



STANDARD OPERATING PROCEDURE

SOP NUMBER CAR-019-02	SOP TITLE OPERATING PROCEDURE FOR THE GRINDING OF POTTERY SURFACE USING A HANDHELD ROTARY TOOL FOR THE SCOPE OF BULK FABRIC ANALYSIS
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PART 1

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PART 2

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PART 3

Authoriser	Date of Issue: 22/02/2022
Mr Simon Sammut University Secretary – Office of the Secretary Rectorate	Date of next revision: 22/02/2026

PART 4 (To be filled in by OOS, QSU or RSSD)

<input type="checkbox"/> This procedure has been revised and is no longer valid as from: (Write date)	<input type="checkbox"/> Date of NEXT REVISION is extended until: (Max. 4 years)	<input type="checkbox"/> SOP rendered obsolete on: (Write date)
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1. Reason for revision

- 1.1. Updated section 4. Sub-sections 4.1 and 4.2 due to a typological error. It is the responsibility of staff and students carrying out 'grinding', and not 'sampling'.

2. Purpose and scope

- 2.1. To describe the use of a handheld rotary tool for the removal of surface contamination and surface material on archaeological pottery sherds for analysis of the bulk fabric.

3. Definitions

- 3.1. SOP – Standard Operating Procedure
- 3.2. PPE – Personal Protective Equipment
- 3.3. Rotary tool – this refers to an electrically-driven rotary tool.
- 3.4. Pottery sherd – this refers to an archaeological pottery fragment

4. Responsibilities

- 4.1. It is the responsibility of staff and students carrying out grinding with the Department of Classics and Archaeology of the University of Malta to read and follow this SOP.
- 4.2. It is the responsibility of staff and students carrying out grinding with the Department of Classics and Archaeology of the University of Malta to read the manual of the equipment and ensure they know how to change and tighten the grinding bits on the rotary tool.
- 4.3. It is the responsibility of the staff and students using the equipment to clean (using dry brushes and dry paper towels) and store it properly after use.
- 4.4. It is the responsibility of the staff and students using the equipment to perform a visual inspection in order to ensure that the accessories to be used are in a good condition and to replace them if not.
- 4.5. It is the responsibility of the staff and students using the equipment to ensure they test the procedure on a test sample to verify that it is suitable for application to the material under study.
- 4.6. It is the responsibility of the staff and students using the equipment to decide how much of the sherd should be machined following this SOP according to the analysis used for their study.
- 4.7. If a person suffers from any allergies, respiratory diseases or is highly sensitive to dust, he must be covered by a medical certificate issued by a licensed Medical Practitioner.

5. Health and Safety Requirements

- 5.1. The procedure produces a large amount of ground pottery dust, and therefore PPE is to be worn, including safety goggles, a mask (with a minimum efficiency level of >94 %: FFP2 or N95) and a laboratory coat.
- 5.2. Any person operating the Dremel tool must make use of earplugs, with an attenuation of at least 25 decibels, in order to lower the noise exposure to respectable levels.
- 5.3. The bits used have to be tightened properly to avoid injuries referring to the manual of the equipment.
- 5.4. A clamp should be used to retain sherds whilst removing their surface. When parts of the surface are not accessible due to the orientation and/or shape of the rim of the sherd, alternative

methods, such as using a different type of clamp or support, should be sought while avoiding any contact between the rotary tool and the hands and the working surfaces.

- 5.5. The rotary tool should be used in a safe environment with no tripping hazard and where the tool can be used comfortably

6. Procedure

6.1. Equipment

- 6.1.1. Safety equipment: mask, goggles, laboratory coat and, if necessary, ear protection
- 6.1.2. Electrically-driven rotary tool: here, a Dremel rotary tool and accessories are used. The sanding bands (Dremel accessory number 408) on the sanding drum mandrel (Dremel accessory number 407) have been found to be the most efficient although they need to be replaced when they are worn out.
- 6.1.3. The sherd should be retained with a clamp on a stable and rigid stand, ensuring that it does not damage the sample.
- 6.1.4. Deionized water is used to rinse the sherd after surface removal. The sherd can then be left to dry.
- 6.1.5. Brushes, such as toothbrushes and small paint brushes, and lint-free paper should be used to clean the Dremel and accessories between each sample to avoid cross-contamination.

