

The serious effects of exposure to excessive radiation are well known and the established tolerance dose is 200 milliroentgens per week based on forty hour week..

Good maintenance of radiation shielding is essential.

Fluorides - All divisions are involved.

Fluorides, sometimes in the form of cryolite (sodium aluminum fluoride) are used in the manufacture of ductile iron and magnesium castings. They are classified as protoplasmic poisons.

Various degrees of respiratory irritation may result from the inhalation of fluorides in the form of dust. This is accompanied after a few minutes by a discharge from the nose or nose bleed. No such effects are noted when the concentration does not exceed 2.5 milligrams per cubic meter of air which is the threshold adopted in the United States.

Dental fluorosis - mottling and discoloration of the teeth - occurs also when the maximal allowable concentration is exceeded for a long period of time.

Cryolite is much less soluble in body fluids than is sodium fluoride and consequently, the danger of physiological effects is less with cryolite than with the more soluble fluorides.

In the manufacture of ductile iron or magnesium castings, the threshold limit is easily far exceeded which is hazardous. Exhaust ventilation is usually indicated at the station where inoculation occurs.

Welding rods are often coated with fluorides so that there is always a possible exposure during welding operations.

Iron Oxide - All divisions are concerned.

Fumes and dust of iron oxide occur during melting, burning, pouring, grinding, welding, and machining operations connected with the manufacture of all ferrous castings. Exposure is particularly high when manganese steel castings are involved.

Iron oxide is physiologically inert but it produces a pulmonary condition called siderosis which is non-disabling. Particles of iron oxide are radio-opaque and produce nodular shadows in a chest roentgenogram that resemble the discrete fibrotic nodulation of silicosis. As a result cases of siderosis are frequently confused in radiographic diagnosis with silicosis, a disabling disease, and compensation awards have been made on the basis of x-ray evidence alone when actually no disability was sustained.

The nodular shadow of siderosis may be compared to a tattoo mark on the arm. They are permanent but there is no loss of function. In severe exposures - 80 milligrams of iron oxide per cubic meter of air - siderosis can be produced in as short a time as one year.

In founding, the job exposures are in the following order of severity: