

## Overview

This standard is about joining materials correctly and effectively using metal inert gas (MIG) brazing techniques and procedures.

Brazing involves melting the filler metal without melting the parent metal in the heat affected zone (HAZ), effectively sticking two metal surfaces together.

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## Performance criteria

- You must be able to:
- P1 use the appropriate personal protective equipment and check it is fit for purpose before carrying out metal inert gas (MIG) brazing operations
  - P2 protect the vehicle and its contents effectively when carrying out metal inert gas (MIG) brazing operations
  - P3 prepare material and align to enable suitable joint to be achieved, ensuring mating flanges are treated following manufacturers' procedures before joining
  - P4 select, set up and use the correct tools and equipment for carrying out metal inert gas (MIG) brazing operations
  - P5 ensure that the tools, equipment and Personal Protective Equipment (PPE) you require are in a safe working condition
  - P6 set up your equipment to carry out metal inert gas (MIG) brazing operations checking:
    - P6.1 suitability of gas/filler wire and size for material to be joined
    - P6.2 parameters are set correctly
    - P6.3 consumables are correct
    - P6.4 feed rollers and welding tips
  - P7 carry out metal inert gas (MIG) brazing operations following
    - P7.1 recognised researched repair methods(see guidance document)
    - P7.2 test procedures and provide test coupons on equivalent material in accordance with recognised standards
    - P7.3 manufacturers processes, methods and procedures
    - P7.4 your workplace procedures
    - P7.5 health, safety and legal requirements
  - P8 avoid damaging other components, standards, panels and surfaces on the vehicle and the surrounding work area
  - P9 recognise when your braze is not forming correctly and what action needs to be taken
  - P10 inspect and assess metal inert gas (MIG) Braze weld quality in accordance to recognised standards
  - P11 check integrity of braze and record the type of joint achieved on the appropriate paper work

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- P12 make sure test pieces must be recorded and stored
  - P13 check the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable
  - P14 clean and store Personal Protective Equipment (PPE) and equipment in appropriate manner
  - P15 promptly report any additional faults you notice during the course of your work to the relevant person(s)
  - P16 promptly report any delays in completing your work to the relevant person(s)
  - P17 carry out metal inert gas (MIG) brazing operations within the agreed timescale
  - P18 complete work records accurately, in the format required and promptly pass them to the relevant person(s) promptly

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## Knowledge and understanding

You need to know and understand:

- K1 the health, safety and legal requirements relating to the joining of materials using metal inert gas (MIG) brazing techniques
- K2 your workplace procedures for carrying out appropriate risk assessment(s), the referral of problems, reporting of delays to the completion of work and completion of work records
- K3 the work that needs to be done and the standard required
- K4 the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using metal inert gas (MIG) brazing techniques
- K5 the importance of selecting, using and maintaining the appropriate Personal Protective Equipment (PPE) when the joining of materials using metal inert gas (MIG) brazing techniques
- K6 how to find, interpret and use sources of information and repair methods applicable to the joining of materials using metal inert gas (MIG) brazing techniques
- K7 how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using metal inert gas (MIG) brazing techniques
- K8 the different types of processes, techniques and joints used for the joining of materials when using metal inert gas (MIG) brazing techniques
- K9 the correct surface preparation methods to ensure a good metal inert gas (MIG) Braze joint is achieved
- K10 the faults and defects that can occur when carrying out metal inert gas (MIG) brazing and the common causes of these faults
- K11 the need for correct alignment of materials and the methods used to achieve this
- K12 the types of quality control checks that can be used to ensure correct joining of materials
- K13 how to inspect and assess metal inert gas (MIG) brazing in accordance with recognised standards

K14 when MIG brazing should be used to join materials

K15 advantages of MIG brazing techniques over other welding methods

K16 the different types of joint that can be used to join materials using MIG brazing, including:

K16.1 Lap slot

K16.2 Lap seam

K16.3 Butt joint

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**Scope/range**

*All of the items listed below form part of this National Occupational Standard.*

1. **Personal protective equipment (PPE)** for metal inert gas (MIG) brazing operations includes:
  - 1.1. face mask with appropriate eye protection
  - 1.2. protective/flame retardant coveralls
  - 1.3. protective/flame retardant gauntlets
  - 1.4. steel toe cap boots
  - 1.5. appropriate vehicle protection
  - 1.6. appropriate protection for others in the workshop
  - 1.7. appropriate fume mask
  
2. **Tools and Equipment** are:
  - 2.1. workshop equipment
  - 2.2. generic hand tools
  - 2.3. manufacturer's specified and specialist tools
  - 2.4. fume extraction equipment

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