

Rubber in Road Construction*

IT is not always realized that by far the greater part—(about three quarters)—of the world's rubber production is used in the manufacture of tyres. For some time there has been intensive research into alternative outlets for rubber, and one of the most promising of these is the use of rubber in road construction. Rubber has been used in roads for many years in the form of blocks, or sheets, and usually in vulcanised form. The principal advantages of such roads are their great durability, the deadening of traffic noise, and their freedom from dust. Such rubber "carpet" roads are unfortunately, very expensive and so they are normally found only in strategic places such as the vicinity of hospitals, &c.

Modern road construction normally takes the form of a foundation of large stones, on which rests a layer of smaller materials cemented together either by concrete or bitumen, with a thin surfacing and sealing layer. This surface layer not only seals the surface against water penetration, but has to withstand the passage of traffic. It must withstand the sudden impact of traffic and yet it must not soften in summer nor become brittle in winter. It has been found that the road surfacing properties of bitumen are appreciably enhanced when rubber powder is mixed with it to the extent of 5-10 per cent. It is claimed that rubberised roads last longer and that they stand up to traffic better, and that the surface has better anti-skid properties than the normal bitumen surface.

Although research on bitumen rubber complexes has not been restricted to Holland or its Empire, most of the work on road construction has originated with the Rubber Stichting, the Dutch centre for Rubber Research. Two types of rubber powder have been investigated, one produced from latex sprayed into hot air and the other by flocculating latex in the presence of certain chemicals which prevent the tiny particles of coagulum from adhering. This latter product is known as "Mealorub", and appears to be the more satisfactory form of rubber powder for roadmaking.

Some 30 test areas were laid down by the Rubber Foundation in Holland in the five years before the war. These rubberised roads received very little attention during the war and some of them were subjected to extremely hard wear. All reports agree that these roads "stood up to it" much better than the control stretches. Similar test roads in Indonesia again subjected to maintenance neglect and to heavy military traffic also stood up much better than the control stretches.

These encouraging results have led to widespread interest in this new form of road construction, and further test areas are being laid down, notably in the U. S. A. Although the percentage of rubber used is small (5-10 per cent.) and is restricted to the road surface, the amount of rubber per mile of road ranges from one third of a ton to a ton. The initial cost of the rubber may be placed very approximately at Rs. 1000 ; this amounts only to about 2 per cent. of the total cost of road building, and it is highly probable that this slight extra cost will be far outweighed by the resulting longer life and lower maintenance costs.

If rubberised roads fulfil their early promise and are generally adopted, it is estimated that the increased consumption of rubber in the U. S. A. alone for this purpose might amount to as much as 200,000 tons per annum, or 10 per cent. of the world's annual production of natural rubber.

E. P.

* The use of Rubber in Bituminous Road Construction and some other applications of Rubber containing Bitumen 1949. Communication No. 96 Rubber-Stichting, Delft, Holland.