Delta$^{4PT}$ Plastic Water version offers:

- Consistent water equivalent QA from calibration to plan verification
- Immediate plan verification
- Highest accuracy in dose determination
- Water equivalence in diagnostic and therapeutic energies
**Water equivalent QA**

Pre-treatment verification using phantoms with non-water equivalent material is widely used in clinical practice. However, some dose calculation algorithms require extra attention when using these materials. Special consideration must be taken into account regarding:

- Density scaling artifacts \[^{[1]}\]
- Non-appropriate scatter from material with density >1 g/cm\(^3\) \[^{[2,3]}\]
- Absence of phantom material as a separate entry in the HU-electron density conversion table \[^{[4]}\]

These factors may contribute to reduced accuracy in the dose determination in the phantom. Using a water equivalent phantom material eliminates these uncertainties and also provides consistency maintained in QA from calibration to patient QA.

The Delta\(^{4PT}\) phantom is available with Plastic Water\(^{\circledR}\) DT material. The material has been chosen because of its capability to simulate water within a wide energy range \[^{[5]}\].

For clinics who base all dosimetry on water and want to stay consistent, the Delta\(^{4PT}\) Plastic Water version is the system of choice \[^{[6]}\].

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![Graph showing depth vs. dose/100MU](image)

Data based on Delta\(^{4PT}\) Plastic Water unit

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Data based on HU=0 (water)

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**Reference**

4. Appendix "Validation of Oncentra Photon Dose using PMMA Phantoms". D192.739ENG-04 Oncentra MasterPlan – Physics and Algorithms
## Technical specification

<table>
<thead>
<tr>
<th>Cylindrical phantom material</th>
<th>Plastic Water® DT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration phantom material</td>
<td>Plastic Water® DT, Back- and sidescatter in PMMA</td>
</tr>
</tbody>
</table>

### Detectors:

- **Type**: p-Si
- **Total number**: 1069
- **Maximum deviation of detection point relative to markings on the phantom**: 0.5 mm
- **Detection area per plane**: 20 x 20 cm
- **Distance between detectors**:
  - Central area (6x6cm): 5 mm
  - Outer area (20x20cm): 10 mm
- **Size (radial x axial)**: 1 x 0.05 mm (0.04 mm³)
- **Shape**: Disc
- **Dose range**: 1 mGy to unlimited
- **Dose resolution**: 50 nGy
- **Sensitivity decrease (6MV beam)**: 0.8 % per kGy
- **SVWT (Temp. dependency)**: 0.27 %/degree

### Size and weight Delta™ unit:

- **Cylinder diameter**: 22 cm
- **Cylinder length**: 40 cm
- **Total length**: 72 cm
- **Total weight**: 24 kg

### Ordering Information:

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
</tr>
</thead>
</table>
| SDOS102-00 | Delta™ basic system Plastic Water® DT version including:  
- 3D detector arrays embedded in Plastic Water  
- Plastic Water Measuring phantom  
- Plastic Water Calibration phantom  
- Delta™ basic software for acquisition of data and analysis  |
| SDOS102-14 | Ion chamber slab for Farmer type chamber 2,571, Plastic Water  |
| SDOS102-15 | Ion chamber slab for Semiflex 0.3 ccm, Plastic Water  |
| SDOS102-16 | Ion chamber slab for A1 SL, Plastic Water  |
| SDOS102-17 | Ion chamber slab for A12, Plastic Water  |
| SDOS120-95 | Upgrade to Plastic Water  |
| SDOS101-01 | Delta™ option  |
| SDOS101-03 | Delta™ software option  |
| SDOS101-06 | Delta™ Professional software option  |
| SDOS101-08 | Delta™ Anatomy software option  |
| SDOS101-04 | Delta™ option  |
| SDOS101-05 | Delta™ software option  |
| SDOS102-01 | Delta™ Trolley  |
| SDOS102-02 | Delta™ Extra cable set  |
| SDOS102-03 | Delta™ Sagittal-Coronal support  |
“We feel confident with Delta™ Plastic Water since the dose planning process is straight forward: All calculations and measurements are performed as if the phantom was true water. In addition we can even CT-scan the Delta™ Plastic Water phantom and thereby extend the verification process to the acquisition of CT data.”

Ulf Isacsson, PhD,
Chief physicist, therapy section,
Uppsala University Hospital