



Glacier Vandervell Bearings

Material Analysis Report

MAR No.

041204

Date

12/7/04

Customer Name

Mack - TEI

Identification of Samples

Qty	Part Number	Description	Date Stamp(s)	Material	Mfg Loc.
6		Rod Bearings			

Application

T-10 Test

Reported History

Instructions

Prepare for comparison to previous analyses,
 Overlay and Ni layer thickness
 OD flash chemistry
 EDS map of overlay

Requested by

Date Required

12/13/04

Analysis

Layer thicknesses are normal for overlay and nickel barrier. Flash layer cannot be directly measured.
 Lead/Tin content in the OD Flash is approximately 65/35 by SEM analysis, which is reasonable given the instrument's accuracy for this type of analysis.
 EDS mapping of composition shows Tin is still evenly distributed throughout the overlay and minimal Tin migration.

Observations / Comments

Reference previous MAR's # 040216 and 040311

Met. Lab

T Greaves

Date Completed

12/09/04

Engineering

D Lonowski

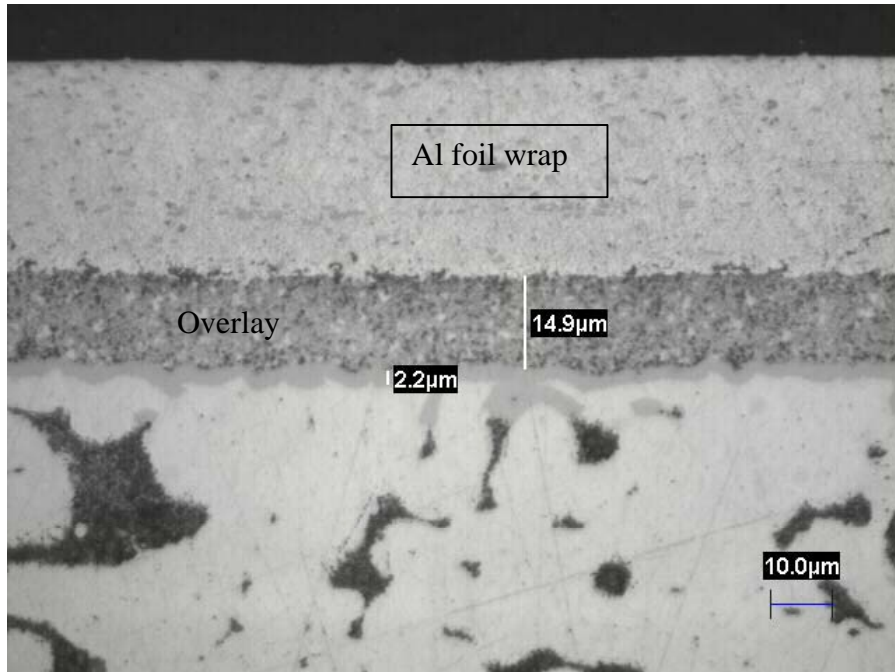


Figure 1 Thickness of Overlay and Nickel layers

Site: OD Flash

Sample: Sample 1

Processing option : All elements analysed (Normalised)

All results in weight%

Spectrum	Sn	Pb	Total
Spectrum 1	35.29	64.71	100.00
Spectrum 2	34.60	65.40	100.00
Spectrum 3	35.16	64.84	100.00
Mean	35.02	64.98	100.00
Std. deviation	0.37	0.37	
Max.	35.29	65.40	
Min.	34.60	64.71	

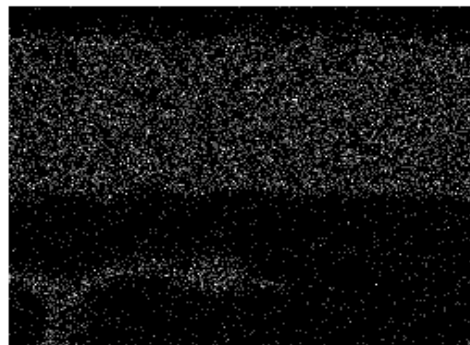
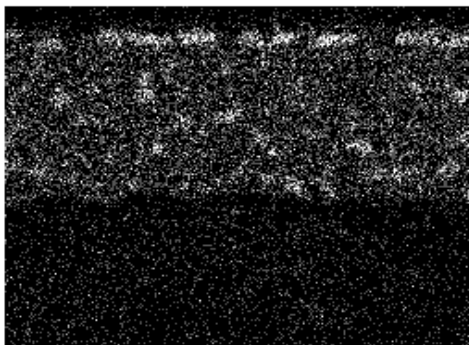
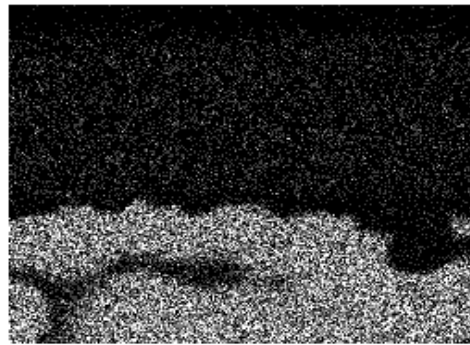
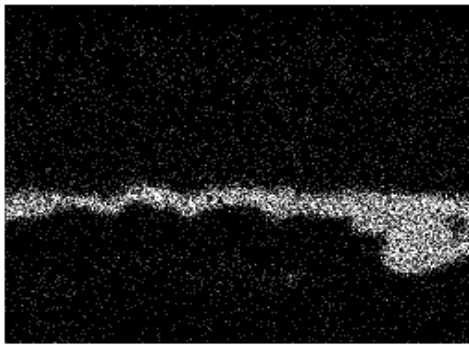
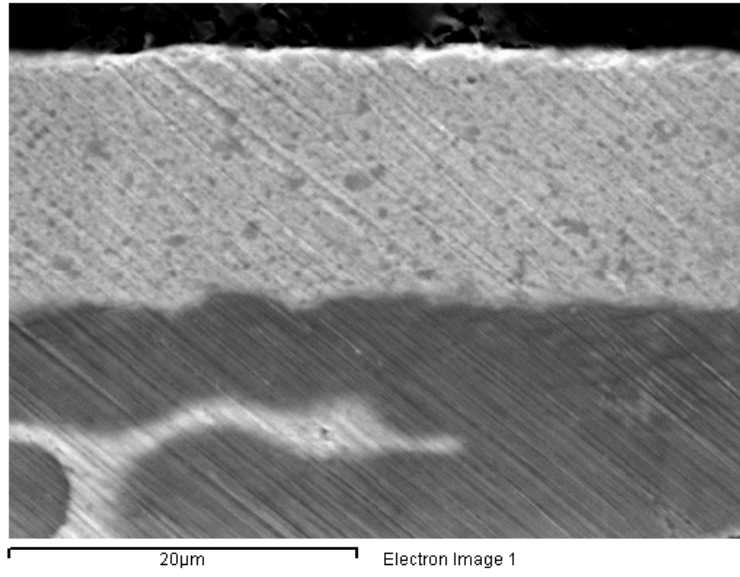


Figure 2 EDS mapping of overlay. Tin is still fairly well distributed throughout the overlay, with some concentration at the top from the flash layer.