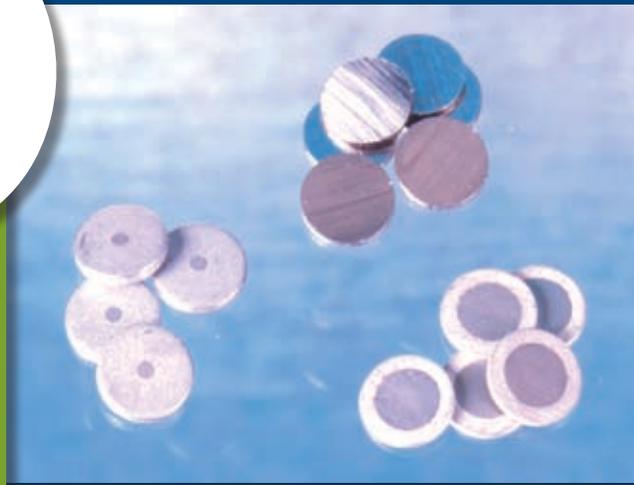


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GammaMat Hybrid

The GammaMat Hybrid is a unique NDT gamma imaging system for use with either Iridium-192 or Selenium-75 sources.

The Best of Both Worlds

Integrating the Best of Both Worlds, the GammaMat Hybrid camera is unlike most gamma radiography cameras on the market today. With the ability to accept either Iridium-192 or Selenium-75 sources, the GammaMat Hybrid offers unparalleled flexibility and ease of use. Its compact design integrates innovative features while keeping weight equivalent to that of other GammaMat systems and less than competitive devices when loaded with 4.44 TBq (120 Ci).

Latest in Innovation

The GammaMat Hybrid integrates an improved source holder path based on a new helical channel design. This innovation allows smoother movement of the pigtail inside the device, adding significant safety and ease-of-use factors for the operator. In addition, the helical source holder path makes maintenance procedures much easier, often without the use of a borescope.

Safety – Always a Priority

A three color source signal indicator provides the user with a clear visual guide as to the position of the source at any given time:

- **EXPOSURE MODE (red):** indicates the source is outside the device
- **ALERT MODE (yellow):** indicates the source is inside the device and the device is unlocked
- **SAFETY MODE (green):** indicates the source is inside the device and the device is fully locked

This new feature provides significant improvements in operator safety not offered in other systems.

Why Choose the GammaMat Hybrid?

The technical innovations of being able to use Iridium-192 or Selenium-75 and increased operator safety make the GammaMat Hybrid a clear leader in today's market. With its new features and overall flexibility, the GammaMat Hybrid is the obvious choice.

Specifications

- **Basic Construction Standards:**
 - ISO 3999 compliant
- **Isotopes:**
 - Ir-192 and Se-75 under special form:
 - Ir-192 half-life..... 73.8 days
 - Se-75 half-life 119.8 days
- **Activity:**
 - Ir-192 4.44 TBq (120 Ci)
 - Se-75 4.44 TBq (120 Ci)
- **Surface Dose Rate:**
 - Max. 2 mSv/h
- **Total Weight:**
 - 22 kg (48.5 lb)
- **DU Weight:**
 - 13 kg (28.7 lb)
- **Overall Dimensions:**
 - Length 302 mm (11.89 in)
 - Width 124 mm (4.88 in)
 - Height 207 mm (8.15 in)

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GammaMat M

Self-propelled Isotope Crawler for Pipeline Radiography

GammaMat M crawlers permit high quality cost-effective testing that keeps pace with pipeline production fabrication. In today's pipeline construction work, an exact radiography inspection of circumferential welds is required. To obtain radiographs of sufficiently high resolution, the source material (Ir-192 or Se-75) must be accurately centered inside the circumferential weld. The completely self-contained GammaMat M Pipeline Crawler fully satisfies these requirements. In addition, it provides the advantages of a single shot inspection for each weld, leading to a tremendous increase in the inspection speed.

Two Available Sizes

The GammaMat M Pipeline Crawler is available in two sizes:

- GammaMat M6 for pipe diameters of 6 in to 18 in
- GammaMat M18 for pipe diameters of 18 in to 60 in

Externally-controlled Functions

An external radioscope control unit is used to control the following crawler functions:

Proceed – Retract – Stop – Expose

Fully-integrated Components

The design of the crawler combines all necessary components for drive, control, power supply and radiation shielding of the Ir-192 or Se-75 source, in one integrated unit.



Unparalleled Safety

The source immediately returns to shielding in the event of a battery or electronic failure. In addition, an independent safety circuit ensures that every exposure period is terminated after 20 minutes. Using the maximum Ir-192 source strength, the dose rate at 10 m (11 yd) from the exposed weld is only 0.05 mSv/h.

Ten seconds after the exposure command has been given by a radiation pulse from the command isotope – enough time for the operator to leave the safety zone – the exposure is started automatically. During the exposure, which can be pre-selected up to a duration of 1,000 seconds, a visual and audible alarm is activated.

Autonomous, Lightweight and Robust

The GammaMat M operates with low power consumption. A pipeline length of approximately 2 kilometers (1.25 miles) can be inspected without recharging the batteries. The crawler is equipped with two sets of batteries facilitating uninterrupted operations by the exchange of the depleted batteries. Optimised shielding design, advanced materials, and high technology electronics result in a lightweight and robust device. The device is capable of climbing a 45% grade.

