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Bright marking solutions

Research – Production – Analysis

www.luminochem.com

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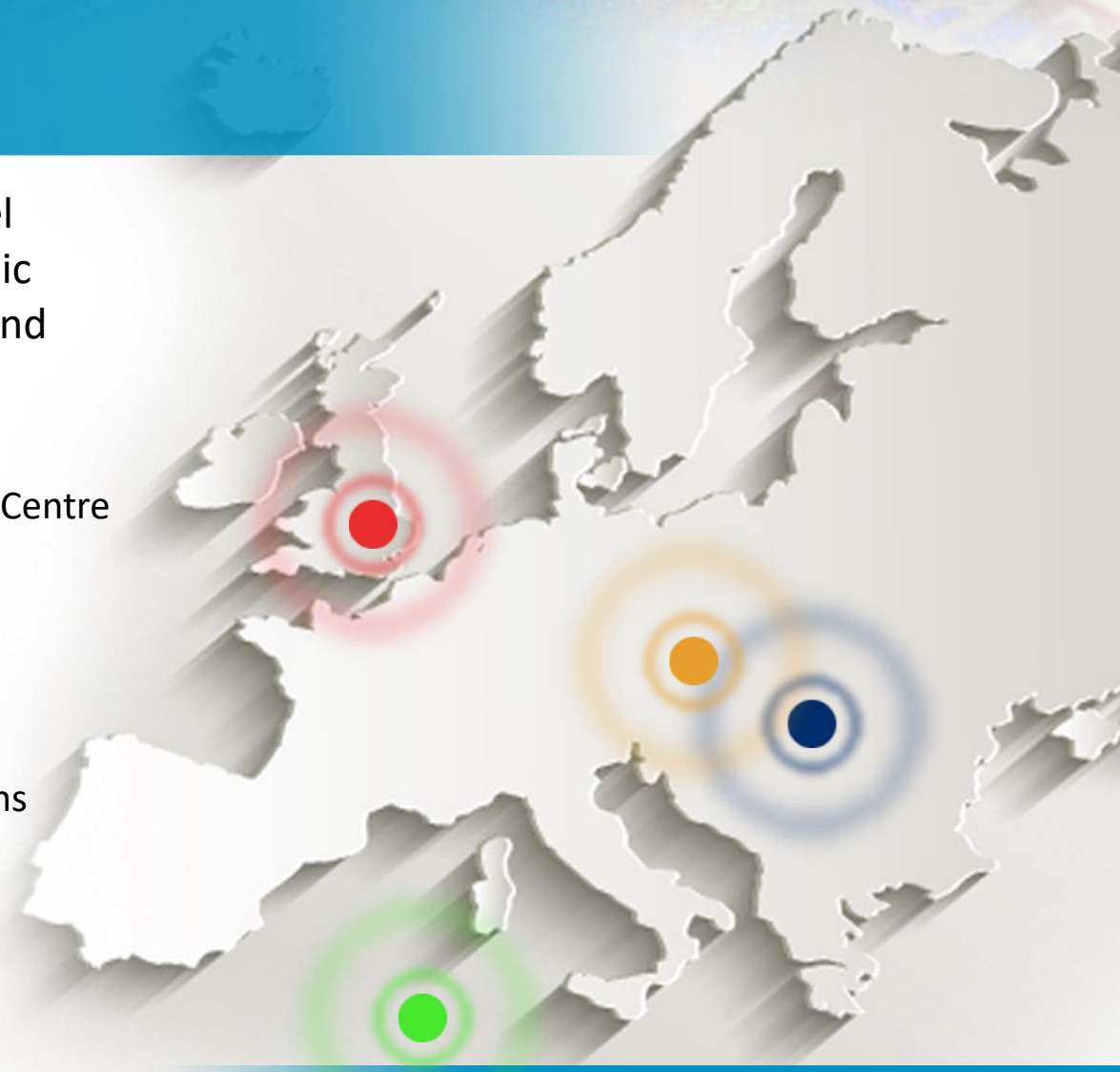
LuminoChem introduction

Our company is specialized in developing and manufacturing novel luminescent photoactive materials and markers, focused on organic fluorescent security pigments and dyes, NIR absorbing materials and pigments for banknotes and high security printing.



