

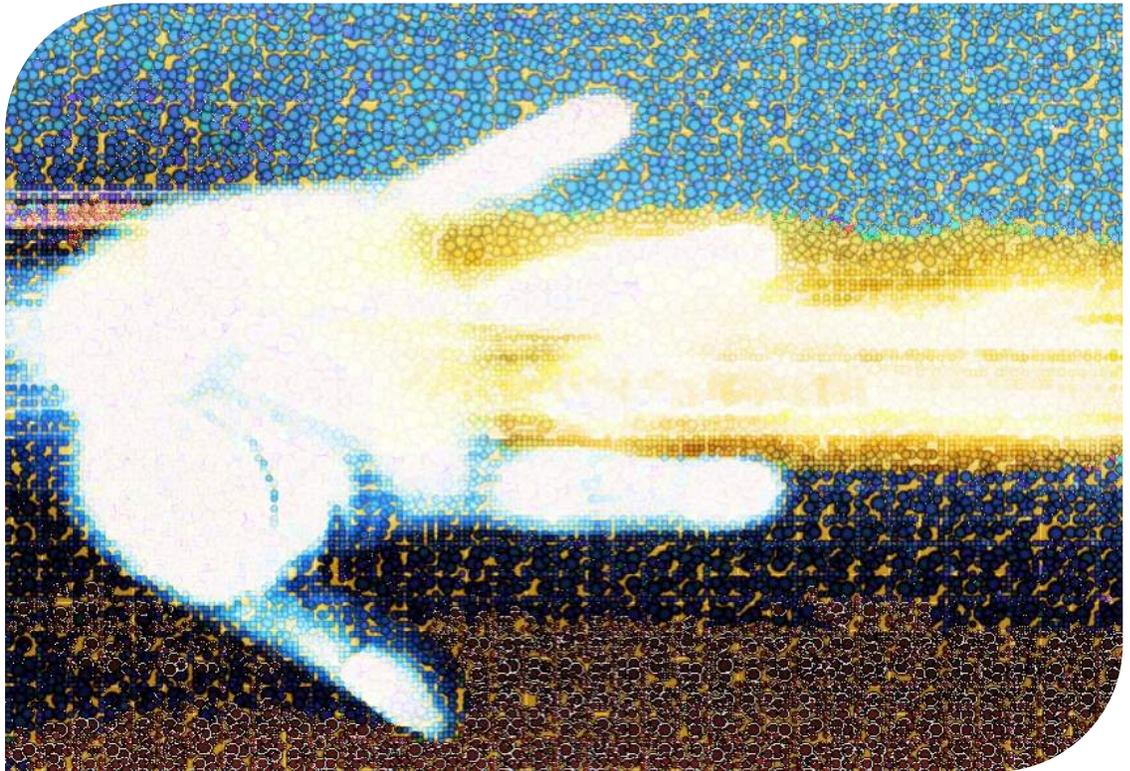


# RADISHIELD

Tungsten Radiation Shielding Sheet

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YOSH INTERNATIONAL CO., LTD



## Distinctive features of RADISHIELD sheet



### 1. High flexibility

- Can be cut with scissors into any shape needed for the intended use. It can also be sewn with a sewing machine.
- High flexibility allows for easy folding into any shape. This also means we can make products of all kinds of shapes and thicknesses depending on our customers' needs.



### 2. High shielding effect from special processing

- Crepe processed product increases shielding effect by 20%.
- Demonstrates especially high shielding effect at sites which have multiple sources of radiation coming from different directions.



### 3. Easy-to-wear & easy-to-use

- The fabric is soft and flexible enough to make into any type of design. A target radiation shielding rate can be achieved by layering sheets, while still being easy to wear compared to other products.
- In accordance with the product's intended use, we collaborate with texture experts to select and propose the right lining, fabric, and surface material to our customers.  
E.g.) Super water-repellent finishing, flameproof finish, deodorized finish, nighttime reflective tape, etc.

## RADISHIELD Flat Sheet



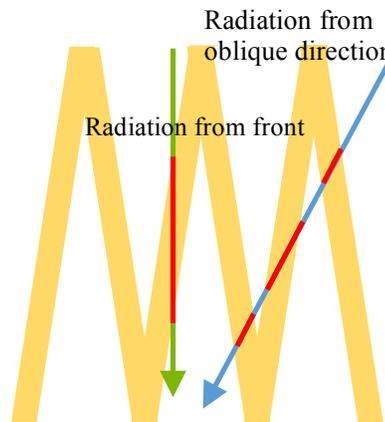
Apply tungsten layer on flexible polyester fabric

JIS T 61331- 1

<b>Product No.</b>	<b>RAF720</b>
<b>Width(cm)</b>	142±5%
<b>Thickness(mm)</b>	0.28±5%
<b>Weight(g/m<sup>2</sup>)</b>	930±5%

Lead Equivalent (110Kv)	Layers	Thickness (mm)	Weight (kg/m <sup>2</sup> )
0.25mmPb	5	1.4	4.7
0.35mmPb	7	2.0	6.5
0.50mmPb	10	2.8	9.3
Lead Equivalent (150Kv)	Layers	Thickness (mm)	Weight (kg/m <sup>2</sup> )
0.25mmPb	5	1.4	4.7
0.35mmPb	7	2.0	6.5
0.50mmPb	10	2.8	9.3

## RADISHIELD Crimped Sheet



Relief structure creates more layers, providing thicker shielding to block radiation coming from oblique directions. In the field, the crimped sheet will efficiently block radiation coming from all different directions.

