

APPLICATION NOTE

Measuring the thickness of protective layers inside aluminium cans and tubes

Aluminium tubes and cans are commonly used as packaging for pharmaceutical, cosmetic or even food products. In order to prevent direct contact and chemical reactions between the container and the contents, the tubes are usually coated inside with a protective polymer layer. The thickness of the coating must be monitored regularly during the application process to ensure the proper function of the protective lining.



Fig.1: Examples of commercially available aluminium packaging tubes

For aluminium cans and tubes filled with pharmaceuticals or food, the inner protective layer is critical for preventing chemical reactions between the packaging and the contents; this is why its thickness must be monitored carefully during manufacture. For quality assurance, random samples are periodically removed from the running production process and their linings are measured using the eddy current testing method. However, care and skill are required: these protective coatings are particularly sensitive to pressure. A "normal" probe can easily compress the layer, thus leading to incorrect measurement results.

After being cut, the samples are shaped to form a flat metal strip. For the measurement itself, FISCHER's probe FTA2.4-SC is ideally suited because of its large contact area and spring-mounted measuring element, which exerts only low contact pressures. The stand V12 guarantees precise vertical guidance and controlled vertical touchdown. The probe can be operated and the results evaluated by the handheld measuring devices from the FISCHER FMP series.

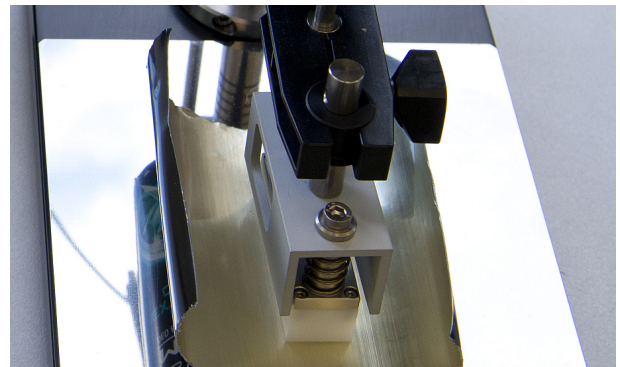


Fig.2: Eddy current probe FTA2.4-SC, attached to the stand V12, measuring a protective layer inside an aerosol can made of aluminium

For processing larger sample quantities, an automated solution is also available with the FISCHERSCOPE® MMS® PC2 and a motorised, programmable stand. In addition to the inner protective layers, the outer skins and coatings can also be measured with these devices.

control point	Tube 1		Tube 2		Tube 3	
	Mean value	Std. dev.	Mean value	Std. dev.	Mean value	Std. dev.
1	12.0	0.09	9.8	0.10	9.8	0.10
2	11.9	0.09	9.8	0.10	9.8	0.10
3	12.1	0.10	10.1	0.10	10.1	0.10
4	12.3	0.08	10.0	0.08	10.0	0.08
5	11.7	0.10	9.9	0.09	9.9	0.09
Mean value	12.0	0.09	9.8	0.10	9.8	0.10

Tab.1: Thickness measurement using the FTA2.4-SC probe on 3 different tubes, 10 measurements at each point. Readings in μm .

To check the thickness of protective coatings inside aluminium tubes and cans, the eddy current probe FTA2.4-SC is ideal due to its low contact pressure. Used together with a handheld or desktop device from FISCHER, the probe enables accurate measurements on these sensitive linings without compromising them with excessive pressure. For more information, please contact your local FISCHER representative.