

PRELIMINARY EVALUATION OF β -CARBOALKOXY
ETHYL TIN COORDINATION COMPOUNDS AS PVC
STABILIZERS

Preliminary evaluation of β -carboalkoxy ethyl tin co-ordination compounds as PVC stabilizers (Mill heat and Oven heat stability.)

Due to inadequate facilities, it has not been possible to evaluate properly the application of β -carboalkoxy ethyl tin coordination compounds prepared in the present investigation as PVC stabilizers. High thermostability of a stabilizer allows the use of high working temperatures and concomitant high working speeds which is of particular advantage in the manufacture of certain PVC products. Before any large scale trials are carried out we intended to study the mill heat stability and oven heat stability tests of the β -carboalkoxy ethyl tin coordination compounds. Thermostability tests of the compounds Bis(β -carbomethoxy ethyl) tin bis-oxinate (Sample No. BD/1; m.p. 152°C) and Bis(β -carbomethoxy ethyl) tin bis-dithizonate (Sample No. BD/2; m.p. 187°C) were carried out at ALA Chemicals Ltd, Ambarnath 421-501, Maharashtra, through the courtesy of Dr. S. Banerjee, Head of the Department of Quality Control.

The mill heat stability of the compounds BD/1 and BD/2 (mentioned above) were carried out at $(180 \pm 2)^\circ\text{C}$ and compared with the standard dibutyl tin glycolate

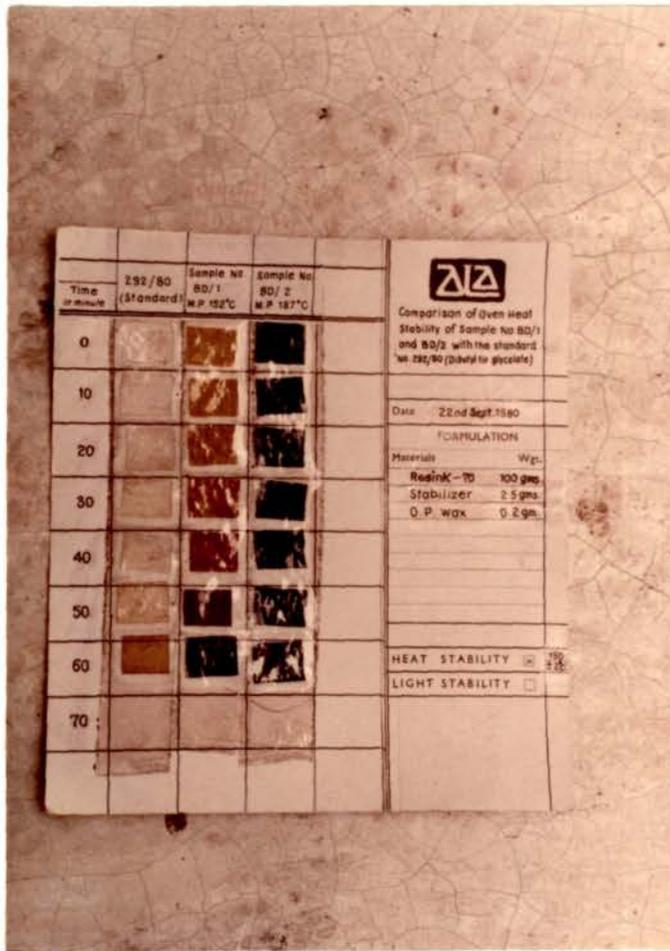


Fig. 105

(Original PVC films are uniformly coloured. Patches on their photograph are due to reflection of light from uneven covering of transparent adhesive tape over the PVC films and therefore , be ignored.)

(No. 292/80) stabilizer. The oven heat stability of these two compounds were also done at a temperature of $(180 \pm 2)^{\circ}\text{C}$. The following formulation was done

<u>Materials</u>	<u>Weight</u>
Resin K -70	100 gms
Stabilizer	2.5 gms
O.P. Wax	0.2 gm.

The film produced was of excellent quality and at least equivalent to that given by the formulation based on butyl tin stabilizer. Mill heat stability and comparative oven heat stability tests were carried out on the film and are given in figures 105 and 106 .

Results of trial of the oven heat stability indicated that Bis(β -carbomethoxy ethyl) tin bis-oxinate showed poor performance in heat stability compared to the standard. But the compound, Bis(β -carbomethoxy ethyl) tin dithizonate (Greenish-black crystal) showed a greater reserved of heat stability and was comparable with the standard, dibutyltin glycolate, stabilizer.

In respect to mill heat stability, the compound BD/1 once again showed poorer performance and got stuck after 21 minutes in comparison to the compound BD/2 .

which stucked at 27 minutes.

Since organotin complexes are deeply coloured, particularly the dithizonates, the PVC products stabilized with such compounds will also be coloured. The intensity of the colour will vary with actual amount of compound present. This may obviate the necessity of adding any additional colours in producing coloured PVC products.

From the results of the trial as mentioned above although the compound, Bis(β -carbomethoxy ethyl) tin bis-dithizonate indicated an encouraging possibility for some selected uses, more detail work is necessary to establish these types of compounds as PVC stabilizers. Unfortunately, it has not been possible to continue further studies in this direction, however, we are planning to make proper arrangements at our own laboratory for further studies in this area.