By applying a special process to the RADISHIELD flat sheet, we created a crimped sheet that offers more flexibility for making different shaped products. When the gamma-ray shielding rate is the same, the crimped sheet is 30% lighter than a flat sheet. The relief structure will also block off environmental radiation from different directions and produces a higher shielding effect than that of a flat sheet with the same weight.

JIS T 61331-1

<b>Product No.</b>	<b>RAS720</b>
<b>Width(cm)</b>	92±5%
<b>Thickness(mm)</b>	5.1±5%
<b>Weight(kg/m<sup>2</sup>)</b>	2.7±5%

Lead Equivalent (110Kv)	Layers	Thickness (mm)	Weight (kg/m <sup>2</sup> )
0.21mmPb	2	10.2	5.4
0.34mmPb	3	15.3	8.1
0.48mmPb	4	20.4	10.8
Lead Equivalent (150Kv)	Layers	Thickness (cm)	Weight (kg/m <sup>2</sup> )
0.23mmPb	2	10.2	5.4
0.36mmPb	3	15.3	8.1
0.49mmPb	4	20.4	10.8

# RADISHIELD Product Examples



## Radiation Shielding Suits

- Used for decontamination at Fukushima
- 3 layers of RADISHIELD crimped sheets

### Features:

- (1) Flexibility of the shielding material  
⇒ Enables improved workability and mobility
- (2) Unique design  
⇒ Decentralizes the massive feeling (Evenly spread out fabric weight)  
Wearable for long periods of work
- (3) "Made in Japan" quality  
⇒ Attention to detail, reliable sewing skills, and quality

Size	Length	Chest	Weight	Shield factor※
L	97cm	130cm	≒9.5kg	≒39%
LL	102cm	145cm	≒10.5kg	≒39%

※Field test result of shield factor in Fukushima



### Option

Cut the RADISHIELD crimped sheet into the right size and wrap it around your neck or anywhere else you wish to cover.

This is an example to show how easily you can use the sheet to block radiation whenever needed during field work.

## Collimator Cover



## RADISHIELD Arm Cover



# Shielding performance of RADISHIELD Radiation Shielding Suit

## Measurement facility overview

### Irradiation room of cobalt 60 (National

Radiation Source	$^{60}\text{Co}$ ( $\approx 34.4\text{TBq}$ )
Radiation energy	1.25 [MeV]
Maximum Radiation Dose( Distance 0cm)	3000 [Sv/h] Distance(0cm)
Measurement device	APPLIED ENGINEERING INC. JARP ionization chamber C-110
Measurement distance to sample	100.45cm

### Radiation Shielding Suits

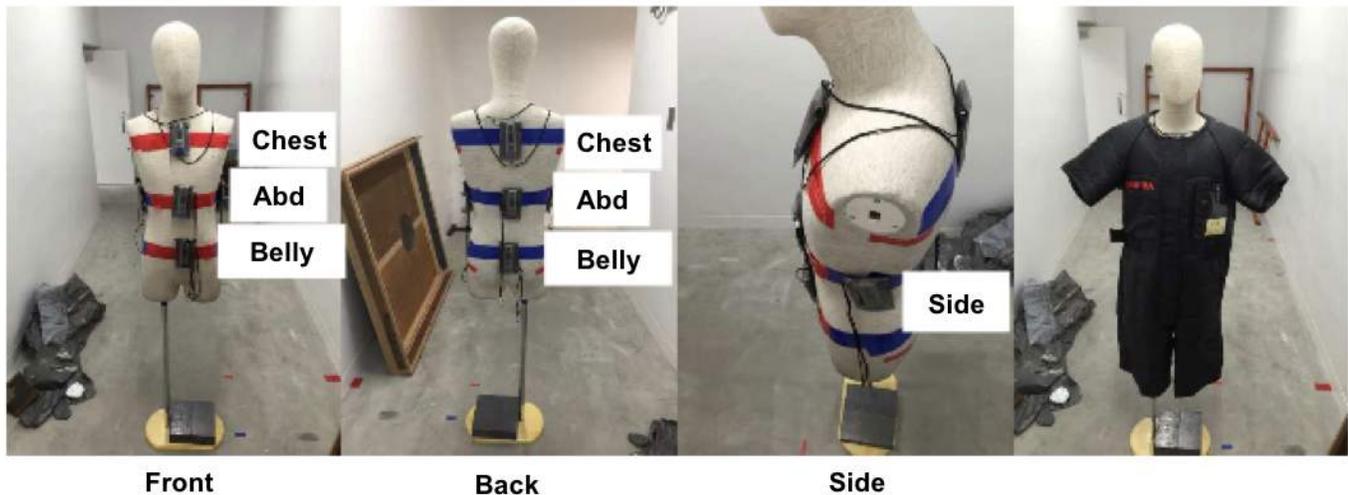
#### **Using same cobalt 60 to measure the shielding performance of radiation protection suits**

\*3 layers of RASSY crimped sheets inside the suits.

Measured spot on the abdomen blank (back of the abdomen), which has about 300[uSv/h].

\*Due to the measurement device's condition, radiation from cobalt 60 was too strong to measure. Therefore, we were only able to measure the shielding performance of scattered radiation.

### University)



	Place	Position	Shielding Rate(%) Each spot	Shielding Rate(%) Average of each side	Shielding Rate(%) Average of all
RADISHIELD Radiation Shielding Suit	Front	Chest	13.7	34.8	42.1
		Abd	38.6		
		Belly	52.1		
	Side	Left	48.5	51.8	
		Right	55.2		
	Back	Chest	30.4	39.8	
Abd		42.8			
Belly		46.1			

# RADISHIELD

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