



Province of the  
EASTERN CAPE  
EDUCATION

**DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)**

**HOME SCHOOLING SELF-STUDY WORKSHEET ANSWER SHEET**

<b>SUBJECT</b>	WELDING & METALWORK	<b>GRADE</b>		<b>DATE</b>	20 MAY 2020
<b>TOPIC</b>	JOINING METHODS	<b>TERM 1 REVISION</b>	(Please tick)	<b>TERM 2 CONTENT</b>	(√)

**QUESTION 1 JOINING METHODS (WELDING INSPECTION)**

**1.1 Non-destructive tests:**

- Liquid dye penetrant test
- X-Ray test
- Ultrasonic test

**1.2 Nick-break test:**

- Make a hacksaw cut through the centre of the weld.
- Cut should be about 6,5 mm deep.
- Place the saw-nicked specimen on two steel supports.
- Use a sledgehammer to break the specimen by striking it in the zone where you made the saw cuts.
- The weld metal exposed in the break should be completely fused and should be free from slag inclusions and contain no gas pockets greater than 1,6 mm.
- There should be not more than one pore or gas pocket per square centimetre. (ANY 5)

### 1.3 Factors of a good arc:

- The surface condition
- The travel speed
- The welding current
- The arc voltage
- The angle of the torch/electrode/shroud (ANY 4)

### 1.4 Welding defects:

- Incomplete penetration
- Lack of fusion
- Porosity
- Undercutting
- Distortion
- Cracks
- Spatter
- Slag inclusion (ANY 4)

### 1.5 Methods to reduce stress:

- Peening
- Controlled heating, followed by controlled cooling

### 1.6 Welding spatter:

- It is the little droplets of molten material that are generated at or near the welding arc.

It is generally regarded as a nuisance and is a critical factor to consider when developing an application.

### 1.7 Cause of spatter:

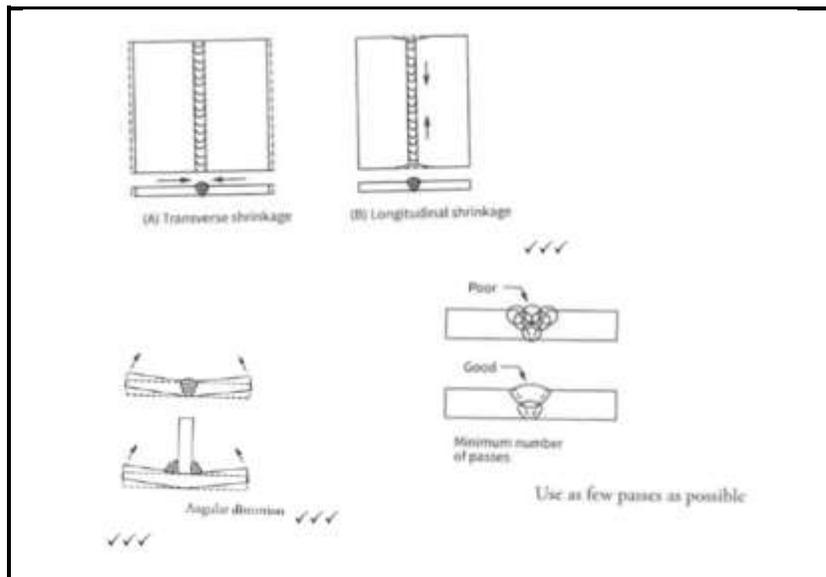
- A disturbance in the molten weld pool during the transfer of wire into the weld, caused by voltage being too low or amperage being too high.

### 1.8 Oxy-acetylene mild steel flame:

- Neutral flame

## QUESTION 2 JOINING METHODS (STRESSES AND DISTORTION)

### 2.1



## 2.2 Types of cracks:

- HAZ stands for: (Heat affected zone) cracks
- Centre line cracks
- Crater cracks
- Transverse cracks

## 2.3 Criteria for free bend test:

- It measures the ductility of the weld deposit and the heat affected area adjacent to the weld.
- It is used to determine the percentage of elongation of the weld metal.

## 2.4 Advantages of liquid dye over X-ray or ultra-sonic test:

- Good for ferrous and non-ferrous metals
- Low cost
- Easy to apply and interpret
- Minimal training required (Any 3)