

USER MANUAL

# RaySafe Pro-Fluoro 150

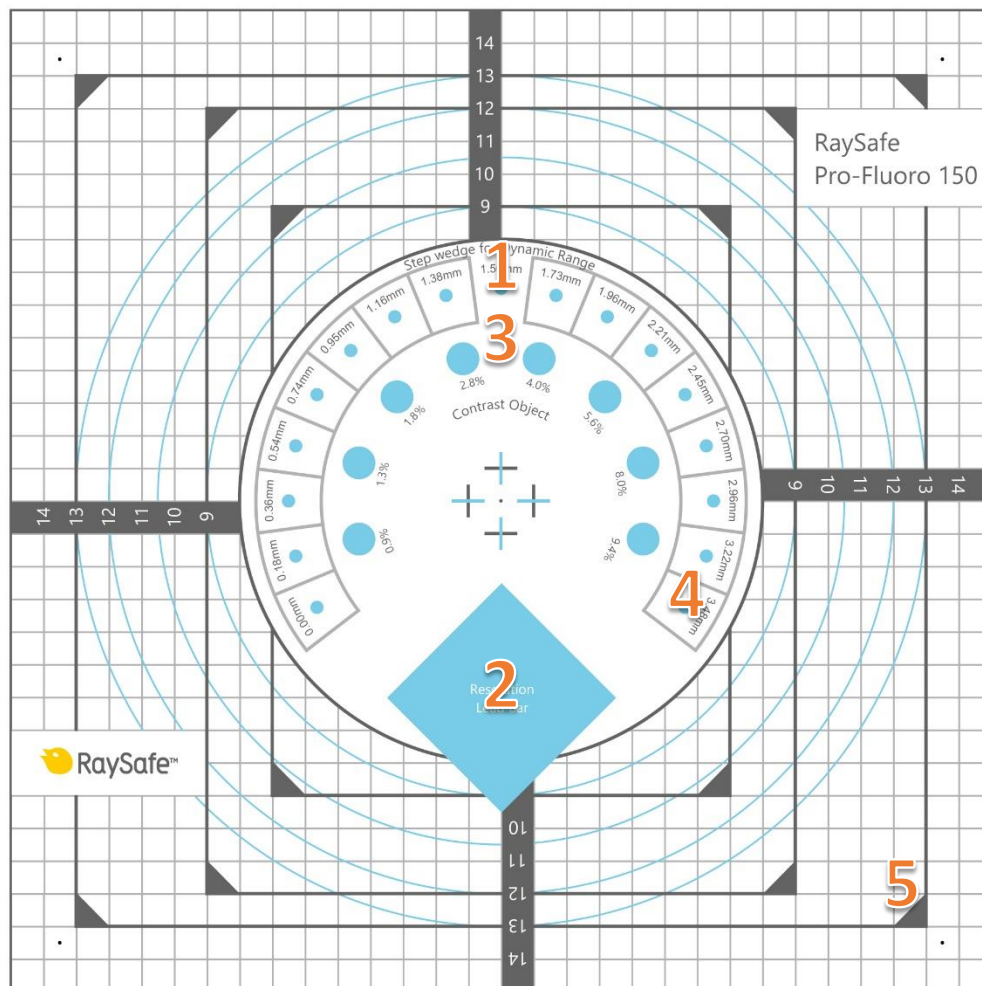


# ABOUT THE RAYSAFE PRO-FLUORO 150

The phantom is made of PMMA (polymethyl methacrylate) and copper, with details of different materials. The phantom complies with DIN 6868-150, DIN 6868-4 and IEC 61223-3-1.

