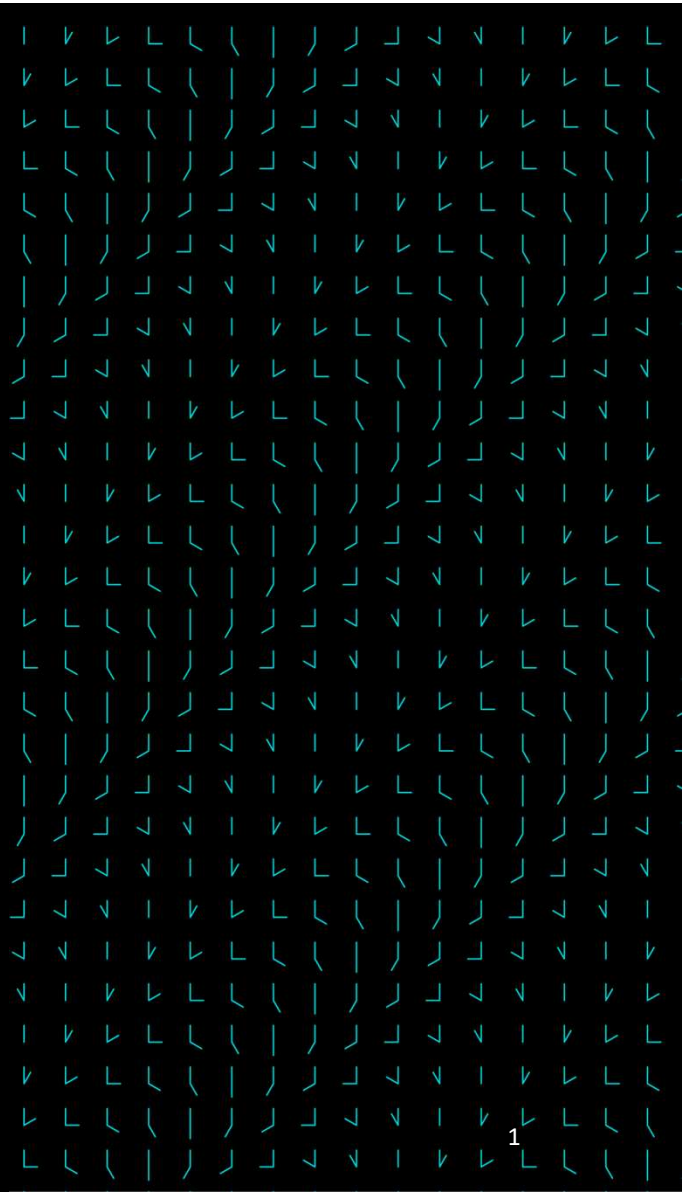
SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

A short introduction



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

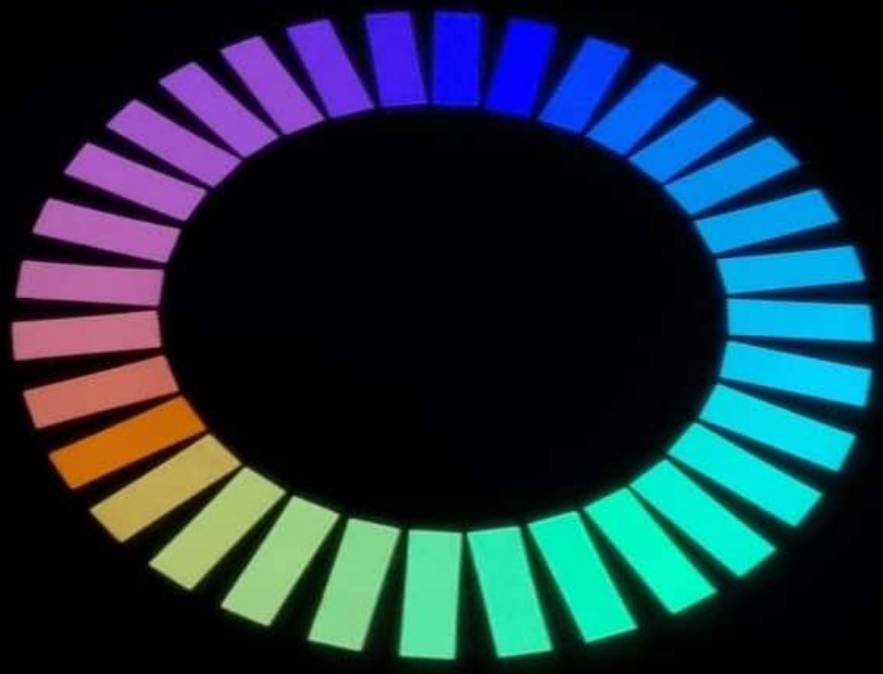
What is Swiss Super-LumiNova®?

