Indian Institute of Technology Bombay, Powai, Mumbai-400076

Department of Metallurgical Engineering & Materials Science

External Registration form for using NanoIndenter facility(nanoindenter@iitb.ac.in)

External RegistrationNo: ……..... Date: ……

1) Name of the User : …….....

2) Degree & Dept/Div/Sec : …….....

3) Industry/Organization : .....

4) Email and Tel No. :…….....

5) Number of samples : …….....

6) Specifications of sample
   a) Material(s) : …….....
   b) Size of sample (≤1cm) : …….....
   c) Height of sample (≤ 5mm) : …….....
   d) Polishing : …….....

7) For Nanoindentation: Low load (<11mN)/High load (500mN).

i) Maximum load…….....

ii) Location of indents in case of multiphase materials.....

iii) Loading/Unloading rate(µN/s).....

iv) Roughness of all samples (<200nm) mandatory.....

v) If coated, specify coating material and coating thickness.....

vi) Total number of indents……..

8) For Scratch test: (Low load <10mN)/ High load (<500mN)

i) Specify load for scratch.....

ii) Ramp load/displacement scratch…….....

iii) Constant load/displacement scratch.....

iv) Scratch load.....

v) If coated, specify coating material and thickness.....

vi) Tip for scratch test to be used.....

vii) Sample roughness (<200nm) mandatory.....

viii) Total no. of scratches…….

[Tip for scratch test available with us so far:

- Low load- Conical 100micron and slightly worn Berkovich tip(~200nm).
- High load – worn Berkovich tip (If no quantification is essential)

Note:

a) For high load scratch test: The total (sample + mount) height should be less than1.5mm.
b) For low load scratch test: The sample height should be less than5mm.]

9) **For Dynamic Mechanical Analysis**:

I) For Dynamic Load Test: i) Frequency of test…….....
ii) Range of load (<10000uN)…….....

II) For Dynamic Frequency Test: i) Applied load…….....
ii) Range of frequency (<300 Hz)…….....
Specify how many tests per sample for DMA ……

10) High temperature indentation: (RT to600°C)

(1 sample is equivalent to 5 indents for a given temperature)

1) Purpose of experiment =.....
2) Specify temperature range..... °C to.....°C OR Specific temperatures.....
3) Step Size =----------
4) Sample Melting Point .....°C
5) In case of polymers/amorphous materials/alloys, please specify T_g.....

Note: Sample should not vaporize at the given experimental temperature.

11) For any additional tests:

1) Please specify the tests to be done
   ……
   ……
   ……
   ……
   ……
2) Specify all the parameters:
   ……..

Please read all the instructions carefully from the website then only proceed to fill the requisition.

[1] 1 slot = 40 indents (Low/High load RT)

[2] 1 slot = 15 scratches (Low/High load RT)

[3] 1 slot = *5 scanning images for indents/scratches (Low load)

- **For scanning rate from 1Hz to 3Hz) - 5scanning images.**
- **If the scanning rate is below 0.4 Hz, the scanning may take more than**

45minutes.

[4] 1 slot = 10 nano DMA indents (RT Low Load)

[5] 1 slot = 5 indents (Low load, High temperature-only in scanning mode) = 5 high temperature indents

[6] For any additional tests not listed here, the charges will be on slot hour basis. A maximum of four hour will be considered as one slot.

GIVEN MATERIAL IS NOT POISONOUS OR TOXIC IN ANY WAY

Whenever the results are used in the publications appropriate acknowledgment of usage of IIT's NanoIndenter facility must be mentioned. The details can be forwarded to nanoindenter@iitb.ac.in

Signature of the User : ……..

Note: 1) The results of nanoindentation are very sensitive to surface preparation. The sample should be as flat as possible and polished to mirror finish. It is strongly recommended to finish polishing with: - Electro polishing for conducting samples, colloidal silica polishing for non-conducting samples.2) The sample should not be epoxy mounted when you give it for nanoindentation.

FOR OFFICE USE ONLY

Sample Received Date: ……..… **Name of the Operator: ……**

Period of Analysis: …….. **Results Sent Date: ……..**

Experiment completed date: …….. **Signature of Operator: …….**

DD No. / Online Transaction No. with Date: …….....