



# MARITIME PHOTOLUMINESCENT SAFETY SIGNAGE

## Introduction to SafeSign

### What is SafeSign?

SafeSign stands for state of the art photoluminescent Safety Signs products. We have a leading position in markets such as cruise- and ferry's, offshore and safety signs solutions for buildings and the industrial market. Besides safety signs we also manufacture photoluminescent tapes and anti-slip products to guarantee safety and clarity in potentially dangerous situations. Safe Sign offers a wide range of standardized products and tailor-made products to fulfill customers specific demands and needs. The quality of Safe Sign products can be found all around the globe, in buildings, industrial plants and on sea.

### How it started?

In 2010 photoluminescent safety sign specialists from the Netherlands, Germany and Norway joined forces to innovate safety sign production and established Safe Sign Products (SSP). Dinxperlo, the Netherlands was chosen as location to build a state-of-the-art production facility, centrally located between Rotterdam, Amsterdam and Hamburg, Germany. Today, almost 10 years later, all founders are still involved and keep investing to maintain our position as the most innovative safety sign manufacturer.

### Capabilities?

Safe Sign has stock all of standardized signage products from our IMO catalogue and all ISO standards in PETX, our innovative, environmentally friendly, UV resistant and 100% recyclable base material. This way we ensure we can deliver our product fast and adequate from stock, to fulfill our customers' demands. Under private label we also manufacture safety signage on both aluminium, PVC or vinyl if required.

Our design office is not only equipped with the latest DTP tools, but also trained and fully up to date on all legislations related to safety signage. They do not only draw your signs, but also advise and ensure full compliance.

Safe Sign production is set up in such way, we can produce bulk orders up to 2000 signs per hour, or print one-off individual signs for your specific needs, on PETX, aluminium, PVC or vinyl. This according to your lay-out or based upon an ISO standardized design from our extensive database of drawings.

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## The Importance of Photoluminescent Signage

You can imagine that in the event of a fire, smoke will rise to the top of the ceiling very quickly. This situation will obscure regular exit signs that are commonly placed above exit doors or other important locations.

What photoluminescent signage does is that it absorbs the regular light from lighting fixtures. This has the consequence that when power falls out, the signage will be clearly visible in the dark. You can imagine that this property can make an enormous difference during, for example, an event of fire. When using photoluminescent signage you are not dependant on man-made lighting systems that require power from an emergency generator or a battery, and are known to fail in emergency situations. Photoluminescent signage will never fail when regular lighting unexpectedly stops working.

### Photoluminescence in Safety Signs

One of the occasions where a photoluminescent effect is used by SafeSign are safety signs. Safety signs are signs that give a general safety message, through a combination of colour and geometric shape and which, by addition of a graphical symbol, give a particular message. They are used at high, low and intermediate locations in a Safety Way Guidance System to guide the evacuee to a place of safety. Combining these signs with photoluminescent properties ensures a clear guiding system for all nearby people. The International Maritime Organisation (IMO) specifies a very specific range of safety signs for use aboard ships. IMO safety signs are made to comply with the requirements of the SOLAS Convention 1974 Chapter III.

### Photoluminescence in LLL Systems

The point of any Low Location Light system is to guide people to safety during emergency situations. In order to rely on a system, you need to be sure that it will work every time. To realize this, you don't want to depend on external power sources like batteries, emergency generators or even the regular power network. Since these power sources can fail during emergencies, it isn't a safe bet when looking for the best solution.

A photoluminescent Low Location Light system allows you to realize a guiding safety system that you can depend on, in any environment and occasion. The only thing a photoluminescent LLL system needs to operate, is light. When the LLL system is exposed to light, whether daylight or artificial, it will charge itself. This way, a photoluminescent LLL system will work everytime, guaranteed.

## Photoluminescence

Photoluminescence (often referred to as P.L.) is the emission of light from any form of matter after excitation from another light source, also commonly called 'glow in the dark'. To put it simply; photoluminescence material stores the energy from a light source and releases it as light in darkness. Three criteria are important to evaluate the quality of photoluminescence; the time required to charge the photoluminescent material, the time the photoluminescent will glow after the charging light is removed and the luminance of the photoluminescent material. These three factors can differ substantially depending on the quality of the material. Safe Sign only offers photoluminescence material which meets and exceeds all the required standards. Of course, Safe Sign only uses environmentally friendly products which do not contain any toxics or radioactive materials.

The real beauty of photoluminescent products, in the context of a Safety Way Guidance System, is that they do not need electricity to glow in the dark, if properly sited and maintained. In an emergency situation where a mains failure has occurred, they will immediately light the way to safety even in conditions with limited sight like smoke.