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GammaMat M — *continued*

Available Models		
Model	GammaMat M6	GammaMat M18
Max Loading		
Ir-192	2.20 TBq (60 Ci)	3.70 TBq (100 Ci)
Se-75	3.00 TBq (80 Ci)	3.00 TBq (80 Ci)
Total Weight		
Ir-192 head	36.0 kg (78 lb)	80.0 kg (178 lb)
Se-75 head	20.0 kg (44 lb)	63.0 kg (138 lb)

GammaMat M Specifications and Accessories		
Crawler	GammaMat M6	GammaMat M18
Range of pipe diameters	6 in – 18 in	18 in – 60 in
Dimensions (overall length x O.D.)	1.25 m x 0.14 m	1.35 m x 0.36 m
Drive motor	24 V/65 W	24 V/140 W
Batteries (sealed)	24 V/7 Ah	24 V/24 Ah
Drive wheel diameter	80 mm (3.15 in)	140 mm (5.51 in)
Maximum pipeline length to be examined without battery recharge weld to weld distance 12 m (49 feet)	Approx. 2 km (1.25 mi)	Approx. 2 km (1.25 mi)
Crawler speed (horizontal)	Approx. 14 m/min Approx. 15 yd/min	Approx. 10 m/min Approx. 11 yd/min
Maximum inclination (in dry steel pipe)	45%	45%
Minimum radius of curvature	Approx. 10 x D	Approx. 10 x D
Precision of alignment with weld position	± 5 mm (0.2 in)	± 5 mm (0.2 in)
Shielding: depleted uranium, Maximum activity for crawler Ir-192 Se-75	60 Ci (2.20 TBq) 80 Ci (3.00 TBq)	100 Ci (3.70 TBq) 80 Ci (3.00 TBq)
Opening angle of radial beam	60°	60°
Delay time between exposure command and exposure start	Approx. 10 sec.	Approx. 10 sec.
Time of exposure (continuously adjustable)	1 – 1000 sec.	1 – 1000 sec.



External Control Unit	Max Loading	Total Weight
(Command modes: Proceed, Retract, Stop, Expose) Command signals are generated by weak gamma source, sufficient for wall thickness up to 25 mm (1") command isotope Cs-137.	Approx. 100 mCi (3.70 GBq)	Approx. 250 mCi (9.25 GBq) (max. 350 mCi/12.95)
Weight	6.0 kg (13 lb)	6.0 kg (13 lb)
Localising and warning device GammaLux M	Lamp and horn	Lamp and horn
Batteries (sealed) 12 hours continuous operation	12 V/2 Ah	12 V/2 Ah
Weight	4.0 kg (8.8 lb)	4.0 kg (8.8 lb)
Charger – with time control for charging (for the batteries of the crawler and the localising device)		
Connection voltage	220 V/50 Hz	220 V 50 Hz
Optional	110 V/60 Hz	110 V/60 Hz
Charging current	0.7 A/0.2 A	Max. 2 A/0.2 A
Weight	4.0 kg (8.8 lb)	5.0 kg (11 lb)
Ir-192 head Type B(U)		
Weight	± 48 kg (106 lb)	± 52 kg (115 lb)
Se-75 head Type A		
Weight	± 14 kg (31 lb)	± 14 kg (31 lb)

Precise Positioning for High Accuracy

The crawler allows accurate positioning of the Ir-192 or Se-75 source at the axis of the pipe, over the entire range of pipe sizes. The source is positioned exactly in the plane of the pipe weld by highly-collimated control beams. Any vertical deviation is automatically corrected.

Easily Removed

Even if one of the control circuits fails, the electric control permits the crawler to be moved out of the pipe so that no cutting of the pipeline is required. Should the crawler come across an obstacle in the pipe, or if the humidity sensor reacts in any way, then it will change direction and come to rest approximately 4-5 m (4.4 – 5.5 yd), awaiting a further command.

Easy Device Location Detection

An accompanying GammaLux M localizing device can be used to determine the position of the crawler in the pipeline at any time. A light signal on the GammaLux M indicates that the crawler is positioned and ready for exposure. In addition to this, the crawler emits a continuous acoustic signal. Five different signals constantly inform the operator about the working condition of the crawler.

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GammaMat SE

Designed for unparalleled handiness, the GammaMat SE gamma projector offers unique and unrivalled portability not found in other systems.

This rugged, light-weight and easy-to-use gamma projector uses Selenium-75 (Se-75) as its radiation source. Se-75 provides greatly improved image quality over other isotopes commonly used, a longer half-life and simplified radiation protection due to its lower gamma energy. Compared to projectors that use higher energy gamma sources, the GammaMat SE loaded with a Se-75 radiation source can be safely used in smaller controlled test areas. All of these features result in substantial cost savings to the user.

Higher Image Quality using Selenium-75

Se-75 provides significantly higher image quality than Ir-192 imaging systems. The gamma ray spectrum of Se-75 ranges from 66 keV to 401 keV, with two lines of high intensity at 136 keV and 265 keV dominating this spectrum. These radiation characteristics are between Yb-169 towards the lower energies and Ir-192 towards the higher energies. The wide gamma spectrum of Se-75 makes it an ideal choice for gamma radiography, especially for a steel wall thickness in the range of 5 mm to 30 mm (0.2 in to 1.18 in).

