothing, automotive parts, medical devices, food wrap, window frames, wire insulation, garden hoses, and phonograph records.

More than 15 billion pounds of VCM is manufactured in the USA. Approximately 5 billion pounds of VCM was transported by railroad tankcars in 1992.

TANKCAR INCIDENT HISTORY

The most recent catastrophic incident involving VCM tankcars occurred on September 28, 1982. Approximately \$25,000,000 of damage resulted due to a Railroad wreck involving VCM tankcars. VCM leaked from the damage tankcars and caught on-fire. This accident occurred in Livingston, Louisiana. There were no deaths due to this

incident. Earlier in the 1960's and 1970's there were more frequent serious accidents resulting in VCM releases causing serious fires and deaths. Since 1982, there have not been any really serious fires or injuries due to VCM tank car incidents. Much of this improvement in performance can be contributed to improvements and changes in tank car design. The Tank Cars have been made stronger resulting in fewer VCM releases when the tank cars have been damaged in Railroad wrecks. Many of the Tank cars now have insulated double shells instead of the old single shell design. Also many of the Tank cars now have reinforced full head shields at each end of the Tank car. These shields are designed to protect the ends of the tank cars from being pierced during a wreck. The success of these new design additions have probably prevented serious releases of VCM and incidents. For instance in 1991 and 1992 there were at least 4 serious railroad wrecks involving VCM tankcars. Many of the tankcars were derailed and experienced serious damage to the shells of the tank cars, but none of these tank cars leaked any VCM.

VINYL CHLORIDE TRANSPORTATION NETWORK (VCNet) is a mutual aid network that can respond to vinyl chloride distribution incidents. The members of VCNet consist of the VCM manufactures in the USA. Members of VCNet include: The BFGoodrich Chemical Group, Borden Chemical and Plastics, Dow Chemical Company, Formosa Plastics Corporation, Georgia Gulf Corporation, Occidental Chemical Corporation, PPG Industries, Inc., and Vista Chemical Company.

VCNet members developed a composite vinyl chloride transportation map that includes information on their "advisory" and "hands-on" response capabilities. In addition to member company resources, the Panel is also completing contracts with private, for-hire emergency response contractors to supplement the network's response capabilities.

Shippers of vinyl chloride will be able to activate the network (VCNet), through CHEMTREC 24 hours a day. Through public outreach VCNet will coordinate its activities with railroad and community emergency response teams.

The Vinyl Chloride Panel has also developed a vinyl chloride safety awareness training manual and has conducted several workshops on vinyl chloride safety for industry and first responders. The workshops are intended to provide emergency response personnel from both the private and public sectors with a better understanding of the principles and techniques involved in responding to a hazardous materials incident involving vinyl chloride monomer (VCM). Workshop presenters provide instruction on the safe approach and assessment of an incident, and proper handling techniques to follow during an emergency response. Attendees also participate in a simulated VCM transportation incident.

HEALTH HAZARDS

Acute Toxicity - When VCM is present in sufficiently high vapor

concentrations (about 10,000 ppm) the vapor has an anaesthetic action. You can usually smell VCM when it reaches a concentration of 1000 ppm. Incidentally, to give you the sense and an idea of how small 1 ppm is: it is equivalent to 1 inch in 16 miles or 1 oz. of vermouth in 7800 gallons of gin. The emergency responders must determine the concentration of the VCM in the air before entering the incident area. If there are concentrations above 5 ppm, or could potentially reach that concentration, the emergency responders will use their respiratory protection equipment. Since VCM liquid vaporizes very quickly, the liquid becomes cold and if the skin gets exposed to the liquid, frostbite of the skin will occur.

Chronic Toxicity - Repeated VCM exposure of workers in PVC and VCM plants in the 1940's, 50's, 60's, and 70's has resulted in a deadly liver cancer in these workers. In the early 70's it was discovered and recognized that long term exposure to VCM could cause Angiosarcoma, a rare liver cancer; at that time industry and OSHA took additional measures to prevent the workers from VCM exposure. There are no known deaths of people outside of the factories that were caused by long term exposure to VCM. The people who may have been exposed to short term low concentrations of VCM did not develop cancer from VCM exposure.

Fire and Explosion Hazards - Vinyl Chloride is an extremely flammable gas. The vapors are heavier than air and may travel along the ground or may be ignited by ignition sources at distant locations.

EMERGENCY RESPONSE TRAINING:

Although, there has been emergency response training and VCM safety awareness training sessions by individual VCM producers and users in the past, the training has been intensified in the last three years. Through the cooperation and coordination of the VCM producers and VCMet, the VCM emergency response training also includes training of emergency response personnel from: Fire Departments, Police Departments, Rail Road Companies, Safety and Environmental Agencies, and Emergency Response "For Hire" Contractors. In the last three years there have been 10 emergency response-VCM safety awareness workshops through out the Country. Over 400 people have been trained at these workshops. A VCM Tank Car Emergency Response Manual has been prepared and a Video will soon be available.

CONCLUSION: The above information has been prepared for your use and reference, if you would like additional information, please contact Dr. Has Shah the Chemical Manufacturers Association at 202-887-1192.

VCNet VCM RAILROAD TANK CAR

Emergency Response Press Information

HANDOUT

INTRODUCTION TO VCM:

Vinyl chloride monomer (VCM) is a basic chemical building block and is mainly used as a raw material in the production of polyvinyl chloride (PVC). PVC is used to make "vinyl" products such as wallcoverings, upholstery, flooring, house siding, water and sewer pipe, luggage, clothing, automotive parts, medical devices, food wrap, window frames, wire insulation, garden hoses, and phonograph records.

Approximately 13 billion pounds of VCM is manufactured in the United States each year. About five billion pounds of VCM was transported by railroad tank cars in 1992.

VCM RELEASE - POTENTIAL HAZARDS TO THE COMMUNITY:

Fire and Explosion Hazards

In gaseous form, vinyl chloride is extremely flammable. A gas cloud may form if a release occurs. If ignited, such a cloud could result in an explosion. Also, vinyl chloride vapors, which are heavier than air, may travel along the ground and could be ignited by distant ignition sources. Therefore, if there is a serious leak, the public would be asked to evacuate at least one-half mile from the scene of the incident.

Short-Term Exposure Toxicity

When VCM is present in sufficiently high vapor concentrations - about 10,000 parts per million (ppm) - the vapor has an anaesthetic effect. The odor of VCM can usually be detected when it reaches a concentration of 1000 ppm. Since VCM liquid vaporizes very quickly, the liquid becomes cold. If skin is exposed to the liquid, frostbite will occur.

Long-Term Exposure Toxicity

There should be no long-term or chronic health problems even if any person was exposed to low concentrations of VCM for a number of days. Prior to development of advanced process and emission control technology, long-term exposure to VCM at higher concentrations over a number of years resulted in a rare liver cancer among some workers.

If you have questions, I will try to get the answers for you.

May 12, 1993

CMA 028415