

# WEK-DSA phantom, Digital Subtraction Angiography QA Test Phantom

## 1. Product Introduction

The WEK-DSA phantom is used to evaluate the digital function of the DSA system; the phantom adopts a new design, which greatly improves the quality of subtraction angiography. Contrast range, resolution, linearity, consistency, amplifier dynamic range, matching accuracy and subtraction effectiveness can be checked, and quantitative measurements can be made to measure high and low contrast spatial resolution. Easy-to-understand results are provided.

WEK-DSA phantom complies with the Association of Physicists in Medicine (AAPM) Report No. 15, IEC61223-3-1, and CE certification. WEK-DSA phantom is a Digital Subtraction Angiography QA Test Phantom



Figure A.1 WEK-DSA phantom Pusher

## Product structure

### A.1. Simulating the minimum resolution size of arterial vessels and motion artifact detection module

Contrast agent concentration: one piece each of 150mg/mL and 300mg/mL, three simulated blood vessels, with width and thickness of 1.0, 2.0 and 4.0mm respectively, each tube has simulated arterial stenosis and aneurysm, with widths of 1/4, 1/2 and 3/4 of the width of a single artery respectively, and the module size is 300x150x25mm, as shown in Figure A.2.

Unit: mm

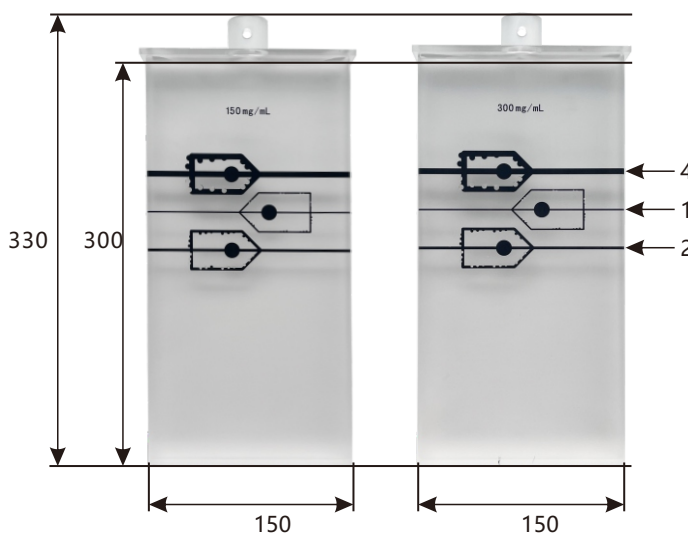


Figure A.2 Simulated arterial minimum resolution size and motion artifact detection module

## A. . o contrast iodine line pair test insert

There are 3 groups of iodine contrast agent test lines in the module, each group of lines consists of 4 lines with different diameters, 0.5, 1.0, 2.0 and 4.0 mm respectively. The concentrations of iodine contrast agents in the 3 groups of lines are 2.5, 5.0 and 10.0 mg/cc respectively. The module size is 300x150x25mm, as shown in Figure A.3.

