Canadian Rock Wool Plant Achieves High Efficiency with New Equipment

• A general view of Gypsum, Lime and Alabastine's modern mineral wool batt plant at Caledonia, Ont. The cupola is housed in the raised portion of the building on the extreme right.

another ON THE SPOT report

OUTSTANDING success in their early endeavors in mineral wool production, combined with a tremendous demand for the material, has led to the construction of an ultra-modern, high-capacity plant

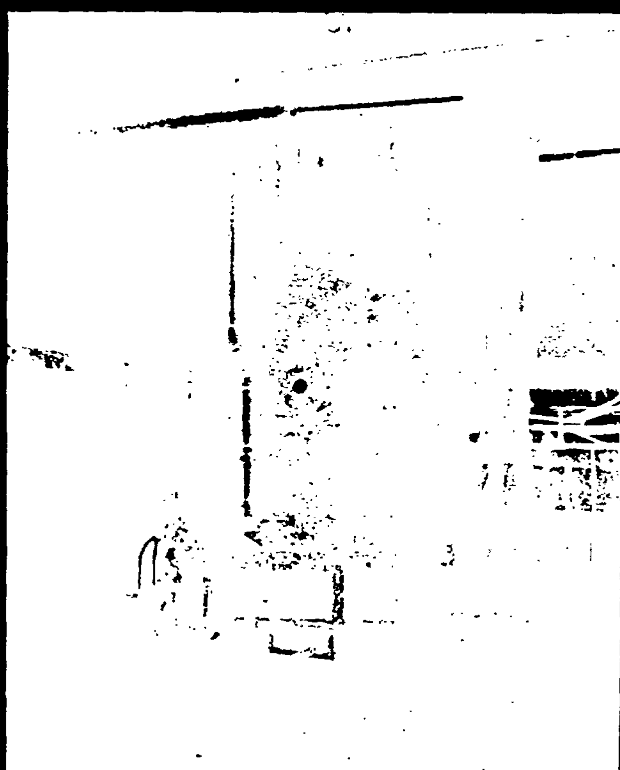
By WILLIAM M. AVERY

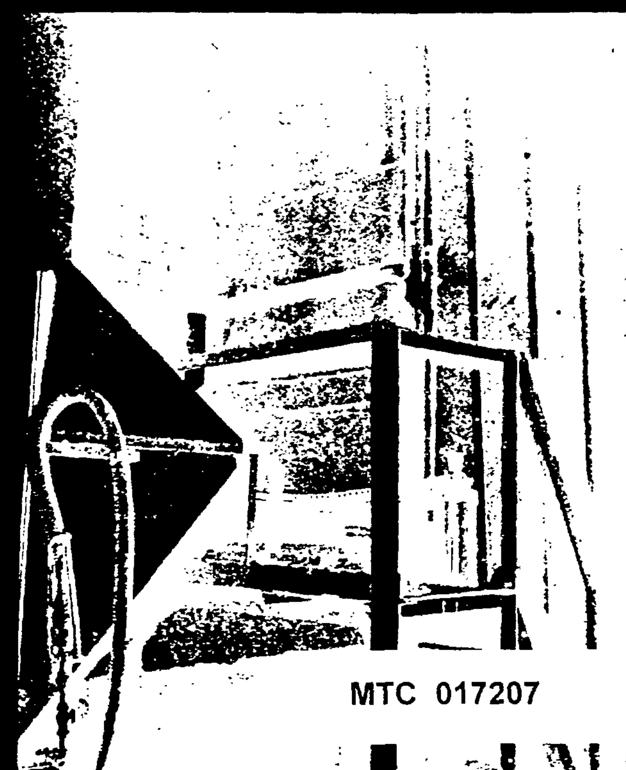
by the Canadian firm of Gypsum, Lime and Alabastine, located at Caledonia, Ontario. The new facilities, which went into production in June, 1946, incorporate a number of features which are quite new in the mineral wool industry, and the plant is in many respects a fine example of the resurgence which seems to be in progress in many phases of Canadian industrial activity.

