



# UCCA MOUNTAIN PROJECT

CONTROLLED COPY NO. 102

Subject:

Identification and Control of Metal Specimens

Approved by:

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4/17/90  
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## 1.0 Purpose

The purpose of this technical implementing procedure (TIP) is to establish methods for the identification and control of metal specimens that will be tested by the Metal Barrier Selection and Testing (MBST) Task.

This TIP is prepared pursuant to Quality Procedure 033-YMP-QP 8.0 "Identification and Control of Items, Samples, and Data".

## 2.0 Scope

This procedure applies to all metal specimens that must be identified and have a documented history which is traceable from specimen material procurement to final disposition at the Yucca Mountain Project (YMP) Local Records Center (LRC) of Lawrence Livermore National Laboratory (LLNL).

This TIP is prepared in accordance with the following Quality Procedures:

- 033-YMP-QP 3.0 "Scientific Investigation Control"
- 033-YMP-QP 13.0 "Handling, Storage, and Shipping"
- 033-YMP-QP 17.0 "Quality Assurance Records"

## 3.0 Responsibilities and Authorities

The Task Leader (TL), Principal Investigator (PI), or Designee is responsible for:

- Assigning and maintaining identification of specimens (whole parts and sub-parts) through pretesting, testing, post-test analysis, and storage.
- Providing detailed specimen identification and labelling requirements for incorporation into the procurement document, if performed by the vendor.
- Insuring that unique requirements are provided for incorporation into the procurement document. (An example is that none of the preparation or processing activities of the stainless steel specimens (as cleaning, sawing, machining, brushing, identifying) shall expose the specimens to contamination from any of the five (5) members of the halogen family, namely, astatine, bromine, chlorine, fluorine and iodine.)
- Maintaining a cross reference in a scientific notebook, between specimen identifiers and locations at all times until activity completion.

- Furnishing the local records center with a listing of the QA record types to be generated and providing the LRC with updated listings.
- Transferring the specimens and their documentation to the LLNL/YMP local records center. These are part of the complete quality assurance records for an activity.

The Technical Area Leader is responsible for:

- Verification that this TIP meets the objective of the scientific investigation plan.
- Approval of this TIP and revisions.

The YMP Quality Assurance Manager is responsible for:

- Verification that this TIP identifies and implements the applicable quality assurance requirements.
- Approval of this TIP and revisions.

The YMP Project Leader is responsible for:

- Approval of this TIP and revisions.

## **4.0 Procured Specimens**

### **4.1 Specimen Labelling**

Test specimens that are purchased directly from a vendor may be numbered by the vendor. (This specimens include those which are machined from LLNL/YMP supplied material.) The scheme for numbering of the specimens will be clearly stated on the procurement documents. This will include the numbering sequence, marking method, and the position of the markings. (If appropriate, drawings indicating where specimens are to be cut from plates are to be included in the procurement documents.)

If procured specimens are not numbered by the vendor, then the vendor must clearly tag or bag the specimens to indicate the specimen material and any other appropriate characteristic, e.g. the rolling direction. Upon receipt of the specimens the TL, PI or designee will assign identification numbers to and label the specimens.

## 4.2 Shipping and Handling

The specimens covered by this TIP shall be packaged and marked to prevent damage due to temperature, humidity, and pressure, and prevent loss of identification during transport.

## 5.0 Specimen Identification

This section outlines the specimen numbering system and the appropriate methods of identifying the specimens. Specimens will be assigned identification numbers by the TL or PI and labelled when fabricated or received. (See Section 4.0 for procured specimens.) Specimen identification will be documented within the scientific notebook.

### 5.1 Specimen Identification Numbering

Specimen identification numbers are required and must be unique to each specimen and its sub-parts. The specimen numbers consist of five parts:

- 1) material identification,
- 2) activity number,
- 3) test number,
- 4) specimen number, and
- 5) sub-part number.

The material identification will be a standard metallurgical industry alphanumeric designation (e.g. 825, AISI 316L, CDA 715) - some shortening of the full designation is permitted to allow it to fit within the dimensional confines of the specimen but must include enough information to accurately identify the material, e.g. the "L" must be included on low carbon materials, "LN" on low-nitrogen materials, and "NU" on nuclear grade materials.

The activity number uniquely identifies the specimen with a particular activity. For example, activity E-20-18a within the MBST Task. The activity number can be shortened for specimen marking e.g. E-20-18a could be shortened to "18a".

A test number is required to identify the particular test within the activity. Sequential numbering of tests starting with the number one (1) is required.

The specimen numbers follow a sequential numbering of the specimens for a given test number.

The sub-part number is a letter designation of the sub-part of a specimen. The letter "A" is reserved for the primary piece of the original specimen, and all sub-parts will be lettered sequentially, starting from this part. All original parts will have the sub-part number "A". The original part need not have the sub-part number until it has been subdivided into other parts.

