

Technical Specification

T0401 Track: Rail and baseplate pads

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1 Purpose

The purpose of this technical specification is to specify the requirements for rail and baseplate pads that are to be used on the London Underground network.

2 Scope

- 2.1 This technical specification applies to rail and baseplate pads for Open, Sub-surface and Tube sections in the following applications:
- a) rail pads between flat bottom rails and concrete sleepers or bearers;
 - b) rail pads between flat bottom rails and baseplates;
 - c) baseplate or chair pads between baseplates or chairs and sleepers or bearers.
- 2.2 Although rail and baseplate pads are expected to contribute to the mitigation of noise and vibration, this specification does not cover the requirements at sites with particularly critical noise and vibration issues, for which site-specific solutions may be required.

3 Requirements

3.1 General

- 3.1.1 Rail and baseplate/chair pads are required to:
- a) provide a conformable interface beneath rails or baseplates/chairs in order to prevent wear of the components;
 - b) provide impact protection of components, particularly sleepers and ballast, under impact load conditions;
 - c) provide satisfactory electrical insulation for signal currents in the rail;
 - d) contribute to the minimisation of noise and vibration emission;
 - e) assist in the prevention of rail corrugation;
 - f) form part of a rail fastening system that is resistant to rail creep (rail pads only).
- 3.1.2 In fulfilling the requirements in clause 3.1.1, rail and baseplate pads (and chair pads where used) shall limit rail rollover and excessive fastening deflection on curves and shall remain durable under railway service loading and environmental conditions.

3.2 Rail and baseplate/chair pad properties

- 3.2.1 Rail and baseplate/chair pad properties shall comply with the requirements set out in Attachments 1 and 2.
- 3.2.2 For baseplate and chair pads, properties may be demonstrated using samples of an appropriate dimension to fit in the test apparatus used for rail pads, with the relevant values factored according to the bearing area.

3.3 Fire resistance

- 3.3.1 Rail and baseplate/chair pads shall comply with LU standard 1-085. In demonstrating compliance with standard 1-085 suppliers have the option of classifying rail and baseplate/chair pads as either “flooring” or “limited and dispersed” items.

3.4 Dimensions and configuration

- 3.4.1 Dimensions of rail and baseplate/chair pads shall be in accordance with the drawings shown in Attachment 2 (of which a number are summarised in Attachment 3 for information). In the case of baseplate and chair pads the drawings relate to the baseplate or chair, from which the dimensions of the pad can be determined.
- 3.4.2 For rail pads, where it is possible to obtain the required impact attenuation and stiffness with a flat-surfaced pad, this is strongly preferred, especially for the upper surface in contact with the underside of the rail. However, if surface configurations are proposed they must resist retention of moisture or debris so as to minimise the risk of corrosion pitting or abrasion of the rail. Should the manufacturer wish to incorporate surface configurations, details must be supplied when applying for product acceptance. Under no circumstances will perforated (i.e. with holes formed between top and bottom faces) or dimpled rail pads be permitted.

3.5 Marking of pads

All pads shall be marked with the manufacturer's name and the part number.

3.6 Quality assurance

A Quality Assurance Plan shall be submitted when seeking product acceptance. The Plan shall state the parameters to be measured and the frequency of sampling of the product for testing of these parameters. The supplier must demonstrate that the frequency of sampling is consistent with the manufacturing process employed. As a minimum the parameters to be monitored during Quality Assurance testing shall be as follows:

- a) static stiffness – to be maintained within the range accepted by LU;
- b) thickness – to be maintained within the original declared design range;
- c) electrical resistance (direct current) – to be maintained at 1 MΩ minimum (this may require more frequent monitoring in the case of materials containing carbon black);
- d) tensile strength – to be maintained at the value accepted by LU;
- e) density variation – samples not to vary by more than $\pm 0.3 \text{ g/cm}^3$ when tested according to ISO 2781. The frequency of monitoring will depend on the material used.

3.7 Product acceptance

- 3.7.1 Three pads of each type being offered shall be subjected to each of the tests listed in Attachment 1. All tests shall be carried out in a laboratory equipped for the purpose: if this is the manufacturer's own laboratory the tests must be shown to have been independently witnessed. The test results shall be submitted to LU for acceptance.
- 3.7.2 LU understands that compromises may be necessary in the achievement of the criteria in Attachment 1. Suppliers seeking product acceptance should explain how they have designed their product to optimise its performance, durability and cost characteristics.