

WHAT IS PHOTOLUMINESCENT MATERIAL (PLM)

There have been various types of PLM offered in the marketplace, as the Technology has advanced. PL Solutions uses STRONTIUM ALUMINATE, mined from the ground. In its original state, it has minimal Luminance, and no Longevity, making it quite useless as an Energy Conservation, or Safety Product.

In order to improve its Quality, originally the catalysts that were added were Zinc, and Phosphorous, which are TOXIC. PL Solutions has developed a Proprietary Laboratory process, which is 100% NON-TOXIC, yet performs at a higher level than any other product available.

As a result of this, and after many years, our Products have now achieved every Building, Fire, and Safety Code there is in North America. Our products perform in any Emergency, which cannot be said for products available requiring Back-up Power, or Generators.

Our Products are completely LEED Qualified, and Environmentally friendly as well, which again cannot be said for any competitive option.

PLM Material is now fully accepted as an alternative to “traditional options” in 2 separate Categories:

1. ENERGY CONSERVATION – EXIT SIGNS and RUNNING MAN SIGNS
2. SAFETY WAY GUIDANCE STRIPS AND SAFETY SIGNAGE

BACKGROUND

Photoluminescent Material (PLM) has been used throughout Europe and Asia for Safety and Emergency Egress since the mid 1980's. In 1988 The International Maritime Organization (IMO) made PLM MANDATORY for all Passenger Ships, for SAFETY WAY GUIDANCE SYSTEMS in all Stairwells and Hallways, as well as Safety Signage. (I.M.O. RESOLUTION A-752 (18)).

WHY? Because only PLM material is GUARANTEED to always perform in any Emergency, and it has been proven to SAVE LIVES.

Similarly, The International Standards Organization (I.S.O. 15370, 16069) implemented the same standards for Safety Way Guidance Systems in Buildings.

In 2001, in the aftermath of The World Trade Centre Tragedy, it was noted by survivors that in the 2nd Tower, some of the stairwells were illuminated by Strips of a “GLOWING” material. These strips provided enough light through the smoke and darkness to assist these people to get out of the Building quicker. These were PLM Safety Way Guidance Strips, and although all other power was cut off, including Back-up Generators, and Exit Signs, PLM worked!

As a result, New York City passed a number of new Laws for PUBLIC SAFETY as BYLAW 26. One of these new Mandatory Regulations was to require PLM in all stairways throughout all Buildings 3 storeys or higher (75 FEET). The LAW requires PLM strips on the Walls, Handrails, and Steps. It also requires Low Level Safety Signs throughout.

WHY? TO SAVE LIVES

Since the initial Legislation, similar Laws are being passed throughout North America. The Safety Way Guidance System, using PLM has received support from every Safety Organization, ranging from the N.F.P.A., E.P.A., PUBLIC WORKS CANADA, O.H.S.A., U.L., U.L.C., I.C.C., and many more.

The current ASTM Standard for Safety Way Guidance Systems requires 2.8 mcd/m² after 60 minutes. Our PLM used for Safety Way Guidance Systems achieves 22.7 mcd/m², which is far superior level than any other lighting option, In addition, only PLM is GUARANTEED to always perform in any Emergency.

PL SOLUTIONS INC.

PL Solutions is the market leader in Photoluminescent Material and the leading Manufacturer, originally manufacturing in Norway, and is now the leading North American provider of fully Coded Photoluminescent Material (PLM).

PL Solutions personnel have and continue to sit on most North American Safety Codes and Standard's Committees, including PUBLIC WORKS CANADA's /NRC PLM Testing Evaluation. THE ONTARIO BUILDING CODE, FEDERAL RAILWAY ASSOCIATION, NEW YORK WORLD TRADE COMMISSION, NFPA, THE INTERNATIONAL CODE COUNCIL , and many more. The purpose of participating in these Organizations is to ensure that the maximum Standards are achieved in order to truly be a Fire, Safety and Energy Conservation Technology, and be accepted as a viable, replacement to older, traditional options.

We represent products that have passed every Fire, Safety, and Building Code and/or Standard available in North America, and focus on two (2) areas.