- Aluminate, “polluted” with rare earth ions
- Very hard(Mohs hardness of 9, Diamond 10)
- Only very small amounts for the luminizing of a watch needed
- Nontoxic, non-radioactive, environmental friendly
- Eight basic emission colors of Swiss Super-LumiNova® available
  - Green (GL)
  - Blue (BL)
  - Ultramarine Blue (UL)
  - Violet (VL)
  - White (WL)
  - Yellow (YL)
  - Pink (PL)
  - Orange (OL)

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Nighttime color adjustments?

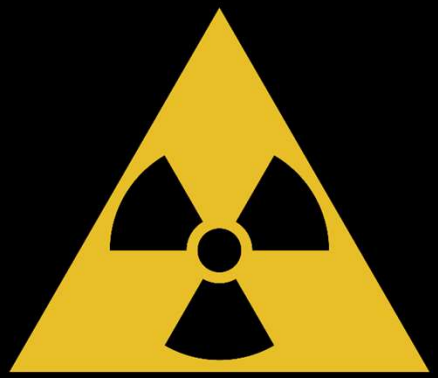
- Almost every emission color is possible to create to your needs
- Just give us a reference and we will realize it



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

A history of luminous pigments

- Originally: Ra-226
  - Radioactive!
  - Highly dangerous
  - Long half-life time
- After: Tritium
  - Radioactive!
  - Hard to measure
  - Very short half-life time (5-10 years)
- Since the nineties: Swiss Super-LumiNova®
  - Not dangerous
  - Produced fully with renewable energies
  - No half-life time, performance for eternity



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Why Swiss Super-LumiNova®?

- The best performing material on the market
- LumiNova Switzerland is able to produce the complete material in-house
- 90 years of experience in the field of luminous materials
- Internal and external research with world leading Universities and research institutes
- Triple quality control
- No minimum order quantity and shortest delivery times
- Infinite storage
- Patent protected X1 Grade

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

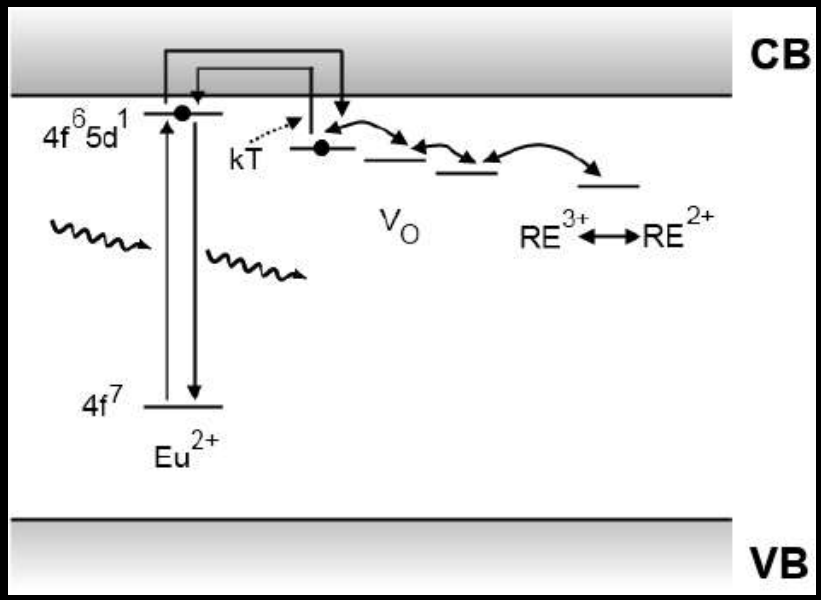
An environmental-friendly product

- All our electricity is generated with solar panels, which are installed on our factory roofs
- Heating is made with geothermal energy

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

How does Swiss Super-LumiNova® work?