- Head office: Hungary, Budapest, Berlini Research and Development Centre
- Development and production of unique nowhere other available photoactive materials for security printing industry
- LuminoChem has research chemical laboratories and pilot plants for synthesis and formulation of pigments with capacity up to 20 tons
- LuminoChem has a strict QA and QC system in order to provide our products always in the same high quality

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LuminoChem introduction

LuminoChem produces security pigments including banknote printing for our main customers in the following countries :

- Hungary (Forint)
- USA (USD)
- Russia (Ruble)
- EU (Euro)
- Thailand (Thai Baht)
- Japan
- Columbia
- Brasil
- Australia

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LuminoChem product range

Development and production of unique photoactive materials

- UV-A, UV-B and UV-C fluorescent pigments
- UV-A, UV-B and UV-C water soluble fluorescent materials
- NIR (Near Infrared) absorbers
- Photo luminescent pigments
- Up-converting materials
- Water based Nano suspensions with fluorescent organic pigments

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Capacity in laboratories

- LuminoChem has several chemical research laboratories for research and development of new products and production of quantities up to 5 kg scale

- LuminoChem has chemical pilot plants for production of several hundred kg in one batch

- We have a unique formulation pilot plant with special grinding mills in order to reach the finest particle size of our pigments

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Unique own developed fluorescent pigments

LuminoChem's luminescent products have an easy to implement fluorescent effect with various colours from ice blue to deep red. We are able to provide delayed and fast fluorescent response security fluorescent pigments.

- Intensive fluorescent colour
- Good light stability
- Good heat stability up to 200-220 °C (TG)
- Very fine particle size (d90 < 1-2 micron)
- Ideal for offset and flexo printing applications
- Broad variation from blue to red
- Fast fluorescent response

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Quality Control Analysis and validation of products and new batches

LuminoChem provides a Full Analytical Service for measuring the particle size distribution of any provided powder or dispersion. Measurement of particle size distributions is routinely carried out with our Horiba LA-950.

Our laboratory is equipped with:

- Perkin Elmer Spectrofluorimeter
- MeterTech Spectrofotometer
- Horiba PSD analyzer
- GC, HPLC by Waters
- Sartorius moisture analyzer – Loss on drying
- Xenon Lamp Chamber for measuring light fastness