An example of a specimen identification number is "CDA 715 E-20-18a 1-1-A". The specimen material is CDA 715, the activity number is E-20-18a, the test number is 1, the specimen number is 1, and the sub-part number is A. For the purposes of marking on the specimen itself (see Section 5.2) the number could be shortened to "715 18a 1-1". The material is adequately identified by "715", the activity is uniquely identified by "18a", this is first test within the activity, and this is the first test specimen and is the original part. The shorten label must be cross-referenced to the full identification number in the scientific notebook.

## 5.2 Specimen Labelling

Whenever reasonable, each specimen will be individually marked with its own specimen number. The marking must be legible, and done in a manner that does not significantly affect the test results. In addition, the marking must be as indelible as reasonably possible for the planned tests. The method of marking an individual specimen may include, but is not limited to engraving, stamping, etching, or scribing. The TL or PI will decide which method of marking to employ in order to produce the least undesirable effect.

In those instances where the specimen identity cannot be placed on the specimen (e.g. small specimens or specimens whose tests results will be affected by the markings) specimen identification must be maintained by alternate means. This will be accomplished by a tag or bag that accompanies the specimen during any pre-test processes and treatments, and during post-test analysis and storage.

The method of labelling and identifying the specimens will be documented within the activity's scientific notebook.

## 6.0 Certification

If the vendor procures the material for fabrication of the specimens, then as part of the procurement and acceptance of the specimens, the vendor will supply a certified chemical analysis of the heat from which the specimens were obtained. Additional documentation of fabrication history, or mechanical or microstructural properties may be required depending on the nature of the procurement, specimens, and type of test. If any additional documentation is required it will be so stated in the purchase requisition.

If an independent certification of chemical analysis is required (vendor chosen by LLNL), then it will be stated in the purchase requisition.

## 7.0 Master File (Records)

A test specimen master file will be maintained in the MBST repository and may contain, but is not limited to, the following information:

- description of the specimen(s) (e.g. type of specimen(s), dimensions, drawings);
- number of specimens;
- a listing of the specimen identification numbers used;
- type or designation of specimen material (ASTM or other appropriate specification);
- a copy of the materials certification for each lot of specimens, indicating the original mill source and process history of the specimen material;
- chemical, mechanical, physical, and microstructural properties, as available from the specimen vendor;
- any particular procedure or process used to fabricate the specimens (e.g. heat treatment records (furnace charts), ASTM standards, etc.);
- a copy of any composition check analyses and any other additional characterizations (e.g. mechanical or microstructural properties, surface finish measurements) obtained;
- a listing of the current disposition of each specimen;

- a description of any special processes or treatments given to the specimens after procurement but before testing (generally, details and results of these processes or treatments are more appropriately kept with the notebooks or files pertaining to the tests where the specimens are to be used); and
- a copy of the procurement documents.

Some of the information in the test specimen master file will also be maintained in the particular scientific notebooks or files used for the individual tests.

## **8.0 Storage**

All specimens that are not in the actual testing process or are not being analyzed must be stored in the MBST archive. This repository is currently located on the LLNL site in Building 241, Room 1883A. The specimens will be stored in such a manner so as to prevent any damage due to temperature, humidity, and pressure. Whenever possible, each specimen will be stored in its own polyethylene bag (or other protective material) with a clearly marked label indicating the specimen identification number. The specimen master file (Section 7.0) shall also be kept within the repository.

Upon completion of the activity all specimens will be transferred to the LRC as part of the Quality Assurance Records package. This is discussed in Section 9.0.

## **9.0 Archiving of Specimens and Their Documentation**

Upon completion of the activity the specimens will be transferred to the LRC as required by 033-YMP-QP 8.0 "Identification and Control of Items, Samples, and Data". This archiving will be performed in accordance with 033-YMP-QP 13.0 "Handling, Storage, and Shipping", and 033-YMP-QP 17.0 "Quality Assurance Records".

Specimens and their documentation will be transferred to the LRC as part of the complete Quality Assurance Record for the activity.

### **9.1 Listing of Quality Assurance Record Types**

The task leader or principal investigator will furnish the local records center with a listing of the QA record types to be generated and will provide the LRC with updates. The QA records covered by this TIP are listed in Section 9.2.

## **9.2 Quality Assurance Records**

QA records covered by this TIP include the test specimens, the procurement documents, the specimen master file (see Section 7.0), and a copy of this technical implementing procedure, TIP-CM-6 "Identification and Control of Metal Specimens". The procurement documents are addressed in quality procedure 033-YMP-QP 4.0 "Procurement Control and Documentation".

## **9.3 Handling, Storage, and Shipping**

The specimens to be sent to the LRC will be in temporary storage at the MBST repository until completion of the activity. The specimens will be handled and stored as specified in Section 8.0.

Specimens to be transferred to the LRC will be packaged in a containers that will protect the specimens from damage due to temperature, humidity, and pressure.

Specimens will be packaged in a logical manner by similar characteristic (for example, by alloy or by test conditions). A description of the contents of package (packing list) will be included within the package. In addition, a duplicate copy of the packing list will be contained in a separate file.

The MBST repository is on-site at LLNL therefore the specimen packages will be transported to the LLNL/YMP LRC by means deemed appropriate by the TL (e.g. LLNL truck).