Source Holders for Radiation-based Measurement
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VEGA is a world leader in radiation-based measurement solutions, with sixty years of experience and success in the industry. Different applications have different requirements, and VEGA recognizes the need to have a complete solution offering. Proper sizing and protection of the source is key to the measurement system’s success, so VEGA offers a variety of source holders for level, density, weight, and point level applications.

Advanced Design & Development
Gamma source placement and alignment is critical to measurement accuracy. Proper protection and shielding for the source ensures the health and safety of employees. The large selection of source holders allows VEGA Nuclear Application Engineers to specify appropriate and cost-effective solutions for each measurement need.

Licensing
VEGA has full-time staff available to assist customers, both experienced users and those new to the use of nuclear instrumentation, with their nuclear licensing needs. Guidance and information is readily provided with respect to license applications or amendments, and working with the Nuclear Regulatory Commission, Agreement State agencies, and regulatory bodies around the world. Assistance is also available with additional regulation requirements.

Source Reuse and Recycling
As a complete radiation-based measurement solutions provider, VEGA is committed to supporting total management of ownership. To fulfill this commitment to its customers, VEGA is pleased to offer the ReSource Program®, a responsible method of source life cycle management as an alternative to stockpiling and burial.

Through the ReSource Program, VEGA takes ownership of a source from the customer and has it recertified through the manufacturer for reuse. A proprietary, over-encapsulation process results in a “new” source without requiring the harvest of new materials. Risks associated with stockpiling and burial are eliminated for the customer, and the source is ready for use in a new application.

VEGA Nuclear and Field Services provide full support for the life of the radiation-based solutions. Top quality start-up service ensures proper function with all safety and compliance issues fully addressed. Fully certified service personnel inspect the source holder mounting, perform leak tests and shutter checks, and document the radiation levels around the equipment. The detector is also checked for functionality and is calibrated to the customer’s process.
How We Earn Your Business

You are the center of our commitment to value and service. We hold our customers in the highest regard. Every action and interaction undertaken by a VEGA employee is to ensure that the customer gets the most out of their experience. Service is our top priority.

Performance Guarantee
To demonstrate our commitment to specifying the right instrument for each application, VEGA Americas offers a Performance Guarantee — if our recommended solution does not perform exactly as expected, we’ll make it right.

The Right Instrument for Every Application
VEGA is committed to supplying instruments that work in all applications, not just those with ideal conditions. All new instruments are tested in extreme heat, dust, chemical, moisture, and cold environments before they are released. VEGA’s goal is to enable customers to achieve operational efficiency with every measured process.

24 Hour Support
The VEGA Field Service team is trained to provide telephone, email, or on-site customer service. Whether starting up, configuring, or troubleshooting the system, VEGA Field Service provides necessary steps to ensure the measuring device and its outputs run efficiently. Through service and training, VEGA supports all users throughout the life of the installed solutions.
## Models & Versions

### SH-F

**Fireproof source holder**
- Cast iron housing material with polyester powder coating
- Cast iron and tungsten shielding material
- Rotary shutter

<table>
<thead>
<tr>
<th>Source Activity</th>
<th>Maximum Source Activity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs-137</td>
<td>2,000 mCi (74 GBq)</td>
</tr>
<tr>
<td>Co-60</td>
<td>25 mCi (0.92 GBq)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fire Resistance</th>
<th>1,472°F (800°C) for 30 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collimation Angle</td>
<td>0°, 30°, 45°, 60°</td>
</tr>
</tbody>
</table>

### SHLD

**Lightweight, cast steel source holder**
- Carbon steel housing material with polyester powder coating, 316 stainless steel (optional)
- Lead shielding material
- Rotary shutter

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<tr>
<th>Source Activity</th>
<th>Maximum Source Activity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs-137</td>
<td>5,000 mCi (185 GBq)</td>
</tr>
<tr>
<td>Co-60</td>
<td>80 mCi (2.96 GBq)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Fire Resistance</th>
<th>1,000°F (538°C) for 5 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collimation Angle</td>
<td>0°, 15°, 30°, 45°, 60°</td>
</tr>
</tbody>
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### SHLG

**Source holder with maximum shielding**
- Low carbon steel housing material with polyester powder coating or stainless steel
- Lead shielding material
- Push/pull handle

<table>
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<tr>
<th>Source Activity</th>
<th>Maximum Source Activity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs-137</td>
<td>10,000 mCi (370 GBq)</td>
</tr>
<tr>
<td>Co-60</td>
<td>500 mCi (18.5 GBq)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Fire Resistance</th>
<th>1,000°F (538°C) for 5 minutes</th>
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</thead>
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<tr>
<td>Collimation Angle</td>
<td>0°, 30°, 45°</td>
</tr>
</tbody>
</table>
Models & Versions

**SHLM**

*Source holder for measurement in a dry well*
- Carbon steel housing material with polyester powder coating
- Lead shielding material
- Cable with handle or rod

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<th>Activity (mCi)</th>
<th>Activity (GBq)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs-137</td>
<td>10,000</td>
<td>370</td>
</tr>
<tr>
<td>Co-60</td>
<td>500</td>
<td>18.5</td>
</tr>
</tbody>
</table>

*Fire Resistance: 1,000°F (538°C) for 5 minutes*

*Collimation Angle: Not applicable*

**SR**

*Source holder ideal for point level and density measurements*
- Low carbon steel housing material with epoxy powder coating or 316 stainless steel (optional)
- Lead shielding material
- Rotary shutter

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<th>Activity (mCi)</th>
<th>Activity (GBq)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cs-137</td>
<td>5,000</td>
<td>185</td>
</tr>
<tr>
<td>Co-60</td>
<td>30</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*Fire Resistance: 1,000°F (538°C) for 5 minutes*

*Collimation Angle: 0°*
About Radiation-based Measurement

Source holders are a component of a radiation-based measurement system, working with one or more detectors to produce a process measurement. A system comprised of a source holder and detector provides a reliable continuous or point level, density, interface, or weight measurement with process values viewable on site or through a control system.

