

IM-94-20

**OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION
DEPARTMENT OF CONSUMER & BUSINESS SERVICES**

INDEXED MEMO

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Issued(PD)	February 1, 1981
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SUBJECT: Hydrogen Cyanide (HCN) Cylinders

AFFECTED CODES/
DIRECTIVES: Division 1, Division 2/J, Division 2/Z 1910.1200

(1) PURPOSE: To inform compliance officers and employers holding old HCN cylinders of the explosion hazard posed by these containers.

(2) BACKGROUND: The Cyanamid Corporation stopped selling liquid HCN in 1968, and has since operated a program to recover outstanding cylinders. Some of these cylinders may still be stored in some undisturbed site. The cylinders were manufactured in 5-pound, 30-pound, 75-pound, and 166-pound sizes. The slightest movement of the hydrogen cyanide cylinders may trigger an internal reaction causing the cylinder to explode. HCN goes through a natural exothermic polymerization, creating a solid black mass plus various gases, predominantly ammonia and carbon monoxide. Since the cylinders are sealed, gas formation will increase the pressure; this can create a situation where the natural reaction can proceed at a dramatic rate. Heat reproduced will cause the reactions to proceed at even a faster rate. Through this natural polymerization, a crust of the solid material will build up across the head space with liquid HCN remaining in the bottom of the cylinder. Sudden movement can break off part of the solid material, dropping it into the liquid HCN. This may set off the reaction creating a sudden increase in pressure due to a rapid rise in temperature, resulting in possible rupture of the cylinder. The explosion hazard from the cylinders is accompanied by an extreme toxicity hazard from the release of HCN gas. Inhalation of the gas may result in immediate death or serious injury.

(3) ACTION:

Compliance officers must maintain an awareness of the possibility of locating hydrogen cyanide cylinders which have been stored for several years. If a compliance officer locates a suspicious cylinder or possible past user of HCN, the responsible party must be notified of the hazard, and the compliance officer must ensure that everyone involved takes appropriate precautionary measures.

The following measures are necessary to prevent HCN cylinder explosions:

a. Employers who may have old HCN cylinders in storage shall search the premises and contact others to whom cylinders may have been reshipped.

b. Suspicious cylinders must not be moved even for the purpose of confirming identification, as even this action may result in an explosion.

c. Warning signs must be posted and the area in the vicinity of the cylinder barricaded or access discouraged by other effective means so that there is no possibility of disturbing the cylinder (Chapter 1-2-14, 1-2-9, 9-2-27, 9-2-14, and Section 22-015(l)(a)).

d. Call Cyanamid (collect) at 201-831-2077. These cylinders must not be handled by the user, or by local safety or emergency authorities. The task of removal requires specially trained disposal personnel.

REFERENCE:

"The Decomposition of Liquid Hydrocyanic Acid" by Mark Walker and D.N. Eldred, Industrial and Engineering Chemistry, Vol. 17, No. 10, Oct. 1925.