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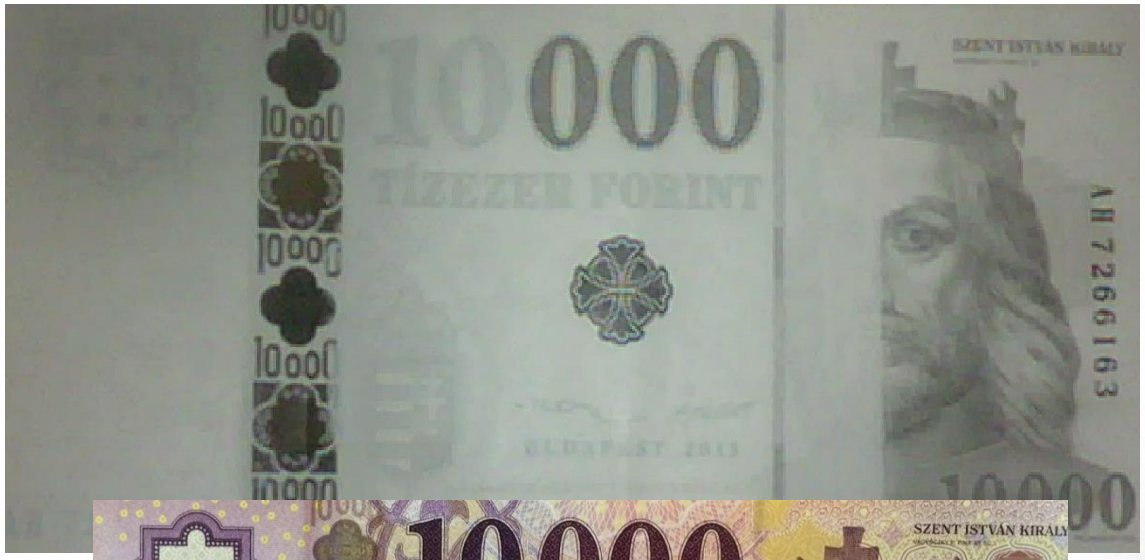
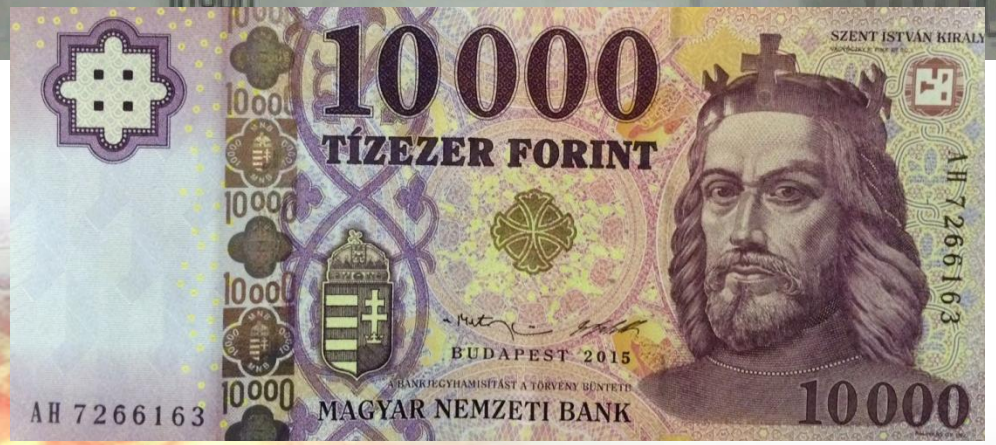
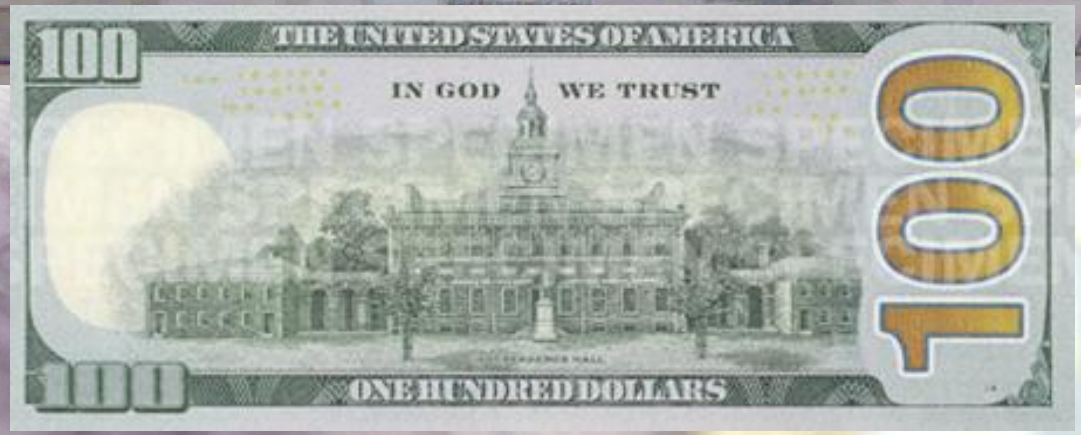
NIR absorbing Pigments in the Hungarian Forint and in the USD under IR light







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Luminescent pigments with special effects

Temperature Dependent Fluorescent Pigment

In normal daylight conditions, LUTE2 powder is virtually invisible on paper. On exposure to UV-A light at room temperature no Fluorescent effect or colour changing can be observed, however at -50°C bright red (optimal effect achieved at approx. 365 nm), fluorescence intensity becomes visible (emission at approx. 618 nm). The red UV-A (365 nm) fluorescence disappears reversibly after the pigment warms up to room temperature within a couple of seconds.

