

TECH Q&A

Photoluminescent Products How are they made?

Photoluminescent (PL) architectural safety products – ranging from 'glow in the dark' exit signs to emergency visibility strips and markers on steps and floors – are now a mainstream safety feature of commercial-grade buildings worldwide.

However, most architectural specifiers, builders, and facility managers are unaware that these classes of products, though often similar in appearance, can in fact be manufactured using completely different fabrication methods!

Below we examine the merits of 'dry' thermoset manufacturing techniques, which create highly durable, UV-resistant, low-waste PL products of premium quality.

Ecoglo International, a global pioneer in the development and application of dry PL manufacturing processes, has spent 20 years refining its own proprietary systems.

The cornerstone of all Ecoglo PL product manufacture, according to Ecoglo's Technical Manager Mark Watson, is High Temperature Curing, or HTC, which is a patented powder coating-style process involving temperatures above 160 degrees Celsius.

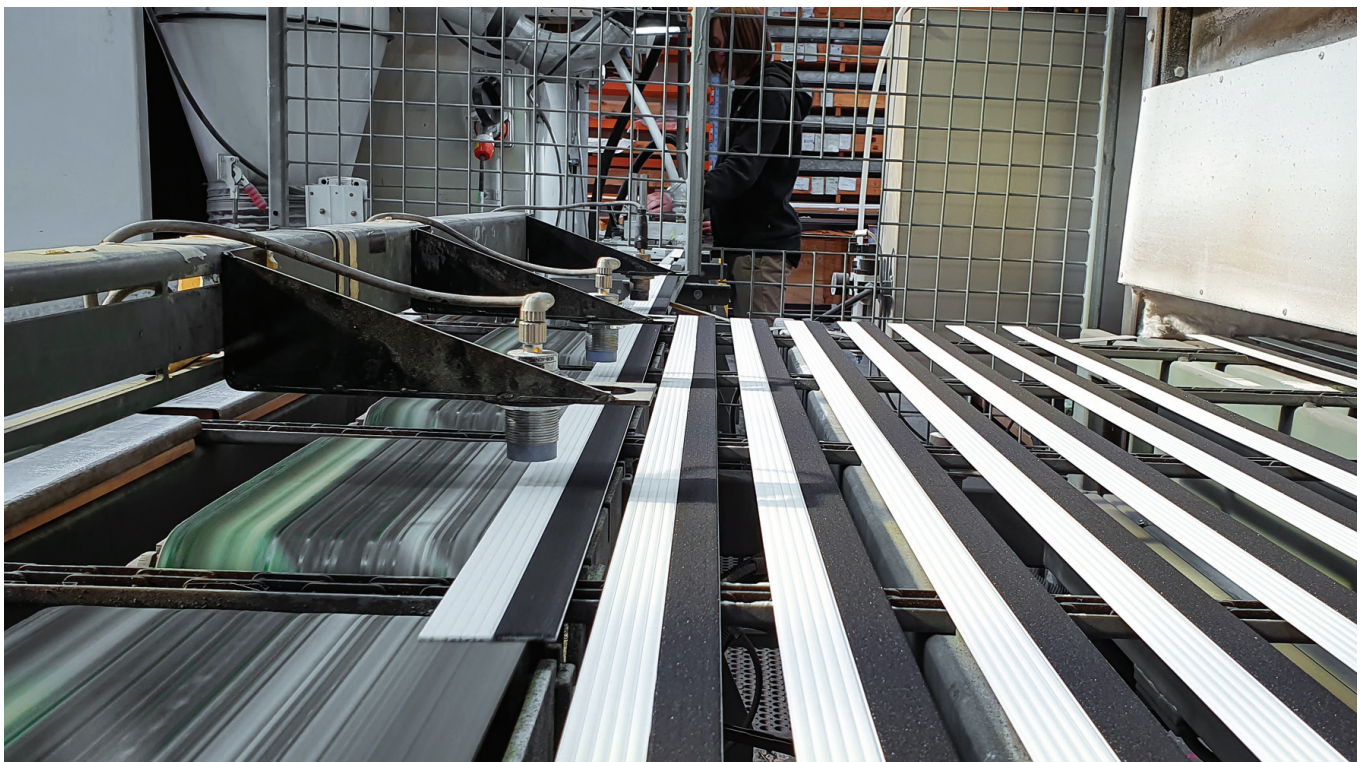
During the heating process, Watson says, a powder mix containing PL pigment and customised, granular Purpose Designed Polymer (PDP) is applied permanently (thermoset) to extruded aluminium strips to create each product.

