NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing

Norfolk Southern Railway general merchandise freight train 32N derailment with subsequent hazardous material release and fires, in East Palestine, Ohio, on February 3, 2023

GROUP	D
EXHIBIT	
27	

Agency / Organization

Oxy Vinyls, LP

Title

Oxy Vinyls SDS Source 1 Hazardous Substances Data Bank, Excerpts

Docket ID: **DCA23HR001**

Chemical Safety & Handling

DOT Emergency Guidelines (Complete)

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Fire or Explosion: EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Silane (UN2203) will ignite spontaneously in air. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Health: Vapors may cause dizziness or asphyxiation without warning. Some may be toxic if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Public Safety: CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind, uphill and/or upstream. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Protective Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Evacuation: Large Spill Consider initial downwind evacuation for at least 800 meters (1/2 mile). Fire If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. [FLAG] In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391). /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Fire: DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. Small Fire Dry chemical or CO2. Large Fire Water spray or fog. Move containers from fire area if you can do it without risk. Fire involving Tanks Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ Spill or Leak: ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded. Stop leak if you can do it without risk. Do not touch or walk through spilled material. Do not direct water at spill or source of leak. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Prevent entry into waterways, sewers, basements or confined areas. Isolate area until gas has dispersed. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

/GUIDE 116P GASES - FLAMMABLE (Unstable)/ First Aid: Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Move victim to fresh air. Call 911 or emergency medical service. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Remove and isolate contaminated clothing and shoes. In case of contact with liquefied gas, thaw frosted parts with lukewarm water. In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin. Keep victim calm and warm. /Vinyl chloride, stabilized/

U.S. Department of Transportation. 2016 Emergency Response Guidebook. Washington, D.C. 2016
PEER REVIEWED

NFPA Hazard Classification

2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

2 - Materials that readily undergo violent chemical changes at elevated temperatures and pressures.

W - No water: Materials that react violently or explosively with water.

Fire Potential

A very dangerous fire hazard when exposed to heat or flame, or oxidizers. Large fires of this material are practically inextinguishable.

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3675
PEER REVIEWED

Flammable gas. /Vinyl chloride, inhibited/

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 49-154
PEER REVIEWED

Flammable Limits

Lower flammable limit: 3.6% by volume; Upper flammable limit: 33.0% by volume

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-115
PEER REVIEWED

Flash Point

Gas (-108.4 °F (-78 °C)) - open cup.

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-115
PEER REVIEWED

-78 °C (-112 °F) - closed cup

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Cambridge, UK: Royal Society of Chemistry, 2013., p. 1858
PEER REVIEWED

Autoignition Temperature

882 °F (472 °C)

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-115
PEER REVIEWED

Immediately Dangerous to Life or Health (IDLH)

NIOSH considers vinyl chloride to be a potential occupational carcinogen.

NIOSH. NIOSH Pocket Guide to Chemical Hazards. Department of Health & Human Services, Centers for Disease Control & Prevention. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010). Available from: https://www.cdc.gov/niosh/npg
PEER REVIEWED

Fire Fighting Procedures (Complete)

If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. /Vinyl chloride, stabilized/

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 931
PEER REVIEWED

Evacuation: If fire becomes uncontrollable or container is exposed to direct flame, consider evacuation of one-half mile radius. /Vinyl chloride, stabilized/

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 931
PEER REVIEWED

Use dry chemical or carbon dioxide extinguishers. ... Do not extinguish fire unless the flow of gas can be stopped and any remaining gas is out of the line. Specially trained personnel may use fog lines to cool exposures and let the fire burn itself out. ... If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors, or shows any signs of deforming), withdraw immediately to a secure position. If cylinders are exposed to excessive heat from fire or flame contact, withdraw immediately to a secure location. ... The only respirators recommended for firefighting are self-contained breathing apparatuses that have full face-pieces and are operated in a pressure-demand or other positive-pressure mode.