Safety – Always a Priority

A bright green/red indicator, showing whether the source is in the safe position, is clearly visible from a distance. In addition, the unique securing mechanism of the GammaMat SE detects and then indicates when the source capsule has been safely returned to its secure position.



Features

- Highly Portable Se-75 Gamma Ray Projector
- Improved image quality using Se-75 as its gamma source
- Meets or exceeds ISO 3999-2000, class P, category 2
- Weighing only 7.2 kg (15.9 lb) and able to be loaded with a 4.44 TBq Se-75 source, the GammaMat SE is your obvious choice for radiography work.

Regulatory Approvals

The GammaMat SE gamma ray projector using Se-75, is designed to meet or exceed the latest versions of various national and international safety standards, including ISO 3999:2000.

GammaMat SE Specifications

- **Source:** Selenium-75 (Se-75)
- **Activity:**
 - Type A : 3.81 TBq (82 Ci)
 - Type B : 4.44 TBq (120 Ci)
- **Half-life:** 119.8 days
- **Surface Dose Rate:** Maximum 2.0 mSv/h
- Meets or exceeds ISO 3999:2000, class P, category 2
- **Depleted Uranium Weight:** 2.7 kg (6 lb)
- **Total Weight:** 7.2 kg (15.9 lb)
- **Dimensions:**
 - Length: 220 mm (8.66 in)
 - Width: 100 mm (3.94 in)
 - Height: 175 mm (6.89 in)

Accessories

- Remote controls cables: 5, 10, 15 meters (5.5, 11, 16.5 yards)
- Guide tubes: 1, 2, 3, 5, 10 meters (1.1, 2.2, 3.3, 5.5, 11 yards)
- Collimators: 60°, 90° and 360°
- Special low-weight tungsten collimators for panoramic and directional beam applications
- Close Proximity Collimator, allowing radiography sessions without interfering with other operations (no down time, increased productivity)
- A wide variety of accessories for various applications are also available.
- Please contact your Best NDT sales representative for a complete listing.

Available Models	Max Loading	Total Weight
GammaMat SE TYPE A	3.00 TBq (80 Ci) Se-75	7.2 kg (15.8 lb)
GammaMat SE TYPE B(U)	4.44 TBq (120 Ci) Se-75	7.2 kg (15.8 lb)

Notes:

- TBq is terabecquerel, or 10^{12} Becquerel
- Ci = 0.037 TBq
- 1 mSv = 0.001 Sv

GammaMat SE includes the following basic accessories:

21-00212 Source Holder

21-00213 Guide Tube Connector

23-00022 Go/No-Go Gauge for Source Holder & Ball Pin

Portable Projector

21-00362

GammaMat SE, 3.00TBq (80Ci) Se-75, Type A

21-00363

GammaMat SE, 4.50TBq (120Ci) Se-75, Type B(U) RUS/5373/B(U)-96



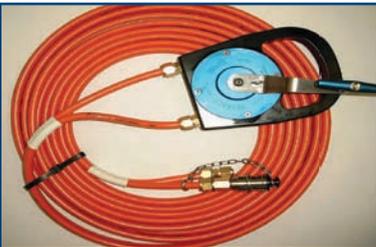
Remote Controls

21-00400

Generation II Remote Control, 5m, Series TSI/SE

21-00401

Generation II Remote Control, 10m, Series TSI/SE



21-00402

Generation II Remote Control, 15m, Series TSI/SE

21-00510

Stand for Remote Control Generation II



Guide Tubes, Extension Tubes and Accessories

21-00249

Guide Tube, 1m, flexible, M18x1.5

21-00242

Guide Tube, 2m, flexible, M18x1.5

21-00273

Guide Tube, 3m, flexible, M18x1.5

21-00251

Guide Tube, 5m, flexible, M18x1.5

21-00252

Guide Tube, 10m, flexible, M18x1.5



Guide Tubes, Extension Tubes and Accessories *continued*

21-00235

Double Nipple for Connection of two Guide Tubes, M18x1.5



21-00234

Quick Connector for Connection of two Guide Tubes, M18x1.5



21-00150

Steel Extension Tube 300 Se/Ir/Co, M18x1.5

21-00161

Steel Extension Tube 500 Se/Ir/Co, M18x1.5

21-00152

Steel Extension Tube 1000 Se/Ir/Co, M18x1.5

Steel Extension Tubes require two Threaded Sleeves, M18x1.5 for Connection



21-00238

Threaded Sleeve, M18x1.5



21-00253

Guide Tube, 1m, adjustable, M14x1

21-00254

Guide Tube, 2m, Adjustable, M14x1

21-00255

Guide Tube, 3m, Adjustable, M14x1

21-00256

Guide Tube, 5m, Adjustable, M14x1

21-00257

Guide Tube, 10m, Adjustable, M14x1



21-00132

Double Nipple for Connection of two Guide Tubes, M14x1



Guide Tubes, Extension Tubes and Accessories *continued*

21-00208

Steel Extension Tube 300 Se/lr, M14x1

21-00148

Steel Extension Tube 500 Se/lr, M14x1

21-00149

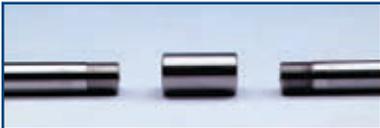
Steel Extension Tube 1000 Se/lr, M14x1

Steel Extension Tubes require two Threaded Sleeves, M14x1 for Connection



21-00214

Threaded Sleeve, M14X1



Guide Tube Connectors and Adaptors

21-00213

Guide Tube Connector, SE (M18x1.5)



