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PRETORIA METAL PRESSINGS
a division of Denel (Pty) Ltd

SPECIFICATION FOR BAR STEEL BRIGHT Ø 24,0mm BASED ON SAE 1017

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1. SCOPE

- 1.1 This specification covers aluminium bar steel based on SAE 1017 that conforms to this specification.

2. APPLICABLE DOCUMENTS

- 2.1 ASTM E92
2.2 DIN 50602
2.3 ASTM E112

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3. REQUIREMENTS

3.1 General material requirements

The material shall be supplied as bright bar in the as hot rolled and peeled condition.

3.2 Product characteristics

- 3.2.1 The material shall be supplied as bright bar in lengths of 3-6m. The maximum variation in length in a batch shall not exceed 50cm.

- 3.2.2 The diameter shall be 24,0mm ^{+0,00mm} -0,13mm

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

3.3 Chemical, mechanical and metallurgical properties

3.3.1 Chemical composition (Cast analysis)

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ELEMENT	SPECIFICATION (%)	AIM
Carbon (C)	0,16 – 0,21	0,18 – 0,2
Silicon (Si)	0,15 maximum	0,1 maximum
Manganese (Mn)	0,4 – 0,6	-
Sulphur (S)	0,015 maximum	0,01 maximum
Phosphorus (P)	0,02 maximum	-
Chromium (Cr)	0,1 maximum	-
Nickle (Ni)	0,1 maximum	-
Aluminium (Al)	0,02 – 0,06	0,02 – 0,04
Molybdenum (Mo)	0,05 maximum	-
Copper (Cu)	0,11 maximum	0,08 maximum
Nitrogen (N)	0,008 maximum	-
Sum of Carbon and Manganese	0,6 – 0,75	-



3.3.2 Mechanical properties

Internal Hardness (HV 10): 150 Vickers maximum

3.3.3 Metallurgical properties

Inclusion count:

The inclusion count shall be done according to DIN 50602, method M. Inclusion ratings per sample must not exceed the following indices:

0.5; 1.5; 2.5; 3.5; 4.5; 5.3; 6.3; 7.3; 8.3; 9.3

Ferrite grain size:

6 – 8 (ASTM E112)

3.4 Workmanship

3.4.1 The material must be free from piping, cracks, laps, porosity and macroscopic inclusions, for example slag inclusions.

3.4.2 The material must be free from surface defects.

3.4.3 The structure shall be homogeneous, consisting of ferrite and pearlite.

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 an applicable quality management system 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.

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4.2 Special tests and examinations

- 4.2.1 Special test methods such as ultrasonic testing, magnaflux, sulphur prints etc., must be used to assure that the material is free from harmful defects, ie., piping, macroscopic inclusions, cracks, porosities, etc.
- 4.2.2 Prior to final rolling or dispatch of the material, at least 12 samples, randomly taken from appropriate billets must be forged to 30 – 50 mm diameter or square and submitted for evaluation by the purchaser. Only if the abovementioned samples conforms to the specification with respect to chemical analysis and inclusion counts, may the material be rolled or dispatched, however, notwithstanding the above, the final acceptance of the finished product will take place at the premises of the purchaser.

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

Hardness test: In accordance with ASTM E92

Inclusion count: In accordance with DIN 50602

Grain size: In accordance with ASTM E112

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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 2 500 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 2 600 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.

5.3 **Documentation for delivery**

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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 during tender.