1. ENERGY CONSERVATION

Our PLM EXIT SIGNS are fully up to Code, and can be installed in any Building. They use NO ELECTRICITY, require NO MAINTENANCE, and are GUARANTEED to always work in any Emergency. They are NON TOXIC, LEED QUALIFIED, and N.F.P.A. and E.P.A. recommended.

2. FIRE SAFETY AND EMERGENCY EGRESS

Our Safety Strips and LOW-LEVEL SAFETY SIGNS are currently being Legislated across North America for all Buildings, and are recommended by B.O.M.A., N.F.P.A. and The International Code Council, (I.C.C.).

PL SOLUTIONS PHOTOLUMINESCENT EXIT SIGNS – BENEFITS AND STANDARDS

- NO ELECTRICITY NEEDED, EVER – NO BACK UP POWER REQUIRED
- NATIONAL AND PROVINCIAL APPROVED – ALL CANADIAN JURISDICTIONS
- MINIMAL MAINTENANCE REQUIRED
- GUARANTEED TO ALWAYS PERFORM IN ANY EMERGENCY
- NO TOXINS UNLIKE L.E.D.'S
- NO RADIOACTIVITY
- LEED QUALIFIED
- N.F.P.A. RECOMMENDED – BUILDING CONSTRUCTION AND SAFETY CODE 11.10 AND LIFE SAFETY CODE 101, 7.10, 1.3.4.7.7.2, 13.4.7.7.3
- E.P.A. "BEST AVAILABLE OPTION"
- ENERGY STAR™ APPROVED
- UL 924 APPROVED/ULC S-572 APPROVED
- APPROVED TO CHARGE WITH 2 FT. CANDLES
- I.C.C. APPROVED – SECTION 1011 – ES REPORT #ER 6040
- TO CODE FOR 120 MINUTES – THE MAXIMUM ALLOWED FOR ANY SIGN
- 1997 UNIFORM BUILDING CODE – SECTION 1003.2.8, 1007.2.7, 1007.6.2.
- NATIONAL BUILDING CODE 2010 CANADA
- 1999 STANDARD BUILDING CODE – SECTION 1016.3
- A.S.T.M. 162, 648, 662, E-2030-99, E 2072-00, E-2073-00, 2072-04, 2073-04, 2030-04
- I.M.O. RESOLUTION A. 752(B)
- I.S.O. 15370, 16069
- APTA 22-PS-004—99, SS-PS-002-98
- CALIFORNIA STATE FIRE MARSHALL – BUILDING MATERIALS LISTING PROGRAM #6200-1617.100
- CITY OF LOS ANGELES - #25531 (CSI - #16530)
- 2001 CALIFORNIA BUILDING CODE – 1003.2.8 – EXIT SIGNS
- EVERY CANADIAN PROVINCE HAS RATIFIED THE PLM TECHNOLOGY
- NEW YORK CITY MEA – BY LAW 26

PHOTOLUMINESCENT EXIT SIGNS AND RUNNING MAN SIGNS

Photoluminescent Exit Signs are guaranteed to always work in any Emergency. Most Signs require 54 LUX from any Ambient Light Source, which is usually available in any Building Hallway. If that Light Source is available, PLM EXIT SIGNS can be installed with NO BACK UP POWER SUPPLY REQUIRED. (UL S 572, I.C.C. NEW YORK, FIRE CODE, N.F.P.A.)

THIS IS WHERE PL SOLUTIONS SIGNS ARE A VAST IMPROVEMENT AS WE ARE APPROVED TO BE ILLUMINATED WITH ONLY 2 FOOT CANDLES OF LIGHT TO CHARGE

OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (O.H.S.A.) AND NATIONAL FIRE PROTECTION ASSOCIATION (N.F.P.A.)

