



SENTINEL™ IRIDIUM-192 INDUSTRIAL RADIOISOTOPES.

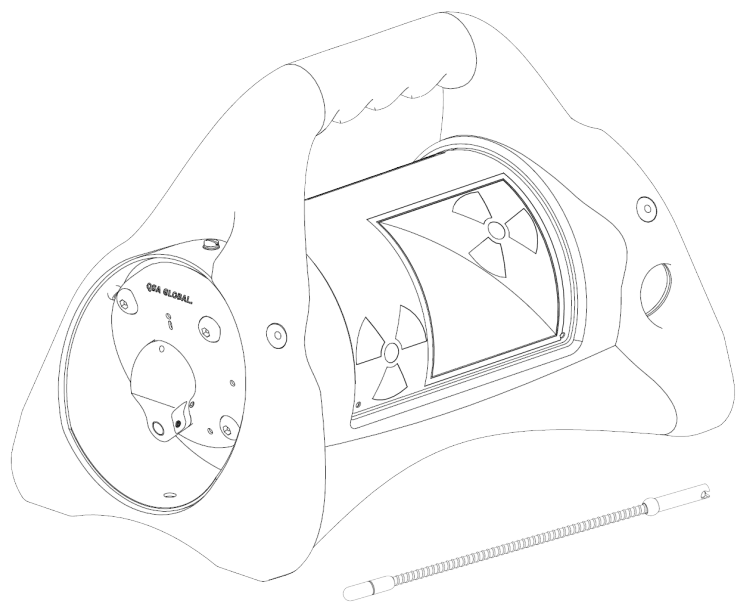
QSA Global, Inc. is the world-leading supplier of SENTINEL Iridium-192 (Ir-192) sealed radioisotope sources to the industrial gamma radiography industry. Our exclusive and diversified supply chain ensures a reliable, long-term supply of SENTINEL Ir-192 to our customers.

Available up to 240 Ci (8.88 TBq) activity, our radioisotope sources are double-encapsulated* and laser welded for superior quality and safety. Custom activities are also available to meet your specific application needs.

QSA Global, Inc.'s natural and enriched Iridium-192 sources are constructed using iridium metal discs or pellets of uniform size in a welded stainless steel capsule. Utilizing enriched Ir-192 produces smaller focal sizes for optimum image quality.

SENTINEL Ir-192 is designed for use with steel thickness ranges of 0.39 - 3.54 in (10 - 90 mm) per ISO 5579:2013.

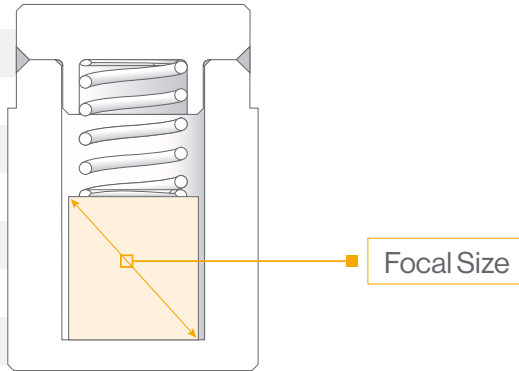
* Select Ir-192 sealed sources are single-encapsulated



ACTIVITIES & FOCAL SIZES.

NATURAL IRIDIUM-192 SOURCES

| Minimum Focal Size in (mm) | Nominal Activities Ci (TBq) |
|-------------------------------|--------------------------------|
| 0.181 (4.60) | 140 (5.18) |
| 0.178 (4.52) | 130 (4.81) |
| 0.171 (4.34) | 120 (4.44) |
| 0.160 (4.06) | 110 (4.07) |
| 0.154 (3.91) | 100 (3.70) |
| 0.148 (3.76) | 90 (3.33) |
| 0.142 (3.61) | 80 (3.00) |
| 0.137 (3.48) | 70 (2.59) |
| 0.132 (3.35) | 60 (2.22) |
| 0.128 (3.25) | 50 (1.85) |
| 0.124 (3.15) | 45 (1.67) |
| 0.123 (3.12) | 40 (1.48) |
| 0.098 (2.49) | 35 (1.30) |
| 0.091 (2.31) | 30 (1.11) |



