SLOVENSKI PREDSTANDARD

oSIST prEN 60793-1-34:2006

januar 2006

Optična vlakna – 1-34. del: Merilne metode in postopki preskušanja – Zvijanje vlaken

(istoveten prEN 60793-1-34:2005)

Optical fibres – Part 1-34: Measurement methods and test procedures – Fibre curl

ICS 33.180.10

Referenčna številka
oSIST prEN 60793-1-34:2006(en)

86A/1001/CDV

COMMITTEE DRAFT FOR VOTE (CDV)
PROJET DE COMITÉ POUR VOTE (CDV)

	Project number Numéro de projet	IEC 60793-1-34 Ed 2.0
IEC/TC or SC: **SC86A** CEI/CE ou SC:	Date of circulation Date de diffusion **2005-03-25**	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) **2005-09-02**
Titre du CE/SC: Fibres et Câbles	TC/SC Title: Fibres and Cables	
Secretary: Guy Perrot Secrétaire:		
Also of interest to the following committees Intéresse également les comités suivants	Supersedes document Remplace le document 86A/970/CD and 86A/994/CC	

Functions concerned
Fonctions concernées

☐ Safety / Sécurité ☐ EMC / CEM ☐ Environment / Environnement ☐ Quality assurance / Assurance qualité

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Titre :

Title : IEC 60793-1-34 Ed 2.0: Optical fibres - Part 1-34: Measurement methods and test procedures - Fibre curl

Note d'introduction

Introductory note

ATTENTION	ATTENTION
CDV soumis en parallèle au vote (CEI) et à l'enquête (CENELEC)	**Parallel IEC CDV/CENELEC Enquiry**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRES –

Part 1: Measurement methods and test procedures – Section 34: Fibre curl

FOREWORD

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International Standard IEC 60793-1-34 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

The text of this standard is based on the following documents:

FDIS	Report on voting
86A/XX/FDIS	86A/XX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annex A forms an integral part of this standard.

Annexes B and C are for information only.

The committee has decided that the contents of this publication will remain unchanged until. XXXX At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

OPTICAL FIBRES –

Part 1: Measurement methods and test procedures – Section 34: Fibre curl

1 Scope

This part of IEC 60793 establishes uniform requirements for the mechanical characteristic: fibre curl or latent curvature, in uncoated optical fibres. Fibre curl has been identified as an important parameter for minimizing the splice loss of optical fibres when using passive alignment fusion splicers or active alignment mass fusion splicers.

Two methods are recognized for the measurement of fibre curl, in uncoated optical fibres:

- method A: side view microscopy;
- method B: laser beam scattering.

Both methods measure the radius of curvature of an uncoated fibre by determining the amount of deflection that occurs as an unsupported fibre end is rotated about the fibre's axis. The method A uses visual or digital video methods to determine the deflection of the fibre while the method B uses a line sensor to measure the maximum deflection of one laser beam relative to a reference laser beam.

By measuring the deflection behaviour of the fibre as it is rotated about its axis and understanding the geometry of the measuring device, the fibre's radius of curvature can be calculated from simple circular models, the derivation of which are given in annex C.

Both methods are applicable to types A1, A2, A3 and B optical fibres.

Method A is the reference test method, used to resolve disputes.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60793,*(all parts), Optical fibres*

3 Apparatus

An uncoated fibre end is mounted in a rotatable fixture so that the end extends freely into space by an overhang distance which will depend on the measurement device. The overhang distance is typically 10 to 20 mm. If the measurement device is designed with overhang distances grater than this, care must be taken to avoid excessive degradation due to effects of vibration and gravity. The fibre is rotated and the deviations in the position of the overhang point relative to a reference position are measured to obtain the fibre's radius of curvature, r_c

Details pertaining to the two methods are given in the relevant annex A or B. Common apparatus requirements are given below.

3.1 Fibre holding fixture

Provide a fixture that holds the fibre on a constant axis at the holding position and allows the fibre to be rotated through 360°. The fixture may be a v-groove holder such as a vacuum chuck or a fibre ferrule. If a ferrule is used, take care to ensure that the inside diameter is