### Luminance properties

The rules, regulations and standards classify the luminescence of signage and low location light systems as per below table, SafeSign products meet or exceed the required luminance.

| Applicable Standards and Resolutions vs. SafeSigns | Luminescent intensity (mcd/m <sup>2</sup> ) (After removing the existing light) |                       |
|----------------------------------------------------|---------------------------------------------------------------------------------|-----------------------|
|                                                    | 10 minutes                                                                      | 60 minutes            |
| IMO Res. A. 752(18)                                | 15 mcd/m <sup>2</sup>                                                           | 2 mcd/m <sup>2</sup>  |
| ISO 15370                                          | 15 mcd/m <sup>2</sup>                                                           | 2 mcd/m <sup>2</sup>  |
| DIN 67 510-4                                       | 23 mcd/m <sup>2</sup>                                                           | 3 mcd/m <sup>2</sup>  |
| ISO 17398 Class A                                  | 25 mcd/m <sup>2</sup>                                                           | 3 mcd/m <sup>2</sup>  |
| ISO 17398 Class B                                  | 50 mcd/m <sup>2</sup>                                                           | 7 mcd/m <sup>2</sup>  |
| ISO 17398 Class C                                  | 140 mcd/m <sup>2</sup>                                                          | 20 mcd/m <sup>2</sup> |
| ISO 17398 Class D                                  | 260 mcd/m <sup>2</sup>                                                          | 35 mcd/m <sup>2</sup> |
| ISO 17398 Class E                                  | 400 mcd/m <sup>2</sup>                                                          | 55 mcd/m <sup>2</sup> |
| ISO 17398 Class F                                  | 520 mcd/m <sup>2</sup>                                                          | 70 mcd/m <sup>2</sup> |
| SafeSign XL                                        | Class B+                                                                        | Class B+              |
| SafeSign XXL                                       | Class C+                                                                        | Class C+              |
| SafeSign XXX                                       | Class E+                                                                        | Class E+              |



*SafeSign PETX sign in daylight*



*SafeSign PETX sign in the dark*

## Regulations and standards

All Safe Sign products comply to the applicable regulation and standards for design and installation. On your request we can advise, design and even install signage and low location light to ensure full compliance, regardless if you are operating in the maritime environment or land based industrial environment. Below a highlight of some of the regulations and standards, based upon your specific industry more and other regulations and standards might applicable on which we can advise.

|                                      |                                                                                                                                               |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IMO Resolution A.752(18)</b>      | Guidelines for the evaluation, testing and application of Low Location Lighting on passenger ships                                            |
| <b>SOLAS Convention 2004</b>         | Means of escape - Marking of escape routes                                                                                                    |
| <b>European Directive 2002/25/EC</b> | Safety rules and standards for passenger ships                                                                                                |
| <b>ISO 15370</b>                     | Low Location Lighting (LLL) on passenger ships                                                                                                |
| <b>ISO 16069</b>                     | SWGS - Safety Way Guidance Systems                                                                                                            |
| <b>ISO 24409-2:2014</b>              | Ships and marine technology - Design, location and use of shipboard safety signs, fire control plan signs, safety notices and safety markings |
| <b>ISO 17398:2004</b>                | Safety colours and safety signs - Classification, performance & durability of safety signs                                                    |

### IMO Resolution A.752(18)

IMO Resolution A.752(18) prescribes that all photoluminescent signage installed on a vessel needs to meet several requirements. With reference to the luminescence the requirements is that the installed signs need to provide 15 MCD / m<sup>2</sup> after 10 minutes, and 2 MCD / m<sup>2</sup> after 60 minutes as a minimum, when they are no longer exposed to a source of illumination. The luminance of LLL (Low Location Light) systems needs to be tested at least every five years.

### IMO Resolution A.1116(30)

IMO has agreed to adopt the safety symbols of ISO 7010 and ISO 24409-2 and as a result, all escape route signs, equipment location markings and other safety signage onboard a vessel must be brought into line with that of ISO safety signage. This means that the same, recognizable, safety signage will be used both onshore and offshore, increasing recognizability and safety.



## Products

Safe Sign manufactures signage and low location light on different base materials; from economical PVC, to innovative PETX and high-quality aluminium. But regardless of the base material, you will always get a detailed quality print of the symbols with the luminescence you require. We only use environmentally friendly pigments, which has extensively been tested to give you long lasting quality. As a standard all Safe Sign signage comes with a self-adhesive backing for an easy fix.

