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PET TOUCHSCREEN MEASUREMENT

I. SUMMARY

Touch screen sample (PET sheet with 2 layers: ITO and hard coating polymer) was measured using MProbeVis system. Results of the measurements are presented in the summary Table below. The measurements were done from the ITO side of the sheet (it can be done from the either side of the sheet – no much difference)

Location	ITO thickness [nm]	HC thickness[nm]
Center	32 nm	1536 nm
Top Left corner	32.2nm	1549 nm
Top right corner	20.5 nm	1549 nm
Bottom left corner	32.3 nm	1493 nm
Bottom right corner	33.7 nm	1490 nm

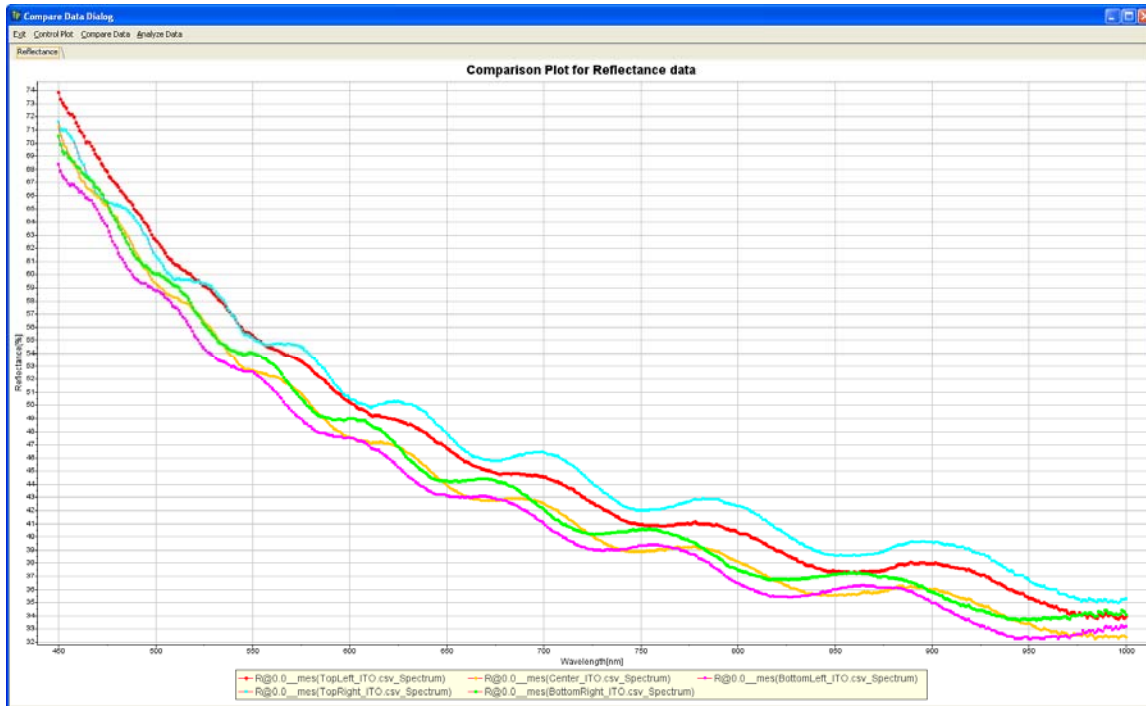**Table. Thickness results summary**.

Fig. 1 Raw reflectance spectra at 5 measured points

II. DATA ANALYSIS DETAILS

ITO material dispersion was represented using classical oscillator approximation and optical constants were adjusted during data analysis.

Hard-coating dispersion was represented using Cauchy approximation, refractive index was determined along with the thickness based on the optical contrast on PET and HC materials interface. The contrast between these 2 materials is very weak and creates small amplitude interference fringes (~ 1% reflectance difference peak-to-peak).

The model was developed in 2 steps.