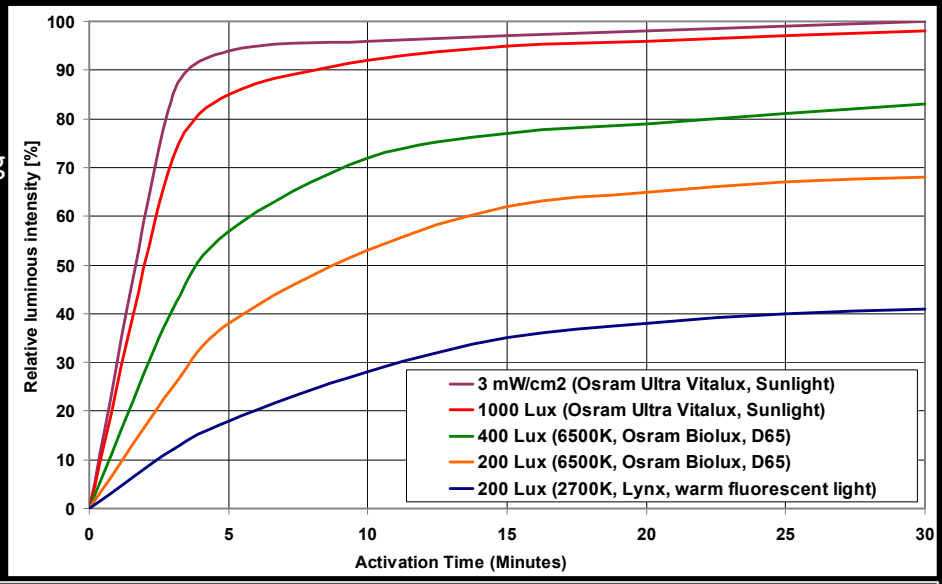
- Like a light storage battery
- Electrons are lifted through UV-light into a higher energetic state and fall back by emitting light into ground state
- Unlimited times rechargeable
- No half-life time, same performance over decades



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

How to charge Swiss Super-LumiNova® correctly?

- The stronger the light source, the more efficient the charg process
- Sunlight brings best performances

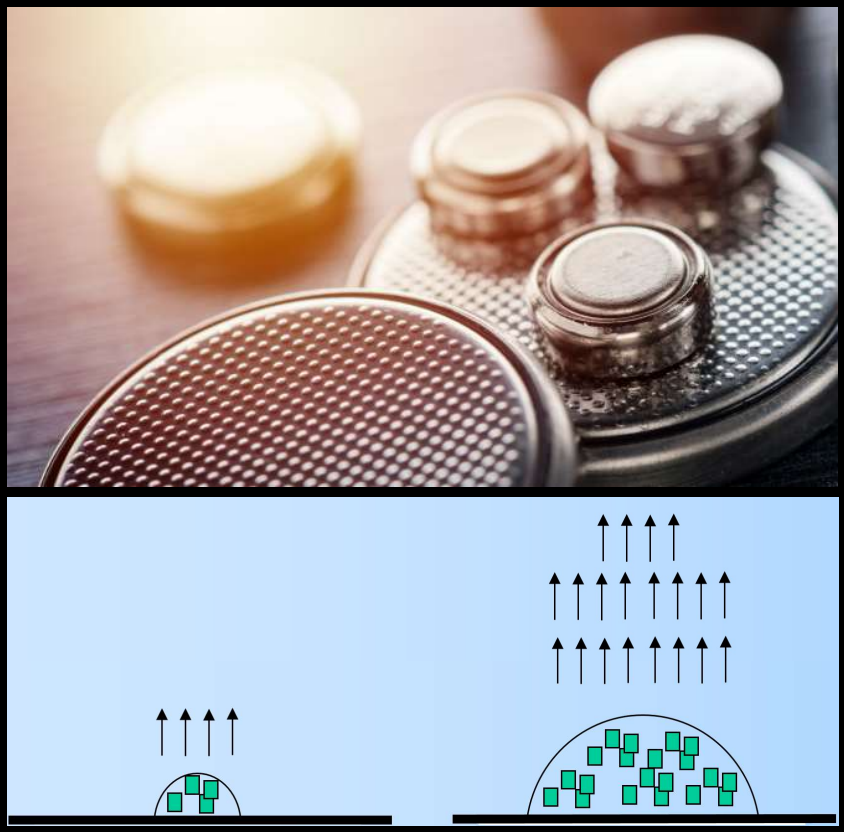


Typical illuminances						
Type	Sunlight	Daylight	Shop	Bureau	Living room	Stars
Lux	27000 - 108000	2100 - 27000	1080 - 5400	215 - 540	50 - 250	0.0001 - 0.001

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Correct construction of a luminous deposit