21-00240

Transition Fit, M14x1/M18x1.5

Additionally required for Adjustable Guide Tubes



Source Terminals

21-00216

Source Terminal 45 Se, M18x1.5

21-00218

Source Terminal 120 Se, M18x1.5

21-00201

Source Terminal 300 Se, M18x1.5

21-00225

Source Terminal 45 Se, M14x1

21-00210

Source Terminal 120 Se, M14x1

21-00217

Source Terminal 300 Se, M14x1





Accessories continued

Link Type Source Holders

21-00212

Link Type Source holder, Series SE



23-00022

Go/No-Go Gauge for Source holder and Ball Pin



Tungsten Collimators for Se-75

21-00222

Plug-on Collimator Se, side Emission 90°

21-00223

Plug-on Collimator Se, side Emission 60°

21-00224

Plug-on Collimator Se, panoramic Emission 360°



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GammaMat TSI/1

GammaMat TSI/1 Specifications

Basic Construction Standards

DIN 45115 part 4 and ISO 3999:2000, class P, category 2

Isotope

Ir-192 in special form half-life: 73.8 days

Activity

TSI 3/1 3.00 TBq (80 Ci)
 TSI 5/1 5.00 TBq (135 Ci)

Does Rate at the Surface

Maximum 2 mSv/h

Applicable Temperature Range

-40°C up to +50°C
 Exceeding ISO 3999:2000, 5.1.4

Depleted Uranium Weight

TSI 3/1 10.9 kg (24 lb)
 TSI 5/1 13.0 kg (28.4 lb)

Overall Dimensions

Length 350 mm (13.75 in)
 Width 132 mm (5.75 in)
 Height 222 mm (8.75 in)

Material Used

Outer shell: CrNi steel,
 Aluminum casting

Shielding

Depleted Uranium Maximum 0.4% U-235
 (Specific activity < 18.50 MGq/kg)

Accessories

Remote controls: 5, 10, 15 m (5.5, 11, 16 yd)
 Guide tubes: 1, 2, 3, 5 and 10 m
 Collimators: 60°, 90° and 360°



Compact, Lightweight Ir-192 Gamma Ray Projector

The GammaMat TSI/1 is the latest model in the GammaMat Series. It is the product of many years of development of gamma radiography devices for the universal application of Ir-192 sources. It incorporates a straight source channel, and a completely new, patented radiation labyrinth made of tungsten. The GammaMat TSI/1 uses no uranium moving parts, and it is smaller and lighter than the conventional S-channel devices. The GammaMat TSI/1 meets all the requirements of the ISO 3999:2000 standards.

Unparalleled Safety

A green/red indicator shows whether the source is in the safe position. This indicator is easily visible, even from a distance. The automated source securing mechanism of the GammaMat TSI/1 does more than detect the return of the source holder into the unit, it checks the arrival of the source capsule into its safe position.

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Available Models		
Model	Max Loading	Total Weight
TSI 3/1	3.00 TBq (80 Ci) Ir-192	20.0 kg (44.0 lb)
TSI 5/1	5.00 TBq (135 Ci) Ir-192	22.0 kg (48.4 lb)

Safe

The GammaMat TSI/1 self-shielding link-type source holder and patented radiation labyrinth keep radiation far below 2 mSv/h at the front and back ends of the source channel. The GammaMat TSI/1 is the only device to incorporate a real source position indicator. The source holder can only be released if the remote control and the source guide tube are properly connected. When in the retracted position, the source holder is automatically locked and the source is shielded.

Regulatory Approvals

The GammaMat TSI/1 is type B(U) approved and satisfies all the requirements of the ISO 3999:2000, ANSI N43.9, N432 (United States) and DIN 54115 (Germany).

GammaMat TSI includes the following basic accessories:

21-00122 Source Holder

21-00069 Guide Tube Connector

23-00022 Go/No-Go Gauge for Source Holder & Ball Pin

21-00237 Wrench for Connectors

Portable Projector

21-00360

GammaMat TSI3/1, 3.00TBq (80Ci) Ir-192, CDN/2086/B(U)-96

21-00361

GammaMat TSI5/1, 5.00TBq (135Ci) Ir-192, CDN/2086/B(U)-96



Remote Controls

21-00400

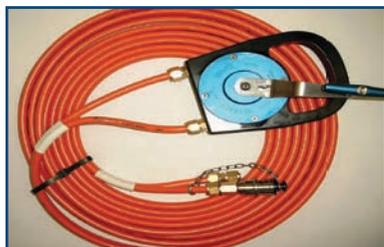
Generation II Remote Control, 5m, Series TSI/SE

