AN INTELLIGENT SAMPLE DELIVERY SYSTEM

HIREP will create a standardised sample delivery system, unifying sample characterisation and positioning of samples and providing external user groups with simplified access to EUCALL's facilities.

The delivery of standard sample frames is a key to enable integrated sample delivery concepts that are used at different user facilities for photon science. HIREP's sample frame will allow users of synchrotron, free-electron laser and high power laser facilities to freely exchange samples. Users will prepare their sample systems on standard sample frames and ship them to any of EUCALL's facilities. Common software will also simplify the access. This will save both time and effort for user groups who are already using several different facilities and will encourage users to investigate which other light sources can provide complementary measurements for their samples. HIREP's system includes an »intelligent« sample and target pre-characterization procedure – automated analysis of sample quality and localization of points of interest. The generated data will then be used to raster-scan the sample frame through the x-ray or laser beam at 10 Hz.

EUCALL

High Repetition Rate Sample Delivery (HIREP)

The European Cluster of Advanced Laser Light Sources

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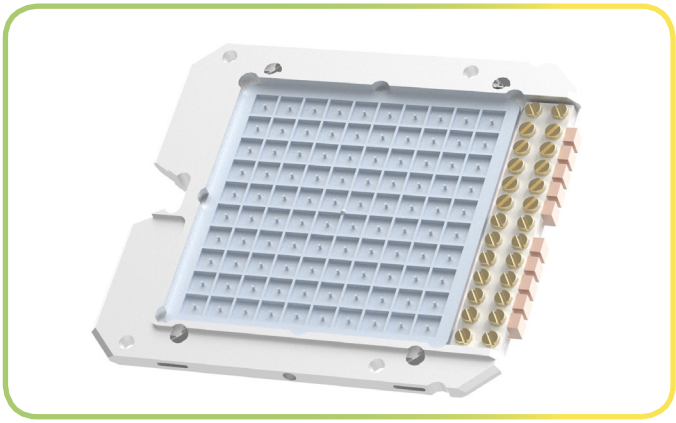


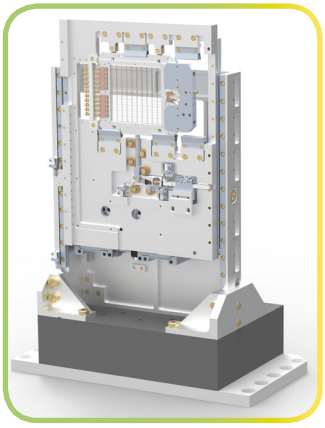
User prepares their samples on HIREP's sample holder –
© European XFEL

Samples are automatically characterised by UHV microscope system –
ID 26581034 © Anyaivanova | Dreamstime.com

HIREP will produce one sample holder which allows ultra-precise positioning in combination with maintaining a controlled constant humidity level or cryo-cooling for synchrotron and FEL experiments. A second larger sample holder, for high energy laser experiments in ambient conditions will also be created.

To promote the distribution, introduction and usage of the standard sample holders, HIREP will present the designs to the corresponding users and to research facilities not involved in EUCALL. EUCALL's facilities will equip their instruments with compatible sample stages and suitable carrier frame designs to adapt all target frames fulfilling the standard.

Additionally, HIREP will establish a database of sample frames that have been designed and used successfully. Users will be encouraged to copy these designs and to share their own developments and improvements on existing designs with the community.



Samples are scanned through
x-ray/laser beam at 10 Hz –
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EUCALL is a network between leading large-scale user facilities for free-electron laser, synchrotron and optical laser radiation and their users. Under EUCALL, they work together on their common methodologies and research opportunities, and develop tools to sustain this interaction in the future. EUCALL has received funding from the European Union's Horizon 2020 research and innovation programme and involves 11 partners from nine countries as well as the networks Laserlab Europe and FELs of Europe during the project period 2015 to 2018.

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