D-5-2

Benzene file

DEADLY BENZOL STILL WITH US

By DeWitt Huffman, P. E., Chief, Engineering and Hygiene, Division of Safety and Hygiene

THIS IS A NO!! NO!! IF GLUE CONTAINS BENZOL!!

THIS IS A NO!! NO!! POURING BENZOL INTO ANOTHER CONTAINER!!

WHAT IS IT? . . . IS IT SAFE? ALWAYS READ THE LABEL!!

A physician phoned the Safety and Hygiene Division, saying he had a patient suffering from leukemia. The physician suspected that the patient had exposure to benzol (benzene). An investigation by this Division showed that the patient, who became a claimant, had been exposed to concentrations well in excess of the safe limit. Of course, when this exposure was called to the attention of the employer he immediately corrected it. All he had to do for a safe operation was provide a well designed, ventilated booth. The claimant was making an exotic chemical which required benzol. He subsequently died.

Beyond the TLV Is Danger

The safe limit—TLV (Threshold Limit Value)—for benzol is 25 ppm (parts per million). This is a "ceiling" value which should never be exceeded. The American National Standards Institute (ANSI) has set a standard of 10 ppm for benzol.

To the layman, TLV is largely meaningless or incomprehensible, Dr. L. H. Ballou. of Firestone, expressed the concept of ppm very well as follows:

1 ppm is a minute in 2 years:

1ppm is a gram needle in a ton of hay;

1ppm is an inch in 16 miles;

1 ppm is one cent in $10,000.

One-fifth of a teaspoon of benzol will saturate an ordinary room 10' x 10' x 8' to the TLV. If you can smell benzol it is way too much. It is in the danger zone. Benzol can be absorbed through the skin as well as taken in through the lungs by breathing.

Many years ago a physician reported a suspected case of a female employe being poisoned by benzol. She was cementing plastic parts together. Benzol was wed because it Stank" less than other less toxic solvents. Once it was found in one plant, we suspected all other plants doing a similar operation. A rapid survey was made of the plastic industry in Ohio and no other plant was found in which benzol was being used as a cement.

Benzol May Possibly Be Found in Paint Remover

We recently received a communication from the U.S. Public Health Service (USPHS) stating that substantial quantities of benzol were being used in a compound for the removal of varnish and paint from old furniture. The benzol was being used in the smaller furniture shops. The USPHS is taking steps to eliminate benzol from paint remover.

Petroleum naphtha may contain substantial amounts of benzol. In fact, this Division found 40 per cent benzol in one sample but apparently the benzol got into the naphtha by mistake. This situation was also corrected.

Dr. Hervey B. Elkins wrote two articles on "Industrial Benzene Exposure from Petroleum Naphtha," which appeared in the January-December 1961 and the March-April 1963 *American Industrial Hygiene Association Journal*. He stated, "Benzene is present in certain naphtha solvents in amounts varying up to 9.3 per cent by weight." It behooves anyone who is using a petroleum solvent to be sure that solvent does not contain excessive quantities of benzene.

According to the Hygienic *Guide Series* on benzene, published by the American Industrial Hygiene Association, atmospheric concentrations immediately hazardous to life are 19,000 to 20,000 ppm within 5 to 10 minutes. This publication states:

The most significant toxic effect of benzene is insidious and often irreversible injury to the blood-forming tissue resulting most commonly from repeated low-level chronic exposures. Human exposure to concentrations in excess of 150 ppm may cause headache. weariness, loss of appetite and lassitude with incipient bloocl effects including decreased red cell counts, mild lym-

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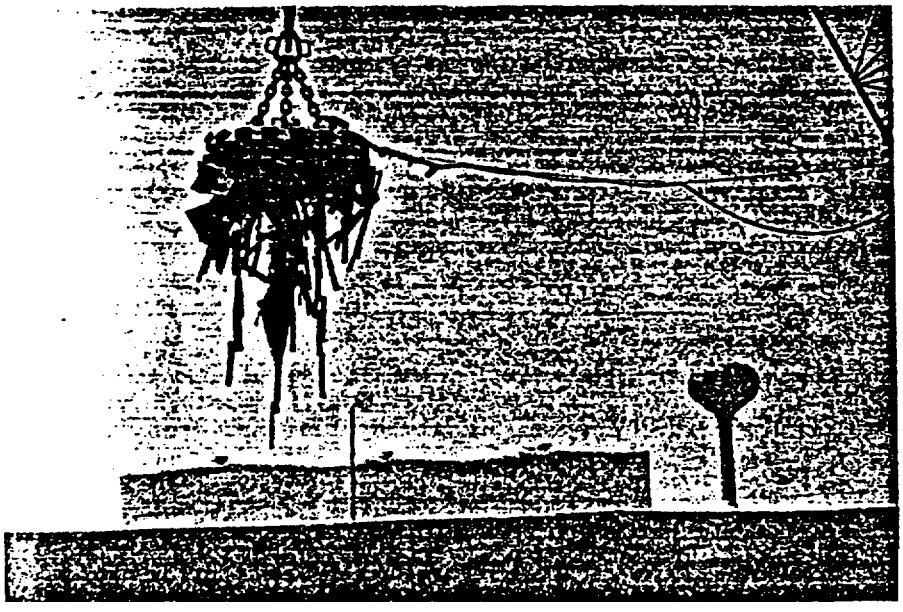
Discussing tho company's safety program with National Electric Coil Co. General Manager Herbert M. Appleton (right) are (left to right): Robert F. Lynch, Director of Industrial Relations, Marie Gigante, Manufacturing Manager, and Anthony C. Purbrick, Personnel and Security Manager who also has responsibility for division safety.

