

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork



Overview

This standard is about

- 1 interpreting information
- 2 adopting safe and healthy working practices
- 3 selecting materials, components, consumables and equipment
- 4 preparing, heating, welding or soldering heritage metalwork

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Performance criteria

- You must be able to:*
- P1 interpret the given information relating to the work and resources to confirm its relevance
 - P2 comply with the given, relevant legislation and official guidance to carry out your work and maintain safe work practices
 - P3 select the required quantity and quality of resources for the methods of work
 - P4 comply with organisational procedures to minimise the risk of damage to the work and surrounding area
 - P5 comply with the given contract information to carry out the work efficiently to the required specification
 - P6 complete the work within the allocated time, in accordance with the programme of work

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Knowledge and understanding

You need to know and understand:

Performance Criteria 1

Interpretation of information

- K1 the organisational procedures developed to report and rectify inappropriate **information** and unsuitable **resources**, and how they are implemented
- K2 the types of **information**, their source and how they are interpreted
- K3 the organisational procedures to solve **problems** with the **information** and why it is important they are followed

Performance Criteria 2

Safe work practices

You need to know and understand:

- K4 the level of understanding operatives must have of **information** for relevant, current **legislation and official guidance** and how it is applied
- K5 the types of **fire extinguishers** and how and when they are used
- K6 how **emergencies** should be responded to and who should respond
- K7 the organisational **security procedures** for tools, equipment and personal belongings
- K8 what the accident reporting procedures are and who is responsible for making the report
- K9 why, when and how **personal protective equipment (PPE)** should be used

Performance Criteria 3

Selection of resources

You need to know and understand:

- K10 the characteristics, quality, uses, sustainability, limitations and defects associated with the **resources** and how defects should be rectified
- K11 how the **resources** should be used and how any **problems** associated with the **resources** are reported
- K12 the organisational procedures to select **resources**, why they have been developed and how they are used
- K13 the **hazards** associated with the **resources** and **methods of work** and how they are overcome

Performance Criteria 4

Minimise the risk of damage

You need to know and understand:

- K14 how to **protect work** from damage and the purpose of protection
- K15 why **disposal of waste** should be carried out safely and how it is achieved

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Performance Criteria 5

Meet the contract specification

You need to know and understand:

- K16 how **methods of work**, to meet the specification, are carried out and **problems** reported
- K17 how **maintenance** of tools and equipment is carried out

Performance Criteria 6

Allocated time

You need to know and understand:

- K18 what the **programme** is for the work to be carried out in the estimated, allocated time and why deadlines should be kept

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Additional Information

Scope/range related to performance criteria

Performance Criteria 1

- 1 interpretation of plans, drawings, specifications, permits, schedules, method statements and manufacturers' information related to the work to be carried out

Performance Criteria 2

- 2 avoidance of risk by following the given information relating to at least four of the following
 - 2.1 methods of work
 - 2.2 safe use of personal protective equipment (PPE)
 - 2.3 safe use of access equipment
 - 2.4 safe use and storage of substances and materials
 - 2.5 safe use and storage of tools and equipment

Performance Criteria 3

- 3 selection of resources associated with own work
 - 3.1 materials, components, consumables and fixings
 - 3.2 tools and equipment

Performance Criteria 4

- 4 protection of the work and its surrounding area from damage
- 5 minimise damage and maintain a clean work space
- 6 disposal of waste in accordance with legislation

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Performance Criteria 5

-
- 7 ~~demonstration of work skills to measure, mark out, fit, heat, weld, solder, prepare, position secure and finish~~
 - 8 use and maintain hand tools, portable power tools, welding and heating equipment and ancillary equipment
 - 9 heat metalwork to given working instructions to achieve at least two of the following
 - 9.1 free components (thermal shock)
 - 9.2 heat treat
 - 9.3 reduce or remove rust
 - 9.4 adjust (localised/spot)
 - 10 join wrought iron, cast iron, other ferrous metals and non-ferrous metals to given working instructions using at least two of the following welding and/or brazing and/or soldering techniques
 - 10.1 oxygen and fuel gas
 - 10.2 manual metal arc
 - 10.3 metal inert gas shielded or metal active gas shielded
 - 10.4 tungsten inert gas shielded
 - 11 carry out the above work in at least three of the following positions
 - 11.1 flat
 - 11.2 vertical/horizontal
 - 11.3 vertical
 - 11.4 overhead

