IEC/PAS 61300-3-35

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Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –

Part 3-35: Examinations and measurements – Fibre optic cylindrical connector endface visual inspection

PUBLICLY AVAILABLE SPECIFICATION

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FOREWORD

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC-PAS 61300-3-35 has been processed by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document:
Draft PAS	**Report on voting**
86B/1677/PAS	86B/1701/RVD

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1 Scope

The purpose of this part of IEC 61300 is to quantitatively assess the endface quality of a polished fiber optic connector. The information is intended for use with other standards which set requirements for allowable surface defects such as scratches, pits and debris which may affect optical performance. In general, the methods described in this document apply to fibers contained within a ferrule, however portions are applicable to non-ferruled connectors. Those portions are identified where appropriate.

2 Normative references

The following normative document contains provisions which, through reference in this text, constitutes provisions of this part of IEC 61300.

IEC 61300-1 Ed. 1.0b: 1995, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance 86B*

3 General description

Two methods are described: (A) Optical microscope and (B) CCD array camera with monitor. In method A, the required equipment is an optical microscope capable of direct illumination with a calibrated eyepiece reticle to measure the size of features in the image. In method B, an optical microscope is used in conjunction with a CCD array camera to project an image onto a video monitor at a known magnification. In both methods A and B, features are identified and measured by an operator.

3.1 Morphological Definitions of Defect Features

For purposes of this document the following defects shall apply for all measurement methods.

Scratches: permanent linear surface features derived from polishing or handling

Pits: permanent non-linear features caused by surface damage during polishing or handling.

Cracks: permanent fracture lines that may extend to the surface of the fiber

Surface debris: non-permanent features that can be removed by cleaning.

3.2 Measurement conditions

No restrictions are placed on the range of atmospheric conditions under which the test can be conducted. It may performed in controlled or uncontrolled environments

3.3 Pre-conditioning

No minimum pre-conditioning time is required.

3.4 Recovery

Since measurements are to be made at standard test conditions, no minimum recovery time is required.

4 Apparatus

The apparatus consists of the following elements.

4.1 Method A: Optical

The apparatus for method A (figure 1) consists of an optical microscope with the following features and capabilties:

– A suitable ferrule or connector plug holder and a positioning stage

– Minimum total magnification of 200X, where total magnification is defined as the product of the objective lens and eyepiece lens magnifications.

– Resolving power of 1,0 µm

The resolving power is determined by the numerical aperature of the objective lens and wavelength of the illuminating light as given in equation:

$$R = 0{,}61\lambda/NA$$

Where: R is the resolving power,
λ is the wavelength of the illuminating light, and
NA is the numerical aperature of the objective lens

– Direct axial illumination with an unpolarisedlight light source shall be used. A center wavelength is 0,56 µm is recommended. This can be achieved with a white light source

NOTE A center wavelength of 0,56 µm requires an NA of 0.34 to achieve the required resolution of 1,0 µm

– A calibrated eyepiece reticle capable of measuring features on the ferrule surface with linear dimensions of 1,0 µm or greater .