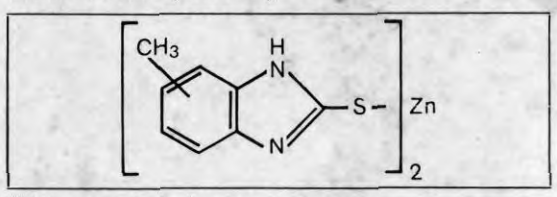
Vulkanox ZMB 2/C 5

®Vulkanox ZMB 2, like Vulkanox MB 2, is an excellent synergist for other antioxidants, including Vulkanox BKF, Vulkanox 4010 NA and Vulkanox HS, the effect of a combination of Vulkanox ZMB 2 with Vulkanox BKF, Vulkanox 4010 NA, Vulkanox HS, or other antioxidants, being greater than the sum of the effects of the individual components. This, in particular, is what makes Vulkanox ZMB 2 important.

Vulkanox ZMB 2 can also be used alone. It is then a moderately powerful non-staining antioxidant with particular suitability for compounds containing ultra-accelerators, as well as for those that are vulcanized without sulphur, but with ®Vulkacit Thiuram, and are intended for rubber goods that must withstand heat.

1. Product description

Chemical Composition	Zinc salts of 4- and 5-methylmercapto-benzimidazole (ZMMBI)



Physical form	White to pale beige powdwer
Density (g/cm³)	About 1.75
Zn content (%)	14–17
Solubility	Partially soluble in petrol (gasoline), ethanol Insoluble in water
Storage stability	Keeps for at least two years
Product safety	Concerning the handling of Vulkanox ZMB 2 your attention is drawn to the safety data sheet

2. Effects on vulcanization and vulcanizates

2.1. Vulcanization

Vulkanox ZMB 2 acts as a retarder on Vulkacit CZ and Vulkacit Merkapto, as well as on thiurams and dithiocarbamates. It therefore improves the processing safety and storage stability of the compounds.

Compounds containing large proportions of Vulkacit Thiuram without sulphur are activated by Vulkanox ZMB 2.

Vulkanox ZMB 2 has an accelerating effect on compounds based on polychloroprene (e. g. ®Baypren).

2.2. Behaviour in vulcanizates

2.2.1. Mechanical properties

The mechanical properties are not influenced by Vulkanox ZMB 2.

2.2.2. Blooming

Vulkanox ZMB 2 does not bloom when the recommended proportions are used.

2.2.3. Staining

White, coloured and transparent rubber goods containing Vulkanox ZMB 2 are not discoloured during vulcanization or when subsequently exposed to light for long periods. According to our experience materials which come into contact with vulcanizates containing Vulkanox ZMB 2, e. g. rubber, paintwork, plastics and fabrics, are not stained either.

2.2.4. Physiological Properties

The vulcanizates are without smell, but they have a bitter taste.

3. Behaviour in latex compounds

Vulkanox ZMB 2 has a heat sensitizing effect on natural and synthetic latex compounds. Depending on the concentration used, they coagulate spontaneously when heated to 40–50 °C. When fairly high concentrations are used the coagulation may even occur at room temperature. The thickening of latex compounds caused by addition of Vulkanox ZMB 2 (i. e. thixotropy) can be reversed by stirring.

4. Protective effect

Vulkanox ZMB 2 affords good protection against oxidation and the harmful consequences of overcure to vulcanizates produced with ultra-accelerators, such as dithiocarbamates and thiurams. It gives somewhat less protection to vulcanizates produced with other accelerators. To vulcanizates produced without sulphur but with a fairly large amount of Vulkacit Thiuram it gives very good resistance to steam and, when used together with Vulkanox HS, to hot air also.

The efficacy of combinations containing Vulkanox ZMB 2, e. g. those in which the other ingredient is Vulkanox 4010 NA, HS, BKF or SKF, is greater than the added effects of the ingredients when they are used separately. The effects of the combinations are therefore synergistic. Combinations of Vulkanox ZMB 2 with the non-staining antioxidants of the KF series or with the staining antioxidants Vulkanox 4010 NA and 4020 (ratio 1 : 1) also give the vulcanizates outstanding protection from rubber poisons.

The protective effects of Vulkanox ZMB 2 are very similar to those of the chemically related products Vulkanox MB 2 and Vulkanox MB.

5. Applications

Suitable for compounds based on natural rubber or synthetic rubber of the types SBR (e. g. ®Polysar S, ®Krylene, ®Krynol), polyisoprene, butadiene (e. g. ®Taktene), and NBR (e. g. ®Perbunan N, ®Krynac).

Suitable for transparent, white and coloured rubber goods, e. g. bathing goods, fabric proofings, toys.

Used with Vulkacit Thiuram, but little or no sulphur, for goods which must withstand heat.

Suitable for latex compounds, in which it serves both as an additional sensitizing agent and as an antioxidant.