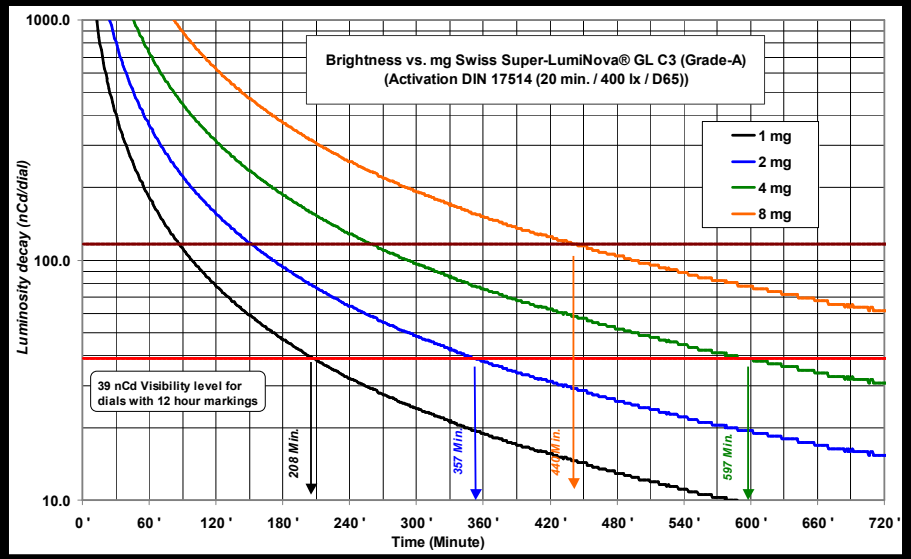
- Swiss Super-LumiNova® work like small rechargeable light batteries
- Maximize the amount of Swiss Super-LumiNova® (batteries) on a watch!
- Apply thicker layers or bigger areas with Swiss Super-LumiNova®
- High concentration of Swiss Super-LumiNova® pigments in the mixture with varnish



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

The luminous performance depends on the applied amount of Swiss Super-LumiNova®

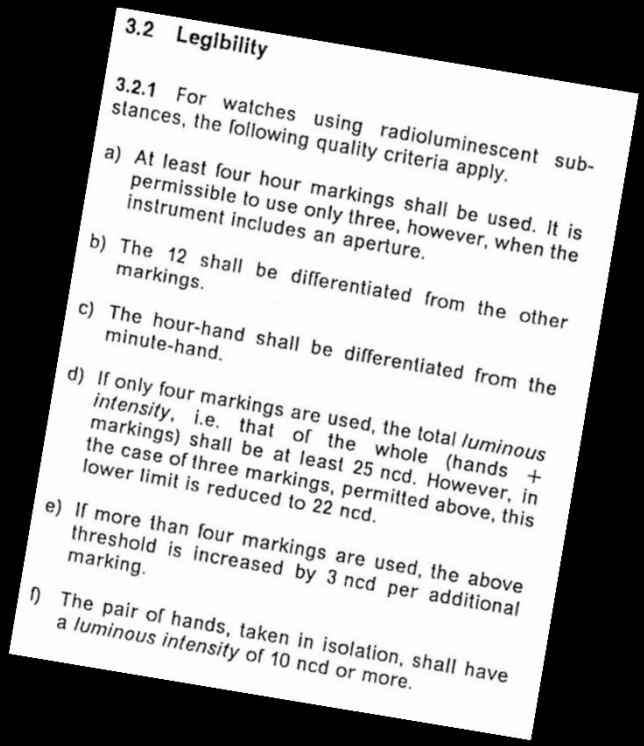
- The more Swiss Super-LumiNova® material on a watch, the better the afterglow performance
  - Layer thickness
  - Area of the applied luminous material
- ISO 17514 defines the duration of the afterglow until the visibility border (39 nCd, legibility limit)



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

ISO 17514 and the legibility

- The visibility border is defined as 39 ncd for 12 luminous indexes and a pair of hands
- How long it takes until this border is reached, depends on the applied amount of Swiss Super-LumiNova® on a watch



3.2 Legibility

3.2.1 For watches using radioluminescent substances, the following quality criteria apply.

a) At least four hour markings shall be used. It is permissible to use only three, however, when the instrument includes an aperture.

b) The 12 shall be differentiated from the other markings.

c) The hour-hand shall be differentiated from the minute-hand.

d) If only four markings are used, the total *luminous intensity*, i.e. that of the whole (hands + markings) shall be at least 25 ncd. However, in the case of three markings, permitted above, this lower limit is reduced to 22 ncd.

