Picolitre and nanolitre dosing systems

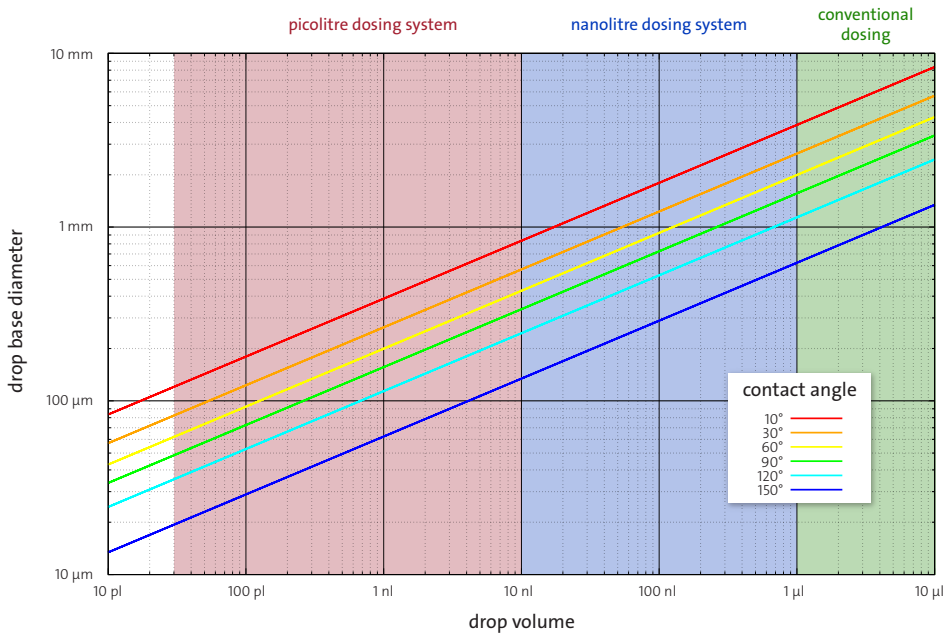
Dosing systems for contact angle meausurements on microstructured samples

dataphysics
Understanding Interfaces

Surfaces with very small test areas for contact angle measurement, like micro-structured samples in precision mechanics, printed circuit boards, medical stents, or single fibres, pose a challenge to liquid dosing. Droplets with drop base diameters even smaller than the limited test areas need to be created.

DataPhysics Instruments offers two solutions for dosing such extra-small droplets, namely the nanolitre dosing system with the ESr-N and the picolitre dosing system PDDS. According to the surface area available on the sample and the expected contact angle the suitable dosing system can be chosen (see diagram).

Integrated in the established contact angle measuring systems of the OCA series both special dosing systems guarantee a fast and reliable measurement of contact angles on even the smallest samples.

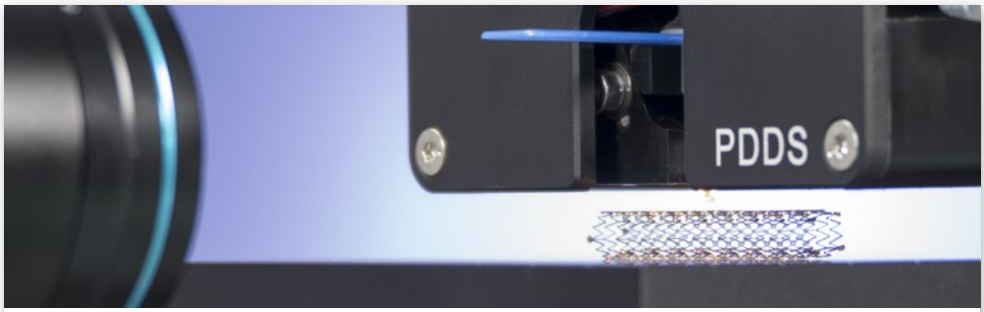


approximate drop base diameter as a function of drop volume and contact angle

Picolitre dosing system

Dosing picolitre droplets on solid substrates carries optical contact angle measurement to the extremes. DataPhysics Instruments' newly developed picolitre dosing system **PDDS** enables to reproducibly dose droplets of down to 30 picolitres. Hence, depending on the contact angle, drop base diameters considerably below 100 micrometres are achieved.

