

CASE STUDY 4 – Chemical analysis

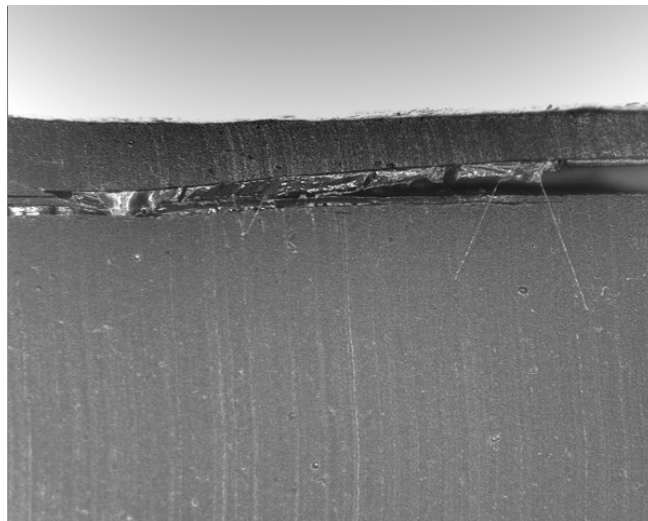
Product fault investigation

Brief

ARTIS were presented with customer parts which showed blistering on the surface. We were tasked with investigating the cause of the blistering and proposing a solution.

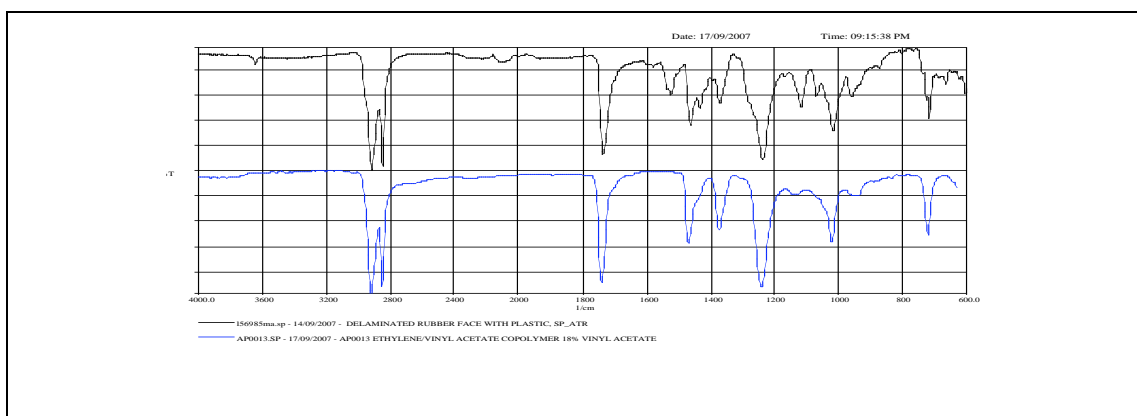
Investigation

Optical examination revealed the presence of thin layers of soft, transparent plastic material on the blister faces, as illustrated below.



Cross-section through blister, optical image, x20

Insufficient material could be recovered to enable DSC melting point so single pass infrared spectroscopy was used.



IR spectra of EVA and suspect material



Though not an exact match the spectra strongly suggests the presence of EVA on the blister surfaces (with a relatively low vinyl acetate content, in the region of 18% providing the best spectra match). A survey of the customer mixing facility showed that a key ingredient was bought in with an EVA protective wrap, which should have been removed prior to mixing and this was matched to the IR spectra.

Conclusion

EVA protective wrap on a key compound ingredient was identified as the root cause of the moulding problem. Actions were put in place by the customer to ensure that all this material was removed prior to mixing.