ENRICHED IRIDIUM-192 SOURCES

| Maximum Focal Size in (mm) | Nominal Activities Ci (TBq) |
|---------------------------------------------------------|--------------------------------|
| | 300 (11.10) |
| | 280 (10.36) |
| | 260 (9.62) |
| | 240 (8.88) |
| These sources are available in custom Focal Sizes | 220 (8.14) |
| | 200 (7.40) |
| | 190 (7.03) |
| | 180 (6.66) |
| | 160 (5.92) |
| 0.152 (3.76) | 140 (5.18) |
| 0.145 (3.51) | 130 (4.81) |
| 0.138 (3.43) | 120 (4.44) |
| 0.138 (3.43) | 110 (4.07) |
| 0.132 (3.28) | 100 (3.70) |
| 0.127 (3.15) | 90 (3.33) |
| 0.122 (3.10) | 80 (3.00) |
| 0.119 (3.02) | 70 (2.59) |
| 0.115 (2.92) | 60 (2.22) |
| 0.096 (2.44) | 50 (1.85) |
| 0.096 (2.44) | 45 (1.67) |
| 0.093 (2.36) | 40 (1.48) |
| 0.088 (2.24) | 35 (1.30) |
| 0.084 (2.13) | 30 (1.11) |
| 0.077 (1.96) | 25 (925 GBq) |
| 0.071 (0.80) | 20 (740 GBq) |
| 0.066 (1.68) | 15 (555 GBq) |
| 0.062 (1.57) | 10 (370 GBq) |
| 0.056 (1.42) | 2-7 (74 - 259 GBq) |
| 0.028 (0.71) | 1 (37 GBq) |



SPECIFICATIONS

GAMMA-RAY SOURCE PROJECTORS

| Device | Assembly Number | Maximum Capacity Ci (TBq) |
|---------------------------|-----------------|---------------------------|
| SENTINEL 880 Series Delta | A424-9 | 150 (5.55) |
| SENTINEL 880 Series Elite | A424-9 | 50 (1.85) |
| SENTINEL 880 Series Omega | A424-9 | 15 (0.55) |
| SENTINEL 959M SCAR | 875XX | 15 (0.55) |
| SENTINEL 959 SCAR | 95904 | 15 (0.55) |
| SENTINEL 865 | 86520 | 240 (8.88) |
| INC IR-100 | 87703 | 120 (4.44) |
| SPEC-150® | 969 | 150 (5.55) |
| GammaMat TI Series | 875XX | 100 (3.7) |

Ir-192 PROPERTIES

| | |
|----------------------------------------------|-------------------------------------------------|
| Gamma Energy Range | 206 - 612 keV |
| Steel Thickness | 0.39 - 3.54 in (10 - 90 mm) |
| Isotope Output at 1 meter per Curie (37 GBq) | 0.48 R/hr (4.80 mSv/hr) |
| Isotope Output at 1 foot per Curie (37 GBq) | 5.2 R/hr (52 mSv/hr) |
| Iridium-192 Half-Life | 74 days |
| Special Form Certifications | USA/0392/S-96 USA/0179/S-96 USA/0335/S-96 |

SELECTED ATTENUATION DATA

| Material | Material Density g/cm ³ | Half-Value Thickness in (mm) |
|----------|------------------------------------|------------------------------|
| Concrete | 2.35 | 1.7 (43.2) |
| Steel | 7.80 | 0.512 (13.0) |
| Lead | 11.34 | 0.200 (5.1) |
| Tungsten | 17.80 | 0.130 (3.3) |

TRANSPORTING ISOTOPES

QSA Global, Inc. distributes radioisotope sources worldwide by utilizing the industry's largest fleet of source changers. Source changers are available to deliver a single source up to ten sources in a Type A/B(U) container for device reloads at your facility or at one of QSA Global, Inc.'s authorized service centers.

LOADING & UNLOADING

QSA Global, Inc. offers a variety of options for SENTINEL Ir-192 source changes to minimize downtime of your assets. QSA Global, Inc. and our authorized distributors can reload your SENTINEL Ir-192 device at local facilities around the world by trained technicians or sources can be delivered directly to your facility for reload by your trained technicians.

ISOTOPE DISPOSITION

Radioactive materials that are no longer required must be transferred to a licensed recipient for final disposition. QSA Global, Inc. provides a one for one exchange on SENTINEL Ir-192 radioisotope sources.

For more information
visit us at
qsa-global.com