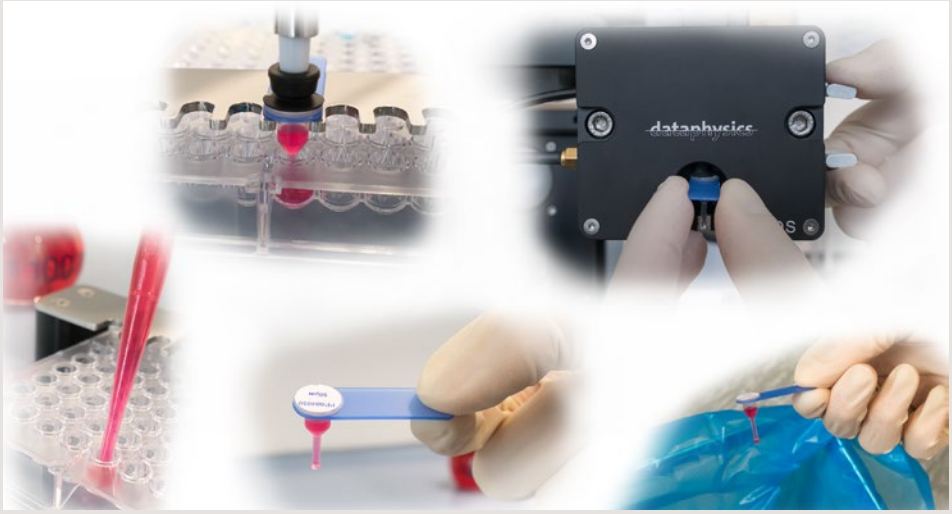
What makes working with the PDDS particularly easy are the disposable cartridges used as test liquid containers. Their volume is only 100 microlitres being economic regarding both material cost and waste. Moreover, the disposable cartridges prevent any risk of cross-contamination when working with different liquids as well as time-consuming cleaning efforts. Hence, also challenging liquids like inks or surfactant solutions can be investigated without any trouble.



measurement on a coronary stent with the picolitre dosing system PDDS

Working with the disposable cartridges

A test liquid can be easily filled into a cartridge via aspiration. For this purpose a standard pipette with a special adapter which is positioned on the membrane lid of the cartridge is used. Creating some negative pressure the liquid is sucked trough the nozzle of the cartridge which is then directly ready to use. It is inserted into the dosing head of the PDDS system and after the experiment removed and disposed of.



Technical data PDDS

single drop volume:
• ca. 30 pl (water)