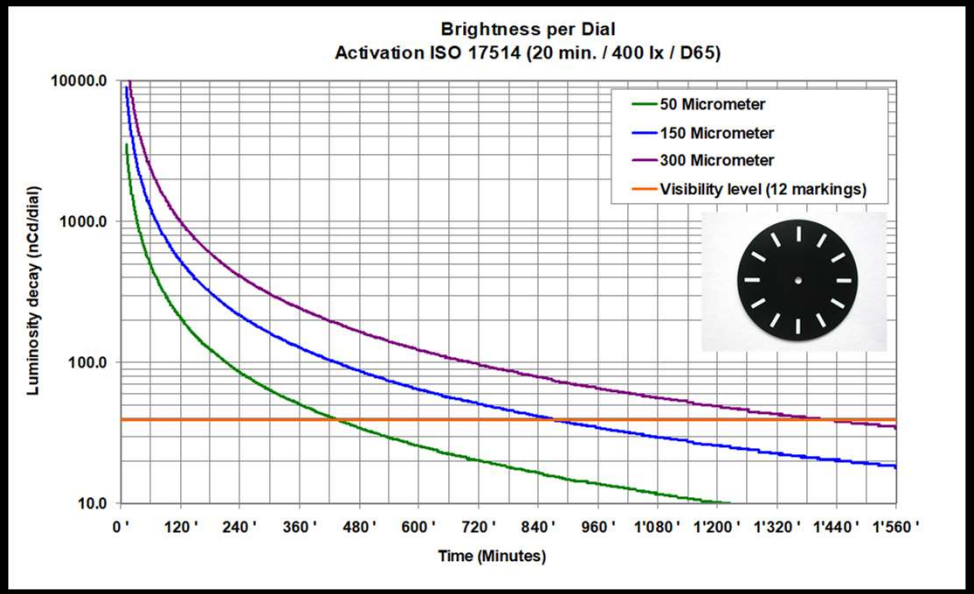
e) If more than four markings are used, the above threshold is increased by 3 ncd per additional marking.

f) The pair of hands, taken in isolation, shall have a *luminous intensity* of 10 ncd or more.

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Layer thickness vs. luminous performance

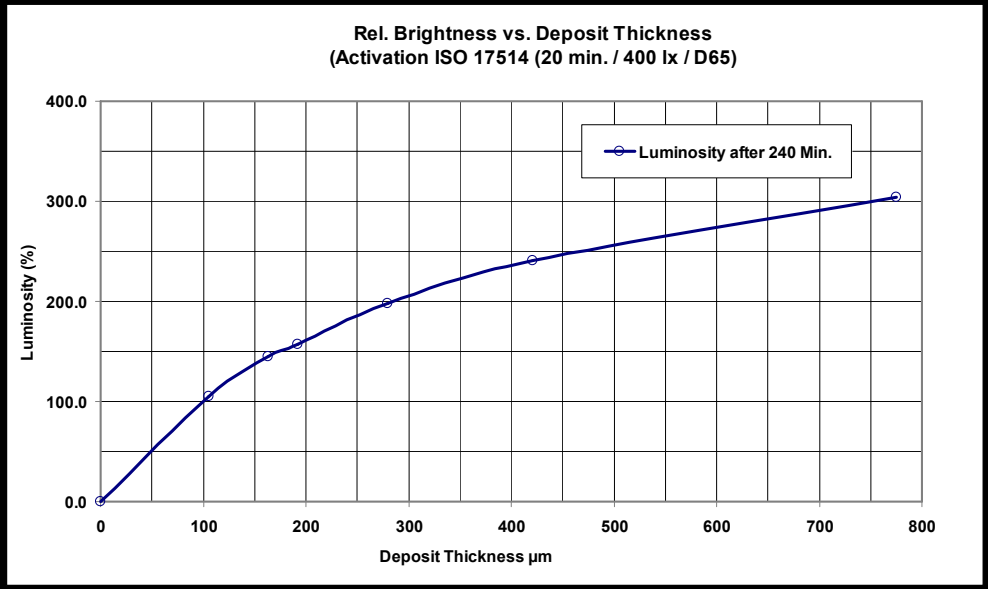
- The thicker the layer, the longer the afterglow duration/legibility
- Engravings in the dial/index allow to place more Swiss Super-LumiNova® too



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Influence of the Swiss Super-LumiNova® layer thickness