The company's initial undertaking in the mineral wool field dates back to 1936, when plain white wool (without binder) was first produced from high-silica limestone. Although the whiteness of the product was unquestionably desirable from the sales standpoint, there were certain disadvantages in the use of limestone as compared with slag. Recovery ran around 60 percent, as against an average on most slag operations of 85 to 90 percent. Apart from this, wide variations in the chemical analysis of the limestone caused a multitude of production headaches. Extensive experiments with this limestone cupola, in which even clay was used successfully for a time, satis-

• Below, left: The base of the 38-in.-diameter cupola, showing molten streams of rock being blown into mineral wool fibers with high-pressure steam.

• Right: The discharge end of the blow room, which has oscillating side panels to form the neat edges which can be seen as the strip passes into the annealing furnace. The edges have not been trimmed at this point.



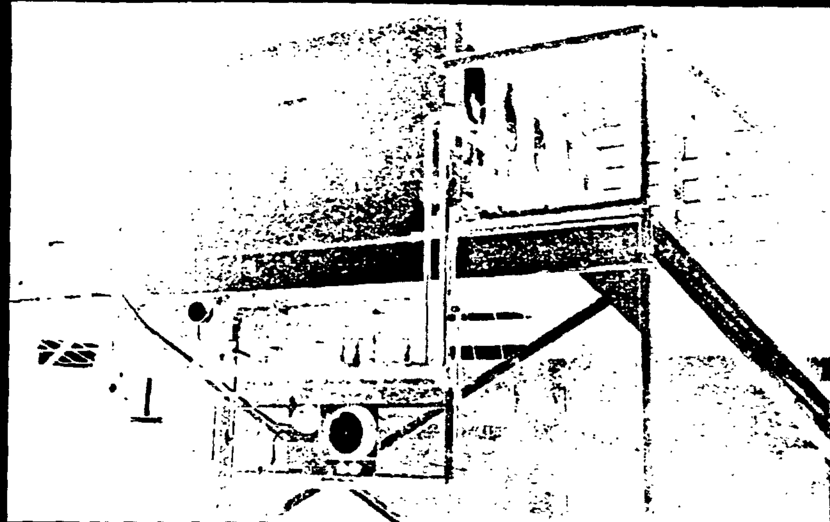


fied the company that mineral wool could be produced from practically any material containing at least 40 percent silica.

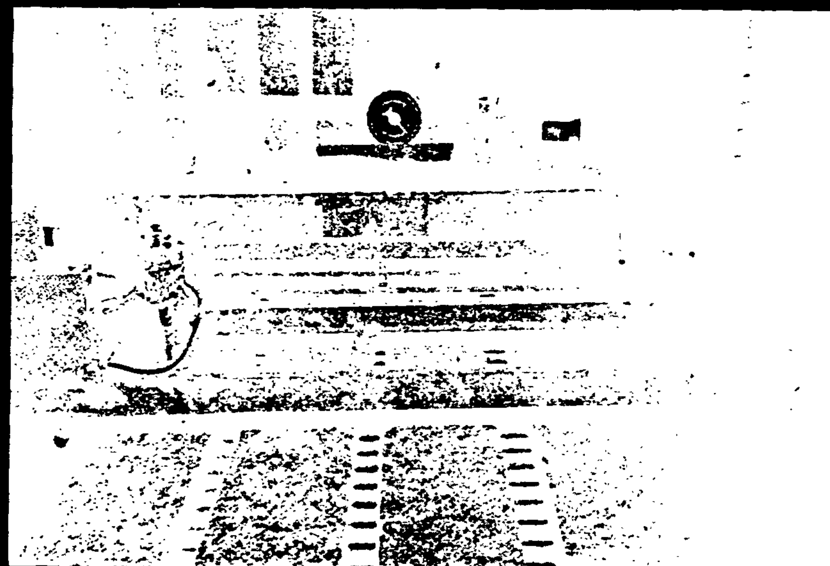
To increase the recovery rate, however, the second cupola installed in 1941 was designed to operate on slag, and the following year the original cupola was converted to slag. Initially the company's entire slag requirement had to be shipped by rail from Buffalo, but subsequently a slag-processing plant was established at Hamilton, Ontario, and a portion of the supply is now trucked from that locality.