64 TO 0 CODE VZOLATZONS IN 8 MONTHS

Involvement, Support of Top Management Keystone of NECCO's Safety Success Story

Based on Workmen's Compensation claims against it during the oldest four years of the five-year period 1960-1964, the National Electric Coil Co. of Columbus earned a 31 per cent credit rating in 1965. In 1966 that credit rating fell to 20 per cent. On these pages is told the story of how NECCO is battling its way bock up tho credit rating ladder rung by rung. Its 1970 credit rating was 29 per cent.



During the heyday of the railroad, periodic visits by the local line's electro-magnet were eagerly awaited by the town's youngsters. Notional Electric Coil Co. is one of the nation's largest manufacturers of clectro-magnets. (Photo Courtesy of National Electric Coil Co.)

Wire Mill Foreman Pete Lange demonstrates a safety catch on o hoist hook, one of the many innovations which have resulted from NECCO's renewed emphasis on safely.

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DEADLY BENZOL STILL WITH US

phocytosis, eosinopenia and monocytopenia although the total white cell count may remain unchanged. Subsequent exposures may produce bleeding of the nose and mucous membranes with the appearance of purpuric spots and ecchymoses at the site of injury. The individual may also show shortness of breath, an anemic appearance, rapid pulse and low blood pressure.

"As the condition progresses, the blood abnormalities may be manifested first by anemia and leukopenia and sometimes macrocytosis and thrombocytopenia. Leukocytosis, eosinophilia, immature marrow cells in the circulating blood and elevated serum bilirubin have also been reported. . . ."

The International Labor Organization's Washington branch office recently issued a news release relative to a conference for an international standard for benzene. This is a standard that has been long overdue.

Needed: labeling Laws For Hazardous Industrial Chemicals

Contrary to the opinion of many people, there is no federal statute governing labeling of hazardous industrial chemicals such as benzol. Some of the states have banned certain chemicals. The Federal Hazardous Substances Act, and Regulations promulgated thereunder, specifically cover hazardous substances intended or packaged in a form suitable for use in the household; the Act does not apply tu industrial situations nor to industrial supplies taken into the home.

The Labeling Act of the State of Ohio, Section 3716.01-07 Revised Codes, applies only to the labeling of packages of hazardous substances intended or suitable for household use, which will include not only packages for use in the home but also packages for use in schools, hospitals, apartments, office buildings, hotels, restaurants and similar places.

Manual L-1 of the Manufacturing Chemists Association (MCA), (1825 Connecticut Ave., NW, Washington, D.C. 20009), has become the "Bible" for proper labeling of hazardous chemicals. Indeed, the labeling required by regulations promulgated under the authority of the Federal Hazardous Substances Act, which applies to hazardous household products, is largely patterned along the lines suggested by the *MCA Guide*. The American Petroleum Institute, in its ***APZ Bulletin*** on ***Precautionary Labels,*** also suggests a labeling system very similar to that recommended by MCA.

What Can Be Done To Reduce Hazard From Benzol?

1. Know what is in the solvent you are using. Have the suppliers provide you with an analysis.

2. Substitute less toxic materials (the Division of Safety and Hygiene has published a Technical Bulletin entitled, ***Substitutes*** for ***Highly Toxic Solvents Such As Carbon Tetrachloride and Benzol.***

3. If benzol is used, use it in a closed system such as found in some plastic plants where it is a basic ingredient.

4. If benzol is used in open containers in small quantities, work in well ventilated booths. (See American Conference of Governmental Industrial Hygienists' ***Ventilation Manual, or IC-5,*** Industrial Commission of Ohio.)

5. When there is a potential exposure to benzol, see that the solvent concentration is monitored by indicator tubes or other methods, and that the ventilation provided is always operating up to the design factors.

6. Keep track of the amount of benzol used. (By noting the amount that is evaporated, an idea can be obtained of the concentration.)

No Excuse Disease

There is no excuse for an occupational disease from benzol or any other toxic substance. Accidents can happen and cause injuries but exposures, other than accidental, can be controlled and no stone should be left unturned until all potential exposures are controlled.

EDITOR'S NOTE

The United States Public Health Service, Bureau of Occupational Safety and Health, has undertaken a performance study to evaluate indicator tubes such as the tube for benzene. As pointed out in the preceding article, the Threshold Limit Value for benzene is 25 parts per million. The USPHS evaluated benzene tubes at 20, 35, 60 and 160 ppm.