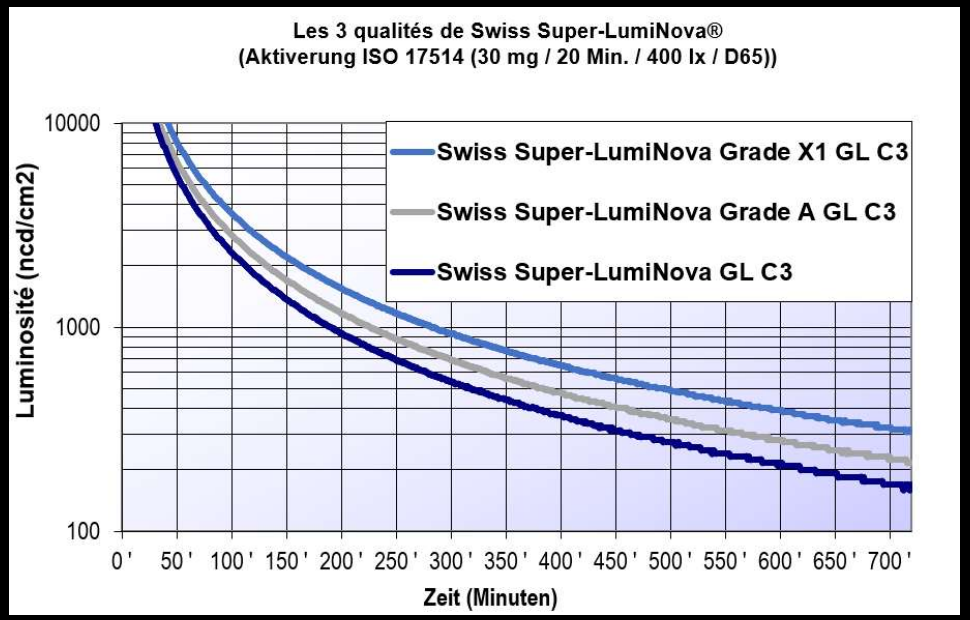
- Nearly linear increase of the afterglow brightness by enlarging the layer thickness



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

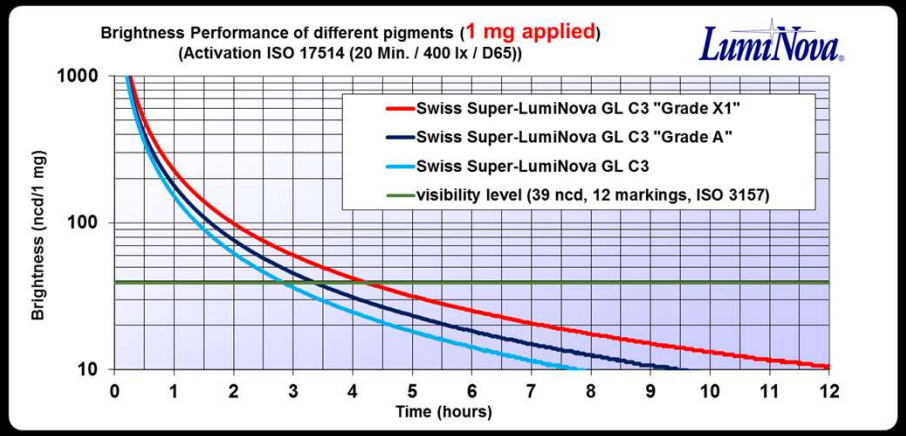
The different qualities

- 3 qualities available
  - Standard Grade
  - Grade A
  - Grade X1
- The higher the quality of the applied Swiss Super-LumiNova®, the brighter and longer the afterglow

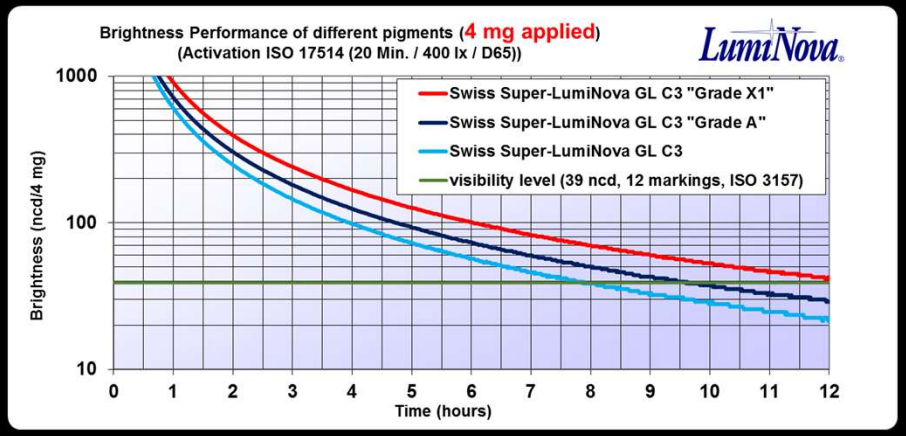


SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Costs



	SLN GL C3	SLN GL C3 "A"	SLN GL C3 "X1"
Duration (ISO17514) [hours]	2.8	3.3	4.2
Price [Rappen]	1.75	2.2	2.9

