
IEC 825-1 and CENELEC EN60825, EN60825-1 Standards for Products with LED Devices

Application Brief I-008

Introduction

European countries are very concerned with public safety relative to products that incorporate light emitting devices. The following organizations have been established to ensure the public safety, including possible eye injury from use of products containing light emitting (LED) devices.

- **International Electrotechnical Commission (IEC):** The technical organization which provides a forum and process for generating voluntary technical standards.
- **European Committee for Electrotechnical Standardization (CENELEC):** The European Regional Standards Organization which provides a forum and process for generating voluntary standards or adopting those of the IEC for use in Europe.
- **European Commission:** The governmental organization which has adopted the CENELEC standards as part of the Low Voltage Directive 73/23/EEC, giving regulatory credence to the CENELEC standards.

- **Testing Organizations (Test Houses):** These organizations are contracted to test new products against current CENELEC standards, including optical measurements on the laser and LED devices in final product assemblies with respect to the eye safety classification in accordance with the current CENELEC Standard.

IEC-825-1 (1993) and CENELEC EN60825-1 (1994) Standards and LED Devices

In calendar year 1993, the IEC TC 76 Standards Committee issued the latest revision of IEC 825 Standard. The original IEC 825 Standard provided eye safety classifications for lasers in final product assemblies. CENELEC adopted the IEC 825 as the EN60825 Standard and the European Commission referenced this EN under the Low Voltage Directive. The new IEC 825-1 Standard (1993) added eye safety classifications for LED devices in final product assemblies. As of March 1, 1995, the older EN60825 Standard was to be rescinded by CENELEC and be superseded

by the new EN60825-1 Standard (1994), adopting the IEC 825-1 Standard (1993).

Problems with the IEC 825-1 Standard (1993) Relating to Classification of LED Devices

After the IEC 825-1 Standard (1993) was completed, it became apparent that more investigation is needed to properly define the necessary measurements and eye safety classifications for LED devices. Although well intended, the selective inclusion of LEDs into the IEC 825-1 (1993) and EN60825-1 (1994) standards will not achieve the standards organization's purpose of protecting the public with respect to eye safety. These standards ignore other light sources, and at the same time overclassify many LEDs which do not exceed currently accepted maximum permissible exposure (MPE) limits under realistic viewing conditions.

The objective of both the IEC and CENELEC, to provide standards that protect the public relative to LEDs and eye safety, will not be achieved by the present IEC 825-1 (1993) and CENELEC EN60825-1 (1994)

Standards. As presently written, these standards incorrectly apply the classifications for laser optics to all types of LED devices. For products utilizing LED devices and tested under the Low Voltage Directive, this results in overly restrictive classifications, labeling requirements, and potentially unjustified rejections on the basis of eye safety by third party test organizations applying requirements of IEC 825-1 (1993) and CENELEC EN60825-1 (1994). In an effort to comply with the CENELEC EN60825-1 (1994) Standard as presently written, manufacturers of products utilizing LED devices would need to develop products of unnecessarily over complicated and expensive design, potentially placing these products at a disadvantage in the public market. As a result, the IEC TC 76 Committee, recognizing the current measurement conditions stated within the text of the IEC 825-1 Standard (1993) do in fact overclassify many LED devices under normal viewing conditions, issued the following statement at their plenary session in Kista, Sweden, October, 1994:

“IEC Committee TC 76 recognizes that the current measurement conditions applicable to the classification of LEDs may overclassify many LEDs which actually do not exceed current MPEs (maximum permissible exposures) under any realistic viewing condition. WG 1 is currently developing a revised procedure to alleviate this problem.”

Note: WG 1 is the working group within the Technical Committee TC 76 that is responsible for defining the specific measurements and LED classifications for eye safety for the IEC 825-1 Standard (1993).

CENELEC Action to Delay Rescinding EN60825 Until March 1, 1996

In response to this statement, CENELEC has adopted the IEC TC 76 statement as the basis for delaying the action of rescinding the original EN60825 Standard until March 1, 1996. EN60825-1 (1994) will coexist with the original EN60825 in the CENELEC standard system until March 1, 1996.

This action by CENELEC gives the relevant technical committees one year to correct the improprieties in the IEC 825-1 Standard (1993) relating to LED measurements and classifications for eye safety.

The Option to Comply Only with EN60825 Until March 1, 1996

As a result of the action taken by CENELEC, manufacturers of products utilizing LED devices may elect to comply only with the original CENELEC EN60825 Standard until March 1, 1996, and by so doing, need not attach any labeling relating to eye safety and LED devices to final product assemblies as specified in the CENELEC EN60825-1 (1994) Standard. Testing organizations need not test products that contain LED devices to the requirements of EN60825-1 (1994), until March 1, 1996, and

may continue to test products against the EN60825 Standard, which does not contain measurement, classification, and labeling requirements for LEDs.

EN60825-1 and March 1, 1996

It is anticipated that by March 1, 1996, both the IEC TC 76 Committee and CENELEC will have incorporated proper testing and classification for all types of LED devices in the IEC 825-1 and EN60825-1 Standards, permitting proper classifications as to eye safety of products utilizing various types of LED devices. By doing so, the revised EN60825-1 Standard would provide for actual eye safety in products that still meet public market price and performance expectations in Europe.

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