The phantom is supplied with:

- Cone for perpendicularity testing
- Pro-RF Al 25 – 25mm aluminium filter, patient body equivalent
- Pro-RF Cu 1 – additional 1mm copper filter for test at and above 100kV
- Pro-RF Rack – holder for mounting the phantom on a chest wall
- Pro-RF Stand – a stand for mounting filter above the phantom



1. Dynamic copper step wedge.
2. Spatial resolution test pattern.
3. Detail contrast objects.
4. Detail contrast objects on copper step wedge.
5. Collimation lines for alignment of light and X-ray field.

# TECHNICAL SPECIFICATION

The phantom is made of a 17 mm thick PMMA (Polymethyl methacrylate) plate and a 1.5 mm thick copper plate. The phantom complies with DIN 6868 150, DIN 6868-4 and IEC 61223-3-1.

1. Dynamic copper step wedge, consisting 17 steps made of different Cu thickness: 0.00, 0.18, 0.36, 0.54, 0.74, 0.95, 1.16, 1.38, 1.50, 1.73, 1.96, 2.21, 2.45, 2.70, 2.96, 3.22, 3.48 mm. The PMMA is thinned out at the site of the copper step wedge: 4 mm PMMA in step 1–8, and 12 mm at step 10–17.
2. Spatial resolution test pattern with 3 periods for each resolution: 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.5, 2.8, 3.1, 3.4, 3.7, 4.0, 4.3, 4.6, 5.0 LP/mm. The pattern is made of 100  $\mu\text{m}$  thick.
3. Eight circular detail contrast objects,  $\varnothing$  10 mm, in the homogeneous field. The objects are air cavities in the PMMA: 0.4, 0.6, 0.8, 1.2, 1.7, 2.4, 3.4, 4.0 mm deep.  
At 75kV and with additional 25mm Al objects produce following contrasts: 0.9 %, 1.3 %, 1.8 %, 2.8 %, 4.0 %, 5.6 %, 8.0 %, 9.4 %.
4. 17 circular detail contrast objects on copper step wedge,  $\varnothing$  4 mm, air cavities with a depth of 2.5 mm in PMMA on every step of the copper step wedge.
5. Collimation lines for alignment of light and x-ray field. Dimensions: 26 $\times$ 26; 18 $\times$ 24; 14 $\times$ 18 cm. Circular diameter dimensions: 26, 24, 21, 18, 16 cm.

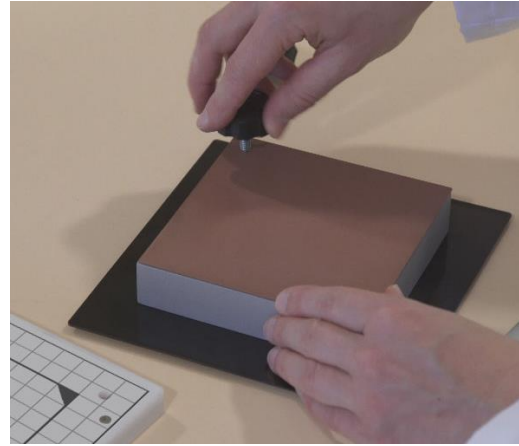
# TEST PROCEDURE

This is an example. Be sure to comply with your local regulations.

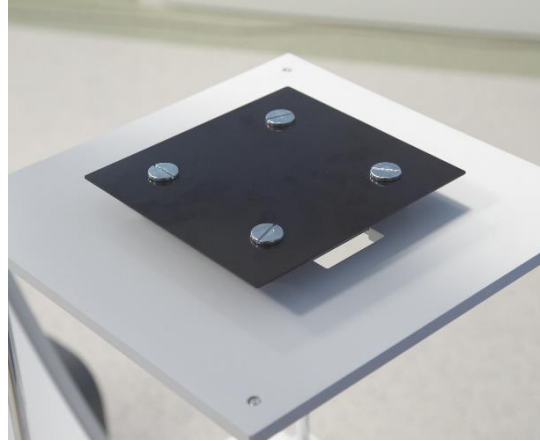
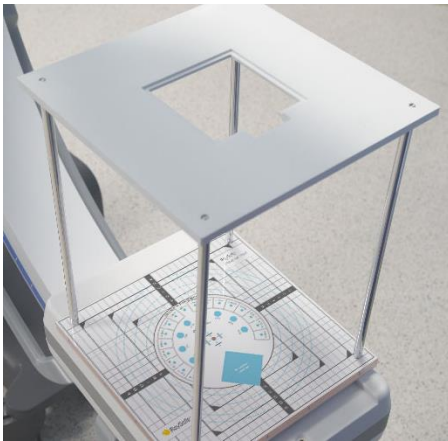
1. Position the phantom on the table. Use FTD of about 1m. The center and main axis should align with the light marker of the apparatus.
2. Narrow the light field (which should represent the X-ray field) to the chosen markings on the phantom.
3. Check that the machine has AEC turned on.



