

metal alloys, and to encourage the production of essential metals. The Controller restricted the use of aluminum, nickel, zinc, magnesium, tin, cadmium, copper and brass, and a large number of other metals and alloys in civilian industry. In addition, by co-operation with the Armed Forces and the Production Branches of the Department of Munitions and Supply, and by mandatory orders, he brought about the substitution of less scarce metals. Supplementing the restrictions on the use of metal in civilian production imposed by the Metals Controller, restrictions on end-uses were invoked by other control authorities, principally Administrators of the Wartime Prices and Trade Board. The first of the Metals Control restrictions were issued in 1940 and as the supply situation deteriorated the controls were drastically tightened. By the beginning of 1944 most of the major base metals were in easier supply and throughout the year the restrictions were gradually relaxed. By the end of 1944 no restrictions remained on the production or use of aluminum, magnesium, lead, zinc and some other metals in wide industrial use.

Oil Refining.—In 1943 the oil industry in Canada had 36 refineries. Of the total of 148,000 barrels per day run by all Canadian refineries, about 94 p.c. was handled by the plants of 7 large oil companies. Independent refineries accounted for only 6 p.c. of the total. Canada's petroleum requirements are supplied largely from these refineries which, fortunately, have sufficient capacity to meet the Canadian civilian and war requirements as well as those of Newfoundland. In 1942, the refineries produced 48,000,000 barrels of petroleum fuels as compared with importations of 3,350,000 barrels.

The demand for aviation gasoline increased to the point where it was necessary for the Department of Munitions and Supply to undertake the construction of alkylation plants for the production of blending agents to produce high-octane aviation fuels. Under the jurisdiction of the Government-owned Allied War Supplies Corporation, the first of these plants was begun in Calgary in 1942 and went into operation in April, 1943. The second was built in Montreal East and went into production in June, 1944. In addition a cumene section went into operation on Sept. 17, 1944, at the Government-owned Polymer Corporation synthetic rubber plant near Sarnia, Ont.

Rubber.—The many chemical substitutes developed to take the place of natural rubber, the supply of which was cut off when Japan entered the War, fall roughly into two categories: vulcanized synthetic rubbers, such as buna-S, butyl and neoprene; and synthetic resins.

Development of synthetic rubber has centred around the vulcanized synthetic rubber materials, and Canadian production of buna-S and butyl rubber was begun in the Government-owned Polymer Corporation plant near Sarnia, Ontario, in 1942. During the first few months Canadian rubber processors employed the synthetic rubber solely for experimental work but in August, 1943, the Rubber Control ordered the substitution of buna-S in passenger, smaller truck and, to a certain percentage, in large truck tires. To make its annual output of 34,000 long tons of buna-S and 4,000 long tons of butyl rubber annually, Polymer requires approximately 400,000 tons of coal, more than 45,000,000,000 imperial gallons of water, 19,000,000 imperial gallons of light-ends petroleum, 25,000,000,000 cubic feet of petroleum gas, 2,250,000 gallons of benzol, and enough brine to contain 18,000,000 pounds of salt. In addition great quantities of acids, soaps and other raw materials are used.