

CADMIUM

Canada Ranks Second As World Supplier

One spring day in 1817, German chemist Strohmeyer found himself faced with a perplexing problem. The zinc carbonate compound he was heating turned yellow instead of the expected white.

Never a man to be impaled long with perplexing problems, Strohmeyer, investigating further, realized he was dealing with something different, and succeeded in reducing the yellow oxide to a metal. This was the first known preparation of the element cadmium.

From such humble beginnings, cadmium has infiltrated into almost every household and has assumed a major role in the constant battle against corrosion.

Canadian Production

Refined cadmium is produced in Canada by The Consolidated Mining & Smelting Co. at Trail, B.C., and Hudson Bay Mining & Smelting Co. at Flin Flon, Manitoba. A small amount is also produced from zinc concentrates exported to foreign smelters, but not all of this is reported.

In 1955, according to the Department of Mines and Technical Surveys, estimated domestic production was 1,971,012 lbs. compared to 1,086,780 lbs. in 1954.

Cadmium is a minor constituent of many zinc ores and is recovered as a by-product at various zinc plants throughout the world either by fractional distillation or by leaching and electrolysis. In the electrolytic zinc refining process used at Trail and Flin Flon the cadmium is accumulated in precipitates resulting from the purification of zinc electrolyte solution and is recovered from the precipitates by leaching and electrolysis.

About 70% of the cadmium in zinc concentrates is recoverable and metal of a purity of not less than 99.95% is turned out in the form of balls, sticks and slabs.

Numerous Applications

Over 90% of the cadmium metal produced is used as a protective coating for iron and steel and to a lesser extent, for copper. Where cost is not of prime significance, cadmium is preferred to zinc as a coating because it can be deposited more uniformly in the recesses of intricate parts. It also has a higher resistance to atmospheric corrosion and has a higher rate of deposition per unit of electric power.

Cadmium-plated articles include a wide range of parts and accessories used in the construction of aircraft, automobiles, military equipment and household appliances.

The metal is vital for bearing alloys used in internal combustion engines designed for high speeds and temperatures. Cadmium is also useful in making low-melting-point solders and fusible alloys of the cadmium-tin-lead-bismuth type for automatic sprinkler systems, fire-detection apparatus, and valve seats for high-pressure gas containers. The addition of 1% of cadmium considerably

strengthens copper wire without seriously reducing its conductivity.

In the field of atomic energy, the metal is used for shielding purposes and in devices of reactor control.

Nickel-cadmium storage batteries have a longer life period than the standard lead-acid battery and are relatively much smaller but more expensive. The use of this type of battery is increasing particularly for military applications and low-temperature conditions.

Cadmium sulphide and cadmium sulphoselenide are used where bright, high quality, yellow and red colors are required for paints, inks, ceramic glazes, paper, rubber, and glass.

Cadmium oxide, hydrate and chloride are used in electroplating solutions while cadmium bromide and iodide are applicable to photographic films and also in the fields of photo-engraving and lithography. Cadmium stearate goes into the making of vinyl plastics.

Mostly from B.C.

Principal source of cadmium in this country is the silver-lead-zinc ore of Cominco's Sullivan mine at Kimberley, B.C., although the company also draws from other holdings in the province. In the Yukon, United Keno Hill Mines in the Mayo district in 1955 shipped 305,800 lbs. of recoverable cadmium to the Trail smelter.

Hudson Bay's output comes from its Flin Flon copper-zinc mine on the Manitoba-Saskatchewan boundary and from several small mines operated by the company in the area. Eleven mines in Quebec and three in other eastern provinces also had cadmium output.

The average Canadian price in 1955, estimated by the Dominion Bureau of Statistics, was \$1.70 lb. Current quotes by Cominco are: lots of 5,000 lbs. or more, \$1.75 lb.; 2,000-5,000 lbs., \$1.85 lb.; and less than 1-ton lots, \$1.95 lb.

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THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF LABOUR
OFFICE OF
THE DEPUTY MINISTER
VICTORIA

IN ANY COMMUNICATION RELATING
TO THIS FORM PLEASE REFER TO

No.

March 31st, 1955.

THIRD REQUEST

STATISTICS OF WAGE-EARNERS EMPLOYED IN TRADES AND INDUSTRIES, ETC., 1954

The "Department of Labour Act," section 4 (*d*), requires this Department to collect such statistical and other information as may be deemed necessary.

For this purpose we mailed you a form on January 5th, 1955, and a second request on February 28th, 1955, to cover your operations for the year 1954, and at this date we have not received the completed form.

If the form mailed you has been lost or mislaid, another will be mailed on request. When requesting another form please give the number in the top right corner and address your request to:—

THE BUREAU OF ECONOMICS AND STATISTICS,
VICTORIA, B.C.

Yours truly,

Deputy Minister of Labour.