Health & Safety

Abrasive Wheels Policy

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[1] *or earlier if change in legislation or on risk assessment*

Amendment Control

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1.0	Jan 23	

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Policy Summary

The policy of Edinburgh Napier University is to provide and maintain safe and healthy working conditions, equipment and systems of work for all staff, students and others, and to provide such resources, information, training and supervision as needed for this purpose.

The University will provide resources and maintain appropriate management systems, systems of work and equipment to ensure that Abrasive Wheels risks to all staff, students and others are controlled. Suitable information, instruction, training and supervision will be provided to all those involved.

The University will adopt the principles of control as set out in the Provision and Use of Work Equipment Regulations. Supply of Machinery (Safety) Regulations as amended will also be used to source best practice guidance where appropriate.

The management of Abrasive Wheels risk will be a continual commitment by the University and will involve regular monitoring and progress meetings, a risk assessment programme, monitoring, inspection and record keeping.

This policy is formally accepted by the University.

The University will do all that is reasonably practicable to comply with its requirements, and will make the necessary resources available.

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1. Executive Summary

The Abrasive Wheels Regulations 1970 (SI 1970 No. 535) have been revoked and replaced by the goal setting provisions of the Provision and Use of Work Equipment Regulations. These Regulations require the work equipment to be suitable, maintained in good repair and inspected at suitable intervals. All persons who use work equipment should receive adequate training, be provided with adequate health and safety information, and written instructions where appropriate.

Although officially revoked, the definition of "abrasive wheel" under the 1970 Regulations is retained here for clarity.

The Abrasive Wheels Regulations 1970 (SI 1970 No. 535) defined an abrasive wheel as any power-driven wheel, cone, cylinder or disc with some form of bonded abrasive material over its surface, that is used for cutting or grinding.

Provision and Use of Work Equipment Regulations (PUWER)
Supply of Machinery (Safety) Regulations (as amended)
Control of Substances Hazardous to Health Regulations (COSHH)
Personal Protective Equipment Regulations (as amended)

Includes wheel breakage/bursting, contact or entanglement with running wheel, physical injury from component being ground, noise and dust inhalation.

The risk of breakage is inherent in every abrasive wheel. Statistics show that nearly half of all accidents involving abrasive wheels are due to an unsafe system of work or operator error.

Edinburgh Napier University is responsible for providing PPE.

Since it is Edinburgh Napier University's policy to comply fully with such duties, all departments must ensure that the requirements of the Regulations are discharged, and that the policy on Abrasive Wheels is incorporated into its local safety statements. Individual staff who organise, arrange or lead such work must acquaint themselves with, and act upon, the requirements of the local safety statement in force in their department. The effectiveness of these arrangements will be monitored periodically by the Health and Safety Office.

2. Introduction

The primary objective of PUWER is to ensure that work equipment, including abrasive wheels, do not give rise to risks to health and safety, regardless of the work equipment's age, condition or origin. PUWER applies to all workplaces and work situations subject to the Health and Safety at Work etc. Act (HASWA) and revoked the remaining provisions of the Abrasive Wheels Regulations.

PUWER requires all machinery to be suitable for its intended use; to be properly maintained; and that persons using, supervising or managing the use of abrasive wheels are fully informed and adequately trained for health and safety purposes. Each machine will be subject to planned preventative maintenance, including inspection and testing to be carried out by authorised competent personnel within the School/Service. Records will be kept of all such maintenance.

The Approved Code of Practice and Guidance to the Regulations contains the following advice, specific to the use of abrasive wheels:

a) To minimise the risk of bursting, abrasive wheels should always be run within the specified maximum rotation speed.

b) If they are large enough, the maximum speed will be marked on the wheel (a requirement of regulation 23).

c) Smaller wheels should have a notice fixed in the workroom, giving the individual or class maximum permissible rotation speed.

d) The power driven spindle should be governed so that its rotation speed does not exceed this.

e) Guarding must be provided to contain fragments of the wheel that might fly off if it did burst, to prevent them from injuring anyone in the workplace. The guarding has an additional role in helping to meet the requirements of regulation 11; it should be designed, constructed and maintained to fulfil both functions. Guards must be properly adjusted prior to and during use. Adjustment must be as close as possible to prevent entrapment, nips etc.

f) Providing information and training of workers in the correct handling and mounting of abrasive wheels (including pre-mounting and storing procedures) is also necessary to prevent the risk of bursting. A list of trained operatives will be held by the School/Service.

g) Abrasive wheels must be examined according to the manufacturer's instructions prior to use to ensure they are not damaged. Regular inspection and dressing of any abrasive wheels must only be carried out by a trained, competent operator.

h) Similarly, abrasive wheels must only be 'mounted' by trained, competent operators.

i) Whilst it may seem obvious, the power supply **must** be switched off before removing or mounting of an abrasive wheel.

j) Nuts must be tightened on flanges sufficiently to drive wheels, only by hand pressure or spanner.

k) Grade 1 impact goggles to be worn during all operations.

