

SPINE SAMPLE HOLDER & VIAL SPECIFICATIONS-L-R05.doc

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Drawings:

~~DM16106A~~ **DM16106B** Cap, **DM16210A** Vial, **DM16100** Sample Holder (with Hampton™ pin),

DM16001A Sample Holder + Vial (with Hampton™ pin), **DM16300** Goniometer mount

Terminology:

- **Cap:** support of the pin
- **Pin:** pin with mounted crystal support (loop...)
- **Sample holder:** Cap + pin
- **Sample Holder Length:** Distance from the base of the cap to the crystal (or beam position) Refer to drawing **DM16100**.
- **Vial:** sample holder reservoir
- **Goniometer mount:** Magnet or electromagnet that holds the Sample holder on the goniometer

Design rules:

- 1) Compatible with commercial Sample changers using HAMPTON Magnetic style Sample holders
 - Mar research
 - Rigaku – ACTOR
 - Bruker Nonius BruNo
- 2) Compatible with sample changers that are under development in academic institutes:
 - EMBL/ESRF Grenoble
 - EMBL Hamburg
 - CNRS Grenoble - ESRF FIP Beamline
 - LBNL Sample changer
- 3) Compatible with the HAMPTON Magnetic Sample holder and Vial system
- 4) Caps accept different pin types (customized mounting holes)
- 5) Identification with ECC200 DATA MATRIX codes + human readable code
- 6) Improved precision for robotised handling
- 7) Improved stability for use with micro crystals
- 8) Compatible with manual use
- 9) Public design for multiple manufacturing companies

Vials - DM16210A

- Rounded edges (or chamfers) on top and on the bottom of the vials to avoid potential blocking during transfers.
- Ferromagnetic disc at the bottom of the vials for “positive” vial manipulation with a magnet
- Polarity of the vial magnetic ring is specified
- Vent hole

Caps - DM16106A

Caps - DM16106B

- Rounded edges (or chamfers) to avoid potential blocking during transfers.
- Recommended material: Steel anticorrosion coated or ferromagnetic stainless steel (Stainless steel 430F or equivalent).
- Minimum material quantity to reduce the freezing/melting/drying cycle when the sample holder is transferred
- Pin' hole diameter and depth are not specified, they depends on the type of pin used. An example is given for 18 mm Hampton "Mounted Cryoloop™". (*DM16100*)
- DATA MATRIX code protection when a sample holder is mounted on a goniometer mount: A gap is maintained between the code and the mount. The surface of contact between the Cap and the Goniometer mount is the Cap Base (*DM16300*). The surface of the internal disc ($\Phi 9.7\text{mm}$) is reserved for labelling. The stability of the sample holder is improved when mounted on the Goniometer. The Sample holder remains compatible with existing goniometer mounts.
- **Dimensions completed/clarified**
- **For good traceability, the batches of Caps produced accordingly to the release -R05 should be registered**

Sample holder length - DM16100

(Sample holder = Cap + pin + loop)

- The sample holder length is **22 mm** (from base of cap to crystal or beam position)
- A fixed Sample Holder length will ensure compatibility with all sample changers
- The pin should be stably attached to the cap

Example of cap design for 18 mm Hampton pin is shown in drawing *DM16100*

Sample Holder identification:

Sample holder's caps are identified with DATA MATRIX and human readable codes.

- **ECC200 DATA MATRIX** label on the top of the cap, printed or engraved on the magnet footprint face ($\Phi 9.7\text{ mm}$).
- Readable code near the DATA MATRIX code and/or on the rim of the Cap.
- The data matrix should be well readable in LN2, cold and RT N2 environment.¹
- **For good traceability, a new series of DATA MATRIX codes should be started for the Caps produced accordingly to the release -R05.**

Each Sample Holder can be reused and the Sample (crystal) identifier in a database can be associated with the "**Sample Holder ID**" when it is mounted in the loop.

DATA MATRIX and readable codes can either be engraved or printed.

¹ A LN2 layer or drops might impair readability. Grenoble is doing tests with cap options 1 and 2 (*DM106A*). Extensive use of the data matrix will allow a better evaluation.

ID encoding scheme

A **Sample Holder ID** should be composed of a string of 10 alphanumerical characters:

MA12BC3456.

MA12BC3456.

The first letter identifies the manufacturer and ensures that different manufactures cannot produce the same ID.

Contact spine.sh.mid@spineurope.org for attribution of the Manufacturers IDs.

See Annex 1.

MA12BC3456.

The remaining 9 characters are organised for good human readability into 1 character, 2 numbers, 2 letters, followed by 4 numbers. These numbers and letters are random.

DATA MATRIX format

Allowed ECC200 DATA MATRIX codes are:

	Format Number	Numeric Capacity	Alphanumeric capacity	Correctable Errors/Erasures
14x14	2	16	10	5/7
16x16	3	24	16	6/9