

EN

*From the IEC standard*  
**IEC 61331:2014**  
*to the German standard*  
**DIN EN 61331:2016**



© Copyright 2021 – MAVIG GmbH, Stahlguberring 5, Munich, Germany – Subject to change.

**MAVIG**

## Overview of Contents

### **The Current Standard Series** **IEC 61331:2014** (international) / **DIN EN 61331:2016** (German)

<b>The Most Important Things in Brief</b>	<b>3</b>
Contents of the standard series DIN EN 61331:2016	3
<b>IEC 61331-1:2014 / DIN EN 61331-1:2016</b>	<b>4</b>
Methodology for determining the lead equivalent	4
Verify comprehensive protective effect	4
<b>IEC 61331-3:2014 / DIN EN 61331-3:2016</b>	<b>5</b>
Design of personal protective equipment	5
Specification of surface weight	5
Apron size to fit your body measurements	5
<b>The New Product Label</b>	<b>6-7</b>

## The Most Important Things in Brief

With these guidelines, MAVIG would like to advise you regarding the selection of your radiation protection apron. The most important criteria for making a decision are highlighted, especially taking into account the current state-of-the-art and the revised and now solely valid standard series.

Standard series **DIN EN 61331:2016**

based on:

Standard **IEC 61331:2014**

IEC 61331-1:1994, IEC 61331-3:1998, DIN EN 61331-1:2006, DIN EN 61331-3:2002 and DIN 6857-1:2009, the predecessor versions of the current standards/standard series, are **outdated** and have been **replaced**.



**Pay explicit attention to the year following the standard. Without specification of the year, it is not possible to evaluate the validity of a standard!**

## Content of the standard series DIN EN 61331:2016

**Part 1** of the standard series deals with the “**Determination of attenuation properties of materials**” and **part 3**, entitled “**Protective clothing, eyewear and protective patient shields**”, with the design of the protective clothing.

You will find more details on the following pages.

(Note: Part 2 of the standard series deals with the topic “Translucent protective plates” and is not relevant for the purpose of this flyer.)

### **How can you find out whether an apron corresponds to the latest state-of-the-art?**

- The label includes the **CE mark**, followed by the **four-digit reference number** of the notified body
- The lead equivalent was determined according to **IEC 61331-1:2014 / DIN EN 61331-1:2016**
- The design corresponds to IEC 61331-3:2014 / DIN EN 61331-3:2016: On the largest girth, the apron covers **at least 60%** of the girth.
- The **surface weight** of the radiation protection material is indicated on the label.

# IEC 61331-1:2014, DIN EN 61331-1:2016

## ► Methodology for determining the lead equivalent

For the first time at international levels, the current standard for the determination of the lead equivalent takes the occurrence of **fluorescent radiation\*** into account by means of a prescribed **measuring method**.

(\* low-energy radiation occurring mainly with lead-reduced and lead-free material)

This is important, as fluorescent radiation represents an additional **hazard** for the user, with a higher biological effect <sup>\*1</sup>.

## ► Verify comprehensive protective effect

It is now mandatory for all manufacturers to demonstrate the **protective effect** of the apron across the **entire X-ray tube voltage range** of **50 kV to 110 kV** or **50 kV to 150 kV**.

This is important, as the **protective effect** at the lower and upper end of the X-ray tube voltage range can **decreases** significantly, especially in the case of lead-reduced or lead-free protective material.

Since 2009, MAVIG has had its radiation protective aprons tested according to the national standard DIN 6857-1:2009, which already took fluorescent radiation into consideration as well as specified a measurement across the entire X-ray tube voltage range.

### In short, this means:

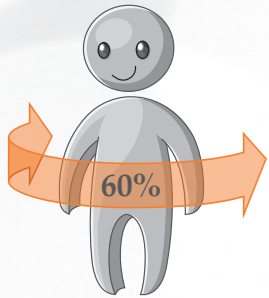
- Fluorescent radiation is taken into account.
- The protective effect of a material must be measured and demonstrated across the entire X-ray tube voltage range.

(<sup>\*1</sup>) Regulla DF et al: *Patient exposure in medical X-ray imaging in Europe. Radiat Prot Dosimetry 2005, Vol 114 (1-3), pp. 11-25*

# IEC 61331-3:2014, DIN EN 61331-3:2016

## ► Design of personal protective equipment

Part 3 specifies that at least **60% of the girth of the user's chest, waist, or hip** (the largest value counts) is to be covered by protective material, in order to better protect the sides of the body.



Well-thought-out, weight-distributing designs are now even more important than before. Due to the new regulations any radiation protective apron is enforced to have a higher total weight.

## ► Specification of surface weight

Additionally, the new IEC and DIN EN demand more transparency regarding the **properties** of the radiation protective material. The real **surface area weight** now has to be indicated on the apron, in order to simplify a **comparison** of different models and different manufacturers of protective aprons.

Always take into account that a slightly heavier radiation protective apron can still offer higher wearing comfort through skilful design and weight distribution.

## ► Apron size to fit your body measurements

The size of a radiation protective aprons must now be **assigned to the corresponding body measurements**, making it easier to select the appropriate radiation protective apron without trying it on.

### **In summary, this means:**

- The front protective area of the radiation protective apron must cover at least 60%.
- The surface area weight of the radiation protective material must be indicated on the label.
- The size of the radiation protective apron must be assigned to the body measurements.

## The New Product Label

Based on these **four traits**, you can recognise whether your protective clothing corresponds to the latest state-of-the-art.

- 1 *Indication of the X-ray tube voltage range 50 - 110 kV or 50 - 150 kV in which the protective effect of the protective clothing has been measured and demonstrated.*

All around protective model RA631 Balance

Costume, front: 0,35 mmPb, back: 0,25 mmPb,  
Small (S), 70 cm, Curacao,  
ComforTex HPMF, NovaLite 0,35, 50-110 kV



**SN** (21) **2935870000001**

**REF** (240) **RA631-STD / RA631K32M752528**

Fig. 1: Example of a product label



20211124



MAVIG GmbH  
Stahlgruberring 5  
81829 Munich  
www.mavig.com

Made in Germany



Cleaning & Disinfection



CE 0302



according to: IEC 61331-1:2014,  
IEC 61331-3:2014, DIN EN 61331-1:2016,  
DIN EN 61331-3:2016, (EU) 2016/425

$W_s$  front: 4.3 kg/m<sup>2</sup>  
 $W_s$  back: 3.0 kg/m<sup>2</sup>

Front: MAVIG HC 0.35 mmPb / 50-110 kV IEC 61331-3:2014

2 CE mark with four-digit reference number of the notified body.

3 Statement of the standards with indication of the year!  
Only the combination of part 1 and part 3 of the standard series in conjunction with the indication of the year 2014 (IEC) or 2016 (DIN EN) corresponds to the latest state-of-the-art (see also pages 4-5).

4 Indication of the surface area weight of the radiation protective material.

## **MAVIG GmbH**

PO Box 82 03 62  
81803 Munich  
Germany

Stahlgruberring 5  
81829 Munich  
Germany

Phone +49 (0) 89 420 96 0  
Fax +49 (0) 89 420 96 200  
e-Mail [info@mavig.com](mailto:info@mavig.com)

[www.mavig.com](http://www.mavig.com)

**MAVIG**