higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE

## PAPERMAKING N4

## 20 April 2021

**This marking guideline consists of 4 pages.**

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## QUESTION 1: FIBRES, SECONDARY FIBRES AND STOCK PREPARATION

1.1
- Hydrophilic
- Colourless
- Chemically stable
- Tensile, flexible.

(Any 3 × 1) (3)

1.2 1.2.1 Mechanical pulp

1.2.2
- RCF
- Chemical pulp

(Any 1 × 1)
(2 × 1) (2)

1.3 1.3.1
- Foil
- Basket
- Inlet
- Outlet

(Any 3 × 1).

1.3.2
- Cons
- Pressure drop
- Reject rate

(2 × 3) (6)

1.4 Temperature, medium and high cons, disperse small particles. (3)

1.5 Chute, two-pump system, trim, deluge showers, break conditions, broke chest. (6)

**[20]**

## QUESTION 2: HEADBOX AND DRAINAGE

2.1 2.1.1 Basis mass valve, silo, fan pump. (4)

2.1.2 Discussion on fan pump, screen location, stock velocity, flanges, polished surfaces, elbow, tapered inlet header (5)

2.2 Discussion on either air flow for total head and stock flow for level or vice versa. (4)

2.3 Slice, maintain screws, replace distorted lips, balance pressure, rectifier rolls correctly seated. (5)

2.4
- Rush or drag
- Pressure or velocity formation
- Affects jet angle
- Three blades, rigid minimum deflection.

(10)

**[28]**

## QUESTION 3: WET-END ADDITIVES

3.1 Improve quality and productivity, retain fillers and fines. (2)

3.2 3.2.1
- Lost production
- Quality
- Dangerous gases (Any 1 × 1) (1)

3.2.2
- Keep system clean
- Wash-ups
- Boil out (3)

3.3 3.3.1
- Machine curing
- Alkaline sizing

3.3.2 Activator surface agent – allows effective emulsification, stabiliser, promoter.
(2 × 2) (4)
**[10]**

## QUESTION 4: PRESSING AND DRYING

4.1
- Nip load
- Impulse
- Felting
- Speed
- Temperature
- Steam box
- Rewetting
- Uniformity. (8)

4.2 Main steam supply, main, separators, thermocompressor, header, DPC, vacuum system. (9)
**[17]**

## QUESTION 5: SURFACE TREATMENT, COATING, WINDING AND FINISHING

5.1
- Solids
- Viscosity
- Sheet porosity
- Moisture (4)

5.2 Weight of bearings and journals at edge of roll. (2)

5.3 Rider roll loading, drum torque differential, tension. (5)
**[11]**

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## QUESTION 6: PAPER PROPERTIES AND PHYSICS

6.1 Reflectance

6.2 Show through-ash, light scattering-fwa, shine

6.3 Smoothness-calendar

(3 × 2) **[6]**

## QUESTION 7: MACHINE CLOTHING, DOCTORS, SHOWERS AND ROLLS

7.1 Economic considerations – discussion on felt life vs cost of felt and tonnage, high pressure showers, vacuum, lubricating showers, chemical/caustic, cleaning showers. (3)

7.2 Mechanical cleaning – discussion on felt life vs cost of felt and tonnage, high pressure showers, vacuum, lubricating showers, chemical/caustic, cleaning showers. (2)

7.3 Chemical cleaning – discussion on felt life vs cost of felt and tonnage, high pressure showers, vacuum, lubricating showers, chemical/caustic, cleaning showers. (3)
**[8]**

**TOTAL: 100**

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