## Escape-, Fire, and Rescue Signage

Our range of Escape-, fire- and rescue signage includes all the signage products you may need to ensure a safe environment in your building, on your vessel or any other fitting occasion. Clearly marked fire extinguishers, fire alarms and rescue equipment are important when emergencies occur. Clear identification is also important from the point of view of prevention. Because people are able to observe the warnings during normal working and visiting situations, they make mental notes of the locations and the equipment. At the moment that an emergency arises they are capable of acting immediately, even in a stress situation, because they are able to find the extinguishers, alarms and rescue equipment rapidly.

There are several ways of making fire prevention equipment, fire-fighting equipment and rescue equipment as easily identifiable as possible. Their presence and location must be visible from all directions. This applies to both the normal and the stressed situations. Our clients see signage as more than just an obligation resulting merely from legislation and regulations.

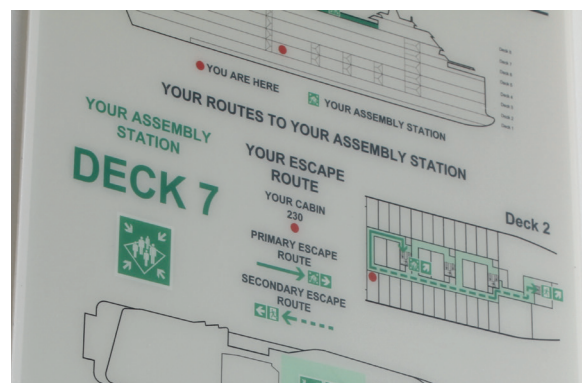
## Cabin Signage

Big vessels have lots of rooms, cabins and areas. All these spaces require their own specific signs to ensure safety. Developing these signs is a big job that requires the right attention. When it comes down to the safety of personnel and passengers, you don't want to bring this in any danger. This is why the cabin-specific signs need to be engineered the right way.

SafeSign has years of experience when it comes down to engineering, designing, producing and installing these cabin signs. We have been working on various renowned vessels and finished high-quality projects. Due to our experience, we can handle projects in a smooth way. This results in the fact that we are providing the opportunity for fast delivery, as well as signage that has been engineered the right way.



Custom cabin sign applied on a wall

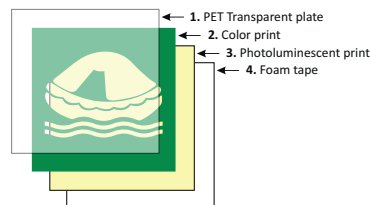


Close-up of the instructions on a cabin sign

## PET-X Signage

Most likely the biggest innovation in signage is our range of PET-X signage. The ambition was simple, use the most environmentally friendly, flame retardant, UV resistant, transparent and 100% recyclable plastic, and print it from the backside. The result is our PET-X signage range which offers more benefits than any other can offer you;

- Halogen free product
- UV resistant (does not discolour)
- Glossy high-quality finish
- Easy to wipe clean
- 100% recyclable
- Self-adhesive backing for easy fix
- Flame retardant



*Build-up of a SafeSign PETX sign*



*SafeSign PETX signs installed*



*SafeSign PETX sign installed on a vessel's hull*

## PVC Signage

The most commonly used base material in the market for signage is still PVC. We produce PVC signage under private label for several customers. Due to the simplicity of the manufacturing process PVC is suitable for high volume production, and moreover, at short delivery times.

- Economic pricepoint
- High-volume production
- Short delivery times
- Private label possibilities

## Aluminium Signage

Aluminium signage offers you the 'premium', luxury look you may be looking for. Besides the great looks, aluminium signage is a very durable product. Our aluminium signs have the same outstanding photoluminescent quality. This makes them great to be used in areas where regulations prescribe the use of non-combustible signage besides our PETX signage. Due to the flexibility of the aluminium material, we can offer several bend aluminium signs. We produce single-sided or double-sided wall-mount signs when your specific situation requires this.

## Panoramic Aluminium Signage

Panoramic aluminium signage makes it possible to display a safety sign widely. The pre-drilled holes make it easy to install, and the aluminium signage comes with the same outstanding properties as the flat aluminium signage. Panoramic aluminium signage realizes a 180° angle reach, which means people will see the sign from a far distance from a 180° range. As well as our regular flat aluminium signage, panoramic aluminium signage features the same outstanding photoluminescent quality.



## Low Location Lighting

Safe Sign produces traditional Low Location Lighting systems with aluminium carriers and PVC or aluminium inserts. Also, our innovative PET-X base material is used, with the same benefits, to manufacture LLL strips. All Safe Sign LLL systems comply to the applicable regulation and standards. Safe Sign LLL systems can be integrated into the Safety Way Guidance System.

