optibelt




## ELASTOMER SOLUTIONS

# X-RAY PROTECTION PERSONAL

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# OUR EXPERIENCE

We have dedicated ourselves to innovation and progress in the manufacturing of x-ray protection materials for more than half a century. Our commitment to quality, innovation and safety has made us one of the leading manufacturers in the industry.
Thanks to continuous investments in research and development, our materials are in compliance with the highest standards and offer the best possible application safety, while also being user-friendly and durable.



**9** **PRODUCTION SITES**
IN 7 COUNTRIES

**33** **SALES SITES**
IN 27 COUNTRIES

**28** **LOGISTIC CENTRES**
IN 21 COUNTRIES

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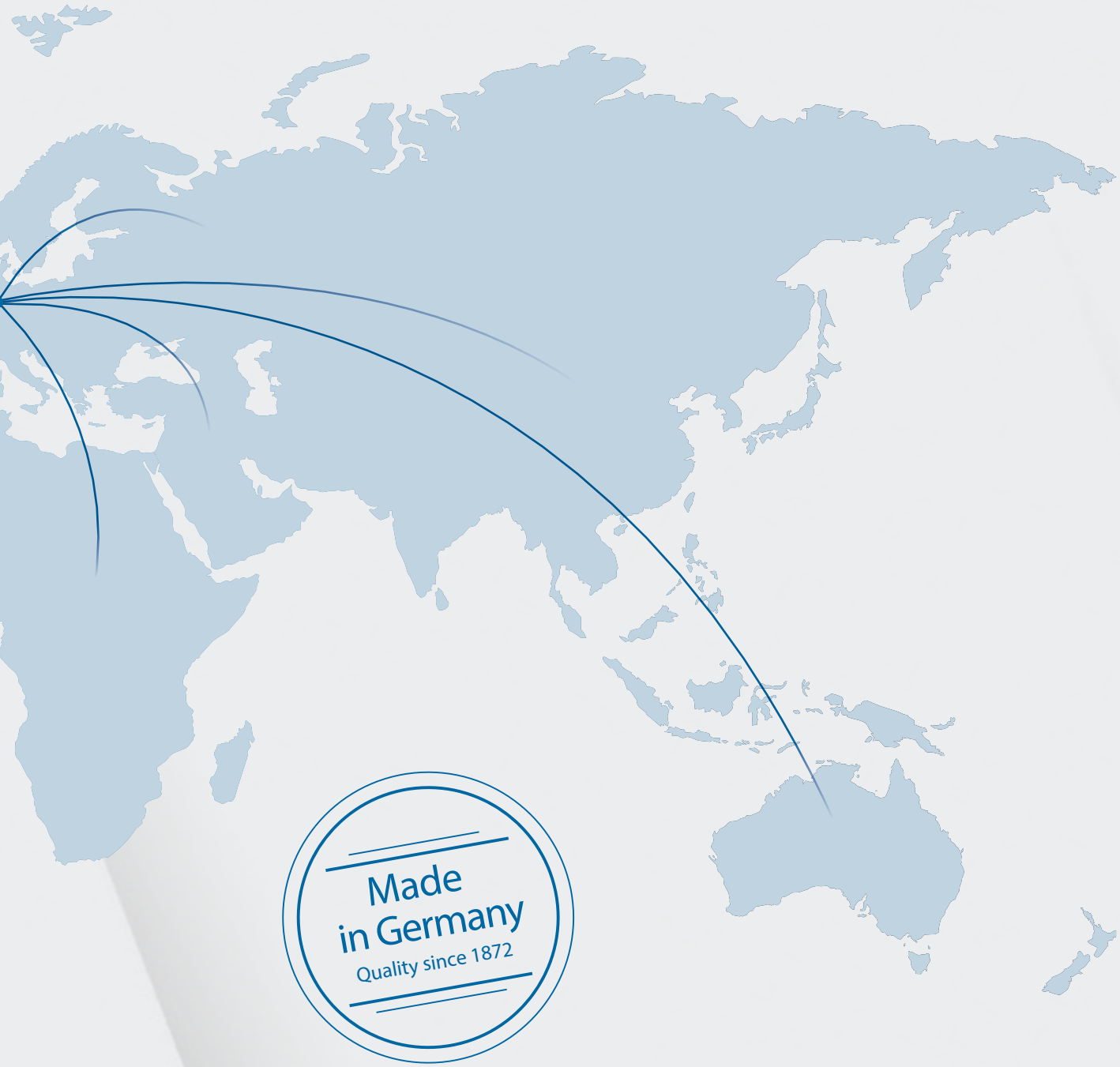
Our experience pays for itself in the many applications where our x-ray protection materials are used. This includes personal x-ray protection, as well as use in the foodstuff industry and the use of x-ray equipment in almost all airports around the world.
Future research and development on our x-ray protection materials will contribute to a safer and more efficient use of x-rays worldwide. Our commitment to quality and innovation will continue to drive us in the decades to come.






