



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER EXAMINATION 2011

MATERIALS

NQF LEVEL 4

11 NOVEMBER 2011

This marking guideline consists of 6 pages.

QUESTION 1: PLASTIC

- | | | | | |
|-----|-------|--|-------------------------------|-------------------|
| 1.1 | 1.1.1 | Newer | | |
| | 1.1.2 | Materials | | |
| | 1.1.3 | Expensive | | |
| | 1.1.4 | Polyethylene | (4 x 1) | (4) |
| 1.2 | | <ul style="list-style-type: none"> • Thermosetting plastics are synthetic materials that strengthen during being heated. • Cannot be remould or reheated after their initial heat-forming. Permanently set. • Will burn when heated after initial moulding. • Thermoplastics can be heated, shaped and cooled as often as necessary without causing a chemical change. • Easier to mould. | (4 x 1) | (4) |
| 1.3 | | <ul style="list-style-type: none"> • Plastic comes from a variety of sources such as rubber, cellulose, casein and resin. • One of the first modern plastic was celluloid which was used to make combs, fountain pens and adhesives middle layer of shatterproof glass. • Casein derived from milk, is combined with formaldehyde to form a very hard material with beautiful colours. | (3 x 1) | (3) |
| 1.4 | 1.4.1 | It is about ten times as much as steel. | (1 x 1) | (1) |
| 1.5 | | <ul style="list-style-type: none"> • Polymer – epoxy, vinylester or polyester thermosetting plastic. ✓ • Fibres – fiberglass, carbon or aramid. ✓ • Composite materials that are used to make plastic bond the materials together to enhance the strength and elasticity of plastics. ✓ ✓ | (1 x 1)
(1 x 1)
(1 x 2) | (1)
(1)
(2) |
| 1.6 | | <ul style="list-style-type: none"> • It is economical • Durable • Easy to cut • Easy to work with | (4 x 1) | (4) |

[20]

QUESTION 2: ELASTOMERS

- 2.1 Alkaline substance like concrete, bricks, plaster, timber, marble, mild steel, lead, etc. (3 x 1) (3)
- 2.2 2.2.1 Gun-grade elastomers are suitable to be used in caulking guns. (1 x 1) (1)
- 2.2.2 Flow-grade elastomers flow like water and are able to fill small joints to leave a smooth surface finish; they are suitable for a horizontal application. (1 x 1) (1)
- 2.3
- Dry surface area.
 - Remove any contaminated area.
 - Remove all dust and debris from joint.
 - Paint joint with a priming liquid. (3 x 1) (3)
- 2.4
- Foam seal
 - Hi-seal (2 x 1) (2)
- [10]**

QUESTION 3: ADHESIVES

- 3.1 3.1.1 These adhesives are made from animal proteins, blood albumen, milk casein or starch. (1 x 1) (1)
- 3.1.2 Adhesives are made from natural resin or from manufactured plastic resin such as melamine resin, urea resin and phenol resins. (1 x 1) (1)
- 3.1.3 These are materials in which rubber dissolve in benzene or ground with other resins of plastics. (1 x 1) (1)
- 3.2
- Using cold glue where there is water.
 - Using close contact glue to a gap fitting.
 - Using PVA glue instead of PVC. (3 x 1) (3)
- 3.3
- You need proper bonding.
 - Work must be tidy.
 - Work must be attractive after you have finished it. (3 x 1) (3)
- 3.4
- Preformed strips are supplied as preformed tapes.
 - Mastic is high viscosity liquid form applied by using a poll knife.
 - Semi – elastic sealants are superior to mastic invariable applied by special guns.
 - Elastomeric sealants are the most effective type of sealant usually supplied in two parts to be mixed. (2 x 2) (4)

- 3.5
- Prevent Inhalation
 - Wear Protective Gloves
 - Wear Clothing that Covers Your Skin
 - Wear a Respiratory Mask and Goggles
 - Mix the Resin and Hardener Carefully
 - Apply Adhesive with a Suitable Tool
 - Keep Away from Eyes, Mouth and Skin (2 x 1) (2)