21-00401

Generation II Remote Control, 10m, Series TSI/SE

21-00402

Generation II Remote Control, 15m, Series TSI/SE



21-00510

Stand for Remote Control Generation II



Guide Tubes, Extension Tubes and Accessories

21-00249

Guide Tube, 1m, flexible, M18x1.5

21-00242

Guide Tube, 2m, flexible, M18x1.5

21-00273

Guide Tube, 3m, flexible, M18x1.5

21-00251

Guide Tube, 5m, flexible, M18x1.5

21-00252

Guide Tube, 10m, flexible, M18x1.5



Guide Tubes, Extension Tubes and Accessories *continued*

21-00235

Double Nipple for Connection of two Guide Tubes, M18x1.5



21-00234

Quick Connector for Connection of two Guide Tubes, M18x1.5



21-00150

Steel Extension Tube 300 Se/Ir/Co, M18x1.5

21-00161

Steel Extension Tube 500 Se/Ir/Co, M18x1.5

21-00152

Steel Extension Tube 1000 Se/Ir/Co, M18x1.5

Steel Extension Tubes require two Threaded Sleeves, M18x1.5 for Connection



21-00238

Threaded Sleeve, M18x1.5



21-00253

Guide Tube, 1m, adjustable, M14x1

21-00254

Guide Tube, 2m, Adjustable, M14x1

21-00255

Guide Tube, 3m, Adjustable, M14x1

21-00256

Guide Tube, 5m, Adjustable, M14x1

21-00257

Guide Tube, 10m, Adjustable, M14x1



21-00132

Double Nipple for Connection of two Guide Tubes, M14x1



Guide Tubes, Extension Tubes and Accessories *continued*

21-00208

Steel Extension Tube 300 Se/Ir, M14x1

21-00148

Steel Extension Tube 500 Se/Ir, M14x1

21-00149

Steel Extension Tube 1000 Se/Ir, M14x1

Steel Extension Tubes require two Threaded Sleeves, M14x1 for Connection



21-00214

Threaded Sleeve, M14X1



Guide Tube Connectors and Adaptors

21-00069

Guide Tube Connector, Series TI/TSI (M18x1.5)



21-00240

Transition Fit, M14x1/M18x1.5

Additionally required for Adjustable Guide Tubes



Source Terminals

21-00018

Source Terminal 40 Ir, M14x1

21-00232

Source Terminal 150 Ir, M14x1

21-00248

Source Terminal 300 Ir, M14x1

21-00228

Source Terminal 500 Ir, M14x1

21-00229

Source Terminal 1000 Ir, M14x1



Source Terminals and Accessories *continued*

21-00231

Source Terminal 40 Ir/Co, M18x1.5

21-00233

Source Terminal 65 Ir/Co, M18x1.5

21-00236

Source Terminal 150 Ir/Co, M18x1.5

21-00230

Source Terminal 300 Ir/Co, M18x1.5

21-00241

Source Terminal 500 Ir/Co, M18x1.5

21-00259

Source Terminal 1000 Ir/Co, M18x1.5



Link Type Source Holders

21-00122

Link Type Source Holder, Series TSI



21-00086

Link Type Source Holder, Series TI



23-00022

Go/No-Go Gauge for Source Holder and Ball Pin





Accessories continued

Tungsten Collimators for Ir-192

21-00099

Plug-on Collimator Ir, side Emission 90°

21-00100

Plug-on Collimator Ir, side Emission 60°

21-00101

Plug-on Collimator Ir, panoramic Emission 360°



21-00146

Saddle Collimator Ir



21-00156

Magnet Device for Saddle Collimator Ir, with 2 Pivots (without collimator)



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GammaMat TK

While the GammaMat TK cameras are no longer available for sale, accessories for this product line are still available.

Trolley

21-00027

Transport Carriage from Serial No. 500, TK30/100



Remote Controls

21-00110

Remote Control with Stand (amber), 10m, TK30/100

21-00111

Remote Control with Stand (amber), 15m, TK30/100



21-00244

Stand for Remote Control (amber)



Guide Tubes, Extension Tubes and Accessories

21-00249

Guide Tube, 1m, flexible, M18x1.5

21-00242

Guide Tube, 2m, flexible, M18x1.5

21-00273

Guide Tube, 3m, flexible, M18x1.5

21-00251

Guide Tube, 5m, flexible, M18x1.5

21-00252

Guide Tube, 10m, flexible, M18x1.5



21-00235

Double Nipple for Connection of two Guide Tubes, M18x1.5



21-00234

Quick Connector for Connection of two Guide Tubes, M18x1.5



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Guide Tubes, Extension Tubes and Accessories *continued*

21-00150

Steel Extension Tube 300 Se/Ir/Co, M18x1.5

21-00161

Steel Extension Tube 500 Se/Ir/Co, M18x1.5

21-00152

Steel Extension Tube 1000 Se/Ir/Co, M18x1.5

Steel Extension Tubes require two Threaded Sleeves, M18x1.5 for Connection



21-00238

Threaded Sleeve, M18x1.5



Guide Tube Connectors and Adaptors

21-00019

Guide Tube Connector, TK30/100 (M18x1.5)



