



Eckert & Ziegler

Gamma Service Recycling



Security of Disused Radioactive Sources

Return to supplier, re-use & recycling

Vienna, 08 Oct 2019

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MD Gamma-Service Recycling GmbH



Content

- Short GSR and EZAG update
- Return to supplier
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 - Co-60
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Return to supplier, re-use & recycling



1990



Gamma-Service Produktbestrahlung GmbH (product irradiation) was founded by former scientists of the Academy of Sciences, Leipzig, with the aim of continuing the construction, operation and service of irradiation facilities

1995



The department **“Takeover of high-radioactive sources”** was created

1998



This department was outsourced and Gamma-Service Recycling GmbH was founded by Juergen Reckin with headquarters in Leipzig, Germany

Gamma-Service Recycling GmbH Timeline

Return to supplier, re-use & recycling



2000



A subsidiary office in Radeberg near Dresden was founded

2007



Takeover of Cs-137 blood irradiation business from BEBIG GmbH

Gamma-Service Recycling GmbH Timeline

2017

Gamma-Service Recycling GmbH was taken over by the Eckert & Ziegler Strahlen- und Medizintechnik AG in Berlin



Gamma-Service Medical GmbH Timeline

Foundation of the Gamma-Service Medical GmbH with headquarters in Leipzig, Germany





- Since 2017 we belong to the Eckert & Ziegler Group: one of the world's largest providers of isotope technology for medical, scientific and industrial purposes
- Employees in 2018: close to 800
- Revenue 2018: € 170 Mio. approx
- Headquarters in Berlin, Germany

Source returns at various companies: GSR, GSM, EZN, EZC, EZE, IPL and others





What means „return to supplier“???

WINS Rio 2015

- **Supplier obligation to take back its delivered RAM**
 - ✓ Relevant either when buying a new source-based device
 - ✓ Or when changing to a X-Ray based device
 - ✓ Recycling or disposal costs to be covered by
 - Supplier?
 - Source owner?
 - Support by a regulator or IAEA?
 - ✓ Shipment of RAM to be organized and costs to be covered
 - ✓ Eventual interim storage in the user's country
 - ✓ Storage costs to be considered

- **International and local safety and security regulations MUST be known and observed at all time**



Return to Supplier



Life can be easy >>>

Obligation Letter

Gamma-Service Recycling GmbH, Bautzner Straße 67, 04347 Leipzig, Germany

TO WHOM IT MAY CONCERN

Leipzig, den 07.10.2019

OBLIGATION LETTER

Subject: radioactive Co-60 source supply to country

We, Gamma-Service Recycling GmbH, inform that we intend to sell Co-60 sources, type GK60TD3 to country in order to distribute them to the final end users located in country.

We confirm the taking in charge of the mentioned Co-60 sources, type GK60TD3 within completion of their medical treatment life, if it will be requested by the customer and if transportation, insurance and other shipping expenses and disposal fees of the sources will be paid by the customer. Such take over must be done within the recommended working life of the sold sources.

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E-mail gsr-contact@ezag.com

Obligation from: Gamma-Service Recycling GmbH

Name of responsible person:

Address: Bautzner Strasse 67
04347 Leipzig
Germany

Date:

Sign and stamp:

Geschäftsführer
Dr. Gunnar Mann
Jens Baldeweg

Sitz Leipzig
Amtsgericht Leipzig
Reg.-Nr. HRB 10787
USt-ID-Nr. DE 173345387

Bankverbindung
Commerzbank AG Dresden
IBAN DE23 8504 0000 0800 6991 00
BIC COBADEFFXXX

zertifiziert durch / certified by:





Return to Supplier

BASICS

- All well established suppliers return sources
- Code of conduct
- Maintain suitable packages
- Maintain logistics
- Contracts with manufacturers
- Financial provision (from the beginning)
- Governmental support



Return to Supplier

CHALLENGES

- Source supplier \neq Source manufacturer
- Device supplier \neq Source supplier
- Recommended working life / special form
- Maintain logistics
- Companies disappear
- Financial provision
- Keep records with regulators



Return to Supplier

We supply various radioactive sources

- Brachytherapy Co-60 (now BEBIG)
- Beamtherapy Co-60
- Large size industrial Co-60
- Cs-137 sources for blood irradiators



GSM D1 & Biobeam



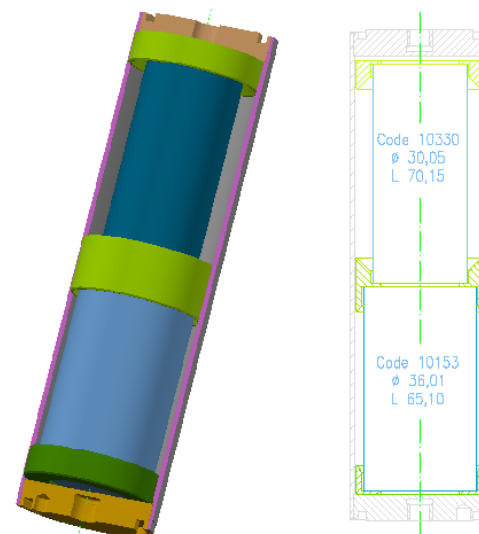
Re-use / Recycle Cs-137

- New Cs-137 from MAYAK
- Last purchase in 2013
- Source frame modified to accept recycled sources
- Security upgrad same time (IDD)

- ✓ 70-80 sources in the last 5 years
- ✓ 2.300TBq / 62.000Ci recycled

GSR-Cs137/B - 156,5mm Nr.111

Kapsel Q.....





