



Introduction to Illumination Design

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This training is aimed at engineers (coming e.g. from the electrical or mechanical design) who are increasingly faced with illumination optics tasks. They may need to design light guides and choose the right LED for a task, perhaps they need to illuminate a surface uniformly, possibly they only need to understand the requirements specified in a standard. This training provides an introduction to illumination optics and an overview of typical quantities and their relations and typical problems and solutions that arise in the design of illumination optics.

Day one – Describing light

Introduction

- Introduction of each other
- What do you expect from the training?
- Illumination optics: A short overview

Specifying and measuring light and color

How much light have I got?

- Radiometric and photometric quantities and units
- What the quantities tell you
- Relations between radiometric/ photometric quantities
- Examples and applications

What color is my light?

- Human color perception
- Definition of color according to international standards
- Color rendering
- Examples and applications

How do I measure it?

- Radiometric and photometric measurement techniques



Day two – Light sources

General rules for illumination systems

How much light can I get where I want it to be?

- Etendue as a physical quantity and what it tells you
- Luminance conservation
- Examples and applications

Light sources

Where do I get my light from?

- LEDs
- HID
- Fluorescent lamps
- Lasers diodes

How do I model my light source?

- Ray data sets
- Modelling a source
- Examples and applications

Day three – Optics for illumination tasks

Optics types

What optics can I use for my task?

- Lenses
- Reflectors
- TIR lenses
- Light guides
- Freeform optics

Optics materials

Which material can I use for my task?

- Glass
- Plastics
- Metal
- Surface and volume scattering

Basic illumination design concepts

Which concepts can I use for my task?

- CPC
- Microlens arrays
- Abbe and Köhler illumination systems
- Cone + Lens
- Freeform optics
- Examples and applications