



**Brighter Lines Save Lives™**



**Flex-O-Lite**  
.....  
***Airport Marking Specialists***



# Type III Airport Glass Beads

## RUNWAY INCURSION INCIDENTS AND NEAR ACCIDENTS ON AIRPORT RUNWAYS, TAXIWAYS AND RAMPS ARE ON THE RISE.

NASA Langley Research Center

"Probably the biggest threat of all, today, many, many people agree, it is not so much a midair collision as a runway incursion incident." Richard Healing, Aviation Safety Expert and Former NTSB member

In *Aerodrome Annex 14, Volume I*, ICAO states..."where operations take place at night, pavement markings should be made with reflective materials designed to enhance the visibility of markings."

Markings that cannot be seen by pilots and others operating on marked surfaces are useless.

FAA Advisory Circular 150/5340-1J

## RECOMMENDATIONS FROM THE EXPERTS:

- "Type III (1.9 Index of Refraction (IOR) airport beads had the best retro-reflectivity, initially and over time."

DOT/FAA/AR-02/128

**Paint and Bead Durability Study** by Holly Cyrus

- The retro-reflectivity data clearly show that the higher IOR (index of refraction, 1.9) Type III beads are far superior to Type I (IOR, 1.5) beads in initial and long-term retro-reflectivity. Thus, the Type III beads will be much more visible from farther distances...

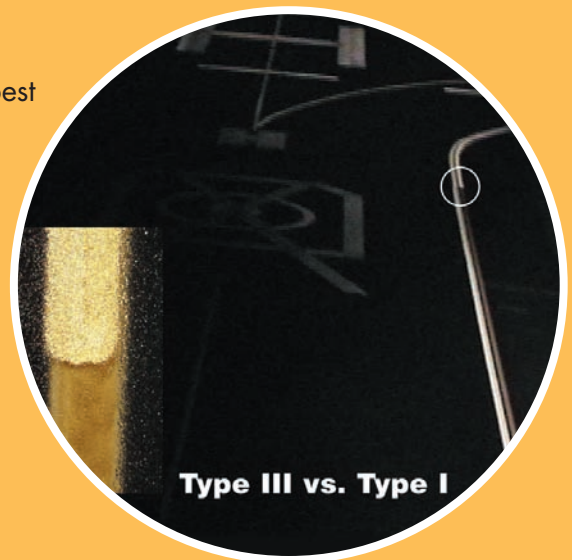
**A comparative Field Study of PermaStripe™ Polymer Concrete and Waterborne Airfield Pavement Markings**

by Kent Newman, PHD US Army Engineer Research and Development Center

- Using 1.9 index beads in place of 1.5 produces a more efficient retroreflective pavement marking system that is brighter and more visible at night (5).

TRB (Transportation Research Board) Paper 08-0775

**Modern Pavement Marking Systems: The relationship between optics and nighttime visibility.**



Type III vs. Type I



Type I 129 mcd²



No glass beads

Type I

Type III

## SAFETY SOLUTIONS

Glass Beads...with a refractive index of 1.9 or greater... have been found best for aerodrome markings. *ICAO Aerodrome Design Manual, part 4*

Due to the increase in marking conspicuity, FAA recommends Type III...beads be used on runway holding position markings. *FAA Advisory Circular 150/5340-1J*

## WHAT CAN YOU DO?

- **Physical Specification • TTB 1325 Type III gradation A**  
Specify Type III 1.9 Index glass beads for purchase or contract applications to achieve the highest visibility and improved safety.

- **Performance Specifications**


- Initial retroreflectivity levels -**

- Measuring the brightness of airfield markings to ensure proper application rates and technique*

- Initial and minimum retroreflectivity levels -**

- Combines the benefits of initial levels and also establishes a level to replace worn markings*

- This method defines a complete management system*

Only  brand glass beads have been proven around the globe. Our proprietary manufacturing process and exclusive coupling agents (applied to the beads) ensure initial and long term performance.



## Type III Beads

**MAXIMUM** Visibility

**INCREASED** Reaction Time

**HIGHEST** Level of Safety

**LONGEST** Life

**COST** Effective



# Testimonials

"...It has become quite evident that using Type III glass beads as part of the marking system provides long term benefits in terms of both safety and maintenance costs...Although the cost of the Type III glass beads is higher than other beads available on the market, if properly applied, the long-term cost of the marking (five years or more) is less than having to repaint every year or two with Low-Index (1.5) glass beads. Combine that with not having to interrupt airport operations for marking maintenance and the added stress to pavements with heavy paint build up from repeated repaints, using Type III beads in airfield markings is very cost effective."

**Donna Speidel**, *President, Sightline Airport Making Consultants*

"My pilots asked me: 'Why did you skip every other centerline mark (when painting)?' Actually, every other line was not missing, it was a Type III vs. Type I bead evaluation. The Type III markings were visibly brighter, to myself and the pilots, from the air."

**Bill Meyer**, *Airport Manager, Jacksonville Naval Air Station*

"St Louis county stripes the Spirit of St Louis Airport. Flex-O-Lite had arranged for a comparison test at the Airport between Type I, Type IV, and Type III Beads. The Type III was a minimum of 5 times brighter than any alternative tested. In some cases it was as much as 10 times brighter...This test was a real eye-opener."

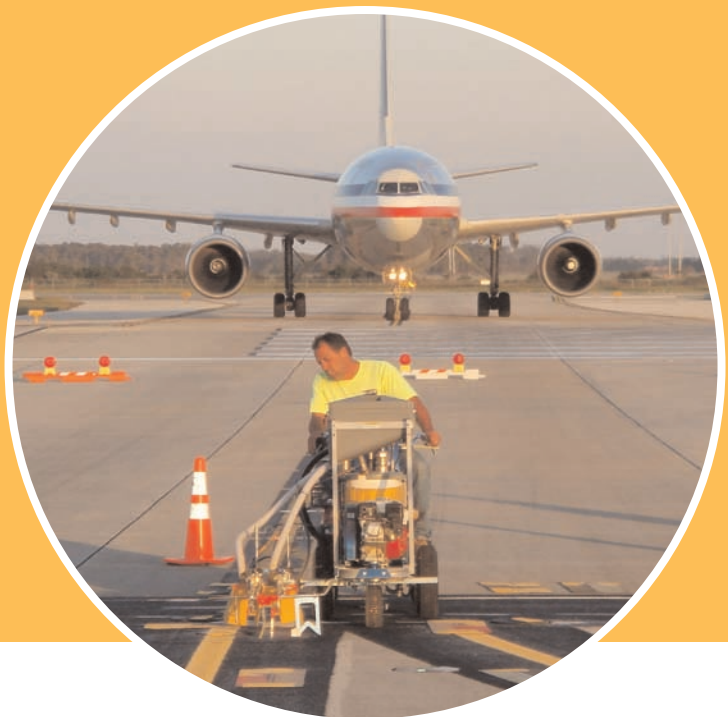
**John Russell**, *St. Louis County Striping Superintendent*

## Contact:

**Michael Boeger** *Global Commercial Manager*  
314.239.9183

**Ron Boeger** *Sales Manager*  
314.378.6511

**Betsy Hudson** *Aviation Sales*  
636.373.1926



**#50 Crestwood Executive Drive**  
**Suite #522**  
**Saint Louis, Missouri 63126**  
**800.325.9525**

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