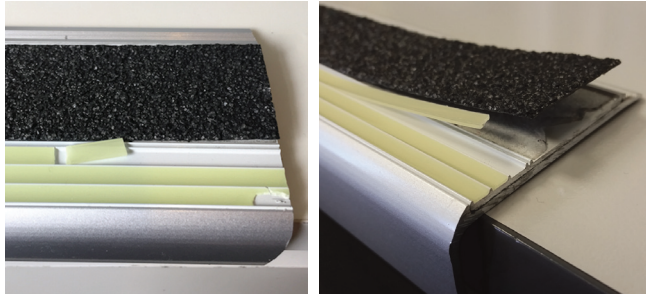
The precise ratios of ingredients used in this process, together with the actual heating processes, are trade secrets – and for good reason: Ecoglo's patented PL product ranges deliver market-leading, long-lasting performance in all environments, including harsh outdoor applications.

So, what makes the HTC manufacturing process so special?

As Watson explains, most manufacturers of PL products use a 'wet' manufacturing process, which typically involves the use of a liquid polymer (such as PVC) that hardens to a designated form.

Not only can this wet process be wasteful in terms of excess ingredients and offcut materials, but it can also induce chemical reactions that degrade the longevity and efficiency of PL pigments, cause brittleness, and lead to accelerated UV-related damage over time. There are additional potential dangers relating to warping and deformation if these products are exposed to high heat after installation.





Non-HTC products from other manufacturers

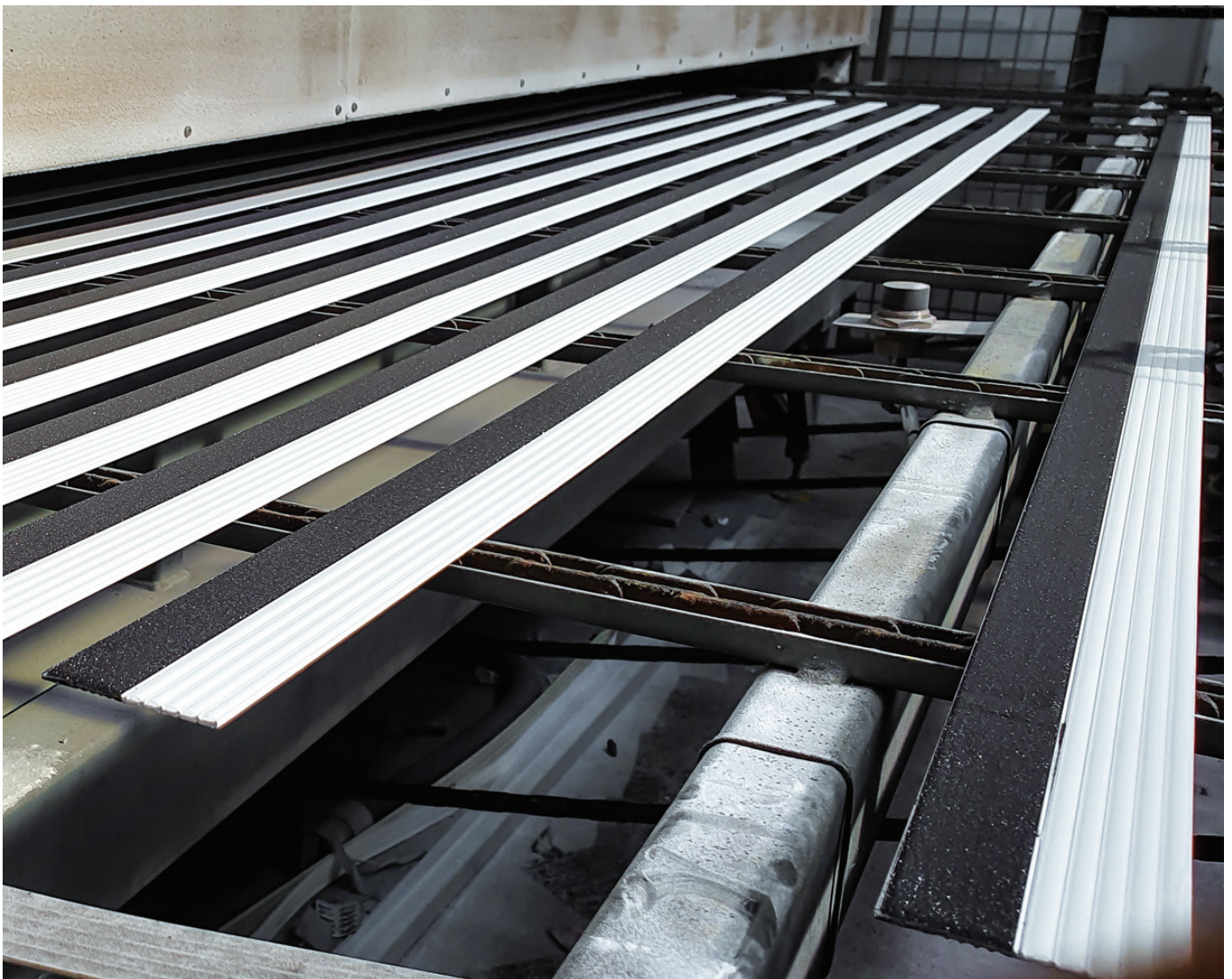
By contrast, Ecoglo's HTC system is designed to deliver a highly stable, transparent PL material that stands the test of time. When PL products have undergone HTC baking, the resultant chemical bonds between the aluminium and PDP coating are extremely strong. From a practical perspective, this strength prevents delamination from the aluminium base and eliminates the possibility of shrinkage or peeling. The integrity of PL pigments is also preserved, which means pigments will not fade, bleach, or lose their PL qualities over time.