6.2. Preparing the Dremel

- 6.2.1. The sanding band on the mandrel should be attached to the Dremel following the instruction manual. This involves pressing the collet lock button and using the wrench to turn the collet nut counter clockwise. The bit should be inserted into the collet. Whilst pressing the collet lock button, the collet nut should be turned clockwise until it is tight. The wrench should be used to further tighten the collet nut
- 6.2.2. The Dremel can then be plugged in to be used, avoiding any twisting of the cable. Prior to plugging in, ensure that the switch is set to the OFF position, as indicated in Figure 1.



Figure 1: Dremel OFF switch

6.3. Setting up the sample and removing the sherd surface

- 6.3.1. The sherd should be fastened/tightened using clamps. The surface of the sherd should be protected from direct contact with the clamps if there is any risk that this could damage the remaining part of the sample, especially if one wishes to keep part of the sherd intact.
- 6.3.2. Once the sherd is secure, the Dremel can be operated. The sanding accessory should be brought to bear on the surface to be sanded applying light pressure and should be moved across the area to be treated.

- 6.3.3. Once the required depth of surface has been removed, and any visible slip, glaze and/or encrustation or contamination, the sherd can be turned around and the other surface treated the same way.
- 6.3.4. The exposed inner part of the sherd/break should also be sanded if it is not a fresh break. The speed should be lowered for this part of the process as it is more difficult to keep steady movements on irregular breaks, and could result in losing control of the movement.
- 6.3.5. Once all the surfaces have been treated, the sherd should be processed with deionised water and left to dry.

6.4. Tidying up and cleaning

- 6.4.1. The Dremel should be unplugged prior to the commencement of cleaning
- 6.4.2. The Dremel and the accessory should be brushed and wiped with lint-free paper to remove the dust in between each sample.
- 6.4.3. When all samples have been processed, the accessory can be removed using the same procedure as described in point 6.2. The grinding bits and work surfaces should then be cleaned using running water and left to dry. The sanding band should not be used while wet, as they would wear more rapidly.
- 6.4.4. The equipment and the dry accessories should be placed in their appropriate space inside the box. It is highly recommended to inspect the sanding band regularly to see if it is worn and replace it if necessary.
- 6.4.5. All PPE should be cleaned and stored adequately as stipulated in the manufacture's manual.
- 6.4.6. All waste material should be collected in suitable bags/recipients and disposed accordingly.

7. References

- 7.1. General Laboratory Practice for the Department of Classics and Archaeology SOP CAR-015
- 7.2. Occupational Health & Safety Policy, 2020, [Online], Available at <https://www.um.edu.mt/hrmd/secure/policies/OccupationalHealthandSafetyPolicy.pdf> [Accessed 18th November, 2021].
- 7.3. Health and Safety Risk Assessment – Department of Classics and Archaeology – Faculty of Arts.
- 7.4. Equipment Manual.

8. List of Appendices/Worksheets

- 8.1. Appendix 1: Equipment use Consent form - Handheld Dremel Rotary Tool

Appendix 1:



L-Università ta' Malta
Faculty of Arts

Department of
Classics & Archaeology

EQUIPMENT USE CONSENT FORM - HANDHELD DREMEL ROTARY TOOL

Individuals wishing to carry out work in the Archaeology Laboratory using the Handheld Dremel Rotary Tool must ensure that they abide by University regulations, follow the required Health and Safety procedures and familiarise with the respective Departmental guidelines and general Lab practices.

Name: _____

I confirm that I have read the Standard Operating Procedure (SOP) for General Laboratory Practice and the Operating Procedure for the Grinding of Pottery Surfaces using a Handheld Dremel Rotary Tool for the Scope of Bulk Fabric Analysis for the Department of Classics and Archaeology. I agree to comply with these regulations and other Health and Safety protocols highlighted to me and fill in the required Safety Data Sheets.

Signature

Date

Name of
Responsible
Person/Lab
Officer/Supervisor

Signature

Date