Pohanish, R.P. (ed). Sittig's Handbook of Toxic and Hazardous Chemical Carcinogens 6th Edition Volume 1: A-K,Volume 2: L-Z. William Andrew, Waltham, MA 2012, p. 2703
PEER REVIEWED

Stop flow of gas before extinguishing fire. Fight fire from protected location or maximum possible distance. Use water spray, dry chemical, foam, or carbon dioxide. Use water spray to keep fire-exposed containers cool. Use flooding quantities of water as fog. /Vinyl chloride, inhibited/

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 49-154
PEER REVIEWED

Firefighting Hazards (Complete)

Vapors are heavier than air and may travel to a source of ignition and flash back. ... Closed containers may rupture violently when heated. /Vinyl chloride, inhibited/

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 49-154
PEER REVIEWED

Fire may restart after it has been extinguished. ... Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions.

Pohanish, R.P. (ed). Sittig's Handbook of Toxic and Hazardous Chemical Carcinogens 6th Edition Volume 1: A-K,Volume 2: L-Z. William Andrew, Waltham, MA 2012, p. 2703
PEER REVIEWED

Explosive Limits and Potential (Complete)

Vinyl chloride forms explosive mixtures with air. WHO/International Programme on Chemical Safety; Health and Safety Guide No. ??enter document number, name of chemical (year)??. Available from, as of ??enter date, e.g. August 26, 2014??:

WHO/International Programme on Chemical Safety; Health and Safety Guide No. 109, Vinyl Chloride (1999). Available from, as of August 21, 2018: https://www.inchem.org/pages/hsg.html
PEER REVIEWED

lel: 4%, uel: 22%

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3675
PEER REVIEWED

A severe explosion hazard in the form of vapor when exposed to heat or flame.

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3675
PEER REVIEWED

Lower explosive limit in air: 3.6% by volume at room temperature; Upper explosive limit in air: 33.0% by volume at room temperature

NIOSH. NIOSH Pocket Guide to Chemical Hazards. Department of Health & Human Services, Centers for Disease Control & Prevention. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010). Available from: https://www.cdc.gov/niosh/npg
PEER REVIEWED

Hazardous Reactivities and Incompatibilities (Complete)

On treatment with strong alkalis at high temperatures it loses hydrogen chloride.

IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Geneva: World Health Organization, International Agency for Research on Cancer, 1972-PRESENT. (Multivolume work). Available at: https://monographs.iarc.fr/ENG/Classification/index.php, p. V19 378 (1979)
PEER REVIEWED

Can react vigorously with oxidizing materials. Can explode on contact with oxides of nitrogen.

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3675
PEER REVIEWED

Copper, oxidizers, aluminum, peroxides, iron, steel. [Note: polymerizes in air, sunlight, or heat unless stabilized by inhibitors such as phenol. Attacks iron and steel in presence of moisture.]

NIOSH. NIOSH Pocket Guide to Chemical Hazards. Department of Health & Human Services, Centers for Disease Control & Prevention. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010). Available from: https://www.cdc.gov/niosh/npg
PEER REVIEWED

Incompatibilities: Copper, oxidizers, aluminum, peroxides, iron, steel. Polymerizes in air, sunlight, heat, and on contact with a catalyst, strong oxidizers, and metals, such as aluminum and copper, unless stabilized by inhibitors, such as phenol. Attacks iron and steel in the presence of moisture.

Pohanish, R.P. (ed). Sittig's Handbook of Toxic and Hazardous Chemical Carcinogens 6th Edition Volume 1: A-K,Volume 2: L-Z. William Andrew, Waltham, MA 2012, p. 2700
PEER REVIEWED

An explosion in a valve in a liquid monomer line was ascribed to traces of oxides of nitrogen remaining after the valve had been passivated by treatment with nitric acid.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 244
PEER REVIEWED

Vinyl chloride tends to self-polymerise explosively if peroxidation occurs ... .

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 244
PEER REVIEWED