Lithium Glass Scintillators – Markets & Applications

AST has a long history in neutron detection and imaging having started commercial production of its range of ^{6}Li and ^{7}Li glass scintillators in the1960's under the guise of Levy West Laboratories. AST is the largest manufacturer of glass scintillators worldwide and supplies nearly all the major scintillator companies with their glass scintillator product lines.

This technology plays a major role in high-energy physics but is also finding new applications within the security and instrumentation markets.

Demands for improved international security and exploration techniques are areas in which neutron detection is being deployed.

Applied Scintillation Technologies solution

AST's Lithium Glass Scintillators are the scintillator of choice in a multitude of applications. It predominately used with photo-multiplier tubes (PMT) and has proven itself to out perform other scintillator/detector solutions especially under harsh operating conditions.

Product range

AST's Lithium Glass Scintillator range consists of three main types based on the isotopic state of the lithium compound – natural ^{n}Li, ^{6}Li and ^{7}Li - summarised in the table below:

Lithium form	Natural ^{n}Li	^{6}Li	^{7}Li
AST designator	GS1 GS10 KG1	GS2 GS20 KG2	GS3 GS30 KG3

The most common varieties are GS20 and KG2 but GS20 and GS30 are commonly used in combination in handheld neutron/gamma discrimination instruments.

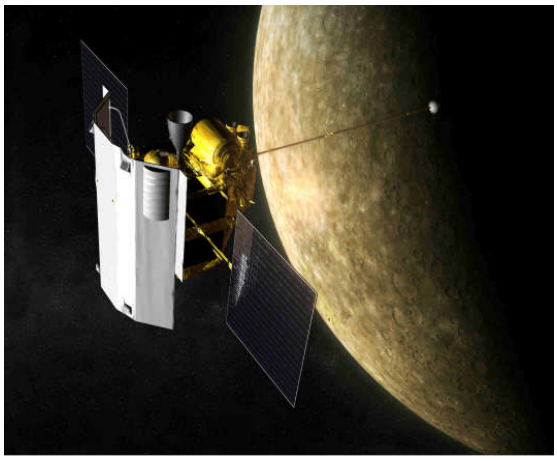
More information on the lithium contents and physical properties can be found on the AST website at www.appscintech.com

Applications:

Typical applications include:

- thermal neutron detection in oil well logging/exploration
- identification of “dirty-bomb” type threats in anti-terrorist control both ground and airborne
- crystallography in the study of crystal orientations and phase boundaries
- α, β, and γ detection in extreme environments such as space

A glass scintillators ability to work in extremes of temperature (up to 200°C) has made it ideal for the one of the techniques used in the detection of oil deposits. Fast neutrons are sent into the strata surrounding a drill bit and the resultant thermalised neutrons, from their interaction with oil-bearing rock, are detected by the glass scintillator giving a characteristic thermal neutron peak.



The demanding conditions found in space meant AST, as the premier manufacturer of glass scintillators, were selected to supply a specially matched pair of GS20 scintillators on the Messenger probe to Mercury. The scintillators are part of Gamma Ray and Neutron Spectrometer (GRNS), developed by Johns Hopkins University, which will map the surface of Mercury. “Is there H_2O on Mercury?” will be one of the questions this instrument hopes to answer.

Availability

AST stocks a small range of standard size scintillators for the more common glass types – GS20, GS30, and KG2 – available with either one or two surfaces polished for direct coupling to common PMT configurations.

Custom sizes are available up to a maximum single piece size of 155mm x 155mm x 2mm thick (finished size). The scintillators can be finished in a number of configurations ranging from simple discs or squares, hollow or solid cylinders, to multiple section arrays.

Applied Scintillation Technologies has the knowledge and expertise based on years of experience to partner you in the development of custom products for Neutron detection and imaging in Instrumentation & other applications.