Unit: mm

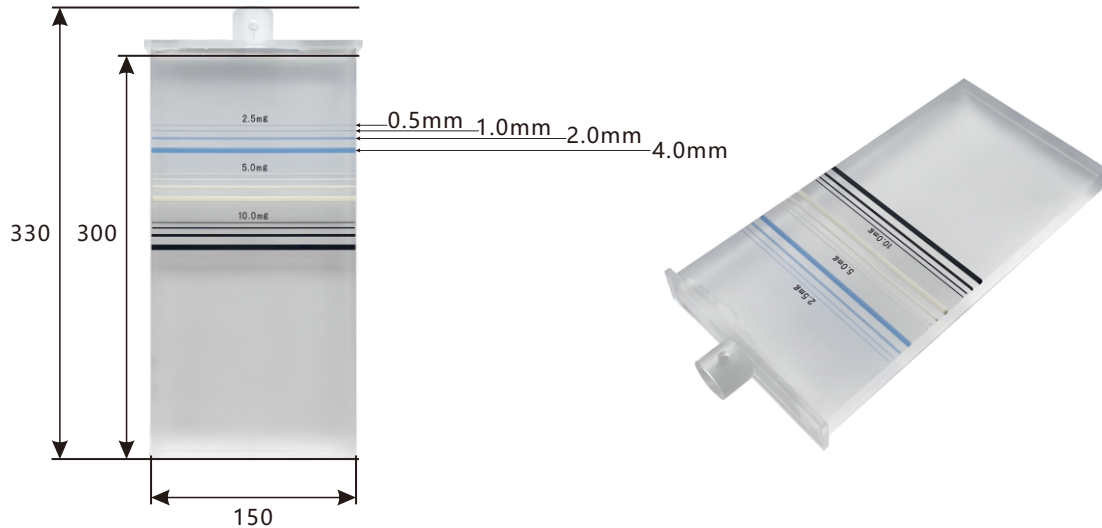


Figure A.3. Low contrast iodine pair test insert

## A. . igh ontrast esolution Test Plug-in

Used with the line pair card, there is a groove for the line pair card on the test board, which can support the horizontal, vertical and 45-degree rotation of the line pair card. The size of the line pair card is 50x50mm. The module size is 200x150x25mm.

Unit: mm

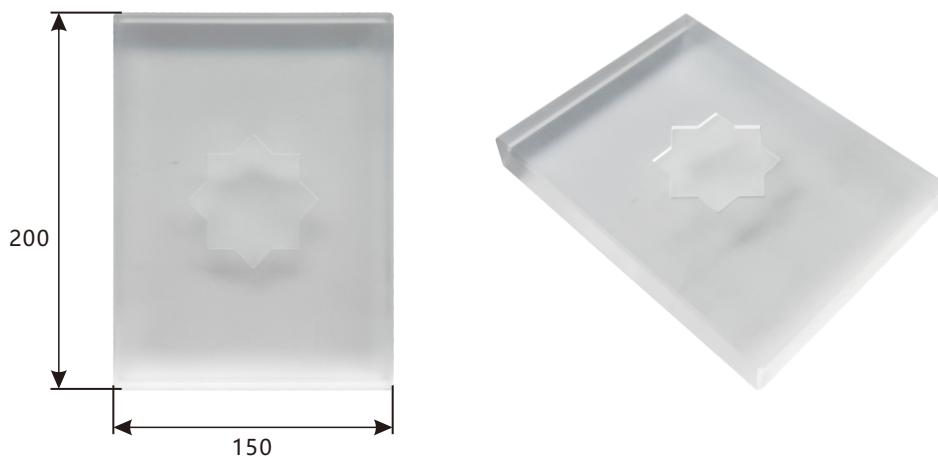


Figure A.4. High contrast resolution test plug-in

## A. . Image inearity Test Plugin

There are six 19mm test areas distributed in a circle on the test plate, with different iodine thickness and triiodine concentration, namely 20.0, 10.0, 4.0, 2.0, 1.0, 0.5 mg/cm<sup>3</sup>, and the size is 200x150x25mm, as shown in Figure A.5.

Unit: mm

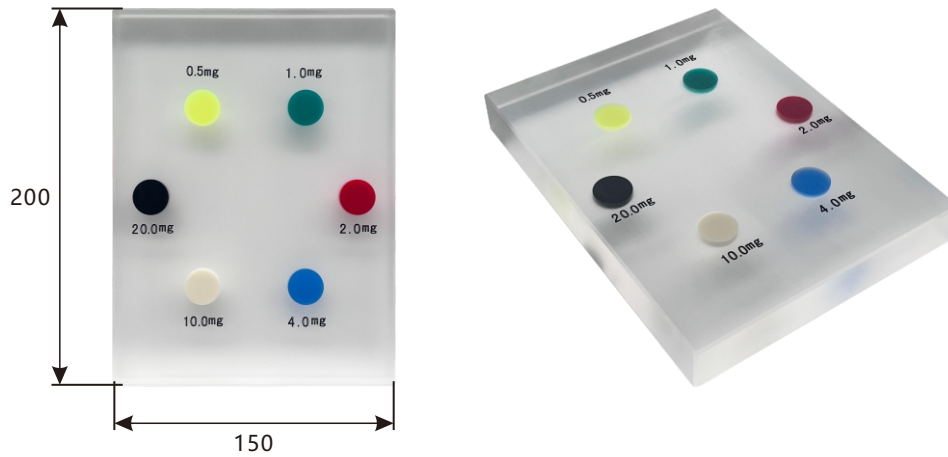


Figure A.5. Image Linearity Test Plugin

## A. . one simulation test bloc

There are three types of PTFE strips simulating bones, with a width of 25 mm and thicknesses of 5, 10, and 15 mm, respectively. The dimensions are 200x200x25 mm, as shown in Figure A.6.