- Standard lead x-ray protection material optibelt ELASTOMIT-R
- High flexibility through the use of natural rubber
- High wearing comfort
- Safety certified according to the highest standards
- Standard conformity: IEC 61331-1:2014 mod BBG (50 – 150 kV)




- Lightweight lead x-ray protection materials optibelt ELASTOMIT-R
- Very comfortable and flexible thanks to its rubber basis
- Reduced surface weight thanks to lead substitute
- Standard conformity pursuant to IEC 61331-1:2014 mod BBG (50 – 110 kV) and ASTM F2547-06 (2013) (80 – 100 kV)




- Standard lead-free x-ray protection material optibelt ELASTOMIT-R
- Excellent flexibility
- X-ray protection material with the lowest surface weight, tested in accordance with current standards
- Standard conformity pursuant to IEC 61331-1:2014 mod BBG (50 – 110 kV) and ASTM F2547-06 (2013) (80 – 100 kV)

## ACCORDING TO ASTM F2547-06

| MATERIAL | LE (mm Pb) | SURFACE WEIGHT** | NOMINAL THICKNESS** (MM) | ATTENTUATION | |
|---|---|---|---|---|---|
| | | | | 80 kV | 100 kV |
| Lightlead 131A | 0.175 mm Pb | 2050 g/m² | 0.59 mm | 84.5% | 77.1% |
| | 0.25 mm Pb | 2750 g/m² | 0.78 mm | 90.0% | 84.6% |
| | 0.35 mm Pb | 4100 g/m² | 1.20 mm | 95.3% | 90.9% |
| Lead-free 107A | 0.175 mmPb | 1880 g/m² | 0.51 mm | 83.7% | 75.9% |
| | 0.25 mm Pb | 2690 g/m² | 0.70 mm | 90.9% | 83.9% |
| | 0.35 mm Pb | 3760 g/m² | 1.01 mm | 95.7% | 91.8% |

## ACCORDING TO ASTM F2547-18

| MATERIAL | LE (mm Pb) | SURFACE WEIGHT** | NOMINAL THICKNESS** (MM) | ATTENUATION | | | |
|---|---|---|---|---|---|---|---|
| | | | | 60 kV | 80 kV | 100 kV | 120 kV |
| Lightlead 181ASTM | 0.175 mm Pb | 2080 g/m² | 0.49 mm | 93.6% | 85.3% | 76.6% | 71.4% |
| | 0.25 mm Pb | 2980 g/m² | 0.68 mm | 96.7% | 90.3% | 84.2% | 79.9% |
| | 0.35 mm Pb | 4160 g/m² | 0.98 mm | 98.6% | 94.4% | 89.5% | 86.9% |

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## ACCORDING TO IEC 61331-1 mod BBG

