
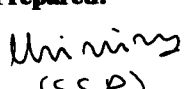
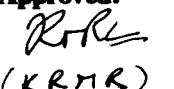


TD-106-1 Rev No. 5	Form No.		<h1 style="text-align: center;">PRODUCT STANDARD</h1> <h2 style="text-align: center;">HYDERABAD</h2>		Prod. Std. No. GT 10185 Rev No. 01 PAGE 1 OF 3
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly in any way detrimental to the interest of the company </p>			<h3><u>TURBINE WHEELS & SPACERS , ETCHING</u></h3>		
			<p>1. <u>SCOPE</u></p> <p>1.1 This process specification outlines the procedures for etching the bore test ring of magnetic and non magnetic gas turbine wheels and spacers.</p> <p>1.2 The test rings shall be etched after removal of the rings from the wheels and after the rings have been ground. Tensile tests specimens shall be removed from regions which appear to be chemically segregated.</p> <p>2. <u>APPLICABLE DOCUMENTS</u></p> <p>2.1 The following documents shall form a part of this specification to the extent herein specified. Unless otherwise specified, the latest revision shall apply.</p> <p style="text-align: center;">GT10424 (P4A-AG1) Metallic Materials - Cleaning and Pickling</p>		
			<p>3. <u>DEFINITIONS</u> - Not Applicable</p>		
			<p>4. <u>ENGINEERING REQUIREMENTS</u></p> <p>4.1 Materials</p> <p>4.1.1 Ammonium Persulphate - Commercially Available</p> <p>4.1.2 Ferric.Chloride Technical per GE Specification D4G6 - Commercially Available.</p> <p>4.1.3 Cotton Batting - Commercially Available</p> <p>4.1.4 Hydrochloric Acid per Ge Specification D4A3D - Commercially Available.</p> <p>4.2 Preparation of Etching Solutions</p> <p>4.2.1 Ammonium Persulphate Etch - Dissolve ammonium persulphate in water in the ratio of 100 grams of ammonium persulphate crystals per 1000 cc of water.</p> <p>4.2.2 Ferric Chloride Etch - Mix 500 cc of Hydrochloric acid with 500 cc of water and dissolve 100 grams of ferric chloride in the acid-water mixture. Always add acid to water, never the reverse.</p> <p>4.3 Procedure</p> <p>4.3.1 Grind the face of the ring which was adjacent to the wheel to a 8 AA</p>		
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finish using care to prevent flow of metal.

4.3.2 Remove oil and grease per process specification P4A-AG1.(GT10424).

4.3.3 Wipe dry with a clean cloth.

4.3.4 Magnetic and Non-Magnetic Materials.

4.3.4.1 Using some cotton batting, swab the prepared surfaces with the ferric chloride solution until the grain structure appears well delineated. In doing this etching treatment and subsequent rinsing operations, extreme care must be exercised to avoid scattering the liquids on any surface outside the designated area.

4.3.4.2 Flush thoroughly with water to remove the etchant.

4.3.4.3 With a clean dry cotton pad, wipe off any excess water.

4.3.4.4 (Magnetic Material Only) - Immediately apply with a small cotton pad a thin film of ammonium Persulphate solution to brighten the etched surface. Rinse with sufficient water to remove all traces of etchant and dry thoroughly so that no corrosion will occur.

4.3.5 Inspection of etched part and/or test ring shall be done visually or with a magnifying glass (10X).

4.3.6 Tensile test specimens shall be removed from the regions which appear to be chemically segregated.

5. QUALITY ASSURANCE PROVISIONS

5.1 Acceptance Limits

5.1.1 Acceptance of the wheel will be based on whether or not the material meets the mechanical properties and other requirements in the parts specification.

6. NOTES

6.1 The etching materials may be hazardous and safety regulations governing their use must be observed. The Industrial Hygienist should be consulted regarding conditions under which these materials are used.



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RECORD OF REVISIONS

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