Unit: mm

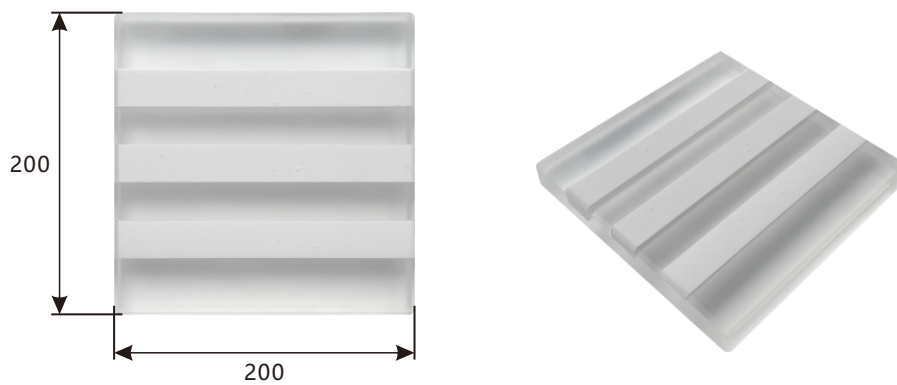


Figure A.6. Bone simulation test block

## A. . lan Inserts

The plexiglass module is made of uniform material and has dimensions of 200x150x25mm, as shown in Figure A.7.

Unit: mm

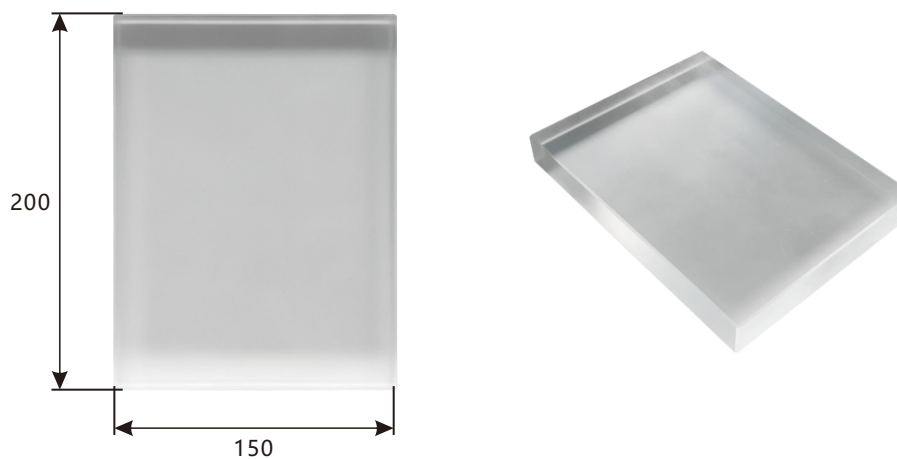


Figure A.7. Blank Insert

## A. . Step edge test bloc

Six stepped blocks (each 25.5 mm high) form a module. When the top three and the bottom three are "folded", they can become a module of 200x200x76.5 mm in size, as shown in Figure A.8.