In 2000, the N.F.P.A., Life Safety Code was updated and recognizes Photoluminescent Exit Signs as **“an alternative to internally lighted electric powered signs. The signs are permitted, provided they are listed in accordance with UL – 924 Standard for SAFETY EMERGENCY LIGHTING and POWER EQUIPMENT, and meet all the requirements outlined in the criteria from The Life Safety Code 101, 2006 Edition, parts 7.10.7.2.”**

The N.F.P.A. Life Safety Code also establishes Photoluminescent Exit Signs as Category 3 which states **“the sign is illuminated by self-contained power sources and operates independently of external power sources.”**

ONTARIO FIRE CODE OPINION – AND ALL CANADIAN PROVINCES

“Photoluminescent Exit Signs use Photoluminescent Materials that absorb and radiate light. These signs do not require Electrical Power, but they need to be charged by Light sources in their surrounding area. Sections 9.3 and 9.5 of The Fire Code specify wording, letter sizing, and contrast criteria for Exit Signs as well as the need for sign illumination. There are **NO REQUIREMENTS** for an Emergency Power Supply for illumination of these signs.”

SECTION 6 – AUTHORIZATION

PART 3 – “The Exit Signs are not required to be provided with an emergency power supply.” The NBC/OBC has certified that PL Solutions Photoluminescent Exit Signs comply with all requirements to code. CAN ULC S 572 proves that PL Solutions Signs conform to the National Building Code of Canada (N.B.C.) and may be used in Construction financed or insured under The National Housing Act.

The National Research Council of Canada (N.R.C.) completed Public Hearings across the country for the Legislation to be adopted for all new Buildings, as well as all Public Buildings for the 2010 National Building Code. According to Phillip Rizcallah, Research Council Officer, Canadian Codes Centre. **“The Proposals have been accepted, and will be subjected to public review in November, 2008.”** The National Building Code, 2010 subsequently passed the Legislation, with all Provinces having now ratified the Legislation.

LOS ANGELES DEPARTMENT OF BUILDING AND FIRE SAFETY BUILDING CODE

DOCUMENT NO. P/BC – 2002-019

“Section 91.1003 and TABLE 10-A of The Los Angeles BUILDING CODE (LABC) and SECTIONS 57.33.15, AND 57.33.16 OF The Los Angeles Fire Code require every stairway, Exit Passageway, exterior exit balconies, hallway, and Exit Court, used for Egress in any Building to be provided with Exit illumination and Exit Signs.”

INTERNATIONAL CODE COUNCIL – 2006/2007 CODE DEVELOPMENT CYCLE

MARCH 24, 2006

- Overseeing body for INTERNATIONAL BUILDING CODE, INTERNATIONAL FIRE CODE, INTERNATIONAL ENERGY CONSERVATION CODE.

1011.3

“EXIT SIGNS AND LIGHT STRIPS SHALL BE INTERNALLY OR EXTERNALLY ILLUMINATED”

1011.4

EXIT SIGNS – “A TACTILE EXIT SIGN STATING EXIT AND COMPLYING WITH ICC A 117.1 SHALL BE PROVIDED ADJACENT TO EACH DOOR TO AN EGRESS STAIRWAY, AN EXIT PASSAGEWAY, AND THE EXIT DISCHARGE.”

1011.6.2

EXIT SIGNS – “THE FACE OF AN EXIT SIGN ILLUMINATED FROM AN EXTERNAL SOURCE, SHALL HAVE AN INTENSITY OF NOT LESS THAN 5 –FOOT CANDLES (54 LUX) AND DOES NOT REQUIRE BACK-UP POWER SUPPLY.”

FURTHER EXCEPTION

“APPROVED EXIT SIGN ILLUMINATION MEANS THAT CONTINUOUS ILLUMINATION IS PROVIDED INDEPENDENT OF EXTERNAL POWER SOURCES, AND AS SUCH, ARE NOT REQUIRED TO BE CONNE3CTED TO AN EMERGENCY ELECTRICAL SYSTEM.”

E.83/06/07

1011.4 CHAPTER 35 (IFC (B) 1011.4, CHAPTER 45)
UNDERWRITERS LABORATORY

“THE PURPOSE OF THIS ADAPTION IS TO BROADEN THE SCOPE OF THIS SECTION TO INCLUDE SELF-LUMINOUS, AND PHOTOLUMINESCENT EXIT SIGNS.”