Source Terminals

21-00231

Source Terminal 40 Ir/Co, M18x1.5

21-00233

Source Terminal 65 Ir/Co, M18x1.5

21-00236

Source Terminal 150 Ir/Co, M18x1.5

21-00230

Source Terminal 300 Ir/Co, M18x1.5

21-00241

Source Terminal 500 Ir/Co, M18x1.5

21-00259

Source Terminal 1000 Ir/Co, M18x1.5



Link Type Source Holders

21-00030

Link Type Source Holder from Serial No. 500, TK 30

21-00008

Link Type Source Holder from Serial No. 500, TK100



Link Type Source Holders *continued*

23-00022

Go/No-Go Gauge for Source Holder and Ball Pin



21-00032

Collimator TK30/100, side Emission 90°



Tungsten Collimators for Co-60

21-00020

Collimator TK30/100, panoramic Emission 360°



21-00023

Combination Collimator TK30/100

Requires additional Connector No. 21-00069



21-00021

Collimator TK30/100, forward Emission 90°



21-00017

Complete Collimator TK30/100, forward Emission 90°

Requires additional Connector No. 21-00069





Accessories continued

Tungsten Collimators for Co-60

21-00159

Collimator Fork, TK30/100



23-00040

Tripod Stand for Collimator Fork, TK30/100





Isotope Pipeline Crawlers

(for pipe diameters 6-18"/M6 & 18-60"/M18)

GammaMat M6 for Ir-192 consists of the following basic accessories:

- 21-00001 Isotope Camera
 - 21-00007 Type B(U) Overpack,
 - 21-00005 GammaLux M Warning Device, Series M
 - 21-00052 Command Isotope Unit, Cs137
 - 22-00015 Cs-137 source, 3,70 Gbq (100mCi) (Loaded in 21-00052)
 - 21-00010 Driving Carriage M6
 - 21-00335 Charger for GammaLux M and batteries
 - 21-00015 Battery M6, completely wired (2x)
 - 21-00179 Axle for pipe diameter 9-14", M6 (2x)
 - 21-00180 Axle for pipe diameter 15-18", M6 (2x)
 - 21-00181 Axle for pipe diameter 19-21", M6 (2x)
 - 21-00193 Spacer sleeve diameter 9-14" (4x)
 - 21-00184 Spacer sleeve diameter 15-18" (4x)
 - 21-00178 Spacer sleeve diameter 19-21" (4x)
 - 21-00187 Camera Support
 - 21-00188 Camera Screw
 - 21-00189 Camera Washer
 - 21-00190 Camera Nut
 - 21-00320 Spare parts for normal use, M6
 - 21-00328 Charging cable for M6 batteries
 - 21-00327 Charging cable for GammaLux M
- Source not included

GammaMat M18 for Ir-192 consists of the following basic accessories:

- 21-00051 Isotope Camera
- 21-00038 Type B(U) Overpack
- 21-00005 GammaLux M Warning Device, Series M
- 21-00052 Command Isotope Unit, C2-137
- 22-00009 Cs-137 source, 3,70 Gbq (250mCi) (Loaded in 21-00052)
- 21-00053 Driving Carriage M18
- 21-00335 Charger for GammaLux M and batteries
- 21-00057 Battery M18, completely wired (2x)
- 21-00168 Axle for pipe diameter 18-25", M18 (2x)
- 21-00162 Axle for pipe diameter 26-35", M18 (2x)
- 21-00170 Axle for pipe diameter 36-45", M18 (x2)
- 21-00171 Axle for pipe diameter 50-55", M18 (2x)
- 21-00172 Axle for pipe diameter 56-60", M18 (2x)

- 21-00173 Spacer sleeve diameter 26-30" (4x)
- 21-00174 Spacer sleeve diameter 36-45" (4x)
- 21-00175 Spacer sleeve diameter 50-55" (4x)
- 21-00176 Spacer sleeve diameter 56-60" (4x)
- 21-00192 Camera Support for Pipe diameter 18-25"
- 21-00185 Camera Support for Pipe diameter 25-40"
- 21-00169 Camera Support for pipe diameter 40-60"
- 21-00163 Support for Detector Bar
- 21-00165 Clamping Screw, M10x1
- 21-00166 Knurl Screw, M24x1,5
- 21-00064 Spare parts for normal use, M18
- 21-00327 Charging cable for GammaLux M
- 21-00329 Charging cable for M18 batteries
- 21-00269 Cable for detector Bar M18

Source not included

GammaMat M6 for Se-75 consists of the following basic accessories:

- 21-00001 Isotope Camera
- 21-00013 Type A Overpack
- 21-00005 GammaLux M Warning Device, Series M
- 21-00052 Command Isotope Unit, Cs-137
- 22-00015 Cs-137 source, 3,70 Gbq (100mCi) (Loaded in 21-00052)
- 21-00010 Driving Carriage M6
- 21-00335 Charger for GammaLux M and batteries
- 21-00015 Battery M6, completely wired (2x)
- 21-00179 Axle for pipe diameter 9-14", M6 (2x)
- 21-00180 Axle for pipe diameter 15-18", M6 (2x)
- 21-00181 Axle for pipe diameter 19-21", M6 (2x)
- 21-00193 Spacer sleeve diameter 9-14" (4x)
- 21-00184 Spacer sleeve diameter 15-18" (4x)
- 21-00178 Spacer sleeve diameter 19-21" (4x)
- 21-00187 Camera Support
- 21-00188 Camera Screw
- 21-00189 Camera Washer
- 21-00190 Camera Nut
- 21-00320 Spare parts for normal use, M6
- 21-00328 Charging cable for M6 batteries
- 21-00327 Charging cable for GammaLux M