| MATERIAL | LE (mm Pb) | SURFACE WEIGHT** | NOMINAL THICKNESS** (MM) | ATTENUATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 kV | 60 kV | 70 kV | 90 kV | 110 kV | 130 kV | 150 kV |
| Leaded 140A | 0.175 mm Pb | 2360 g/m² | 0.63 mm | 97.0% | 94.2% | 91.2% | 84.5% | 79.0% | 74.4% | 70.3% |
| | 0.25 mm Pb | 3380 g/m² | 0.89 mm | 98.8% | 97.1% | 95.0% | 89.8% | 85.8% | 82.4% | 78.9% |
| | 0.35 mm Pb | 4750 g/m² | 1.26 mm | 99.6% | 98.8% | 97.5% | 93.8% | 90.9% | 88.2% | 85.6% |
| Lightlead 181A | 0.175 mm Pb | 2200 g/m² | 0.51 mm | 97.2% | 95.0% | 92.0% | 84.0% | 78.0% | 73.0% | 68.0% |
| | 0.25 mm Pb | 3180 g/m² | 0.72 mm | 99.0% | 98.0% | 96.5% | 92.0% | 88.0% | 84.0% | 80.0% |
| | 0.35 mm Pb | 4400 g/m² | 1.03 mm | 99.5% | 99.0% | 98.3% | 96.0% | 93.5% | 91.0% | 88.5% |
| Lead-free 114A | 0.175 mm Pb* | 2025 g/m² | 0.54 mm | 96.7% | 94.4% | 92.1% | 85.4% | 78.7% | 73.8% | 69.5% |
| | 0.25 mm Pb | 2850 g/m² | 0.75 mm | 98.9% | 97.5% | 96.2% | 90.8% | 85.8% | 82.3% | 78.7% |
| | 0.35 mm Pb | 4050 g/m² | 1.08 mm | 99.7% | 98.0% | 96.0% | 93.5% | 90.7% | 87.6% | 83.5% |

* Information about further lead equivalencies from 0.125 - 1.00 mm Pb are available on request.

** These are the minimum requirements.



# THE BENEFITS OF X-RAY PROTECTION MATERIALS

## ON RUBBER BASIS

### ELONGATION

- of min. 350 %
- high rebound elasticity

### FLEXIBILITY

- due to natural rubber basis
- low material thickness

### LOW HARDNESS

- of approx. 60 Shore A
- thus higher flexibility

### PVC FREE

- Due to the natural rubber base
- Pleasant tactile feel

### LATEXT FREE

- Contains no latex proteins
- Suitable for allergy sufferers

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# TOP QUALITY FOR MAXIMUM SAFETY



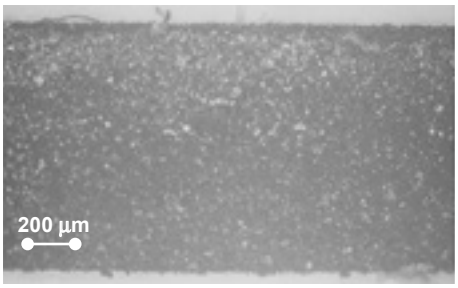
The personal X-ray protection products of the **optibelt ELASTOMIT-R** brand are subject to comprehensive internal and external testing procedures. External tests include, among others, verification of shielding performance in accordance with **IEC 61331-1 mod BBG** and **ASTM F2547-06**, as well as various durability tests conducted by recognized testing institutes.

Internally, the material is continuously inspected at every stage of production, from raw material to finished product. As a final step, **100%** of all products undergo **inspection** for safety-relevant **defects** using an **in-house Hi-Scan continuous X-ray inspection system** up to a lead equivalence of **0.35 mm Pb**. This enables us to guarantee defect-free and safe products for our customers.

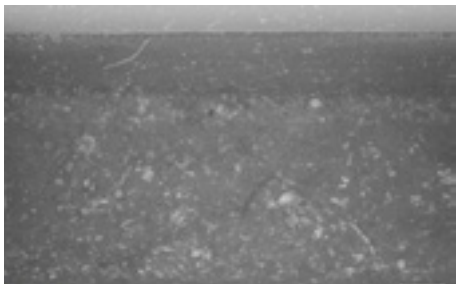
### HOMOGENEITY OF OUR MIXING RATIOS COMPARED TO THE COMPETITION

Based on the latest technologies and state-of-the-art machinery, we are able to blend raw materials optimally and achieve a highly homogeneous mixture.

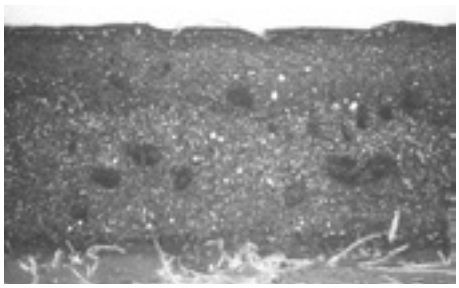
**Microscopic Image of the Cross-Sectional Profiles of Thin X-Ray Shielding Films**




optibelt ELASTOMIT



Competitors 1



Competitors 2

# GENEREL INFORMATION

## STANDARD DELIVERY FORM

- Usable width 1200 mm
- Uncut edges
- Standard roll length 0.175 mm Pb – 30 m
  0.25 mm Pb – 20 m

Other roll widths and lengths available on request.

