DELTA retroreflectometer instruments for airfield use

DELTA and the retroreflectometer business
DELTA is the global leader within development, production and sale of retroreflectometer instruments for measuring retroreflection levels of pavement markings and traffic signs. DELTA has since the late 70s been involved in the retroreflectometer business as well as being an active part in writing the current European and American standards on retroreflection measurement of pavement markings and traffic signs.

Importance of retroreflection
Measuring retroreflection has so far primarily been a focus when it comes to traffic on roads. Markings and signs are important to ensure safe guidance of traffic reducing the risk of accidents. Especially at nighttime where the visibility is limited to light from vehicle headlights and partly from street lightening, high performing markings and signs are important in guiding drivers safely to their destinations.

Lately, DELTA has experienced an increasing interest by airfields in retroreflectometers to ensure high performing markings and signs on airfield traffic areas, taxiways and runways. This may be a result of FAA Advisory Circular AC 150/5370-10G from 2014 for the first time stated minimum retroreflection levels for pavement markings.

DELTA retroreflectometers
DELTA offers the instruments necessary for measuring retroreflection on roads and airfields. DELTA offers two lines of instruments, hand-held and mobile.

Hand-held instruments
Hand-held instruments are typically used on small and medium size airfields and where a limited amount of markings and signs are to be measured. The instruments are hand-held and provide spot measurements. DELTA’s retroreflectometers are easy to calibrate and use for measuring. The instruments can be operated with a limited training.

LTL-X Mark II and LTL-XL
LTL-X Mark II and LTL-XL measure retroreflection of pavement markings.
Depending of the model they are able to measure nighttime and daytime visibility of white and yellow markings. Both instruments are able to measure plane and profiled markings and the markings can be measured under dry and wet conditions as well as under continuous rain to show the performance under various climatic conditions.

**RetroSign GRX**

The RetroSign GRX instruments are in a position to show how traffic signs perform at nighttime. RetroSign can be used for measuring all types of retroreflective sheetings and colors. RetroSign is, among others, able to read barcodes and QR codes used for asset management and provide a picture of the sign measured for later review.

**Mobile instrument**

A mobile device is typically used in large airports and when frequent retroreflective measurements are to be made. DELTA’s LTL-M mobile retroreflectometers measure pavement markings at traffic speed.

LTL-M delivers results for night visibility, daylight contrast and line width. LTL-M can provide night visibility data under dry conditions and on all types of white and yellow markings. LTL-M makes use of the latest technology within real time digital image processing ensuring accurate measurement under all driving conditions.

**Data presentation**

Measurement results are presented as a log file, curve (for LTL-M) and as a display on Goggle Earth. Each measured pavement or sign can be given a unique ID for easy recognition. The mobile LTL-M system can be delivered with an overhead camera for later review of the measured pavements.

**Standards and accuracy**

DELTA’s retroreflectometers comply with existing European and US standards for pavement markings and traffic signs. DELTA’s instruments, when properly calibrated and operated, typically operate with a reproducibility of +/- 5 % and a repeatability of +/- 3 %.

**Calibration standards**

DELTA is an accredited calibration laboratory and delivers its instruments with calibration references which are traceable to international calibration institutes. DELTA recommends to make a daily calibration of the instruments to ensure correct measurement results.

**Practical use on airfields**

DELTA’s retroreflectometers are increasingly used in airport around the world. More recently DELTA has entered into a co-operation with US based Hi-Lite Airfield Services who use the LTL-M mobile system as the backbone in airfield marking surveys. Mobile surveys are assisted by hand-held measurements in areas not easy accessible with mobile equipment.

**Contact and further information**

For further information about DELTA’s retroreflectometer instruments, please contact Market Manager Kjeld Aabye at +45 72 19 46 30 or e-mail: kaa@delta.dk.

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FAA Advisory Circular AC 150/5370-10G published in August 2014 is the first document providing requirements to minimum retroreflection levels of markings at installation in airports. Besides, the AC refers to the US ASTM E 1710 standard for information on the test method. The AC requires:

- **Type I, gradation A, remarking at least every 6 months**
  - White = 300 mcd
  - Yellow = 175 mcd

- **Type III, gradation A, where higher reflective values are desired**
  - White = 600 mcd
  - Yellow = 300 mcd

- **Type IV, gradation A, with type 3 paint and larger glass beads**
  - White = 400 mcd
  - Yellow = 225 mcd

- Preformed thermoplastic markings
  - White = 225 mcd
  - Yellow = 100 mcd

Further details can be located in the Advisory Circular chapter 620-2.3

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