Why Use Radiation-based Measurement?
Radiation-based measurement is a proven technology with thousands of installed applications. Unlike most other level and density technologies, nuclear gauges avoid contact with process conditions. Processes with extreme temperature, pressure, or corrosive properties have no adverse effects on nuclear gauges. Radiation-based technology installs with no process shutdown and generally requires no modification to existing vessels or piping, reducing total installation cost.

The Radiation-based Measurement Principle of Operation

Source Output
A source holder and detector are mounted on opposite sides of the process vessel. A cesium-137 or cobalt-60 isotope is used as the source of gamma radiation that is passed as a collimated beam through the process vessel and material toward the detector.

Detector Inference
As the process level rises, it shields the detector from the radiation. The more radiation the detector receives, the lower the process density and vice versa. The NaI crystal on the opposite side of the tank infers the density based on the radiation received.
Application Areas

Several source holders provide reliable source management for density and point level applications. Selection of the source holder and source activity are dependent on the specific application’s needs. The systems are non-contact and in most cases require no alterations to the process vessels or downtime for installation.

Slurry Flow
Tracking percent solids in slurry transport pipelines ensures that the process is running at optimum capacity. A MiniTrac density detector bracketed with an SHLD source holder mounts around a vertical section of the pipe to provide the measurement. The amount of radiation from the SHLD that passes through the slurry is detected by the MiniTrac, from which the percent solids measurement is generated.

- Lightweight source holder installs quickly and easily
- Single bracket system mounts around pipe, requiring no special modification

Desalters
Separation units in oil & gas and chemical industries take raw process materials and use the variance in specific gravities to create layers. This critical process must be tracked to control output, making proper source holder selection imperative. The SHLM source holder inserts multiple sources into a dry well that pairs with a series of MiniTrac density detectors to create the Multi-Point Density Array system.

- Complete system provides multiple points to generate a density profile
- Internal components require only one dry well, reducing installation costs
- Reliable interface control applies to many separation unit types
“VEGA has been helping customers manage their source holders for over 60 years. From specification and licensing to decommissioning and disposal, our support team simplifies ownership and gives customers piece of mind.”

**Plugged Chute Detection**
A VEGA nuclear switching system is a reliable solution for plugged chute detection. Comprised of an SR source holder and PoinTrac detector, the system mounts external to the vessel and measures through the vessel walls to detect plugging.

- Non-contact system does not interfere with process
- Easy on/off shutter for safe operation
- Level detection system can also be used as a high level alarm

**Fly Ash Hopper**
Hoppers in the power industry collect fly ash from the precipitator process and are monitored to avoid overfill. An SHLD with a PoinTrac point switch are an ideal radiation-based high level alarm. The measurement system protects the precipitator process from backup, and is not affected by process conditions.

- Non-contact system measures through hopper walls
- Simple mounting procedure reduces installation time and cost
Application Areas

For level, weight, or combination system measurements, the best source holder is selected for the application. The radiation beam is collimated to avoid stray radiation, and multiple measurements, such as continuous level and density, can be derived from a single source. Source activities are sized as small as possible to produce the measurement, and are safely contained in the source holder.

Curved Vessel
Level measurement in a curved vessel can be difficult due to its shape. An SHLD source holder and a flexible FiberTrac detector mount to the contour of the vessel, allowing a single source holder and detector combination to produce the measurement. The SHLD is lightweight for ease of installation.

- Single source holder and detector minimizes cost
- Single system measures up to 23 feet of level

Reactors
In applications where a short measurement span is required, level measurement with a SoliTrac and SH-F measurement system is ideal. The system measures a critical span in reaction applications, or where thick walls and other variables may be present between the source and detector.

- Iron and Tungsten shielding provides high fire resistance
- Highly sensitive system offers increased accuracy
“At VEGA, we are strongly committed to radiation safety and responsibility. Our radiation safety training classes, source recycling program, and extensive field service capability demonstrate our commitment.”

**Coke Drum**
Coking units require extreme heat during operation, making radiation-based measurement the ideal solution for tracking level. SHLG source holders are paired with FiberTrac detectors for continuous measurement of the coke drum. The SHLG is a plunger-type source holder, safely retracting the potentially large source into the container when not in use.

- Multiple collimation angles fit different application requirements
- Use with density detectors for complete coke drum control

**Wood Chip Conveyor**
For reliable monitoring during pulp and paper processing, tracking material on screw or belt conveyors is important. An SHLD and WeighTrac radiation-based measurement system measures the amount of material passing on the conveyor. When used in conjunction with a tachometer, the system provides real time mass flow data for controlling speeds of the conveyor.

- Compact, lightweight source holder installs quickly
- Approved for North American market as a General License option in certain applications