HSE's Guidance Document 'Safety in the Use of Abrasive Wheels' (HSG17) expands on how the general requirements of PUWER relate to abrasive wheels and should be read in conjunction with the PUWER Code of Practice. Dust, vibration and noise matters are dealt with in other guidance documents.

3. Risk Assessment

Line managers will ensure a risk assessment has been completed for the use of any abrasive wheels. It will cover the following topics:

a) Planned Preventative Maintenance regime.
b) Inspection and Testing regime (pre-use inspections and regular inspections).
c) PPE to be used.
d) The training competencies required.
e) A list of competent persons will be held by the School/Service.
f) The emergency arrangements, should they be required, shall be included in the Standard Operating Procedure and shall be communicated to all operators.

4. Procedures

Given an abrasive wheel is of sound manufacture, mounted on a well–designed machine, safe operation depends largely on proper maintenance and on the treatment to which the wheel is subjected when in use. The following are among the main operating precautions to consider. Each is further explained and discussed in the guidance publication HSG17 and detailed information is also given on the marking systems for wheels, suitable storage facilities, mounting procedures and tables of maximum permissible speeds for each type of wheel. Reference to this document is essential if you use abrasive wheels at work.

Training - Regulation 9 of PUWER requires:

(1) *Every employer shall ensure that all persons who use work equipment have received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.*

(2) *Every employer shall ensure that any of his employees who supervises or manages the use of work equipment has received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.*

Also a record of training be kept. The training record will cover the following:

- Name of Person
- Class or description of wheels for which the appointment is made
- Date of appointment
- Signature of occupier
- Date of revocation of appointment
- Signature of occupier

Examination - by visual examination and, if practicable, by 'ring' test with a light non-metallic implement. Also need careful handling and secure/suitable storage.

Speed of rotation –·is **extremely important** as the centrifugal force increases as the square of the speed. Recommended peripheral speed must never be exceeded.

Restrictions of use - Certain markings will indicate restrictions of use, e.g. RE3 - not suitable for wet grinding.

Shelf life - All organic bonded wheels will bear a use-by date of three years from the date of manufacture.

Grinding Machine - Considerations include suitability of spindles; machine bearings; speed control; work rests (steel, renewable top plate, securely clamped, adjustable); insufficient power; stopping devices; magnetic tables and chucks; proper mounting of wheels; guarding; wheel enclosure angles specified for various types of machine; portable, hand held, internal combustion and pneumatic grinders; electrical considerations (double insulated, abrasion resistant cabling, reduced voltage); planned inspection and maintenance; tidy work environment/even floor surface around machine.

Operation - Wheel to be 'trued & dressed' (to avoid excessive vibration, impaired cutting action) and balanced. Side grinding is dangerous unless operator is competent in its application in specific

circumstances. Choice of grinding fluids may adversely affect strength of wheel if chosen incorrectly. Dust from the grinding of magnesium alloys can create a fire and explosion risk if ignited and fatalities have resulted when clothing has caught fire and explosions have occurred in dust extraction and settling systems.

Precautionary measures - include: 'the prohibition of smoking, open lights, fire and other causes of ignition; the provision of appliances for the interception, removal and drenching of dust by exhaust appliances and scrubbers; and the provision of protective clothing. Dust extraction and settling systems should be kept clean and free from deposits of dried sludge, which must be removed from the scrubber and the work room. Eye protection/shields must be used when using power-driven cutting off wheel, truing or dressing or dry grinding where there is a risk of injury from thrown particles. Loose clothing, ties, coat sleeves are easily drawn into a revolving wheel and should not be worn.

5. Monitoring compliance

The Health and Safety Office will periodically monitor this procedure which will, from time to time, require certain information including (inter alia): copies of maintenance records.

6. References/further details

Safety in the use of abrasive wheels (HSG17 - ISBN 978 0 7176 1739 5)
Safe use of work equipment (L22 - 978 0 7176 6619 5)

Appendix 1 – Checklist: Abrasive Wheels

a) Inform and adequately train those involved in the use, mounting and supervision of persons to mount abrasive wheels.

b) Record relevant details of the above training and distribution of information, instructions, etc.

c) Have a procedure/system for maintaining grinding machines.

d) Keep records of maintenance/inspections of machines.

e) Provide and maintain suitable eye protection/shields/dust protection and other PPE.

f) Provide suitable storage for abrasive wheels.

g) Check that safety precautions are being observed.