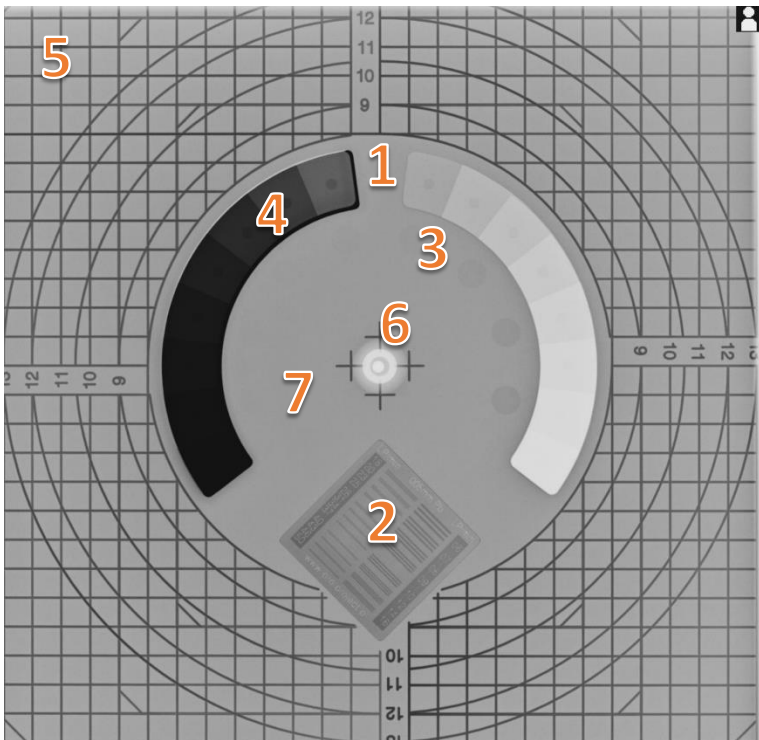
4. Use an additional 25 mm aluminium filter (patient equivalent) for the test for the tube voltage to reach the desired range (for example 75  $\pm$  7 kV according to DIN 6868-150). Mount the Al 25 filter in rails on the collimator.  
For test above 100kV use additional 1mm Cu filter.



Some x-ray systems don't have the possibility to add the 25 mm Al filter in a slot close to the collimation, for example when the tube is positioned underneath the table. Use the Pro-RF Stand for positioning the filter and the phantom properly in these cases.



5. Make the exposure and read the results from the image.



1. Dynamic range: Number of Cu steps visible (max 17)
2. Spatial resolution: Number of line pairs per millimeter (max 5.0 LP/mm)
3. Contrast resolution: Visibility of detail contrast objects (max 8)
4. Contrast resolution: Visibility of detail contrast objects on copper step wedge (max 17)
5. Collimator light field and beam alignment: Check the alignment using the grid and circles (ok or not)
6. Beam perpendicularity: Check the perpendicularity with the cone (ok or not)
7. Homogeneity: Artefacts in the image (yes/no)

## OTHER SETUPS

The phantom and holder can be used for mounting on chest wall.