Source not included

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GammaMat M18 for Se-75 consists of the following basic accessories:

21-00051 Isotope Camera
21-00013 Type A Overpack,
21-00005 GammaLux M Warning Device, Series M
21-00052 Command Isotope Unit, Cs-137
22-00009 Cs-137 source, 3,70 Gbq (250mCi) (Loaded in 21-00052)
21-00053 Driving Carriage M18
21-00335 Charger for GammaLux M and batteries
21-00057 Battery M18, completely wired (2x)
21-00168 Axle for pipe diameter 18-25", M18 (2x)
21-00162 Axle for pipe diameter 26-35", M18 (2x)
21-00170 Axle for pipe diameter 36-45", M18 (2x)
21-00171 Axle for pipe diameter 50-55", M18 (2x)
21-00172 Axle for pipe diameter 56-60", M18 (2x)
21-00173 Spacer sleeve diameter 26-35" (4x)
21-00174 Spacer sleeve diameter 36-45" (4x)
21-00175 Spacer sleeve diameter 50-55" (4x)
21-00176 Spacer sleeve diameter 56-60" (4x)
21-00192 Camera Support for Pipe diameter 18-25"
21-00185 Camera Support for Pipe diameter 25-40"
21-00169 Camera Support for Pipe diameter 40-60"
21-00163 Support for Detector Bar
21-00165 Clamping Screw, M10x1
21-00166 Knurl Screw, M24x1,5
21-00064 Spare parts for normal use, M18
21-00327 Charging cable for GammaLux M
21-00329 Charging cable for M18 batteries
21-00269 Cable for detector bar M18

Source not included

Remarks

21-00266 Charging cable for GammaLux M (old charger)
21-00267 Charging cable for M18 batteries (old charger)
21-00268 Charging cable for M6 batteries (old charger)
21-00269 Cable for detector bar M18 (old and new charger)



Cobalt 60 (Co-60)

Main Application

Level gauges – Gamma Radiography

Description

Simple or double stainless steel capsule containing Co-60

Specifications

- Source: high nickel-plated cobalt
- Capsule: welded stainless steel (AISI 316L)
- Half-life: 5.27 years

Delivery Time

- Level gauges: 4 weeks
- Gammagraphy: on request

Source Disposal

For each source purchased, Best NDT will provide disposal of one source as per the price list.



Radiation Energies in MeV

Gamma	Beta
1.17 (100%)	0.138 (100%)
1.33 (100%)	1.491 (0.1%)

Air Kerma Rate at 1 meter: 11.4 mGy/h for 37 GBq
(Exposure rate at 1 meter: 1.3 R/h for 1 Ci)

Maximum Focal Spot Size

	Active Diameter	Active Height	Equivalent Activity
Level Gauges	3.0 mm	3.0 mm	185 GBq (5 Ci)
Gamma Radiography	on request	on request	from 185 to 3700

Cobalt 60 (Co-60) — *continued*

Co-60 Capsules					
Type	Material	Authorized Activity	ISO Code	AFNOR Code	Certificate Material Special Form
G1	Stainless Steel AISI 316L	1850 GBq (50 Ci)	C64545	C64545ic*	B/014/S-96
G3	Stainless Steel AISI 316L	2960 GBq (80 Ci)	C64545	C64545ic*	B/015/S-96
G4	Stainless Steel AISI 316L	3700 GBq (100 Ci)	C64445	C64445ic*	B/013/S-96
G6	Stainless Steel AISI 316L	1850 GBq (50 Ci)	C64445	C64445ic*	B/012/S-96
G8	Stainless Steel AISI 316L	1850 GBq (50 Ci)	C64445	C64445ic*	B/010/S-96
G10	Stainless Steel AISI 316L	1850 GBq (50 Ci)	C64445	C64445ic*	B/018/S-96
G21	Stainless Steel AISI 316L	1850 GBq (50 Ci)	C64545	C64545ic*	B/020/S-96

*i: fire tests up to 1200°C – c: corrosion tests



Iridium-192 (Ir-192)

Description

Single or double stainless steel capsule containing Ir-192 pellets for gamma radiography.

Optimal Sharpness

Best NDT Iridium-192 sources are renowned for providing optimal image sharpness. To achieve and maintain this standard of excellence, our pellets are selected for their uniform thickness and geometry, resistance to deformity during reactor activation, and are carefully checked to assure the iridium source is centered in each pellet we produce.

Tailored to Customer Needs

Using combinations of pellets, our sources are manufactured with active diameters ranging from 0.5 to 4.0 mm and active heights ranging from 0.33 to 4.0 mm. Using one pellet, or combining several pellets, allows us to produce a variety of sources to meet all of our customers' needs. Our manufacturing process also provides us with the versatility to make custom sources to the exact dimensions and activities required for specific applications.

Air Kerma Rate at 1 meter

- 1.95 mGy/h for 37 GBq
- 0.224 R/h for 1 Ci

Delivery Time

- 3 to 7 days
- 4 mm available on request with the delivery depending on reactor schedule
- Single or double stainless steel capsules
- Uniform pellet thickness
- Ir-192 centered in each pellet
- Custom sources, diameter-height-activity, are available.



