



# KULSEN & HENNIG

Nature's Brilliant Colours

Newsletter No. 15

06/2013

Page 1

## Gemmology Corner

### The Brilliant Cut – Part 3: The “Ideal” Brilliant Cut

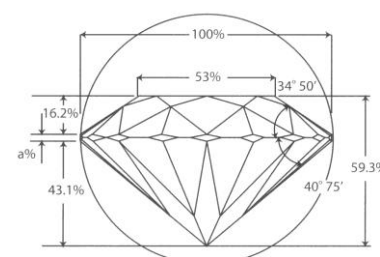
#### 1919 – *Tolkowsky-Brilliant* (Standard American Ideal Cut)

Crown Height	16.20 %	Pavilion Depth	43.10 %
Crown Angle	34.50°	Pavilion Angle	40.75°
Table Diameter	53.00 %	Crown : Pavilion	1:2.66

The diamond cutter, gemmologist and mathematician Marcel Tolkowsky (1899-1991) is known as the father of the modern brilliant cut. Published in London in 1919, his thesis, “*Diamond Design, A Study of the Reflection and Refraction of Light in a Diamond*”, tried to establish an optimal diamond cut by using mathematical calculations. He included all the relevant information for obtaining the best possible dispersion (the diamond’s fire) and the highest degree of brilliance.

Tolkowsky calculated the ideal proportions for optimal brilliance, based on the diameter of a diamond being 100%

In the United States, the *Tolkowsky Brilliant Cut* (Standard American Ideal Cut) forms the basis for cut graduation. Its brilliance meets the highest requirements.

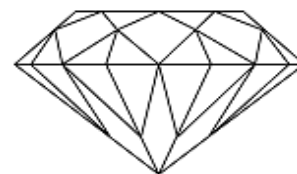


*Tolkowsky-Brilliant*, © M. Dundek

#### 1926 – *Ideal-Brilliant*

Crown Height	19.20 %	Pavilion Depth	40.00 %
Crown Angle	41.10°	Pavilion Angle	38.70°
Table Diameter	56.10 %	Crown : Pavilion	1:2.07

In 1926, Johnson and Rösch calculated the so-called *Ideal Brilliant*. To do this, they took into consideration the light entering the stone vertically, but failed to consider light entering slantwise. This type of cut produces only slightly satisfying brilliance.



*Ideal-Brilliant*

#### 1939 – *Practical Fine Cut* (European Cut, Eppler Fine Cut)

Crown Height	14.40 %	Pavilion Depth	43.20 %
Crown Angle	33.10°	Pavilion Angle	40.50°
Table Diameter	56.00 %	Crown : Pavilion	1:3.00

Born in 1902, Dr Wilhelm Friedrich Eppler was the son of the German mineralogist Dr Alfred Eppler. Like his father, he studied mineralogy at the Universities of Bonn and Hamburg. In Germany, the Practical Fine Cut developed by Eppler in 1939 is considered as the standard cut to assess symmetry and proportions.



# KULSEN & HENNIG

## Nature's Brilliant Colours

Newsletter No. 15

06/2013

Page 2

Eppler examined well-cut diamonds with excellent brilliance and fire. The resulting dimensions, originating from practice (hence the term "practical fine cut"), also took into account the light entering the stone slantwise.

These dimensions differ significantly from those of the "ideal" brilliant but only slightly from those of Tolkowsky's brilliant.

### 1951 – Parker-Brilliant

Crown Height	10.50 %	Pavilion Depth	43.40 %
Crown Angle	25.50°	Pavilion Angle	40.90°
Table Diameter	55.90 %	Crown : Pavilion	1:4.13

Although the cut calculated by Parker exhibits good light yield, it is of little importance in terms of brilliance because the crown is too shallow.

