Plastic Water®

Model PW

DISCONTINUED

USER GUIDE

CIRS

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INTENDED ENERGY RANGE

[3] Plastic Water - The Original - 150 keV - 100 MeV
Permits calibration of photon and electron beams within 0.5% of true water dose. Perform routine beam constancy checks following TG51 recommendation.

OTHER ENERGY RANGES AVAILABLE

[1] Plastic Water LR - 15 keV - 8 MeV
Use for such things as dose evaluation for low energy brachytherapy sources or CT dose verification.

[2] Plastic Water DT - 50 keV - 15 MeV
Use for special applications requiring exposures to both diagnostic and therapeutic energies such as radiation therapy planning and dose verification in IMRT.

SET UP

Create a stack of PW slabs so that the measurement tool is the desired depth below the top surface. In conjunction with material above the collecting chamber, an additional minimum of 10 cm thickness of material needs to be placed below the chamber at all times to achieve appropriate scatter characteristics.

VISUAL APPEARANCE AND VARIATION:

The visual pattern variations on the top and bottom surface are due to the interaction of the released mold surface and the speed in which the material is flowing in the mold. Variation on the sides of the slab occurs during finishing. The slabs are cut to size which leads to different surface appearances. Surfaces untouched will appear shiny while machined surfaces may have a matte, textured finish. Over time you may notice “yellowing” of the slab. This generally starts on the outer edges of the slab and works in. This is a common aging phenomena experienced in most epoxies. These variations will have no impact on the attenuation properties of the material.

CLEANING

Clean with mild soap and water.
DO NOT use solvent based cleaners.

HANDLING AND STORAGE

Plastic Water should be stored flat. Plastic Water, like most plastics, is flexible in nature and will creep (warp/bow/deform) under constant stress over time, even under its own weight. This deformation is not permanent. The slab will self correct and recover its original shape if placed back in its original geometry. An easy way to maintain slab flatness and minimize creep is to store the slabs, clean free of debris on or in between flat surfaces. If the Plastic Water is to be shipped, special care should be given to packaging or the use of a specially fitted carry case which will protect flatness.

PLASTIC WATER DESCRIPTION

It is known to be advantageous to use water equivalent materials for output calibration of photon and electron beams. Plastic Water has been designed such that the signal detected by the same dosimeter in Plastic Water agrees with true water within 0.5% at equal depths. Unlike other water equivalent material on the market, Plastic Water is flexible and resists breakage under impact. Plastic Water is the only calibration material available in 1mm thickness.[1] Other water-equivalent materials are available for other energy ranges. Plastic Water is non-hydroscopic.

Photon Recalculated Linear Attenuation Coefficients (cm-1) of Plastic Water

Plastic Water® - High Energy			
En, MeV	H_2O	PW	Ratio%
0.10	0.1707	0.1754	102.75
0.20	0.1370	0.1376	100.55
0.40	0.1062	0.1060	99.81
0.60	0.0896	0.0894	99.78
0.80	0.0787	0.0785	99.75
1.00	0.0707	0.0705	99.72
2.00	0.0494	0.0493	99.80
4.00	0.0340	0.0340	100.00
6.00	0.0277	0.0277	100.00
8.00	0.0243	0.0242	99.59
10.00	0.0222	0.0222	100.00
20.00	0.0181	0.0181	100.00
30.00	0.0171	0.0171	100.00
60.00	0.0168	0.0168	100.00
100.00	1.0172	0.0173	100.58
Electron Density 10^{23}, cm^{-3}	3.343	3.336	99.79
Density g/cm^{-3}	1.00	1.030	-

References:

1. Wallace, R.E., Evaluated phantom material for ^{125}I and ^{103}Pd dosimetry poster: SU-DD-EXH-12, AAPM Annual Meeting, Montreal, CANADA July, 2002.

2. Heaton, R., et. al, Dosimetric Evaluation of Plastic Water-Diagnostic Therapy (PWDT) Phantom Material poster: PO-T-97, AAPM Annual Meeting, 2003.

3. Tello, V.M., Tailor, R.C., and Hanson, W.F. How water equivalent are water equivalent solid materials for output calibration of photon and electron beams? Medical Physics 22 (7), July 1995 pgs. 1177-1189.

WARRANTY

All standard CIRS products and accessories are warranted by CIRS against defects in material and workmanship for a period as specified below. During the warranty period, the manufacturer will repair or, at its option, replace, at no charge, a product containing such defect provided it is returned, transportation prepaid, to the manufacturer. Products repaired in warranty will be returned transportation prepaid.

There are no warranties, expressed or implied, including without limitation any implied warranty of merchantability or fitness, which extend beyond the description on the face hereof. This expressed warranty excludes coverage of, and does not provide relief for, incidental or consequential damages of any kind or nature, including but not limited to loss of use, loss of sales or inconvenience. The exclusive remedy of the purchaser is limited to repair, recalibration, or replacement of the product at manufacturer's option.

This warranty does not apply if the product, as determined by the manufacturer, is defective because of normal wear, accident, misuse, or modification.

NON-WARRANTY SERVICE

If repairs or replacement not covered by this warranty are required, a repair estimate will be submitted for approval before proceeding with said repair or replacement.

RETURNS

If you are not satisfied with your purchase for any reason, please contact your local distributor prior to returning the product. Visit https://www.cirsinc.com/distributors/ to find your local distributor. If you purchased your product direct through CIRS, call Customer Service at 800-617-1177, email rma@cirsinc.com, or fax an RMA request form to 757-857-0523. CIRS staff will attempt to remedy the issue via phone or email as soon as possible. If unable to correct the problem, a return material authorization (RMA) number will be issued. Non-standard or "customized" products may not be returned for refund or exchange unless such product is deemed by CIRS not to comply with documented order specifications. You must return the product to CIRS within 30 calendar days of the issuance of the RMA. All returns should be packed in the original cases and or packaging and must include any accessories, manuals and documentation that shipped with the product. The RMA number must be clearly indicated on the outside of each returned package. CIRS recommends that you use a carrier that offers shipment tracking for all returns and insure the full value of your package so that you are completely protected if the shipment is lost or damaged in transit. If you choose not to use a carrier that offers tracking or insure the product, you will be responsible for any loss or damage to the product during shipping. CIRS will not be responsible for lost or damaged return shipments. Return freight and insurance is to be pre-paid.

WITH RMA NUMBER, ITEMS MAY BE RETURNED TO:

CIRS
Receiving
900 Asbury Ave,
Norfolk, Virginia, 23513 USA

PRODUCT	WARRANTY PERIOD
Plastic Water	60 Months

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