“THE REASON FOR THE CHANGE IS TO PROVIDE FLEXIBILITY AND TO ADD CLARITY TO THE USER. INTERNALLY POWERED COVERS ALL EXIT SIGNS THAT GENERATE THEIR OWN LUMINOSITY. NO BACK UP POWER SUPPLY WILL BE REQUIRED WHERE EXIT SIGNS ARE INSTALLED UNDER THE UL 924 OR ULC S 572 GUIDELINES.”

I.C.C. EVALUATION SERVICE INC.

ACCEPTANCE CRITERIA FOR PHOTOLUMINESCENT EXIT SIGNS

JULY 1, 2005

1003.2.10.5 POWER SOURCE

EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES WHEN A BUILDING IS OCCUPIED. TO ENSURE PERFORMANCE DURING A POWER LOWW, EXIT SIGNS SHALL BE CONNECTED TO AN EMERGENCY POWER SYSTEM PROVIDED FROM STORAGE BATTERIES, UNIT EQUIPMENT, OR AN ON-SITE GENERATOR.

EXCEPTION

- “APPROVED PHOTOLUMINESCENT EXIT SIGNS ARE NOT REQUIRED TO BE CONNECTED TO AN EMERGENCY ELECTRICAL SYSTEM.”

U.S. ENVIRONMENTAL PROTECTION AGENCY (E.P.A.)

FACILITIES MANUAL VOLUME 2

ARCHITECTURE AND ENGINEERING GUIDELINES

- UPDATE OF GUIDELINES TO INCLUDE PROCUREMENT OF ENERGY EFFICIENT PRODUCTS REQUIRED BY THE ENERGY POLICY ACT OF 2005 DATED JULY 20, 2006

SECTION 1.8 EXIT SIGNS

Recommended: 5 Watts or less

Best Available Option: Photoluminescent Exit Signs

“Non-electrically powered Photoluminescent Exit Signs **DO NOT REQUIRE** a direct connection to a source of electrical power to operate. With proper charging sources, PLM EXIT SIGNS can have an unlimited service life.”

LEED – (LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN)

November 24, 2006

“By installing Photoluminescent Exit Signs, instead of LED, LEED Building Projects may be able to gain points in the Energy and Atmosphere, Materials and Resources or Innovation in Design credits, and benefit from a Safer, less expensive and truly sustainable technology.” “Increasingly, GREEN Building projects are installing Photoluminescent Exit Signs because they do not have the Environmental drawbacks of LED Exit Signs. LED Exit Signs contain battery and circuit/light board components and are considered hazardous wastes due to heavy metals. The fabrication process of most LED Exit Signs involves toxic chemicals, and contribute to Greenhouse gas emissions, acid rain, and radioactive wastes.”

Photoluminescent Exit Signs are a highly sustainable product that can directly contribute toward securing points in the following LEED credits:

- | | | |
|------------------|-------------------------|-------------------------|
| • EA CREDIT #1 | Energy and Atmosphere | Energy Performance |
| • MR CREDIT #4 | Materials and Resources | Recycled Content |
| • ID CREDIT #1.1 | Innovation in Design | Exceptional Performance |

ARCHITECTS AND ENGINEERS – JULY 2006

“LED EXIT SIGNS have adverse safety, efficiency and sustainable issues when compared to another evolving technology, the non-electrical Photoluminescent Exit Sign.”

“Watt miser LED Exit Signs should not be considered a sustainable building product for 3 reasons:

1. Contribution to Greenhouse Gas Inventory.
2. Hazardous Chemicals are used during Fabrication process. The housings of many LED's are PVC, which are associated with chlorinated dioxins. The fabrication of the circuit boards involve methyl ethyl ketone, hydrochloric and sulphuric acids.
3. Circuit Boards and Batteries are hazardous wastes. Federal Regulations, (E.P.A. 40CFR PART 273) considers the back-up Batteries in LED's to be hazardous waste”, as they contain lead, chromium, cadmium, and possible mercury. Universal Wastes are not permitted in Municipal Landfills and must be directed to a recycler.

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