The new production unit, which at present produces only batts, is housed in an entirely new fireproof building in which provisions have been made for a total of four cupolas. The single cupola now in operation is 48 in. in diameter (compared with 36 in. on the older units) and about 20 ft. in height. Designed by the company's own engineers and built by the Hamilton Bridge Co., it is completely water-jacketed and utilizes a Foster-Wheeler heat exchanger to effect a 20-degree drop in the temperature of the cooling water.

The cupola is fed continuously at the rate of about two tons per hour, using a 2- to 4-in. slag in the ratio of 4½ parts (by weight) to 1 of coke. When better coke becomes available, the company expects to be able to increase this ratio to about 5½ to 1. The raw materials are drawn from bins, blended with up to 2 percent sandstone to lift



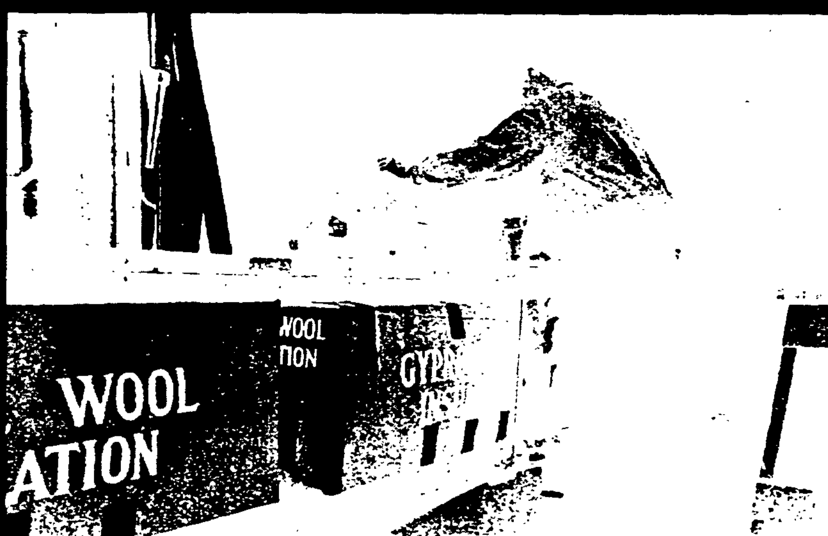
• A general view of the 56-ft. oil-fired annealing furnace where the binder is set. Temperatures in this unit are thermostatically controlled, and both surfaces of the blanket are annealed by means of updraft and downdraft sections.



• A view of the power-driven band saw which automatically cuts the strips into 4-ft. lengths. In the background is the platform scale on which the packed cartons are check-weighed.

• Below, left: Vapor seal, from reels located in the concrete pit under the production line, is applied to the bottom surfaces of the 15-in. strips.

• Below, right: Thirty-six inches of wool is compressed into a 24-in. carton by forcing the carton through this double-frame roller conveyor. Resiliency, imparted to the material by the binder used, prevents any permanent compression of the fibers.



the silica content, weighed and elevated to the top of the cupola by an 18-in. belt conveyor.

The melt is carried out at a temperature of around 2,700 degrees F. and the molten rock is discharged continuously through four nozzles at the base of the cupola. Fibers are produced in the usual manner by blasting the molten material with high-pressure steam as it flows from the cupola. The asphaltic binder, which imparts the dark brown color associated with mineral wool, is introduced at the moment the fibers are formed.

The fibers enter a blow room which is about 12 ft. high, 35 ft. long and a little over 5 ft. wide. Here the wool is pulled down by means of a 25-hp. fan which continuously exhausts about 25,000 cubic feet of air per minute.

From the blow room to the final cutting operation the blanket of mineral wool moves on a continuous Wickwire-Spencer chain belt driven by a 5-hp. Reeves Varispeed Moto drive. The strip, measuring 60½ in. in width, passes from the blow room into a 56-ft. oil-fired annealing furnace (designed and built by J. Campbell Smith) where the binder is set at temperatures ranging between 600 and 700 deg. F. Accurate temperature control is effected by dividing the 10 burners into two groups of 5 each; one group operates constantly, while the other is thermostatically controlled.