Performance Criteria 6

- 12 completion of own work within the estimated, allocated time to meet the needs of other occupations and/or client

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Scope/range related to knowledge and understanding

Disposal of waste

- 1 environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance

Emergencies

- 2 operative's response to situations in accordance with organisational authorisation and personal skills when involved with
 - 2.1 fires, spillages, injuries
 - 2.2 emergencies relating to occupational activities

Fire extinguishers

- 3 water, CO₂, foam, powder and their uses

Hazards

- 4 those identified by risk assessment, method of work, manufacturers' technical information, statutory regulations and official guidance

Information

- 5 plans, drawings, specifications, permits, schedules, method statements, manufacturers' information, archaeological watching brief, historical conservation plans and charters, legislation and regulations governing buildings

Legislation and official guidance

- 6 this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting

Maintenance

- 7 operative care of hand tools and/or portable power tools, ancillary equipment and welding and heating equipment

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Methods of work

-
- 8 application of knowledge for safe work practices, procedures and skills, relating to the method/area of work and materials used, to
 - 8.1 assess requirements for repair, restoration or the maintenance of metalwork by joining and heating
 - 8.2 validate appropriate ways in which the work should be carried out
 - 8.3 recognise sensitive areas
 - 8.4 maintain heritage and archaeological integrity
 - 8.5 maintain the principles of minimum intervention and reversible alterations
 - 8.6 survey, label and record components
 - 8.7 stop work at the point when conjecture begins and report findings
 - 8.8 relate equilibrium diagrams to metal types/properties
 - 8.9 identify metal properties
 - 8.10 apply the principles and methods of joining and heating ferrous and non-ferrous metals
 - 8.11 join metals by welding, soldering and brazing in all positions (flat, vertical/horizontal, vertical and overhead)
 - 8.12 recognise joint types (butt, lap, fillet, corner)
 - 8.13 inspect joints by non-destructive testing (visual, x-ray and dye penetrates) and destructive testing (bend test, tensile, nick break and weld etch)
 - 8.14 finish and dress joints
 - 8.15 recognise the effects of applying heat to metals (distortion, heat affected zone)
 - 8.16 record the work carried out (written, photographic or digital)
 - 8.17 recognise and/or report endangered/ protected flora and fauna
 - 8.18 use and store fuel gases
 - 8.19 use hand tools, power tools and equipment
 - 8.20 work at height
 - 8.21 use access equipment
 - 9 team work and communication
 - 10 needs of other occupations associated with heating, welding or soldering heritage metalwork

Personal protective equipment (PPE)

- 11 occupational use, types, purpose of each type and work situations

Problems

- 12 those arising from information, resources and methods of work
 - 12.1 own authority to rectify
 - 12.2 organisational reporting procedures

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Programme

-
- 13 types of progress charts, timetables and estimated times
 - 14 organisational procedures for reporting circumstances which will affect the work programme

Protect work

- 15 protect work against damage from general workplace activities, other occupations and adverse weather conditions

Resources

- 16 materials, components and equipment relating to types, quantity, quality, sizes and sustainability of standard and/or specialist:
 - 16.1 metals
 - 16.2 consumables (gases, filling rods/wires)
 - 16.3 welding machines equipment and ancillaries
 - 16.4 hand and/or powered tools and heating equipment
- 17 methods of calculating quantity, length, area and wastage associated with the method/procedure to heat, weld and solder heritage metalwork

Security procedures

- 18 site, workplace, company and operative

COSVR623 – SQA Unit Code HG5E 04

Heat, weld or solder heritage metalwork

Developed by	ConstructionSkills
Version number	1
Date approved	June 2010
Indicative review date	July 2015
Validity	Current
Status	Original
Originating organisation	ConstructionSkills
Original URN	VR623
Relevant occupations	Smiths and Forge Workers
Suite	Heritage Skills (Construction)
Key words	Heat; Weld; Solder; Braze; Fuel; Gas; Inert; Shielded; Tungsten; Flat; Vertical; Overhead