

PNA GROUP INC.

2025 Guelph Line

Unit 263

Burlington, Ontario

L7P 4X4

Telephone: 905-337-7433

Toll Free: 888-268-0520

Fax: 905-331-3732

PNA / JESSUP

PHOTOLUMINESCENT MATERIAL

(PLM)

A Realistic Overview

of an

Emerging Technology

WHAT IS PHOTOLUMINESCENT MATERIAL (PLM)

There have been various types of PLM offered in the marketplace, as the Technology has advanced. PNA/JESSUP 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. PNA/JESSUP have 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
- 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 BY LAW 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 this 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., C.C.M.C., I.C.C., and many more (please see The Standards and Codes Sheet).

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 a far superior level than any other Lighting option. In addition, only PLM is GUARANTEED to always perform in any Emergency.

PNA / JESSUP – THE PARTNERS

Jessup Manufacturing is the market leader in PhotoLuminescent Material, and the leading Manufacturer, under the Trade-name GLOBRITE™. PNA GROUP, originally manufacturing in Norway, joined forces with Jessup in 2007, and is now the leading North American provider of fully Coded PhotoLuminescent Material (PLM).

Combined, the two Organizations 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.

• 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.

• 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.).

PNA PHOTOTLUMINESCENT EXIT SIGNS – BENEFITS & STANDARDS

- NO ELECTRICITY NEEDED, EVER – NO BACK UP POWER REQUIRED (B.M.E.C. ONTARIO).
- NO 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 – 5000 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 APPROVED
- C.C.M.C. APPROVED – 13211-R
- I.C.C. APPROVED – SECTION 1011 – ES REPORT # ER 6040
- B.M.E.C. (ONTARIO) 03-12-291
- 1997 UNIFORM BUILDING CODE – SECTION 1003.2.8, 1007.2.7, 1007.6.2.
- 1997 UNIFORM FIRE CODE
- 1999 B.O.C.A. NATIONAL BUILDING CODE – SECTION 1023.
- 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
- ASSOCIATION OF MUNICIPALITIES OF ONTARIO – SPECIFIED EXIT SIGN (see attached)
- NEW YORK CITY MEA – 235-OS-M

PNA PHOTOLUMINESCENT EXIT SIGNS

PhotoLuminescent Exit Signs are Guaranteed to always work in any Emergency. They require 54 Lux from any Ambient Light Source (UL 924), which is almost always available in any Building Hallway. If that Light Source is available, PLM EXIT SIGNS can be installed with NO BACK UP POWER SUPPLY REQUIRED. (ONTARIO B.M.E.C., I.C.C. NEW YORK FIRE CODE, N.F.P.A.). This is logical, as the objective is for an EXIT SIGN to work, when it is needed, and PNA's EXIT SIGNS WILL.

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 now 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 - NOVEMBER, 2004

“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.”

CANADIAN CONSTRUCTION MATERIALS CENTRE (C.C.M.C.)

ONTARIO BUILDING MATERIALS EVALUATION COMMITTEE

- AUTHORIZATION REPORT - # 03-12-291

SECTION 6 – AUTHORIZATION

PART 3 “ The Exit Signs are not required to be provided with an emergency power supply.”

“The C.C.M.C. has Certified the PNA/JESSUP’s PhotoLuminescent Exit Signs comply with C.C.M.C.’s Technical Guide for Exit Signs” (NOV 15, 2007)

The C.C.M.C. Certification means that PNA/JESSUP 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.) is completing Public Hearings across the country for the forthcoming 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”**. (CONDO LIFE MAGAZINE, FEB., 2008)

LOS ANGELES DEPARTMENT OF BUILDING AND 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 connected 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 adaptation 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 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 loss, 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.

NATIONAL RESEARCH COUNCIL CANADA – C.C.M.C 13211-R

2. OPINION

Test results and Certification registration show that “**GLOBRITE**” PHOTOLUMINESCENT EXIT SIGNS comply with CCMC’s Technical Guide, dated 2005-07-06. These Exit Signs provide a Level of performance equivalent to that required by –NBC 1995- ARTICLE 3.4.5.1, EXIT SIGNAGE.

4. USAGE AND LIMITATIONS

The Exit Sign must display the word EXIT or SORTIE. The Exit Sign must be illuminated by an exterior source of energy to charge itself. The minimum illumination on the sign face shall be 54 Lux (the normal illumination is above 60 Lux.)

The N.R.C./PUBLIC WORKS is currently preparing Legislation for The 2010 National Building Code whereby PLM products will be made mandatory in Buildings across Canada. (DR. GUYLENE PROULX, NRC – 613-993-9634)

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, including back-up power if necessary.

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 keton, hydrochloric and sulfuric acids.
- 3) Circuit Boards and Batteries are hazardous wastes. Federal Regulations, (E.P.A. 40CFG PART 273) considers the back-up Batteries in LED’s to be “hazardous waste”, as they contain lead, chromium, cadmium, and possibly mercury. UNIVERSAL WASTES are not permitted in Municipal Landfills and must be directed to a recycler.

Robert A. McIntosh
President
PNA GROUP
2025 Guelph Line, Unit 263
Burlington, Ontario
L7P 4X4
www.pnagroupplm.com
bobmcintosh@pnagroupplm.com
905-337-7433

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- 3) BUILDING MATERIALS EVALUATION COMMISSION AUTHORIZATION REPORT # 03-12-291
- 4) C.C.M.C./NFPA – JESSUP APPROVAL
- 5) INTERNATIONAL STANDARDS ORGANIZATION (I.S.O.)
- 6) NEW YORK CITY BY LAW 26 – CODE REFERENCE RS-61
- 7) INTERNATIONAL CODE COUNCIL (I.C.C.) – INTERNATIONAL CODE PROPOSALS
- 8) INTERNATIONAL CODE COUNCIL (I.C.C.) – ACCEPTANCE CRITERIA FOR PHOTOLUMINESCENT EXIT SIGNS – JULY 1, 2005
- 9) UNDERWRITER’S LABORATORY – APPROVAL
- 10) NRCC – 49230 – EVALUATION OF PHOTOLUMINESCENT MARKINGS – DR. GUYLENE PROULX
- 11) LOS ANGELES – EXIT ILLUMINATION AND EXIT SIGN LIGHTING – JUNE/03
- 12) STATE OF CONNECTICUT – PUBLIC ACT – 06-162/SENATE BILL 666
- 13) CITY OF LONDON, ONT. – BUILDING INSPECTOR APPROVAL
- 14) CITY OF WINDSOR, ONT. – BUILDING INSPECTOR APPROVAL
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- 18) ENVIRONMENTAL PROTECTION AGENCY (E.P.A.) – APPROVAL
- 19) UNITED STATES DEPT, OF ENERGY (D.O.E.) – APPROVAL
- 20) ARCHITECTS AND ENGINEERS – APPROVAL
- 21) NORTH AMERICAN ELECTRICAL MANUFACTURER’S ASSOCIATION
“ISSUES WITH LED EXIT SIGNS”