

**SCHEDULE OF TECHNICAL REQUIREMENTS  
FOR MANUFACTURE & SUPPLY OF  
POLYIMIDE FOIL (KAPTON) P1 F0 1  
&  
POLYAMIDE PAPER (NOMEX) PA P1  
FOR  
3-PHASE TRACTION MOTOR OF ELECTRIC  
LOCOMOTIVES**

**APRIL'2008**

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ISSUED BY

**TRACTION MOTOR DEPARTMENT  
CHITTARANJAN LOCOMOTIVE WORKS  
CHITTARANJAN - 713331  
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## SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE & SUPPLY OF POLYIMIDE FOIL (KAPTON) P1 F0 1 & POLYAMIDE PAPER (NOMEX) PA P1 FOR 3-PHASE TRACTION MOTOR OF ELECTRIC LOCOMOTIVES.

1. **Scope:** This schedule of technical requirement (STR) is being issued to serve as guidelines to manufacturers/firms for manufacturing Polyimide Foil (KAPTON) P1 F0 1 & Polyamide Paper (NOMEX) PA P1, format of quality assurance plan to be followed, minimum machinery and plant, testing facilities and measurement facilities required. This STR should be read in conjunction with the relevant CLW specification. The firm should satisfy themselves having complied with the requirements of the specification and STR.
2. **Reference:** ABB's Specn. No. HZN - 02575 & HZN - 02239.
3. **General Requirement:** The firm should be certified to ISO 9001 by an agency accredited by NABCB.
4. **Desired aspect in QAP:** As per format CLW/MLAS/EL/F/04 ----- Appendix - 4 (1/1) to be followed.
5. **M&P, Testing & Measuring instruments:** List of typical M&P required for manufacture, testing & measuring instruments finished in Annexure - I is for general guidance only and actual manufacturing operations, specific testing & measuring instruments shall be submitted and get approved by the firm as a part of QAP.
6. **Internal Quality Control System:**
  - 6.1. The manufacture shall procure all the raw-materials from standard brand preferably from RDSO/CLW approved sources along with test certificates and source should be available as & when asked for.
  - 6.2. Quality Assurance Process of incoming materials, manufacturing process used for the subject items, including type of tests, supplying criteria, governing spec., acceptance norms, agency if test, format of records etc.
  - 6.3. Detailed process flow chart indicating process of manufacture and individual product.
  - 6.4. The testing & measuring equipments shall be and the validity of calibration should be current and calibration certificate issued by the calibration agency should be maintained.
  - 6.5. Relevant standards like IS/BS/IEC etc. shall be available with the firm.

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**Format: CLW/MLAS/EL/F/04 ----- Appendix-4(1/1)****QAP to be submitted by the vendor shall cover the following aspects:**

1. Organisation Chart clearly bringing out the quality control set up.
2. Qualification log sheets of the personnel manning the quality control set up.
3. Process flow chart indicating the process of manufacture of an item or a family of items from which the process is same.
4. Details of sub-vendors:
  - The name of the item for which sub-vendor is approved.
  - The name of the approving agency.
  - Inspection criteria of the sub-vendor.
  - The sub-vendor has ISO-9001 certification.
  - The primary vendor approves QAP of the sub-vendor.
  - Sub-vendor has submitted the Quality Manual of the Primary Vendor.
  - The sub-vendor has all the requisite infrastructure of manufacturing and testing facilities, preferably under one roof.
  - The primary vendor is following periodical inspection schedule for sub-vendor strictly.
5. Quality Assurance System – Inspection and testing plan.
  - Incoming Material
  - Process control
  - Product control

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This must be furnished in the following format.

Subject/Product /Process	Sample size & its frequency of Inspection	Parameters of Inspection	Mode of Inspection/ Equipment used	Acceptance Limit/Criteria/ Specified Value	Action taken on rejection

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## ANNEXURE-I

**REQUIREMENTS FOR POLYIMIDE FOIL (KAPTON) P1 F0 1 & POLYAMIDE PAPER (NOMEX) PA P1****A. Machinery:**

1. Automatic slitting machine (digital) range 510 mm & 914 width.
2. Dust free space for working and air condition space for storing self-life items.

**B. Testing facilities:**

1. Weighing machine with least count (03 digital after decimal).
2. BDV tester upto 10 KV with mA meter.
3. Necessary laboratory for composition analysis.

**C. Measuring instruments:**

1. Vernier caliper.
2. Micrometer.
3. Paper micrometer.
4. Scale/tape.

**D. Other requirement**

1. Authorisation of OEM.
2. DGFT import certificate (Polyimide film/foils/tapes).

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