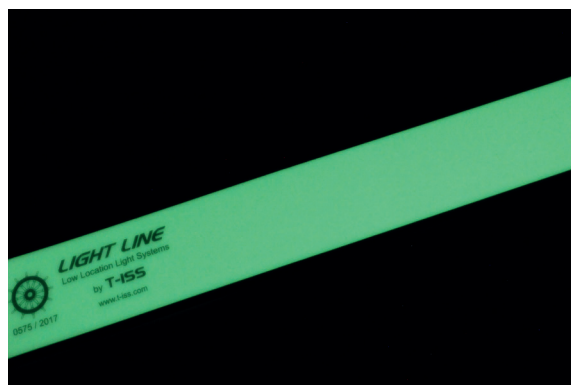
## Light Line Systems

As an alternative to the commonly used profile/insert Low Location Light strips, Safe Sign has developed Light Line PETX strips. These self-adhesive strips are an excellent alternative to the profile systems, easy to install and maintain. We manufacture Light Line strips according to the same high standard as Safe Sign signs; back printed on PETX, which gives a glossy, easy to wipe clean finish, halogen free, flame retardant, UV resistant and 100% recyclable.

| Height of LLL system in mm | Luminescent intensity (mcd/m <sup>2</sup> ) (After removing the existing light) |                         |
|----------------------------|---------------------------------------------------------------------------------|-------------------------|
|                            | 10 minutes                                                                      | 60 minutes              |
| 75 mm                      | 15,0 mcd/m <sup>2</sup>                                                         | 2,0 mcd/m <sup>2</sup>  |
| 65 mm                      | 23,4 mcd/m <sup>2</sup>                                                         | 3,1 mcd/m <sup>2</sup>  |
| 50 mm                      | 33,8 mcd/m <sup>2</sup>                                                         | 4,5 mcd/m <sup>2</sup>  |
| 40 mm                      | 52,7 mcd/m <sup>2</sup>                                                         | 7,0 mcd/m <sup>2</sup>  |
| 30 mm                      | 93,7 mcd/m <sup>2</sup>                                                         | 12,5 mcd/m <sup>2</sup> |
| 25 mm                      | 135,0 mcd/m <sup>2</sup>                                                        | 18,0 mcd/m <sup>2</sup> |



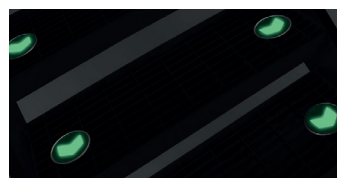
*Light Line XXL strip in daylight*



*Light Line strip in the dark*

## LLL Traildots

Traildots are photoluminescent aluminium plates that are used to mark escape routes. The traildots are equipped with a SlipStop layer and sturdy 3M mounting tape. The traildots can also be equipped with special mounting brackets. This allows you to mount the traildots on (metal) staircases and different applications.



*Trail dots on a staircase*

## LLL Staircase nosing

We can supply various sizes and models of LLL staircase profiles. These profiles make sure that, during the event of an emergency or lighting failure, the staircase steps in a stairwell or on a vessel can be found easily. This will reduce the amount of accidents on the stairs and will make a safe and quick evacuation possible.



*LLL staircase noses*

## Low Location Light Measurements

According to several regulations, vessels that carry passengers are obligated to have a Low Location Lighting system installed. This could be a photo luminescent system as well as an electric system. A photo luminescent system is charged by the lighting on the vessel and will use the energy it collects to light up in the dark. The big advantage of this system is that there are no electric installations that need to be installed.

T-ISS is accredited by DNV to execute Low Maritime Location Lighting measurement services, our certification can be found on our website. As a vessel owner, you need to test all Low Location Lighting systems at least once every five years. Our engineers will test the luminance of your LLL systems on-board with fully certified test equipment. The photoluminescence measurement process as well as equipment are all certified by DNV.



*LLL measurement being done*



*Isolated measurement tool applied on the LLL system*

## Signage audits

Together with our distributors we can inspect, measure and report your current escape route and safety signage system to ensure it is in full compliance with the applicable rules and regulations. If you would like to know more about the signage audits, please contact us using the contact information on the back of this brochure.

## Installation service

Together with our distributors we can travel all over the world to install signage and LLL systems. We realize projects on industrial locations, warehouses, factory floors, ships, offshore platforms and many more occasions. We don't limit ourselves; we can manage your complete escape route and safety signage project as a key turn solution.



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