

# Sees better, looks better – the prism optics of the DSA100

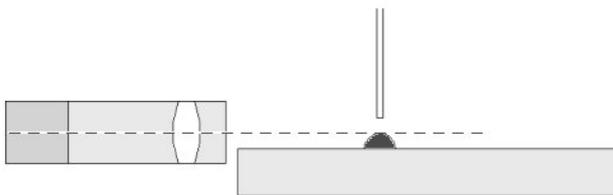
Functionality and design fused to form an organic unit – this was the demand placed on all the components of the DSA100 Contact Angle Measuring instrument by our R&D people. An example of this is the patented construction of the optics which characterizes our particular system.



## Low horizons

Conventional contact angle measuring instruments work with a direct light path – illumination, sample, lens system and camera all lie on a single axis. However, although at first glance this arrangement seems to be logical, it nevertheless has several disadvantages.

On the one hand the camera side together with the lens system has a considerable length. The width of the instrument is therefore determined to a considerable extent by the length of the optical arrangement and is not – as it ought to be – available for wide samples. And, as the objective is located exactly at the sample level, the size of the sample area is additionally limited by the working distance of the objective.



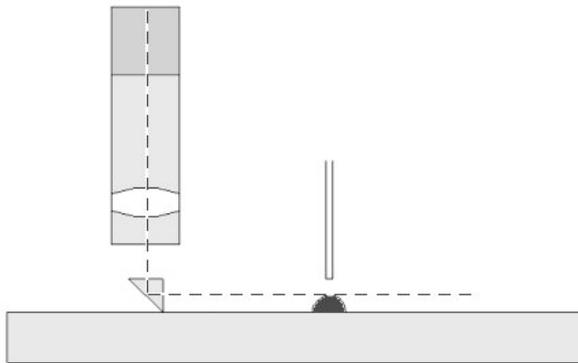
There is also the following problem: unless the whole instrument housing is widened the complete optical system including the camera will project – this exposes one of the most expensive and sensitive components of the contact angle measuring instrument to mechanical damage and dirt.

Until now a further difficulty was adjusting the tilt angle: altering the tilt angle changed the position of the drop in the image. This resulted in time-consuming adjustment of the drop baseline and possibly even the height of the sample.

## Looking further

The KRÜSS patent solved all the problems mentioned above at a single stroke or, more accurately: by using tilting optics equipped with a prism. This displaces the drop image so that the camera lies vertically to the optical axis and is safely contained in a housing above the sample level. This protects the camera and reduces the total width of the instrument – and, incidentally, improves its appearance. With respect to the quality of the presentation there are no disadvantages provided that, as in the DSA100, a top-quality prism is used and that the arrangement is at an exact right-angle.

The decisive advantage of this construction is that the working distance of the objective no longer plays any role in limiting the possible sample size. In contrast to the optics in the horizontal arrangement, the prism can also be located vertically above the sample. This means that a large sample can be placed directly beneath the prism and still measured without any problems.



In the portable GH100 Contact Angle Measuring Instrument, which has used this principle for a long time now, it is even possible to place the whole instrument on the sample.

The tilting problem has also been solved. The tilting optics of the DSA100 move exactly in the center of the image axis. This prevents the position of the drop in the image from changing, so that once they are set the optics and sample height parameters no longer need to be readjusted. In addition, the right-angle arrangement is always guaranteed, so that no distortion of the drop image can occur.

Space savings, gains in time and security, a better appearance – a simple idea with far-reaching effects.