Getting the HTC manufacturing process 'just right' has been a complex and time-consuming task for Ecoglo technicians. Everything from the grade and consistency of the granular PDP to the precise calibration of heating machinery has been refined over many years, with supply chains regularised to reinforce batch consistency throughout the full calendar year.

Long-term benefits of HTC manufacturing include:

- **Enhanced resilience:** products are designed to withstand rugged weather, salinity, humidity, heavy impacts and abrasions, regular washing, and numerous other environmental hazards.
- **Reliable charging and charge control:** the underlying stability of the chemistry of Ecoglo's PL ranges means charging and illumination characteristics are more constant and predictable over the average lifespan of the product, compared with the 'peaks and troughs' in performance often associated with products made with wet manufacturing systems.
- **Safety:** products are fire-rated for surface flammability and burning rates, and are non-toxic and non-radioactive.

In addition, in-house manufacturing in New Zealand has complemented product development in two ways: not only has local on-site manufacturing provided immediate and direct quality control, but it has also allowed Ecoglo to innovate freely without freight delays or the possibility of miscommunications with external contractors.



Environmentally Friendly

A particularly important feature of the HTC process, Watson says, is its low environmental impact.

"The beauty of a dry process is that any ingredients that aren't baked onto the aluminium can be used next time," he says.

"There are no leftover or surplus ingredients that have to be discarded after each production run. By applying a dry powder there is absolutely no liquid effluent coming from the process. The amount of waste from the process is a tiny, tiny fraction of any other methodology."

Cleaning agents used in the HTC manufacturing environment are also non-toxic.

Tested & certified

Ecoglo's Executive Chairman Trevor Dimond says all Ecoglo PL products are made in-house using the same advanced processes, and are therefore uniformly suitable in all countries, regardless of climate or environmental conditions.

"Today's building management professionals are not interested in short-term building safety solutions; they want PL products that

will perform reliably, satisfy genuine lifespan targets, and conform with budgetary expectations over the long term," Dimond says. "Our HTC manufacturing process allows us to satisfy these rigorous requirements – all in an affordable fashion."

As a means of formalising the premium performance characteristics of its products, and to provide objective peace of mind to customers, Ecoglo is working in conjunction with Allunga Exposure Laboratory, Queensland, Australia, to develop a product testing methodology, which will be incorporated into specification documents.

In addition, Dimond says, all Ecoglo PL manufacturing is carried out at its manufacturing facilities in Christchurch, New Zealand, in accordance with global ISO 9000 workplace benchmarks; custom product commissions can also be undertaken in full compliance with the International Living Future Institute's 'Declare' certification scheme, which is the world's most rigorous product certification scheme referencing full supply chain product sustainability.

See Ecoglo products at www.ecoglo.com

