

## CIE in the world

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### Synopsis

The Commission Internationale de l'Eclairage (CIE) was established in 1913. From work on basic standard matters in light and lighting the interest focused on application with publication of guides. Today the main interest is again on standards where the CIE is the international standardising body in co-operation with ISO and CEN and in new technology.

As financial support is more difficult to find for the National Committees, the CIE seeks new forms for membership and new ways of getting funding from organisations and companies

### Summary

The Commission Internationale de l'Eclairage or CIE dates back from 1913.

It was based on needs for standardisation of terms and measures related to light and lighting.

From the start, with just a few countries participating, the interest and involvement in the work has grown and today about 40 countries are members. All continents are today represented but the majority of members are from Europe and one goal for the future is to increase especially the memberships from other continents to make the CIE really worldwide.

From basic standards the work turned into basic research and then to application. Today standards is again one of the major topics, especially international standards for the ISO.

The CIE covers many aspects of light and lighting and new areas are developing as technology develops. The latest new focal point is Image Technology, which is handled by a new Division within the CIE.

To be in a better position for the coming years the CIE has established a Business Plan with the aim both to increase the efficiency in the work, get CIE even better known as The International Lighting Body and to find new sources for the financial support needed.

### History

International co-operation in the field of lighting started a long time ago, almost a 100 years. There was a need for standardisation of measures and terms to use in lighting and lighting applications. September 3<sup>rd</sup>, 1900 the CIP, Commission International de Photométrie, started in Paris with representatives from the USA and Europe, in all 9 countries. It was the National Electrotechnical Committees from the different countries that were invited to take part.

During the first decade or so it became clear that lighting involves much more than production and photometry of light. Lighting engineering became more pronounced and lighting engineering societies were established in the industrialised countries.

CIP held conferences about every 4<sup>th</sup> year in Zürich. At the 4<sup>th</sup> meeting of CIP held in Berlin end of August 1913 the CIE was established. And it has gradually grown since then to become the international organisation in lighting.

## Development

The number of member countries has grown to about 40 today. And one of the important tasks for the coming quadrennium is to widen the CIE family even more. Different new ways will be tried.

One of the major tasks for the CIE has been to find international agreement on matters related to light, lighting and vision, both fundamental and in applications. Some of these matters are so basic that they have become standards. First more in reality than in actual presentation.

Most CIE papers were for many years presented in the proceedings of the sessions but in the early 60:s it was recognised that CIE should publish reports on specific topics to make them more easy to find. Today the number of reports has exceeded 130 and that includes a number of new editions, or updating of existing reports. For a period the CIE also published a Journal.

Among the early standards that CIE established is the  $V(I)$  curve which was first published in 1924 at the session in Geneva. The celebration of its 75 years was held in the special CIE symposium on photometry held last week in Budapest.

At the meeting in 1928 a number of recommendations were endorsed. As an example 85 cm above the floor was agreed as the basic level for measurements of illuminance indoors. The ratio between the "international candle" and the Hefnerkerze was very noticeably different at different colour temperatures. This led to a recommendation to work on finding a method for heterochromatic photometry.

The luminance distribution of the *overcast sky* was also established by the CIE and later for the *clear sky*. These are used for calculation of indoor daylight all over the world. They have now appeared as formal CIE standards.

At the 1931 session the international system, the so-called CIE System, of tricromatic colorimetry was established. The colour vision characteristics of a "reference observer" were defined. A standard white light and 3 illuminants for use in colorimetry were defined.

In *colour* the CIE has thus been very active and published standards and methods also for describing the *colour rendering* properties of light sources. These have been criticised very much over the years but so far no one has been able to present a better method. The first official CIE Standards were on Colorimetric illuminants and on the Colorimetric observer numbered S001 and S002 and published in 1986.

The term *candela* was adopted at the session in 1948 (in Paris) to replace the old national names such as bougie, candle and Kerze.

Another field where the CIE has been active is in glare, especially *discomfort glare* in interiors. As you know methods to describe the risk for glare disturbance were developed in many countries and it was very difficult to find a method that all could agree upon. One reason for this was of course that no method was perfect for all applications. It should be both simple and still flexible! The CIE presentation of lighting guides for indoor lighting needed a method also for the assessment of discomfort glare. And finally in 1995 a proposal for a CIE method called the UGR was published as an interim method until new research could lead to a better method.

And the CIE has the challenge to find both a better basis in understanding what glare is and from that a better method. So far funding and interested researchers is lacking.

The *vocabulary* used in lighting and the definitions of measures and words has been published in the 4 official CIE languages. The first edition came in 1938 including 103 terms and their definitions in the then 3 official languages. Each term or word has also been translated to several languages by the CIE. 2<sup>nd</sup> edition in 1957. When the 3<sup>rd</sup> edition came in 1970 it was adopted also as an IEC standard and this is also the case with the 4<sup>th</sup> edition from 1987. The revision of this vocabulary is constantly going on and is now approaching a new edition. Due to the rapidly increasing number of terms and definitions it is quite probable that the 5<sup>th</sup> edition will only appear on disc, with the possibility to print relevant chapters for specific purposes.