Re-use / Recycle Cs-137

Source type	External dims		Standard-Primaries	Potential primary or secondary (examples)
	length	diameter		
GSR-Cs137/A	152	38	IGI-Z-21-1, IGI-Z-22-1,	IGI-Z-8
GSR-Cs137/B	170	44,5	X66, RSL 6060,	C-161, C-440, IGI-Z-9, GSR-Cs137/A
GSR-Cs137/C	350	23	CSL 15	CSL 12, C-1000, C-3000, C-378
GSR-Cs137/D	155	28	CSL 20	
GSR-Cs137/E	350	28	2x CSL 20	CSL 12, C-1000, C-3000, C-378



Re-use / Recycle Co-60

Large size industrial source type R38

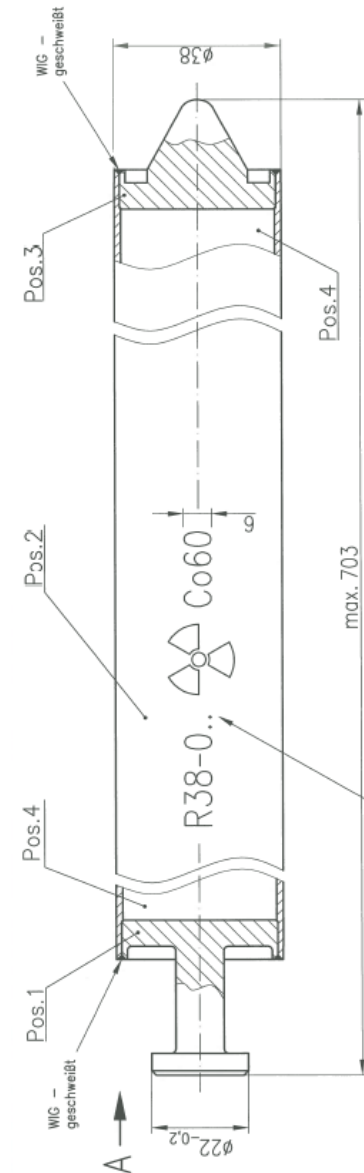
- Maximum activity: 1,480 TBq / 40,000 Ci
- Dimensions according to customer request
- German special form
- Max. diameter 38 mm
- Max. length 703 mm
- Standard rod source for dry storage sterilization plants



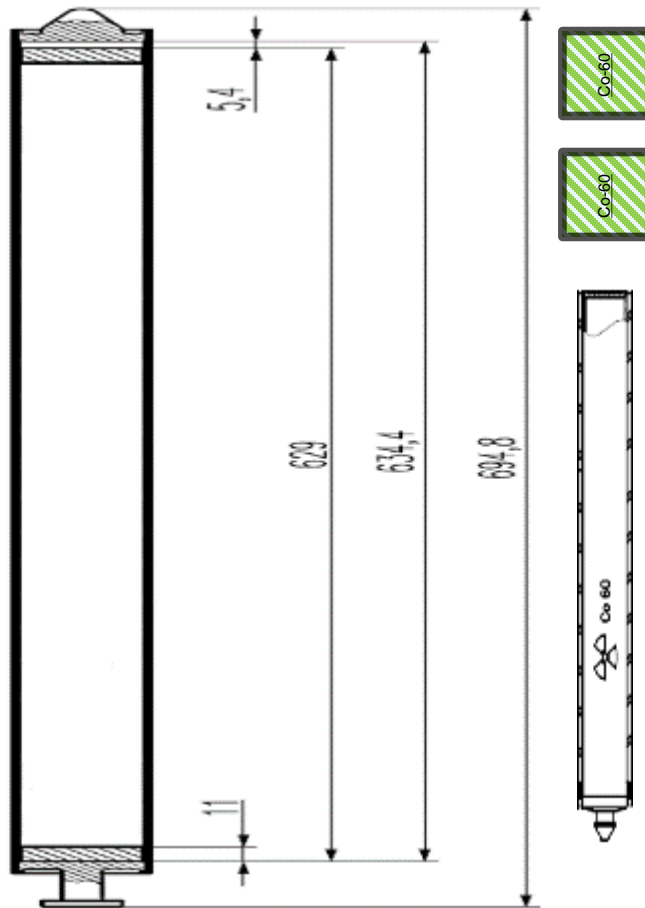


Re-use / Recycle Co-60

- New Co-60 from Russia
 - Lower specific activity
 - Combine with recycled Co-60
 - Source interior flexible up to 35 x 630mm
- ✓ 200 sources in the last 5 years
- ✓ 3.000TBq / 81.000Ci recycled



Re-use / Recycle Co-60



How an R38 gets together

Source details:

Diameter 38 mm

Max. length 703 mm

Max. activity 40.000 Ci / 925 TBq

German special form certificate
D/0083/S-96 (Rev.5)



Re-use / Recycle Co-60

Usable inner capsules in R38

- More less any source that physically fits
 - ✓ Brachytherapy
 - ✓ External Beam Therapy
 - ✓ Small industrial
 - ✓ OWL
 - ✓ Short rods (GC220)
 - ✓ Standard industrial sources
- Inners to be tight but no SFC required

Re-use / Recycle Co-60

CHALLENGES

- Age / conditions of disused sources or irradiators / shields





Re-use / Recycle Co-60





Re-use / Recycle Co-60

CHALLENGES

- Disappeared suppliers / manufacturers





Re-use / Recycle Co-60

CHALLENGES

- Combine both bad condition + lost supplier





Disused sources

SUMMARY

- Keep records at users and with regulators
 - Track sources and usage status
 - Surveil storage conditions esp. when disused
 - Evaluate all options of EOL management
 - Establish financial provision
- Get regulatory or IAEA support if one of the above is not in good manner



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THANK YOU !!!

Questions ???

Vienna, 08 Oct 2019

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