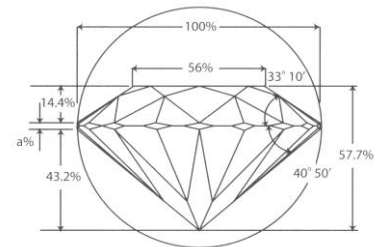
### 1969 – Scandinavian Standard Brilliant

Crown Height	14.60 %	Pavilion Depth	43.10 %
Crown Angle	34.30°	Pavilion Angle	40.45°
Table Diameter	57.50 %	Crown : Pavilion	1:2.95

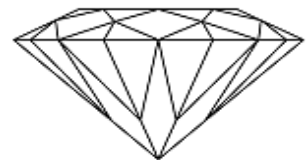
Herbert Tillander was born in St Petersburg where his grandfather was a purveyor of jewels to the Russian court. After the Russian Revolution, the family returned to Finland and Tillander worked throughout Europe for many exclusive jewelers.

He later studied gemmology in the United States and London. For his work, the British Gemmological Association awarded him its highest honour, the Tully Medal. Tillander eventually took over the family business and became court jeweller to the Swedish royal family.

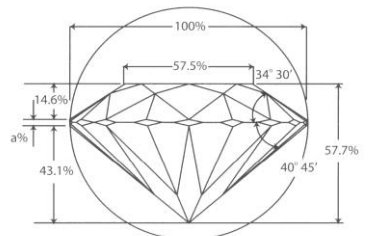
Tillander is mainly known for his significant contributions to the development of the Scandinavian Diamond Nomenclature (Scan D.N., 1969), an internationally recognized grading system. Just like Eppler, Tillander calculated the "ideal" proportions based on a large number of diamonds available on the market. The Scandinavian Standard Brilliant constitutes the basis for diamond grading in Scandinavia.



Practical Fine Cut, © M. Dundek



Parker-Brilliant



Scandinavian Standard Brilliant  
© M. Dundek



# KULSEN & HENNIG

Nature's Brilliant Colours

Newsletter No. 15

06/2013

Page 3

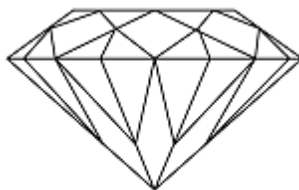
## 1972 – Eulitz-Brilliant

Crown Height	14.45 %	Pavilion Depth	43.15 %
Crown Angle	33.36°	Pavilion Angle	40.48°
Table Diameter	56.60 %	Crown : Pavilion	1:2.95

In his book, "*Mathematically Determining the Optimum Brilliance of Brilliants*", Werner R. Eulitz showed mathematically that by using the proportions he had calculated, a maximum of light yield (resulting from total internal reflection) and an optimal colour dispersion could be attained. These calculated values are very close to those determined empirically by Eppler.

The following illustrations clearly show the variations in the proportions of each model and the differing cultural perceptions of what is "ideal".

*Tolkowsky Brilliant*

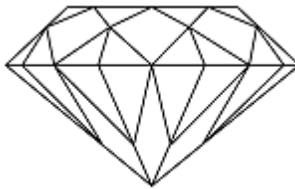


Crown Height	16.20 %
Pavilion Depth	43.10 %

Crown Angle	34.50°
Pavilion Angle	40.75°

Table Diameter	53.00 %
Crown : Pavilion	1:2.66

*Ideal-Brilliant*

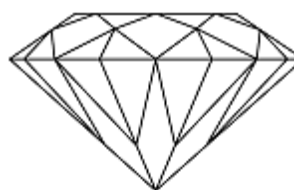


Crown Height	19.20 %
Pavilion Depth	40.00 %

Crown Angle	41.10°
Pavilion Angle	38.70°

Table Diameter	56.10 %
Crown : Pavilion	1:2.07

*Practical Fine Cut*

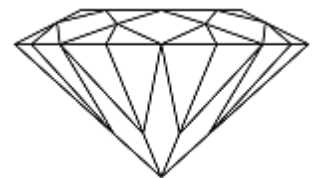


Crown Height	14.40 %
Pavilion Depth	43.20 %

Crown Angle	33.10°
Pavilion Angle	40.50°

Table Diameter	56.00 %
Crown : Pavilion	1:3.00

*Parker Brilliant*



Crown Height	10.50 %
Pavilion Depth	43.40 %

Crown Angle	25.50°
Pavilion Angle	40.90°

Table Diameter	55.90 %
Crown : Pavilion	1:4.13