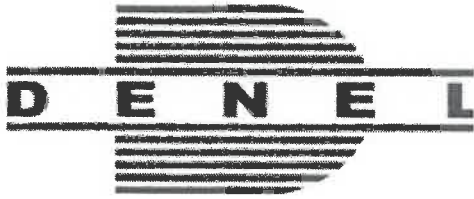


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DENEL PMP

SPECIFICATION FOR BAR STEEL Ø 20,5 mm BASED ON ALLOY C45 Pb (WN 1.0504 OR WN 1.1195)

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APPROVAL PAGE

COMPILED BY

I Pretorius
Configuration Control

2019-11-07
Date

APPROVED BY

L Jansen
Production Engineering

2019-11-07
Date

HJ van Eck
Acceptance Authority

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2019-11-28
Date

ORIGINAL SIGNED

AMENDMENT HISTORY SHEET

ISSUE	DETAILS	ECP NO.	DONE BY	DATE
2	Update specification.	E2/081/19MC	I.P.	2019-10-09

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SPECIFICATION FOR BAR STEEL Ø 20,5mm BASED ON ALLOY C45 Pb (WN 1.0504 OR WN 1.1195)

TABLE OF CONTENTS

PARA	SUBJECT	PAGE No.
1.	SCOPE	4
2.	APPLICABLE DOCUMENTS	4
3.	REQUIREMENTS	4
3.1	General material requirements	4
3.1.1	Product characteristics	4
3.1.2	Chemical, mechanical and metallurgical properties	4
3.1.2.1	Chemical composition	4
3.1.2.2	Mechanical properties	4
3.1.2.3	Metallurgical properties	5
3.1.3	Workmanship	5
4.	QUALITY ASSURANCE PROVISIONS	5
4.1	Responsibility for inspection	5
4.2	Special tests and examinations	5
4.3	Quality conformance inspection	6
4.3.1	Lot information	6
4.4	Test methods	6
5.	PREPARATION FOR DELIVERY	6
5.1	Packing	6
5.2	Package marking	6
5.3	Documentation for delivery	7
6.	NOTES	7

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1. **SCOPE**

- 1.1 This specification covers bar steel based on Alloy C45 Pb (WN 1.0504 or WN 1.1195) that conforms to this specification.

2. **APPLICABLE DOCUMENTS**

2.1 ASTM E8

2.2 ASTM E45

3. **REQUIREMENTS**

3.1 **General material requirements**

The material shall be supplied as bright, lead bearing, free cutting steel, cold drawn and unheat treated.

3.1.1 **Product characteristics**

3.1.1.1 The material shall be supplied as bright bar with plain ends in lengths of 3 m ± 20 cm.

3.1.1.2 The diameter shall be 20,5 mm +0,00 mm.
-0,130 mm.

3.1.1.3 Straightness deviation shall not exceed 1,5 mm/meter.

3.1.2 **Chemical, mechanical and metallurgical properties**

3.1.2.1 **Chemical composition**

ELEMENT	SPECIFICATION (%)
Carbon (C)	0,42 - 0,50
Silicon (Si)	0,40 maximum
Manganese (Mn)	0,50 - 0,80
Phosphorus (P)	0,045 maximum
Sulphur (S)	0,045 maximum
Lead (Pb)	0,15 - 0,30

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3.1.2.2 **Mechanical properties**

Ultimate tensile strength: 785 - 885 MPa
Yield point: 590 MPa minimum
Elongation (G = 50 mm): 6% minimum

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DATE 2023-10-11

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3.1.2.3 Metallurgical properties

The maximum acceptable inclusion count according to ASTM E45, method A, will be 2 (excluding lead inclusions) or $K3 < 35$ according to DIN 50602.

3.1.3 Workmanship

3.1.3.1 The material must be free from piping, cracks, porosity and any other macroscopic inclusions, for example, slag inclusions.

3.1.3.2 The material must be free from rust and handling marks.

3.1.3.3 Surface defects up to a maximum depth of 1% of the bar diameter is acceptable.

3.1.3.4 Waves or size variations within a bar exceeding 0,10 mm are not acceptable.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection

4.1.1 Unless otherwise specified in the contract or order, the supplier is responsible for the performance of all inspection requirements as specified herein.

4.1.2 Except as otherwise specified, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements.

4.1.3 The purchaser or his representative reserves the right of inspection of Laboratory Certificates of raw materials and components used for the manufacture of the material.

4.1.4 The supplier shall be responsible for making available to the purchaser all facilities necessary if required, for inspection of the material.

4.1.5 The supplier will be responsible for the implementation of the applicable quality management systems to assure the appropriate quality of the product. The purchaser reserves the right to audit the supplier's production facilities at all times to ascertain whether quality requirements are being met.

4.2 Special tests and examinations

Not applicable.

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SPECIFICATION FOR BAR STEEL Ø 20,5mm BASED ON ALLOY C45 Pb (WN 1.0504 OR WN 1.1195)

4.3 Quality conformance inspection

4.3.1 Lot information

A lot shall consist of one or more batches of material produced by one manufacturer in accordance with the same specifications under one continuous set of operating conditions. All material must be of the same cast or heat.

If the quantity is such that more than one cast is required, material of the same cast shall be grouped together. Each case or bundle shall be clearly identifiable as to the relevant cast number.

The supplier shall ensure that all deliveries to the end user are fully traceable by lot number and that identification records be supplied to the end user to match lot numbers with inspection records.

4.4 Test methods

4.4.1 Tension testing in accordance with ASTM E8.

4.4.2 Inclusion count in accordance with ASTM E45.

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5. PREPARATION FOR DELIVERY

5.1 Packing

5.1.1 To be strapped in bundles suitable for forklift handling using 4 evenly spaced steel straps. The maximum mass shall not exceed 1 000 kg unless otherwise agreed between the supplier and purchaser.

5.1.2 In the case of an overseas supplier the bundles shall be packed in a seaworthy condition using suitable wooden boxes secured by steel straps. The gross mass of the strapped boxes may not exceed 2 000 kg.

5.1.3 If containers are used for transportation of the material, open top containers must be used. The wooden boxes must be properly stacked in the container with spaces of ± 150 mm between them.

5.2 Package marking

All bundles, boxes and/or containers to be legibly and durably marked with the following details on suitable labels:

5.2.1 Document and order number.

5.2.2 Name of supplier.

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5.3 Documentation for delivery

The following documents must be forwarded with each consignment of material:

- 5.3.1 The original specification which accompanied the order in the case of a single consignment or the final consignment of staggered deliveries.
- 5.3.2 A certificate of conformance/analysis stating all the results of the tests conducted by the supplier during manufacture and final acceptance.
- 5.3.3 Certificate of acceptance issued by the end user or his duly representative or a letter from the end user for the release of the consignment for shipment in the case of an overseas supplier.
- 5.3.4 The supplier's delivery note shall clearly state the relevant order and document number.

6. NOTES

If the supplier of the material is not the original manufacturer, the full name and address of the manufacturer must be supplied in writing prior to the despatch of the consignment.

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