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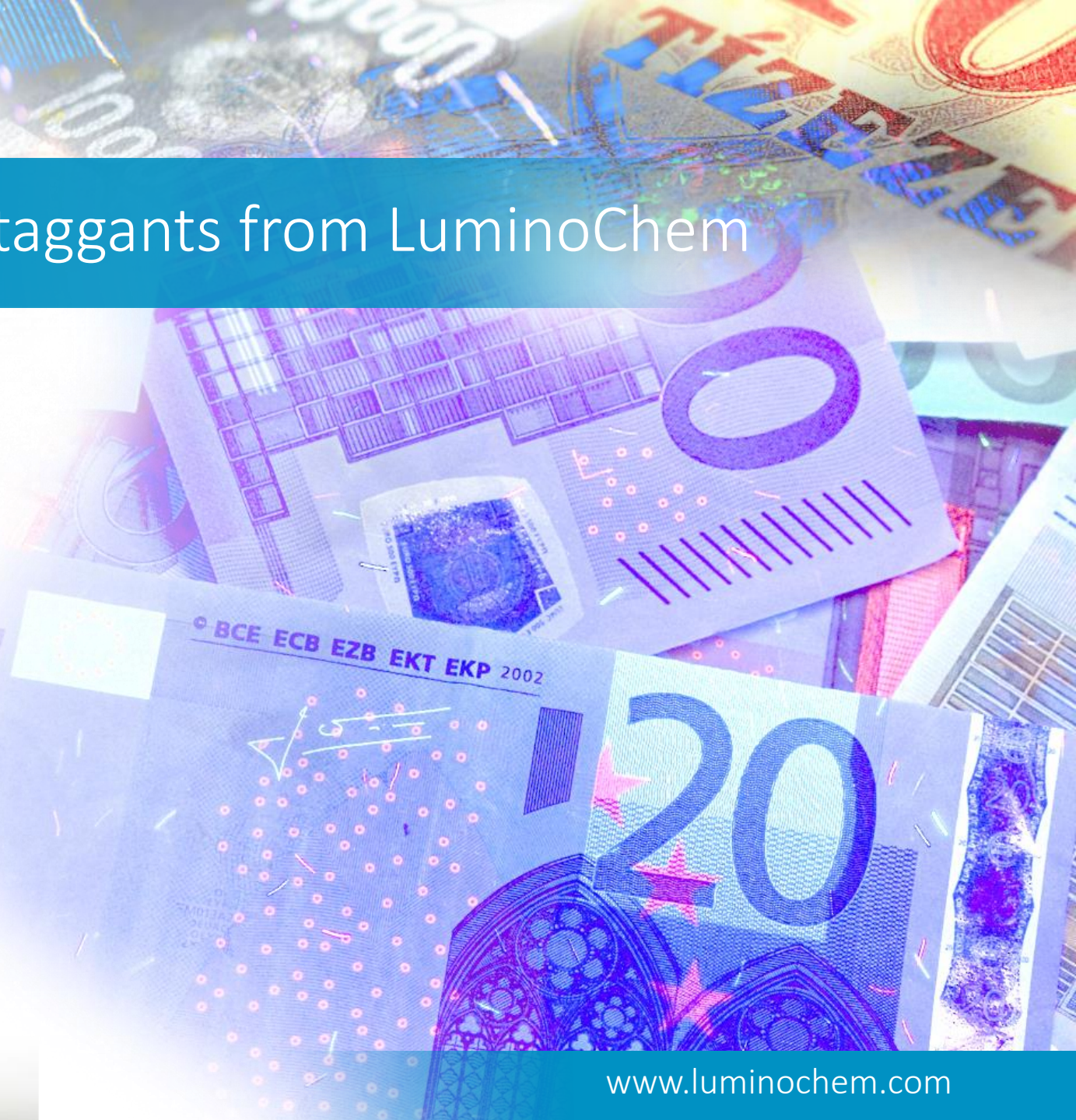
Advantages of the introduced taggants from LuminoChem

- Excellent dispersibality
- Easily redaable by simple quality control device
- Safe and do not have healt hazards
- Resitant againts reverse engineering
- The unique fluorescent colors and three fluorescent taggants are uniqe.
- Available exclusivley



