

## The Energy Crisis – The case for a wider use of Photoluminescent Safety Wayguidance Systems.

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What happens when the lights go out? These days everyone with a mobile phone switches on the torch app. and then the search begins for the old stock of candles and matches. But if you don't have a mobile phone or torch to hand – and I am thinking particularly of the older generation and the most deprived members of the population, what is the effect? Panic, disorientation, severe stress, alarm and a high risk of accident or injury.

The energy crisis means that there is a strong possibility of power shortages and blackouts in the next year at least. It therefore makes sense for everyone to think about how they can manage without power. Of course, you can invest in battery back-up systems but unless you are in the fortunate position to have your own solar or wind farm most people just have to manage somehow.

In public buildings or multiple occupancy buildings there should be adequate escape route marking in all public areas as is specified by National and local regulations. Usually, these systems involve emergency electrical lighting with battery back-up systems. However, we have seen in numerous examples including the Twin Towers (9/11), and more recently Grenfell Tower, that such systems, even if installed correctly, do not necessarily function properly in an emergency. What is always true is that electrical systems require power and if the power source is interrupted or if not properly maintained, it does not function.



Stairwell with Photoluminescent system in natural light

Stairwell with Photoluminescent system in the dark

Photoluminescent (PL) systems are based on special pigments which absorb UV light, store it and re-emit the energy in the form of visible light over a period of several hours. Critically, these systems – provided they are first charged with UV light, cannot fail. There are many examples of cases where their existence has meant that people have managed to safely evacuate public buildings and transport only because such systems were installed – often supplementary to electrical systems, just because in an emergency they work! The most famous example of course was 9/11 when several people only managed to evacuate down the stairwells because of the photoluminescent paint markings which guided them to safety (all electrical systems had ceased to operate).

If you travel on a ferry, cruise ship, plane, train or transit many road tunnels you will find photoluminescent escape route systems installed. The unfortunate fact is that in most cases these systems were only installed subsequently as a result of a disaster. You may remember the ‘Herald of Free Enterprise’ ferry accident, the Piper Alpha Oil platform explosion, the Scandinavian Star cruise ship disaster, Swiss Tunnel fires, World Trade Centre New York bombing, 9/11 etc. etc. There is a long list of such accidents which have led to Photoluminescent systems being introduced into safety regulations and successfully installed.

In 1945 when the Americans dropped the atomic bombs on Hiroshima and Nagasaki the whole area was devastated. However, people had to be able to move around despite the chaos that ensued. The founder of Nemoto & Co. Japan, Kenzo Nemoto first started business making photoluminescent paints to help people find their way in the wake of the devastation. Today as the worlds’ leading manufacturer of PL pigments, the main applications remain for emergency evacuation. You might consider that in other war zones – one thinks today of Ukraine, there could be a case for similar applications now unfortunately.

Away from war zones, but as a direct result, on a practical level (if energy is likely to become rationed in future due to escalating costs), it surely must make sense for us to consider simple applications in the home for Photoluminescent material in case of blackouts, not just for emergency evacuation? Applications could include :-

- Marking torches/mobile phones
- Marking doorways/stair treads
- Marking door handles/keyholes/keys
- Marking Spectacles/hearing aids
- Marking Nebulisers/pill dispensers
- Marking on safety jackets (in addition to reflective)
- Marking any hazards (e.g. obstacles, trip hazards)

When you experience a serious blackout first hand it makes you realise how difficult it is to navigate in the dark, especially if there is also smoke present due to a fire incident or powder atmosphere as a result of the collapse of a building (earthquake, bombing etc.).

In 2003 there was an interesting study made by Ilmenau University in Germany where Photoluminescent systems were compared with electrical evacuation systems in smoky conditions (typical of an emergency situation). The study concluded that continuous lines of low ambient light fitted at a low level (approx. 1m above floor level – typical of a Photoluminescent system), were found to be much more effective as an escape route marking system than high mounted, high brightness electrical sources. The reason being that bright lights are scattered by smoke and can cause disorientation while Photoluminescent systems below the smoke offered a continuous escape pathway.

From an environmental perspective the common LED lights and Photoluminescent systems both require special pigments and a lot of energy to produce. The big difference is that if you use a high quality Photoluminescent system, there is no end of life. As long as there is a source of UV light, Photoluminescent systems will work when there is a sudden blackout and we should be more prepared for that in the future.

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NOTES:

LumiNova® pigments were invented by Nemoto & Co, Japan in 1993. These pigments are not radioactive and are activated by UV light sources. The energy is stored and re-emitted over many hours as a visible yellow/green light – so most discernible to the human eye and appropriate for safety.

Photoluminescent systems containing LumiNova® are already widely installed in ships, cars, aircraft, tunnels and public buildings where in some cases they have totally replaced electrical systems.

G.B.C. (Speciality Chemicals) Limited is the European marketing company for Nemoto & Co., Japan and Nemoto is a shareholder in the company.

Photographs courtesy of Nemoto & Co, Japan.

References:

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[www.thepspa.com](http://www.thepspa.com)

[www.luminova.co.uk](http://www.luminova.co.uk)