[15]**QUESTION 4: PAINTS, WATERREPELLENTS, COATING AND PRESERVATIVES**

- 4.1
- Resin – non-hazardous component which forms a film on the surface.
 - Solvent – keeps the paint in a liquid until the solvent evaporates.
 - Pigment – provides the colour and covering power.
 - Additives – include stabilizers, dryers, thickeners and preservatives. (2 x 2) (4)
- 4.2
- Advantages
- Limewashes represent the best of both form and function.
 - They're beautiful and breathable, making them the perfect choice for both historic and new buildings.
 - Unlike typical modern paints, they don't trap water and they age beautifully--instead of getting shabby, they develop a lovely mellow patina over time.
 - Limewash protects underlying lime coating and masonry as it acts as sacrificially.
 - It also remains vapour permeable thus allowing moisture to evaporate from the building fabric. (3 x 1) (3)
- Disadvantages
- Can be impermeable
 - Can easily rub off wall
 - Not washable (3 x 1) (3)
- 4.3 Creosote is an oil-borne preservative, which is applied in an open or pressure treatment plant. It is a heavy duty preservative used primarily to treat wooden poles. (2 x 1) (2)
- 4.4 Dilute solutions of either hydrochloric or sulfuric acid to remove surface rust and mill scale to provide a chemically clean metallic surface. (1 x 2) (2)
- 4.5 4.5.1
- Lead based
 - Chromate based
 - Chlorine based (3 x 1) (3)

- | | | | |
|-------|--|---------|--------------------|
| 4.5.2 | <ul style="list-style-type: none"> • Lead based - red lead • Chromate based - zinc chromate • Chlorine based - chlorinated rubber | (3 x 1) | (3)
[20] |
|-------|--|---------|--------------------|

QUESTION 5: WATER PROOFING

- | | | | |
|-----|--|---------|--------------------|
| 5.1 | <ul style="list-style-type: none"> • Clean surface area. • Saturate surface with bituprimer. • Fully bond by Heat welding 4mm torch-on to surface. • Include welding to outlets and vertical walls. • Overlaps to be 75mm, butt joints to be 100mm and up-laps to be 100mm. • Saturate with Bitumen UV protective agent. | (4 x 1) | (4) |
| 5.2 | <ul style="list-style-type: none"> • To provide an impermeable barrier to the passage of moisture. • Resist moisture penetration from below (rising damp). • Resist moisture penetration from above. • Resist moisture penetration from horizontal entry. | (3 x 1) | (3) |
| 5.3 | <ul style="list-style-type: none"> • To prolong the life span of the waterproofing material. • Weather resistance. • To keep the waterproof material's strength and elasticity. • For the waterproof material to have a low permeability in humid climates. | (4 x 1) | (4) |
| 5.4 | <ul style="list-style-type: none"> • The minimum slope of a flat sheet metal roof is 5° • 3° if long single span sheeting is used. | (2 x 2) | (4)
[15] |

QUESTION 6: BITUMEN, TAR & ASPHALT

- | | | | |
|-----|---|------------------------|-------------|
| 6.1 | <ul style="list-style-type: none"> • Avoid harm or injury to the health of employees or persons on their premises, or those living in the vicinity. • Avoid skin contact. • Avoid damage or loss to the environment. • Wear respiratory mask • Avoid eye contact | Any reasonable answer. | (3 x 1) (3) |
| 6.2 | <ul style="list-style-type: none"> • Avoid the use of open flames or sparks near flammable products. • Do not smoke or use cellphones within 15 m of flammable products. • Ensure that fumes blow downwind from gas burners. • Do not heat products above recommended temperatures. | (3 x 1) | (3) |

6.3	<ul style="list-style-type: none"> • Rolled asphalt concrete • Warm mix asphalt • Cold mix asphalt • Cut-back asphalt concrete • Mastic asphalt 	(2 x 1)	(2)
6.4	The dangers of using tar are because it causes lung, skin, and scrotal cancers.	(1 x 2)	(2)
			[10]

QUESTION 7: FASTENERS

7.1	<ul style="list-style-type: none"> • Fasteners can be cheaper. • It is easier to remove something screwed in than glued or welded in. • Threaded fasteners go deeper than adhesives, giving more for the object to hold onto than just the surface area. 	(3 x 1)	(3)
7.2	7.2.1 Steel grade	(1 x 1)	(1)
	7.2.2 Strength class	(1 x 1)	(1)
7.3	<ul style="list-style-type: none"> • Lubricate the joint to minimize torsional stress • Use a reliable locking system: • Achieve the desired clamp load • Use a wedge-locking washer 	(3 x 1)	(3)
7.4	Torque tensioning can be unreliable if you set the torque ranch below the specification or above the specification.	(1 x 2)	(2)
			[10]
		TOTAL:	100