An important step for the recognition of the CIE as the international body in lighting was the *agreement with ISO and IEC* in 1989 that all standardisation work in lighting should be done by the CIE. This is published in an “ISO Council Resolution 10/1989”, a “CIE Council Resolution 1/89 on Joint ISO/CIE Standards” and a “Memorandum of mutual understanding between the IEC and CIE”. The CIE standards can be accepted as ISO standards, or rather joint CIE/ISO standards after a simplified procedure within the ISO. This is not only good for the CIE reputation but also a practical agreement as the number of experts is limited and duplication of work would mean also that the same persons, more or less, should do the work twice. Thanks to this agreement the CIE work on standardisation has become officially accepted.

## Situation today

### Standards

Several technical committees in the CIE are working on standards. This is partly by request from ISO, partly because standards are playing a more important role internationally, as trade becomes more and more worldwide. It also seems easier to get national support for the work in the CIE when the outcome can be a standard.

There are certain rules for the work on standards within the CIE. To ensure that the outcome is an agreement between several countries you must have participants, TC members, from at least five member countries. And it is advisable that all division members in the actual division inform their country standardising committees that a work is going on so they can follow and influence the work before a draft standard is presented for voting. This makes it easier for the following voting which must be done in the NCs, not only within the TC, division and Board of CIE.

At the CIE Session in Warsaw in June this year an agreement on co-operation between the CIE and CEN, the European Standardisation Organisation, was signed. This is an agreement basically similar to the one between CIE and ISO about avoiding double work and making use of existing reports and standards. As the legal status of CEN standards in the member countries are different from the ISO standards the agreement has a slightly different form.

### New technology

Light and lighting including light-sources is a very active area for development. The new technologies lead to a need for new application guides and rules for both calculation and measurements. For the CIE this means establishment of new technical committees and even a new Division. (As you know the activities in the CIE are handled by Divisions for different areas.)

During 1999 a division for Image Technology has been established as a result of international discussions and demand for guides in description and measurement of image quality in a broad sense. For the CIE it is a positive sign that the international community involved in image technology turned to us to create this forum for co-operation.

## The future

New membership structure.

The CIE will not only try to widen the fields of technology to cover new areas of importance to light and lighting. The funding of the CIE is an everlasting problem and new ways of finding sponsoring will be tried. At the Session on Warsaw in June this year the General Assembly consisting of representatives for all member countries, decided to widen the membership categories both in order to facilitate for new members to participate but also to allow sponsoring members to be part of the CIE family.

The funding of the CIE has been based on fees from the National Committees that are members and from sales of publications. CIE publications are rather expensive, many think, and the number of copies sold is small. In order to spread the CIE knowledge we would like to be able to distribute the reports for free or make them available on the net. But then the fees must be raised and this is a very big problem for many members. So finding interested international organisations and companies that are willing to sponsor the activities is one way to reduce the burden on the member countries. They are called Supportive Members in the new structure.

New member countries or persons from countries without a National Committee yet have also a possibility to become what is called Associate National Committees or Associate Members on a trial period basis to get familiar with the activities within the CIE without a too high cost. Also developing countries can become associate members.

Today the majority of member countries are from Europe even if all continents are represented. One goal for the coming quadrennium is of course to get more members from all continents including developing countries to make the CIE really world wide.

## Activities in the Divisions

Has the CIE covered the fundamentals in light and lighting? Even if we have been working for such a long time there are questions not yet solved. Glare for instance is still debated. How can you describe glare and measure or calculate the risk for glare? We don't have the answer.

Colour notation is another area where the debate continues and the CIE lacks the answer, if there is one answer.

Lighting applications become more complex as the understanding of the interactions of all environmental parameters is increasing. Many propose that the CIE should develop new guides in lighting for specific places, not only develop standards. The aim is of course good lighting quality, but we don't know how to describe lighting quality in a measurable way!

Lighting and energy is another area where the CIE has not been very clear in its role.

Education is another area where the CIE should be more active. But how?

As new technology develops also the measurements must be developed. The same for calculations. Computerised calculations are spreading but how can we assure that the programs give reasonably correct answers? What tolerances in calculations can we accept and what are the tolerances in both calculations and measures? This becomes more and more important as standards have to be fulfilled and the quality assurance becomes more and more a legal matter.

### Summary

Even if the CIE has worked for more than 85 years there are still questions unanswered and new challenges appearing.

To handle this the CIE is also developing both in its technical activities and in its member structure. There are many important questions to solve for the new board when entering the new millennium. As the CIE is based on voluntary work the support from the National Committees and from all individuals is crucial.

The Session in Warsaw was very successful. Many good papers were presented, new contacts and liaisons established and a number of new active persons are found for the work. This looks promising and I am convinced that we together will achieve a lot during the coming years.

Finally I hope that the number of member countries also has increased at the end of the period.

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