The following tubes were found to read with an accuracy of ±50% at the 95% Confidence Level:.

Manufacturer	*Type*
Mine Safety Appliances	*93074*
Scott-Draeger	*CH-248*
Unico-Kitagaica	*118-A*

This report is contained in the June 1971 issue of the American Industrial Hygiene Association Journal.

BWC AKRON DISTRICT OFFICE RELOCATED

The Akron District Office, Bureau of Workmen's Compensation, was moved to 680 E. Market Street in Akron (Zip 44304). The phone number remains the same (216) 253-8103.

"This," Shaw continues as he approaches another work area, "is one of our smaller balancers and Leonard Mullen here, our Machine Shop foreman, will tell you about it."

Mr. Mullen, a leader of the company's safety committee, points out the safety shields which have been installed around the balancer. We were balancing a rotor here one day when a piece broke loose and went right through the wall. Needless to say, that can't happen now."

Pointing to a nearby rotor mounted in what appears to be a giant lathe, Mullen explains, "After we'd worked on this one we found a defect the customer apparently wasn't aware of and took care of that too. Now we're machining off the excess of the materials we used in the renovation process prior to balancing."

Turning to the balancer, Mullen points to a flashing light, noting that "the strobe light there tells us where the unit is out of balance. Then, when we've put on the counterweight and run her up to 3,600 revolutions per minute, it will continue to flash until it reaches a perfect pattern, then we know the rotor's in balance."

"And over here," Tony Purbrick says as he leads the way across the aisle, "is Gene Manbevers, another safety committeeman and our Maintenance Supervisor. He's the fellow we call on when we need an item of safety equipment such as a guard for a machine."

New Safety Ideas

"But what is really gratifying is that our people are taking an interest in safety and coming up with ideas of their own," Purbrick continues.

"Here, for example, is Ralph Haley who helped build a guard for his own punch press."

Haley explains the guard: "We first made it out of sheet metal, but that wasn't too good because we couldn't see well enough what we were doing. So then we made it out of heavy wire mesh with Plexiglas in the center so we can now see exactly where the coil we're working on is at all times."

A little farther down the aisle two women busily operate the machine which combines mica flakes with an adhesive to produce the insulating material used extensively at NECCO.

At strategic locations throughout the plant posters and streamers announce the safety message, as do various signs recommending "Caution" and other appropriate action.

More Magnets

And thence out the rear exit and back to magnets-dozens of iron electro-magnet shells ranging from 14 to 92 inches in diameter lying in neat rows.

"When we get an order for a magnet," states Manufacturing Manager Mario Gigante, we come out here and pick out the size shell we need, take it back there, grind it off, and add the *'guts.'"*

"Back there" is a converted warehouse which houses the electro-magnet shop Inside, a worker wearing safety glasses grinds an inside section of a magnet shell and above an overhead crane moves an almost completed magnet.

Tripled Output

"About three years ago," says Gigante, "we decided to quadruple our electro-magnet business so we converted this warehouse into a shop. We've already tripled our output and are among the top two or three electro-magnet manufacturers, but now we're running into space problems again.

"And the revitalization of the safety program." Gigante continues, "has meant a lot to us in meeting our electro-magnet production goals."

Outside again, Gigante directs us to a wire fence-enclosed "bullpen" containing several large dumpster-type trash containers. "We used to burn our trash in there, but we made our biggest contribution to the anti-pollution campaign some time ago when we discontinued burning in favor of these dumpsters."

Next to the magnet shop is the building where NECCO does most of its work on the many U.S. Defense Department contracts it holds.

Unique Device

Here is found what is probably the most unique safety-security device in the NECCO plant. Inside an area enclosed by a pipe railing a man works at a machine which is rendered inoperable by an electric eye whenever an unauthorized person enters. The machine also shuts off automatically when he leaves it.

In response to a remark to the effect that the machine operator is probably the loneliest man in the plant, Gigante points out that he is well paid.

As we pass through the wire mill-and coils require a lot of wire —Dick Moore calls Mill Foreman Pete Lenge over to demonstrate a safety catch on a hoist hook. This is one of the many benefits of the renewed emphasis on *safety* here," the Safety and Hygiene district supervisor remarks.

The final stop on our tour of NECCO takes us to the southeastern corner of the plant where Industrial Relations Director Bob Lynch holds forth in "The White House," a double mobile home which has been converted into a suite of offices.

Mr. Lynch's secretary goes to her files and gets out the October, 1968 "attitude survey" and the September, 1970 follow-up to it.

Solid Groundwork

"As you can see from your tour and from reading these reports," Lynch says, "we've come a long way and we've laid a good, solid groundwork for even greater progress in the future in industrial safety and hygiene. It's also interesting to note that McGraw-Edison, our parent company, was so impressed with our experience here that it has adopted the 'attitude survey' concept for company-wide application."

Perhaps an observation by KECCO General Manager Herbert M. Appleton best sums up the National Electric Coil Company's attitude toward safety — "Action on what you learn is what really matters most. Finding out what's wrong and what needs to be done without the desire nor the power to act is pointless."