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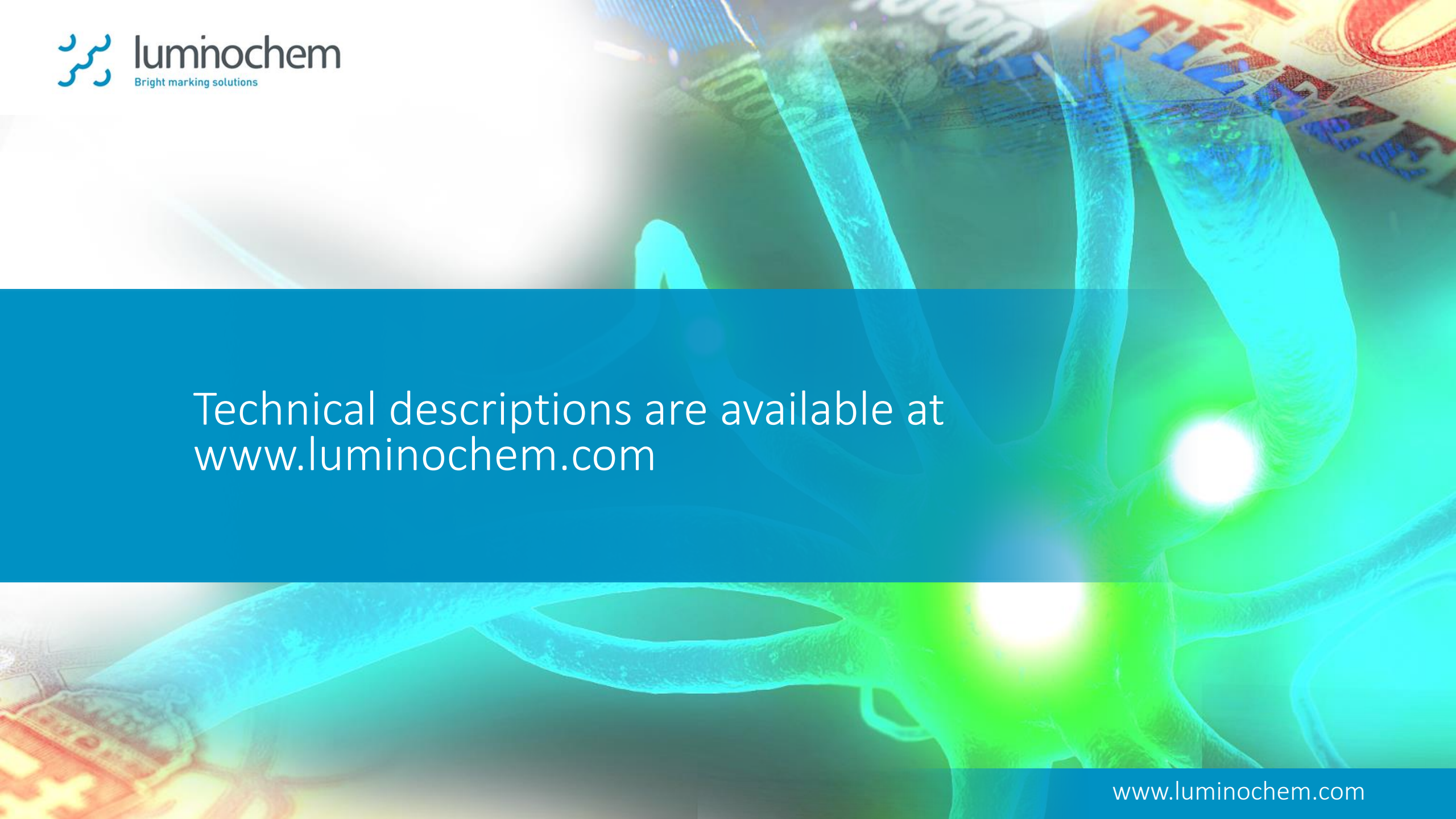

Technical descriptions are available at www.luminochem.com