higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE (VOCATIONAL)

# MATERIALS
## NQF LEVEL 4

(12010484)

**12 November 2024 (X-paper)**
**09:00–12:00**

**Calculators may be used.**

**This question paper consists of 6 pages.**

085Q1N2412

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# DEPARTMENT OF HIGHER EDUCATION AND TRAINING
# REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
MATERIALS
NQF LEVEL 4
TIME: 3 HOURS
MARKS: 100

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**INSTRUCTIONS AND INFORMATION**

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Use only a black or blue pen.
5. Write neatly and legibly.

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## QUESTION 1: PLASTICS

1.1 Describe the following types of glass fibre:

1.1.1 Continuous roving

1.1.2 Cloth and woven roving

1.1.3 Hammer-milled filament

1.1.4 Chopped-strand mats

(4 × 1) (4)

1.2 Indicate what each type of glass fibre mentioned in QUESTION 1.1 is used for. (4)

1.3 Name FIVE uses of glass-fibre-reinforced plastic. (5)

1.4 Define the following concepts:

1.4.1 Photo degradation (2)

1.4.2 Lamination (2)

1.5 State ONE property of plastic. (1)

1.6 Name TWO types of polymers. (2)
**[20]**

## QUESTION 2: ELASTOMERS

2.1 Name THREE materials that acetic acid-based silicone sealants will not adhere to. (3)

2.2 Define the following concepts:

2.2.1 Gun grade (1)

2.2.2 Flow grade (1)

2.3 Briefly explain the preparation procedure before inserting a polyethylene foam bond breaker into a joint. (3)

2.4 Identify a non-acetic acid-based silicone sealant that will adhere to masonry and concrete. (2)
**[10]**

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## QUESTION 3: ADHESIVES

3.1 The following flowchart explains how epoxies set and harden.
Complete the sentences by writing only the missing word next to the question number (3.1.1–3.1.4) in the ANSWER BOOK.

The resin and hardener components of epoxies are both (3.1.1) … when they are separated.

↓

When the resin and hardener are mixed in the correct ratio, a (3.1.2) … occurs. This reaction generates heat

↓

The reaction is called (3.1.3) …. This process cannot be reversed and results in a thermoset polymer.

↓

The epoxy hardens in a process called curing. An increase in (3.1.4) … makes the curing process more effective.

(4 × 1) (4)

3.2 Explain why surfaces to be joined must fit well, are clean, dry, dust free and sound. (2)

3.3 Name TWO ingredients of contact adhesives. (2)

3.4 Explain the application of wood glue when joining porous and permeable timber and boards. (5)

3.5 Name TWO uses of a cyanoacrylate adhesive. (2)
**[15]**

## QUESTION 4: PAINTS, WATER REPELLENTS, COATINGS AND PRESERVATIVES

4.1 Name TWO ingredients of paint and describe the functions of each. (2)

4.2 Compare the advantages and disadvantages of using lime wash for masonry coatings. (4 × 1) (4)

4.3 State FOUR advantages of bagging a masonry wall. (4)

4.4 Briefly discuss how creosote acts as an effective wood preservative. (1)

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4.5 Until quite recently, a dangerous substance called coal-tar creosote was the only preservative used to treat timber poles against rot.

State THREE safety measures to be applied when using creosote. (3)

4.6 THREE types of paint are no longer recommended for use.

4.6.1 Name THREE of these types of paint. (3)

4.6.2 Give an example of each type of paint mentioned in QUESTION 4.6.1. (3)
**[20]**

## QUESTION 5: WATERPROOFING AND DAMP-PROOFING

5.1 A flat roof covered with torch-on waterproofing needs to be redone.

Explain how one will execute this task. (5)

5.2 Explain the role of a damp-proof course in the building environment (3)

5.3 Name TWO types of water repellents. (2)

5.4 Distinguish between *efflorescence* and *repellent*. (4)

5.5 Where in building construction is DPC used? (1)
**[15]**

## QUESTION 6: BITUMEN, TAR AND ASPHALT

6.1 List FIVE precautionary measures to take to avoid the risk of fire when working with asphalt. (5)

6.2 Name THREE types of asphalt. (3)

6.3 State TWO dangers of working with tar. (2)
**[10]**

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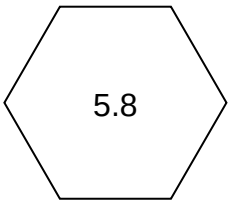
## QUESTION 7: FASTENERS

7.1 Various types of washers are used in the construction industry.

Name TWO types of washers and the application of each. (2 × 2) (4)

7.2 A class grade is stamped on a bolt as shown below.




Calculate the following:

7.2.1 Nominal tensile strength of the given bolt (3)

7.2.2 Nominal yield strength of the given bolt (3)

**[10]**

**TOTAL: 100**

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