

TOXIC SUBSTANCES IN ELECTRONIC DEVICES

Notice to Owners, Masters, Officers and Seamen of Merchant Ships, Yachts and other Vessels; to Owners, Skippers and Crews of Fishing Vessels; to Marine Radio Companies; and to Training Schools

1. This Notice is of particular concern to radio officers and operators, and to other persons concerned with electronic equipment on board ships.
2. The Department of Trade and Industry wish to draw attention to a possible health hazard from Beryllium Oxide (Beryllia) material, the dust of which is toxic. This material is used in certain components employed in electronic equipment. Generally the components are:

- Power transistors, particularly VHF types
- Power diodes
- Thyristors
- Ceramic material, where identified by blue colouration or black lines
- Heat sink washers.

Hazard

3. Beryllia is highly dangerous in a dust form when it might be inhaled or enter a cut or skin irritation area.
4. If dust is caused as a result of chafing, filing or breakage and if inhaled, a single exposure lasting minutes or seconds can cause injury to skin or mucous membranes severe enough to endanger life or cause permanent injury. Particles penetrating the skin through wounds or abrasions are liable to cause chronic ulcerations.
5. Symptoms of poisoning indicated by respiratory troubles or cyanosis (grey/blue discolouration of the skin) may develop within a week; or after a latent period extending to several years.

Precautions

6. Power transistors, diodes and thyristors

Power transistors, diodes and thyristors, as received in the manufacturer's packing, are clearly identified by attached information. They should be stored in the original packing and not mixed in with other items. The Beryllia is encapsulated and they are safe to handle for replacement purposes. Care should be exercised in removing defective items to ensure that they do not become physically damaged. They *must not*:

- (a) be carried loosely in a pocket, bag or container with other components where they may rub together or break and disintegrate into dust;
- (b) be heated excessively (normal soldering with thermal shunt is quite safe);
- (c) be broken open for inspection or in any way abused by tools.

7. Heat sink washers

Not all heat sink washers contain Beryllia. Those that do are highly polished and of a dark brass appearance. When new they are packed individually.

They *must not*:

- (a) be stored loosely;
- (b) be filled, drilled or any way tooled;
- (c) heated other than when clamped in heat sink application.

They are better handled with gloves, cloth or tweezers when being removed from equipment.

8. *Ceramic application*

Some makes of cathode ray tubes are coated on the inside with a ceramic beryllium oxide mixture. The tube is safe unless the glass is broken. Should this occur, *DO NOT*:

- (a) handle the broken glass with bare fingers;
- (b) blow on the exposed surface because of the danger of inhalation.

Handling

9. It is preferable to handle Beryllia parts with gloves or similar protection. This is imperative if the person concerned has any cuts or abrasions, or is suffering from any skin disease. If Beryllia enters the skin, it should be dealt with immediately by washing and normal first aid, when it will generally be found to cause no further trouble.

10. It is recommended that parts should be handled with tweezers. No filing, abrading, dipping, machining or excessive heating should be permitted, and care must be taken that parts do not scrape on a rough surface or come into contact with other parts made from Beryllia.

11. If parts are broken or damaged they must be separately and securely packed. Strict attention should be paid to manufacturer's instructions about the return or disposal of such parts.

Department of Trade and Industry
Marine Division
London
October 1972

(MNA 33/1/031)

Reprinted by the Department
of Transport
December 1987