***Clear*** & ***Clean contributing Trace Analytics for Satellite Production.***

Clear & Clean is taking up challenges in Surface Purity Analytics (9.2021)

**Development task:** Our development work on ultra-pure collector substrates for the contamination control on satellites and other large Space-HiTech-Objects is in its final stage. This task was to be conducted outside the ESA-DEAR project *for which we are* no *longer active.* Working at the same time on two tasks of this magnitude would exceed our capacity being a small specialist company. The purity requirement for the Swabytex® collector substrates are immense and we need all our skills to succeed here.

**Cooperation with the Satellite industry.** However, we accepted the challenge to work with the space industry with enthusiasm and were closely supported in terms of counter-testing and validation by an expert lady from one of the Satellite Engineering Companies. We delivered usable prototypes within 18 months and the Clear & Clean collector substrate was registered under the brand name SWABYTEX® and will be available to interested users hopefully from late autumn or during the 1st decade of 2021. A very important part of the development is the packaging design, as this must have a product-equivalent degree of surface purity. Various packaging options are now being developed and finally tested.

**Trace Analytics Testing** The surface purity specified for the delivery, assembly and transfer of satellite components requires the use of trace analytical test methods. An obvious method would be a wipe transfer test: For this purpose, a solvent-soaked substrate of highest degree purity (swab, dabber, cloth,) is wiped as a contaminate collector over the object surface. As a result of the relative movement a certain amount of surface contamination is transferred onto the collector substrate. After extraction with a suitable solvent, the mass or active substance of the contamination can be determined by using ATR-FTIR Infrared Spectroscopy, GC-MS Mass Spectrometric Chromatography or TOF-SIMS Spectrometry. The weak point of the process envisaged in the past has been the inadequate purity of the collector substrate in particular for trace analytical purposes. To increase the difference in mass between the substrate- and the surface contaminant to be removed and analyzed, it was necessary to prepare a wipeable and at the same time ultra-pure cleaning substrate. After the project operators could not identify a commercially available item of this kind, they were possibly reminded of the substrates that Clear & Clean had supplied to the Physikalisch-Technische-Bundesanstalt (PTB) for the longevity-storage of the Ur-Kilo and asked us for collaboration.