Source Disposal

For each source purchased, Best NDT will provide free disposal for one (1) source.

Specifications

- **Source:** high purity iridium (>99.9%)
- **Capsule:** welded stainless steel (AISI 316L)
- **Half-life:** 73.8 days

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Iridium-192 (Ir-192) — *continued*

Ir-192 Source Capsules

- ISO Code: C64545
- AFNOR Code: C64545 (fire tested to 1200° C, and corrosion tested)
- Material: Stainless Steel (AISI 316L)

Type	Activity		Certificate Material Special Form
	GBq	Ci	
G1	7,400	200	B/014/S-96
G3	18,500	500	B/015/S-96
G4	18,500	500	B/013/S-96
G6	7,400	200	B/012/S-96
G10	7,400	200	B/018/S-96
G21	7,400	200	B/020/S-96

Ir-192 Source Sizes

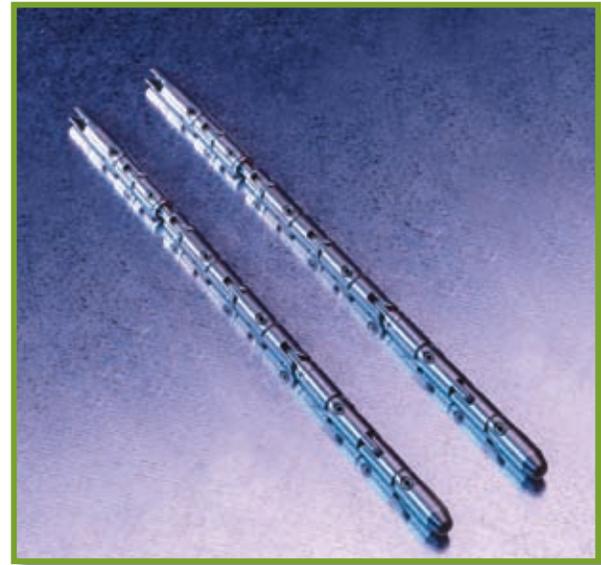
Active Diameter (mm)	Height (mm)	Activity		Active Diameter (mm)	Height (mm)	Activity	
		GBq	Ci			GBq	Ci
0.5	0.50	44	1.2	2.0	2.64	2,590	70
0.6	0.60	81	2.2	2.0	2.97	2,886	78
1.0	0.50	178	4.8	3.0	0.99	2,146	58
1.0	1.00	296	8.0	3.0	1.32	2,738	74
1.2	0.80	333	9.0	3.0	1.65	3,330	90
1.2	1.20	481	13.0	3.0	1.98	3,959	107
1.2	1.60	629	17.0	3.0	2.31	4,588	124
2.0	0.99	1,073	29.0	3.0	2.64	5,180	140
2.0	1.32	1,406	38.0	3.0	2.97	5,698	154
2.0	1.65	1,702	46.0	4.0	3.00	7,770	210
2.0	1.98	1,961	53.0	4.0	3.50	8,880	240
2.0	2.31	2,257	61.0	4.0	4.00	10,360	280

All activities are approximate values 8 days after being unloaded from the reactor.



Selenium-75 (Se-75)

The success of an isotope used for gamma NDT depends on the ability of the isotope to penetrate the material being imaged, and then, to produce an image of acceptable contrast on the processed radiograph. Isotopes with low gamma energies produce unacceptable images as a result of their inability to penetrate the object being imaged. Higher energy gamma sources over-penetrate, causing a noticeable lack of contrast in the process radiograph. The 66 keV to 401 keV gamma spectrum of Se-75, with two lines of high intensity at 136 keV and 265 keV dominating this spectrum, make it an ideal choice when high quality images in the 5 mm to 30 mm (0.2 in to 1.18 in) range are required.



Description

- **Double encapsulated:** inner vanadium capsule, stainless steel outer capsule
- **Half-life:** 119.8 days

Air Kerma Rate at 1 meter

- 1.95 mGy/h for 37 GBq
- 0.224 R/h for 1.0 Ci

Focal Spot Sizes

Active Diameter (mm)	Active Height (mm)	Equivalent Activity ($\pm 10\%$)	
		GBq	Ci
1.0	1.0	185	5
1.5	1.5	370	10
2.0	2.0	1,295	35
2.5	2.5	2,220	60
3.0	3.0	3,330	90
3.5	3.5	4,440	120

Delivery Time (approximate)

- 2 to 3 weeks for 3 x 3 and 2.5 x 2.5 mm
- 12 to 16 weeks for other dimensions, dependent on reactor schedule

Source Disposal

For each source purchased, Best NDT will provide free disposal for one (1) source.

Selenium-75 (Se-75) — *continued*

Gamma Spectrum

Selenium-75 (Se-75)	Gamma — Ranging from 66 to 401 keV	Major Yield (%)	Energy (keV)
		17.4	121
		59.4	136
		59.5	265
		25.3	280

Se-75 Capsules

Types	Material	Activity		ISO Code	Certificate Material Special Form
SR-17, SR-18 and GS75M	Stainless steel	5,180 GBq	140 Ci	C63545 (fire tested to 1200°C)	RUS/6223/S-96