



Brake Disc and Brake Drum Material Specification

Specification: TW/CBD/1

Issue no. 1

Dated 25/02/2011

1. MATERIAL

The material is defined as a grey iron from which casting will be produced generally in accordance with material specifications:

BS EN 1561:1997
ASTM A159:83
SAE J431 : AUGUST'96

2. MECHANICAL PROPERTIES

2.1 *Ultimate Tensile Strength*

Guideline tensile strength on test pieces machined from brake drum/disc contact faces:

- 241 N/mm² European Requirement minimum
- 35,000 psi American Requirement minimum

Test pieces shall meet the dimensions and conditions according to specifications BS EN1561:1997 and SAE J431:AUGUST'96

2.2 *Hardness*

Hardness of the brake drum/disc casting tested on the brake contact surface shall be in the range: 178 – 240 HB

Testing shall be carried out in accordance with material specifications BS EN ISO 6506-1:1999/ASTME10.



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2.3 Chemical Compositions

The composition of the grey iron castings may vary depending on material type, ruling sections, production methods and manufacturer.

For guideline purposes, the table below shows typical composition ranges:

Total Carbon	3.1 – 3.7%
Silicon	1.6 – 2.1%
Manganese	0.6 – 0.9%
Sulphur	0.15% Maximum
Phosphorus	0.15% Maximum
Chromium	0.30% Maximum

Minor deviations may be permitted due to prevailing or governing section size of the castings being produced.

The element lead is seen as a detrimental element. For control purposes a maximum value of 0.003% is specified.

2.4 Metallographic Structure

The matrix structure shall consist of 90% pearlite and the main part of the graphite shall be of the distribution A type (for reference purposes see international standard ISO945:1975(E). Cast iron - Designation of Microstructure of Graphite.

No under cooled graphite forms (types D & E) are permitted. The content of free cementite in the matrix must not exceed 5%.

3. Freedom from Defects/Effects on machinability

The supplied castings shall show a good sound clean surface free from adhered sand etc. Excessive ferritic surface/sub surface zones are not permitted. All as-cast surfaces must be free cutting using ceramic cutting inserts. After machining, all machined surfaces must be free from surface blemishes (that is: inclusions, gas blow holes, porosity etc) as all such blemishes will result in the product being rejected.



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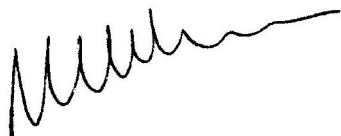
4. Approval of Material

Approvals of samples to this specification are required prior to despatch of the first production batch from each supplier. This evaluation should take the form of a test report and may be required to be compiled independently.

5. Identification of Castings

For traceability purposes all incoming product must be identified by a part number and casting date. All paperwork must make reference to these identities.

Approved by:



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Director
Thos. Winnard & Sons Ltd



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