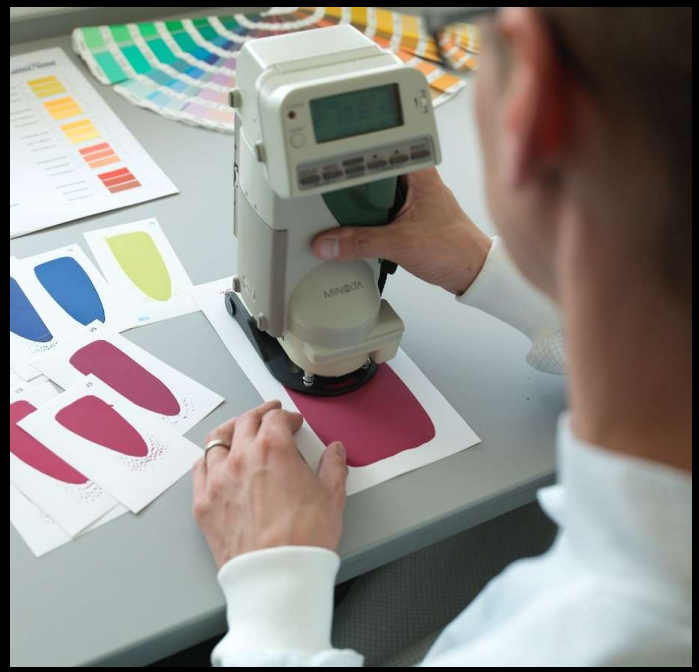


	SLN GL C3	SLN GL C3 "A"	SLN GL C3 "X1"
Duration (ISO17514) [hours]	7.8	9.6	12.5
Price [Rappen]	7.0	8.8	11.6

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Colors

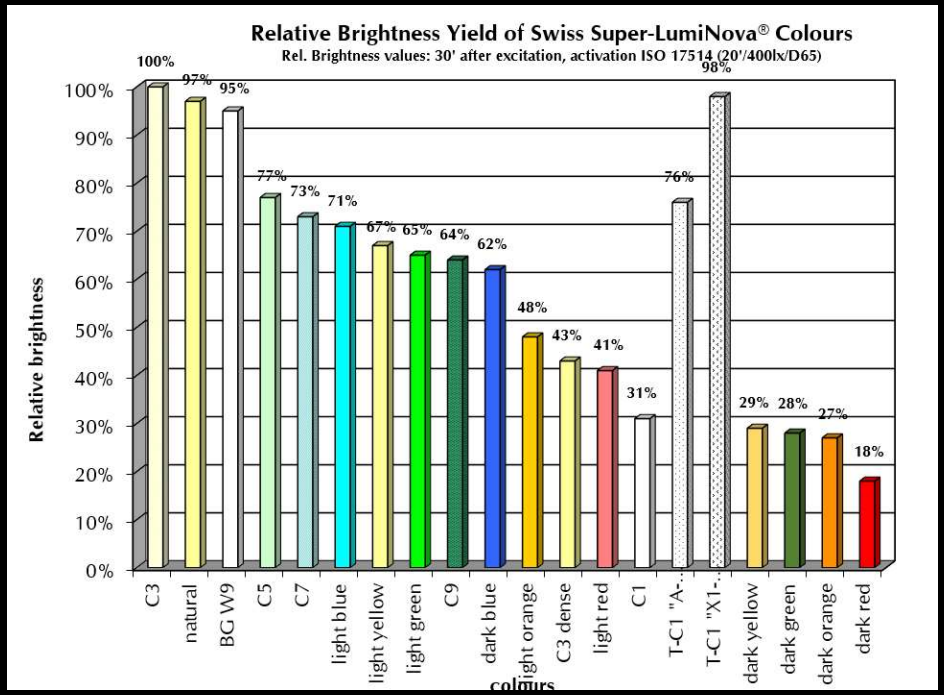
- Nearly all daylight colors possible
- Development of new colors within a few days



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Colored Swiss Super-LumiNova®