In order to anneal both sides of the blanket the oven is divided into sections, with a rising stream of air in the front portion and a downward stream in the back portion. Additional control of the annealing conditions is effected by varying the speed of the fan drive motor. In order to prevent disarrangement of the fibers, the blanket during its passage through the annealing furnace is held between upper and lower chain belts. The strip of mineral wool passes from the furnace into a 15-ft. cooling chamber in which the temperature is reduced about 200 degrees.

Power-driven circular knives, located just beyond the cooling chamber, split the blanket into four 15-in. strips. Since the material is fully cured at this point, there is a ready market for the comparatively small amount of bulk side trim which is created in the splitting operation. Vapor seal, heated electrically to 300 or 400 deg. F., is applied to the bottom surfaces of the strips, which are then cut into 24-in. and 48-in. lengths by a power band saw. The downward stroke of the band saw is actuated by a limit switch located on the extreme end of the runout conveyor, assuring remarkable accuracy and uniformity in the length of the finished batts. The finished product, sold under the trade name Gyproc Wool, is packed in 24-in. and 48-in. cartons which are check-weighed on a Fairbanks Springless scale.

In a typical 22-hr. run this plant was charged with 9 tons of coke and 36 tons of slag, which yielded 32½ tons of finished wool for a recovery rate of 91 percent. Although most producers of the material would consider 91 percent a quite satisfactory recovery, this company wants and expects to increase the rate. Highest recovery, of course, is achieved when the plant is producing 4-in. batts, the rate drops slightly for 3-in. and 2-in. batts, and may fall materially on 1-in.

In 24 hours the new production line (which is designated as plant No. 3) turns out about 2,000 cartons of finished batts, employing about 22 men on each shift. This output is about 50 percent higher than that of the No. 2 batt plant, which employs about the same number of men, and is roughly comparable in other respects except for the size of the cupola. Both the older cupolas are 36-in. in diameter as compared with the 48-in. measurement of the newest unit. The company's No. 1 plant, incorporating the cupola originally designed for limestone, produces granulated wool at present.

The new plant is one of the cleanest mineral wool production units we have visited. Particularly remarkable is the almost complete absence of fly, an accomplishment that it not only reflected in the high recovery rate but contributes materially to the working comfort of the employees.

L. V. Robinson is general superintendent of Gypsum, Lime and Alabastine's varied operations. J. E. Gillespie is assistant to the general superintendent, J. M. Hagan is plant superintendent and Reg Hudspeth is superintendent of rock wool plants. The company's director of quality and research is M. C. Haller.

Cinnabar Operation

(*From page* 63)

plus 10 liters (2½ gal.) of diesel fuel oil per metric ton of lime to make steam for atomizing the crude oil. According to the handbooks this didn't make sense, but on each test it came out very nearly the same.

The lime production per ton was more profitable than the mercury business, but the demand at this locality was very limited.

From this beginning with work, patience and considerable expense the Nelsons have evolved a standardized furnace unit which is neat, exacting, positive in performance and modern in every respect.

Choctaw Lime Plant to Have 300-400-Ton Daily Output

At Ft. Towson, Okla., the Choctaw Lime Company is currently erecting a crushing plant for the production of agricultural limestone. Capacity is expected to be from 300 to 400 tons daily.

J. W. Trieschmann Sr., whose son, J. Werner Trieschmann Jr., is his partner, has operated a lime plant at St. Joe, Ark., a crushing plant at Eureka Springs and a sand plant at Caruthersville, Mo. J. W. Trieschmann Jr. will be in charge of production at the Ft. Towson plant.

Basic Refractories Offers New Refractory and Gun

"Gunchrome," an air-emplaced refractory designed to speed up steel production by reducing "down-time" for maintaining and repairing open-hearth furnaces, has been announced by Basic Refractories, Inc., of Cleveland, O. The product is made from Cuban chrome ore.

Highlighting the opening day meeting of the Open Hearth Committee of the American Institute of Mining and Metallurgical Engineers at Cincinnati, April

• The new refractory gun.

21, was a special demonstration of the new B.R.I. gun developed by Basic Refractories.

This gun was primarily designed to speed the application of "Gunchrome" and similar materials to vertical and semi-vertical furnace brickwalls at the rate of more than 100 pounds per minute.

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