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Manfred Eickhorst studied applied physics in Hamburg / Germany and got his M Sc Physics 1969. He founded SYSTEM EICKHORST after this and received various patents for photometric colour determination of diamonds. More patents were granted for microscopy, spectroscopy and lighting. This led to the design and worldwide marketing of an innovative manufacturing range of optical instruments and lighting technology.

His publications on lighting for gems, jewellery and gemmology are covering substantial new insights for the gem community. At international conferences of GIA, ICA and gemmological or lighting associations his contributions for the professionals are respected since 40 years.

The challenge of new technologies led to more designs of light and optics. This generated another application field in the domain of Low Vision for impaired vision people. Today Manfred Eickhorst's sophisticated luminaires are a daily aid for the enhanced vision of those who are handicapped.

愛科思先生專研應用物理，於1969年德國漢堡取得他的物理學碩士。他創立了愛科思系統公司 SYSTEM EICKHORST，後來更獲得測定鑽石的色彩光度計的多項專利。在顯微鏡、光譜儀和照明等其他方面也取得多個專利。致此不斷的創新，他設計製造了一系列的光學儀器和照明技術並行銷全球。

除此之外，他有關寶石、珠寶和寶石學領域的照明的著作，對於寶石行業有著重要的嶄新見解。在 GIA、ICA、寶石學方面和照明行業的協會所舉辦的國際會議上，四十年來，他專業的貢獻備受業界人士所推崇。

新科技的挑戰也引領出更多的照明和光學設計。這也衍生出一個可以改善因視力受損而導致視力低下的應用領域。現今，曼弗雷德·愛科思先生所設計的精密燈具，已經成為視障人士每日改善視力水平不可或缺的工具。

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Putting LEDs to work for Gemmology

Manfred Eickhorst, M Sc Physics

在將發光二極體LED照明技術應用於寶石學

曼弗雷德·愛科思，應用物理學碩士

Abstract:

LED – the future illumination for gemmology - is a very special story of faith, hope and performance. I have been eye witness of this development and also engaged myself as designer filing patents for various illuminators and gemmological instruments. In 1970's, the fibre optic cold light illumination workhorse entered gemmology and replaced the hot incandescent bulbs. Now, LEDs are more powerful, more affordable, longer life-time, but less faulty, and have taken place of the fibre optic light, being widely employed in the gemmological illumination. LEDs further resolve the problems of heat and bad focussing of the traditional illumination. The patent applied by the author adopted punctual monochromatic LEDs light of 589nm for illumination inside the refractometer with low power requirement. The low luminous flux of LEDs leads to the application in microscope and replaces the traditional dark field quartz halogen lamps. It is remarkable that the low power LED is now extremely powerful enough to replace the fibre optic cold light sources. Finally, the diamond colour grading is a further new application for LEDs in gemmology. The problem of colour over grading of fluorescent diamonds gets a new sight as the daylight spectrum of LEDs does not contain long wave UV. But, this also brings us some fascinating discussions on the traditional gemmology, to some extent.

摘要：

發光二極體 未來寶石學照明的趨勢。這當中充滿著信念、希望和表現。作者見證著這些發展，並且致力於開發各種照明和寶石學專用設備儀器的設計和專利申請。1970 年代，光纖冷光源取代了古老的白熾燈泡，而如今，LED 光源能量強、價格便宜、維護便利、壽命長，強大的 LED 光源正取代光纖燈，並廣泛應用於各種寶石學儀器的照明：解決了傳統分光鏡照明中的發熱和聚焦差的問題，作者的專利 LED 光源為折射儀提供了精準的 589nm 單色光源並由於低能耗而得到全球應用，高能量、低熱量的 LED 點光源已經應用於顯微鏡並成功取代石英鹵燈解決了暗場照明技術問題，低能耗的 LED 光源已經逐漸取代冷光纖燈光源，不含長波紫外線的 LED 日光光源成功解決了鑽石顏色分級中熒光的干擾問題，但卻也在某種程度上改變了傳統的寶石學並帶來一些有趣的討論。