## SPECIAL DESIGNS

- Available with rubber top surface on one or both sides
- Available with fabric in the center and coatings



**Make sure that the materials used have been certified according to the applicable standard and that relevant certificates are available.**

# RADIATION PROTECTION STANDARDS

Two standards are decisive for the manufacture of the shielding properties of materials with radiation protection: standards **IEC 61331-1:2014 mod BBG** and **ASTM F2547-06 (2013)**. Please observe the applicable standard according to your region.

**optibelt ELASTOMIT-R** materials are tested according to the modified broad beam geometry in order to also detect any fluorescence radiation that may occur in materials with a low atomic number. Depending on requirements, our materials are tested in an x-ray tube voltage range of 50 kV – 110 kV or 50 kV – 150 kV.

Standard **ASTM F2547-06 (2013)**, x-ray tube voltage range of 80 kV – 100 kV, mainly applies to North America. **optibelt ELASTOMIT-R** x-ray protection materials can be adjusted to meet this standard upon request.

All test certificates are available with details of shielding properties and surface weights for all materials.

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## QUALITY, ENERGY AND ENVIRONMENTAL MANAGEMENT

The Arntz Optibelt Group is committed to its social and ecological responsibility within the scope of its worldwide business activities – a sense of tradition and generational compatibility are evident throughout the company's history, which now goes back more than 150 years.

The quality and continuous development of its processes and products, as well as ensuring compliance with the DIN EN ISO 9001 and 14001 certified quality and environmental management standards and the DIN EN ISO 50001 energy management system, are of central importance to the Arntz Optibelt Group.

It goes without saying that we are committed to complying with all the statutory provisions and our own more stringent regulations relating to environmental protection.

High-quality products, technologically advanced solutions and close personal ties between our company and our business partners help to improve the level of satisfaction of all parties involved.

The responsible use of natural resources is an integral part of our corporate activities. In our business processes, we consider aspects of the efficient use of energy and raw materials and strive for transparency regarding the origin of key materials used.

As part of the continuous improvement of our processes, we regularly evaluate opportunities to increase the efficient use of energy and materials. In addition, we continuously assess options for the reuse and recycling of materials and promote the circular use of valuable resources wherever possible.

## REACH, ROHS AND CONFLICT MINERALS

During product development, we evaluate opportunities to reduce the use of materials and energy. We take measures to make a contribution to environmental and climate protection. Our use of natural materials is carefully considered. We take due care to verify the sources of the raw materials that we use in our products.

For the Arntz Optibelt Group, it is therefore essential that its suppliers are aware of and ensure compliance with the applicable legal requirements, such as REACH, RoHS and "Conflict Minerals – the Dodd-Frank Act".

On the basis of our chemicals management and the declaration on the duty to communicate information on substances in products, in accordance with Article 33 of Regulation (EC) No. 1907/2006 (REACH), we can confirm that our products do not pose a hazard to consumers.

A significant focus is placed on the issue of so-called conflict minerals and critical materials in general, where the entire supply chain is key to greater responsibility and care. The Arntz Optibelt Group has set itself the mission, for itself and its suppliers, that all products are free from conflict minerals and that legal requirements – in particular EU regulations and the Dodd-Frank Wall Street Reform and Consumer Protection Act – are complied with. The Arntz Optibelt Group establishes due diligence processes to promote responsible supply chains for minerals from conflict areas and high risk areas.

# X-RAY PROTECTION
## NEW GENERATION



LIGHTER.
THINNER.
MORE FLEXIBLE.

**XTRA SECURED**
Maximum durability

**MORE FLEXIBILITY**
Enhanced wearing comfort

**LESS WEIGHT**
Reduced operator fatigue

**LOWER REAL THICKNESS**
Slimmer apron constuction

# SUPPORT
## YOU CAN RELY ON

If you have any questions regarding our service, products or materials, our team is always ready to give you comprehensive advice. We are happy to provide support during the selection of suitable products, the specification of precise dimensions, and throughout the entire ordering process. Don't hesitate to contact us – we are there to assist you and to resolve your issues quickly and dependably.



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