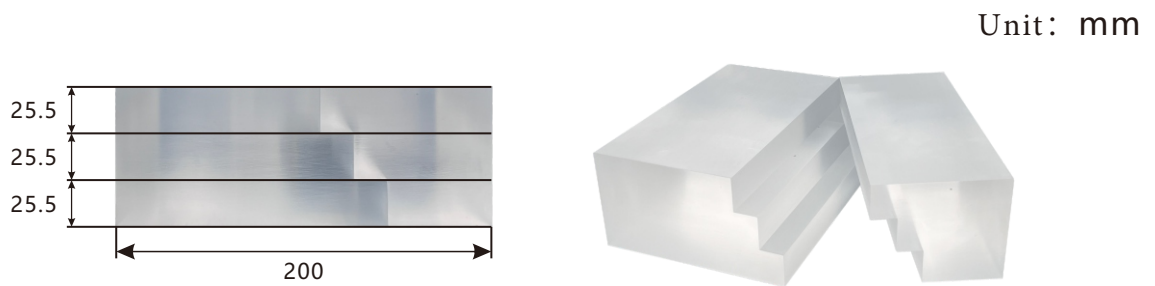


Figure A.8. Stepped wedge test block

## A. . Matching plate

Made of aluminum, full of 3.2mm holes, size: 200x200x2mm.

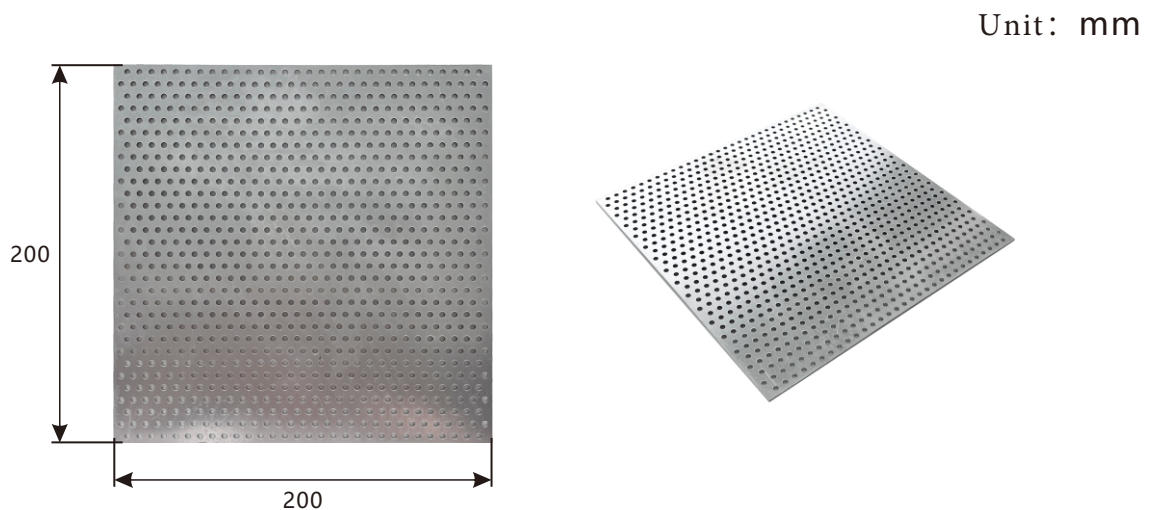


Figure A.9. Matching plate







## A. . Slot bloc Phantom base

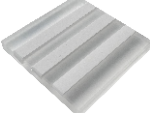
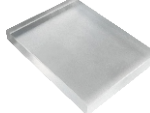

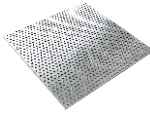


The phantom has an opening that can be used to fix and position other modules, and to place different modules to achieve different parameter measurements. Module outer dimensions: 200x200x77mm, slot dimensions: 200x150x25mm.



Figure A.10. Slot block (phantom base)

### Table A.1 Phantom parameters

Name	Pusher	Artifact Detection Module Arterial Block 150mg/ml	Artifact Detection Module Arterial Block 300mg/ml	Low contrast iodine line pair test plug-in	High contrast resolution test plug-in	Image Linearity Test Plug-in
Image						
Length mm	260	300	300	300	200	200
Width mm	170	150	150	150	150	150
Height mm	65	25	25	25	25	25
Quantity	1	1	1	1	1	1

Name	One simulation test block	Planar Insert	Step edge test block	Attachment board	Slot block	Custom Aluminum box
Image						
Length mm	200	200	200	200	200	535
Width mm	200	150	200	200	200	375
Height mm	25	25	76.5	2	77	250
Quantity	1	1	1	1	1	1