Step 1. On this step, HC layer was ignored and only ITO layer was used in the analysis .ITO optical constants and thickness estimate were determined.
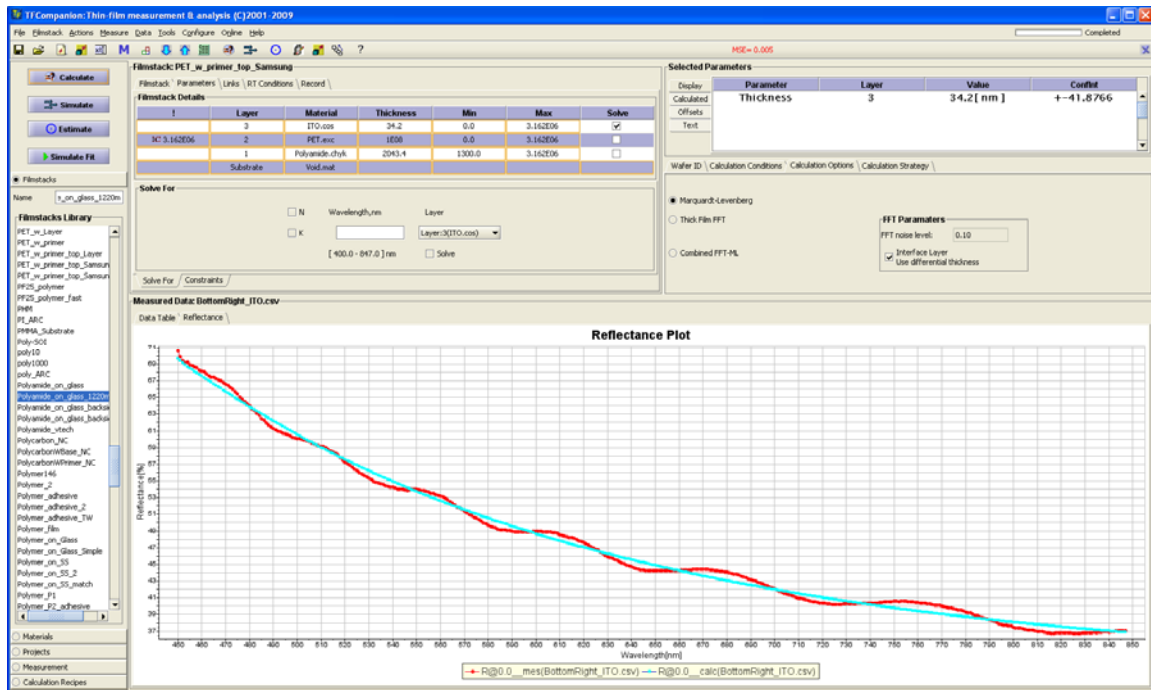

Fig. 2. Fit of the model to measured data. Only ITO layer is used (HC layer is ignored). Measured spectrum has weak fringes (due to HC layer) – they are ignored in the model.

Step 2. On this step, HC layer was added and optical constant, thickness of HC layer and thickness of ITO layer were determined simultaneously.

After step 2 the model development was completed and all points were measured using this model.

Fig. 3. Fit of the model to measured data. Both ITO and HC layers thickness is determined. Model data now follows the fringes and the fit is much better as compared to the Fig. 2 where HC layer was ignored.
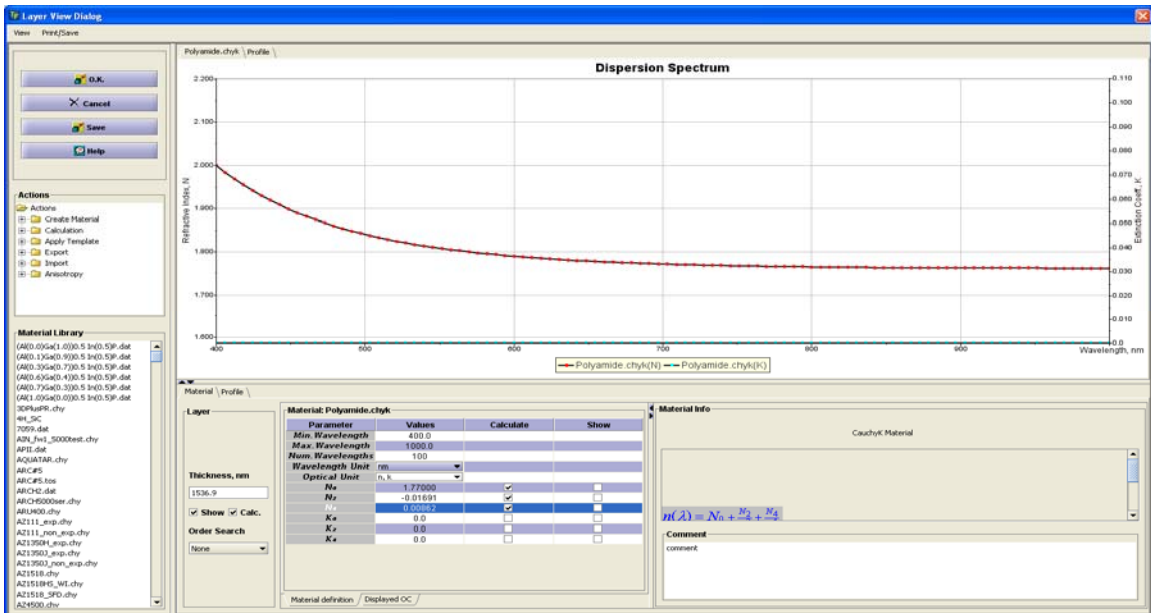

Fig.4 Refractive index dispersion of the HC layer, determined from the measurement