

extent as a refractory material in fireproof paint, and in mixtures with crude magnesite and other material in furnace linings.

Recently the Steel Company of Canada, has been using calcined Grenville magnesite mixed with 10 to 40 per cent furnace slag as a lining for open-hearth steel furnaces, with satisfactory results. The chemical composition of the slag is as follows:

Silica.....	9.81
Alumina.....	1.78
Oxide of iron.....	17.29
Lime.....	51.97
Magnesia.....	6.74
Phosphoric acid.....	2.70
Sulphur.....	0.247
Oxide of manganese.....	5.67

The manner in which the mixture is prepared and placed in the furnace is as follows:

The crude magnesite as it arrives from the mine is calcined for eight hours in a furnace holding approximately 9 tons of the crude material, about 3 tons of coal being consumed in this operation. The calcined magnesite is then broken down with hammers to fragments one-half inch or less in diameter and mixed with the crushed slag in proportions ranging from 15 to 40 per cent slag and 85 to 60 per cent magnesite.

When a furnace is to be lined it is heated to a temperature above the melting point of the slag (2,700 degrees to 2,800 degrees Fahrenheit), and small charges of the mixture of slag and partially calcined magnesite are thrown in and spread out uniformly over the furnace bottom at intervals of 15 minutes. In this manner the lining is built up on the furnace bottom to the depth required. If carefully laid and intimately mixed this bottom will last for a considerable length of time without repair, and is equal in every respect to bottoms prepared from Austrian magnesite.

Prior to the present war it was stated by manufacturers of magnesite brick generally that refractory brick could not be manufactured from magnesite containing more than a very small percentage of lime, but the following analysis of a magnesite brick obtained from one of the principal purchasers of Canadian magnesite seems to indicate that such is not the case, and that Grenville magnesite is being used in large proportions, if not entirely, for this purpose.

SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	CaO	MgO	loss on ignition
10.26	6.67	2.98	8.70	71.75	0.05

It is also reported that a mixture of dead burned Grenville magnesite, caustic calcined Grenville magnesite, and magnesium chloride is now being satisfactorily employed as a furnace lining to replace magnesite brick.¹

¹ Roast, H. J., "The development of Canadian magnesite," Annual meeting, Can. Min. Inst., 1917.