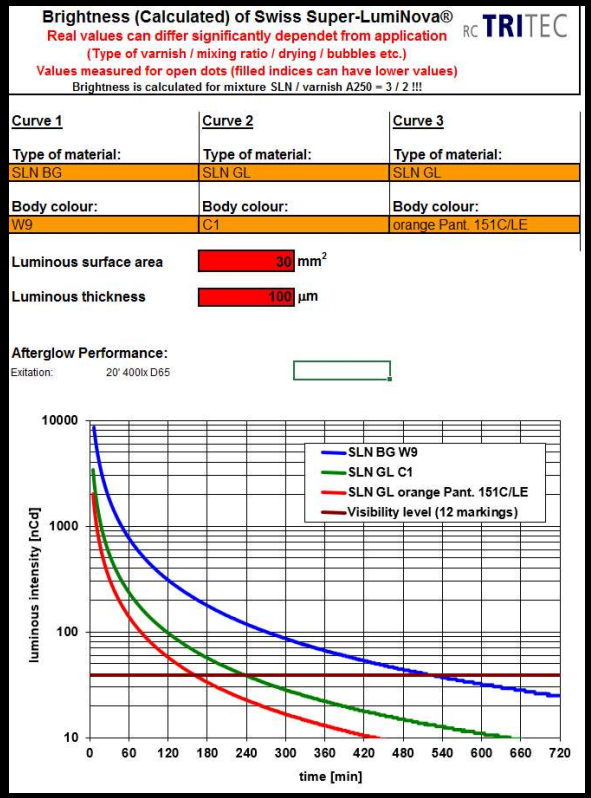
- Intense colorization of the luminous pigments reduces the afterglow performance
- Activation-light of the colorants is absorbed and causes this reduction



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Calculation of the luminous performance

- Afterglow-performance calculator for the duration until the visibility border
- We can send it to you



SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Lumicast

- A very effective method of improving the luminous performance
- More volume
- A design element
- Almost all shapes are possible
- Highly reproducible
- A collaboration of RC Tritec, Les Cadraniers de Genève and your dial or hand supplier

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

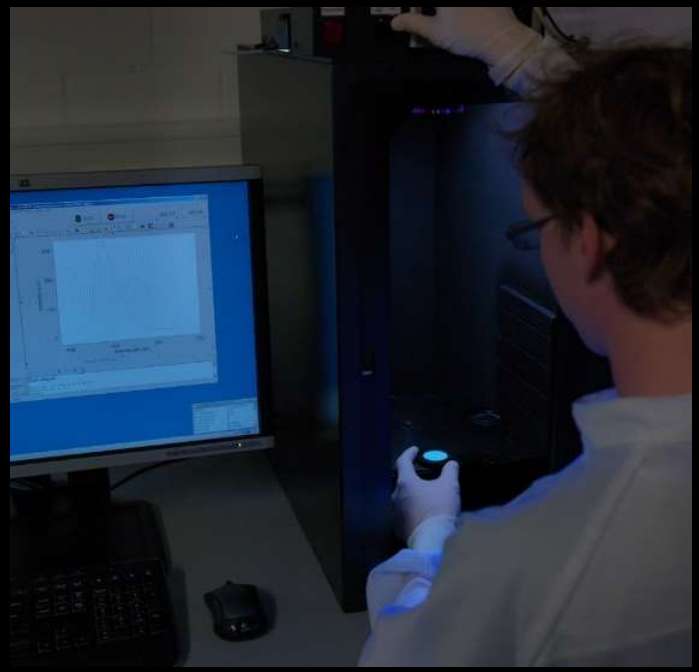
Additional Products

- Specialized binders
- Application tooling for Swiss Super-LumiNova® pigments

SWISS
SUPERLUMINOVA
World Leading Luminous Pigments

Additional Services

- Measurement service according to ISO 17514
  - Brightness measurements
  - Environmental stability tests
- We can check if fake-Swiss Super-LumiNova® has been used
- Quality control of already luminized hands and dials
- Individual solutions for your problems




SWISS
SUPERLUMINOVA
World Leading Luminous Pigments
Exclusive agent in Asia:
JC Universal Group Limited
Tel. +852 2664 9999
Email: sales@jcucl.com
JC Swiss Technology (Shenzhen) Company Limited
Tel. +86 0755 8886 4449
Email: jccn@jcucl.com
Speicherstrasse 60a
CH-9053 Teufen
Switzerland
sales@rctritec.com
Tel. +41 71 335 73 73
Fax +41 71 335 73 74