

#### BENEFITS OF PLASMA

Plasma-shells™ produce a homogenous light source with no hot spots. This is a green technology fabricated using a low cost environmentally friendly process that does not use mercury.

#### ULTRA RUGGED

Unlike most lighting technology, the Plasma-shell™ light source is ultra rugged. It is resistant to shock, vibration, temperature extremes, pressure extremes, and harsh chemical environments.

#### ADAPTIVE DESIGN

The Plasma-shells™ can be applied to rigid or flexible surfaces. They can be tiled to fit any size or shape. Colors and electrode patterns can be varied to achieve specific effects.

## IST Plasma-Shells™ Lighting Applications



Plasma-shell™ lighting elements provide large area, homogenous lighting for:

- Architectural
- Decorative
- Industrial

The tiny light emitting elements are placed onto substrates to form large arrays of distributed light. The elements can be tightly packed to form a low-cost, continuous, and completely diffuse light source without concern of heat build up.

Plasma-shells™ are voltage controlled, so the power source can be remote from the array allowing for an array depth of less than 4mm. Plasma-shell™ tiles can be made to respond to touch, so they light at the touch of a finger.

Plasma-shells™ can be produced in a wide variety of colors including violet, blue, green, orange, and red. Colors can be mixed for various effects.

#### Plasma-shell™ Features:

- Flexible packaging
- Conformable
- Scalable to very large areas
- Low profile (4mm depth)
- Environmentally friendly (no mercury)
- Highly diffuse
- High surface area
- Low cost
- Typical life is 60,000 hours
- Hydrostatic crush strength > 15 Ksi
- Impact resistant to 750 lbs / sq inch
- Temperature resistant >1000° C

#### TECHNICAL SUPPORT

IST provides world class customer service to support our cutting edge technology.

#### QUALITY ASSURANCE

IST is an ISO 9001:2008 certified manufacturer and designer. We constantly strive to improve our processes to ensure the highest quality products and services.

#### CUSTOM SOLUTIONS

Our team of electrical and mechanical engineers can design and develop the solution that best fits your needs.

#### CONTACT

For more information on any of our products please visit us on the Web at:

[www.Plasma-spheres.com](http://www.Plasma-spheres.com)

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

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# Plasma-shell™ Technology



Plasma-shells™ are hollow gas encapsulating devices developed by Imaging Systems Technology (IST). When a voltage is applied across the walls of the shell, the encapsulated gas is energized into plasma. The Plasma-shells™ are electronic components that can be used as light emitters, switches, and sensors. Under a sister company, Deep Springs Technology (DST), hollow shells are being introduced into mechanical and structural applications including armor, buoyancy, and heat shielding.

## Current Plasma-shell™ Applications

IST is introducing the Plasma-shell™ components into a number of electronic markets including: germicidal, photo curing, lighting, displays, nuclear, and RF. Applications and products are listed below.

#### Plasma-Switched Frequency Selective Surface (PS-FSS)

Plasma-shell™ switches activate and deactivate electromagnetic aperture with fast response time for HPM/EMP shielding and low observable applications.

#### RF-Alert™ Sensor

Plasma-shell™ sensors are employed to provide a passive, low cost, RF monitoring system for personal safety. Applied to clothing, gear, or other surfaces, these devices can be used in industrial, military, or scientific settings.

#### IST Plasma-shell™ Display

Plasma-shell™ pixels are formed into low cost, rugged, large area arrays for use in large area digital signage, simulation, and scene generation.

#### IST Plasma-shell™ Light Tiles

Plasma-shell™ lighting elements offer a customizable, low profile, ultra rugged light source for decorative, architectural, and industrial applications.

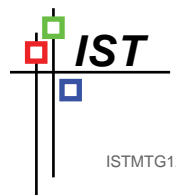
#### UV Light Source

Plasma-shell™ lighting elements provide large area, homogenous lighting for germicidal, photo-curing, medical treatment, and UV band communication.

## FABRICATION CAPABILITIES

Our Plasma-shell™ manufacturing process has many customizable parameters. Tight control over our process allows IST to produce shells to the specification of a wide variety of applications.

Controllable Parameters	Notes
Sizes	IST fabricates shells from 0.5 mm to 10 mm. Other sizes are possible. Typical applications call for sizes of 1- 4 mm
Wall thickness	Wall thickness is controllable. Typical applications call for wall thickness of 5 to 10 percent of shell diameter
Shapes	Practically any shape is possible. Typical shapes include cylinders, cubes, oblate spheroids, rectangular prisms, and other complex shapes
Materials	Glass, Metal, Ceramic. Typical materials include Y <sub>2</sub> O <sub>3</sub> , ZrO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , maraging steel, carbon steel, and various glasses
Layers	Shells can be fabricated with layered walls
Gas Fill	Inert gas, including mixtures with hydrogen up to 4%
Gas Pressure	0 – 500 Torr
Post Processing Capabilities	Coating, electroding, and application of shells onto substrates



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