dosing speed:
• max. 1000 drops/s

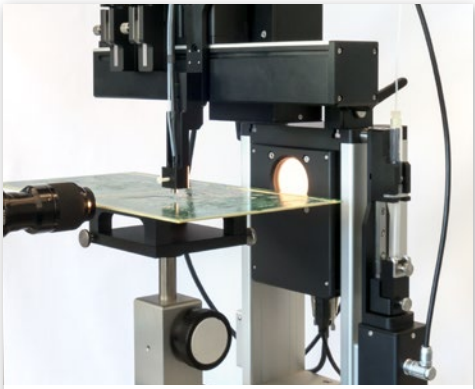
cartridge volume:
• 100 µl

nozzle diameter:
• 30µm, 50 µm, 70µm or 100µm

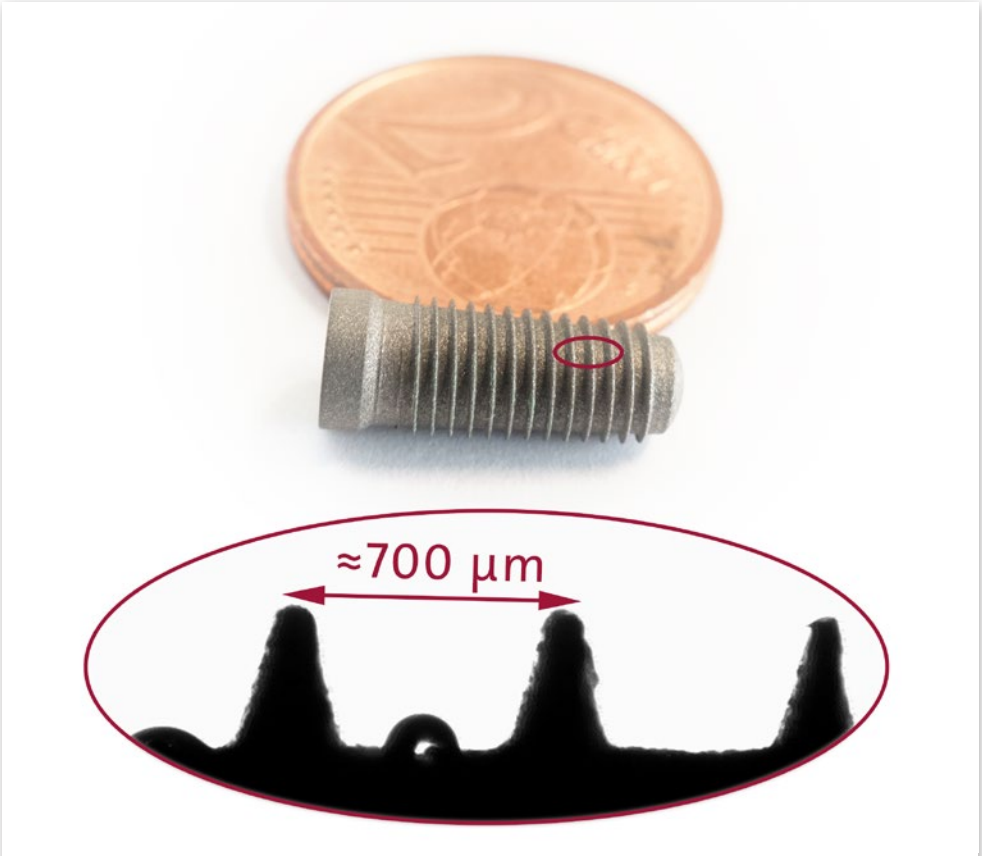
Nanolitre dosing system

The electronic syringe module **ESr-N** is the new standard syringe module of DataPhysics Instruments' optical contact angle measuring and contour analysis systems of the OCA series. This module, of course, allows for conventional direct dosing in the microlitre range using glass or disposable syringes.

Moreover, the ESr-N is already prepared for nanolitre dosing. By simply adding a nanolitre dosing valve, the system is ready to dose droplets of down to 10 nanolitres. This directly extends the application area of the contact angle measuring system considerably into the microstructure range.



ESr-N syringe module with nanolitre dosing valve



nanolitre drop inside the screw threads of a dental implant

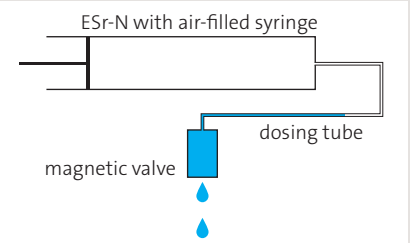
Technical data ESr-N

single drop volume:
• ca. 10 nl (water)

dosing speed:
• ca. 250 drops/s

Functional principle of nanolitre dosing

With an air-filled syringe in the ESr-N module, the liquid in the dosing tube is pushed against a magnetic dosing valve. The valve is triggered by the OCA software. This set-up allows to reproducibly dose nanolitre droplets onto a microstructured surface.



**For more information please contact us.
We will find a tailor-made solution to your surface chemistry requirements and will be pleased to provide a quotation, obligation-free, for your instrument system.**

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