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## **Appendix 4. Photographs**

This appendix contains the following photographs:

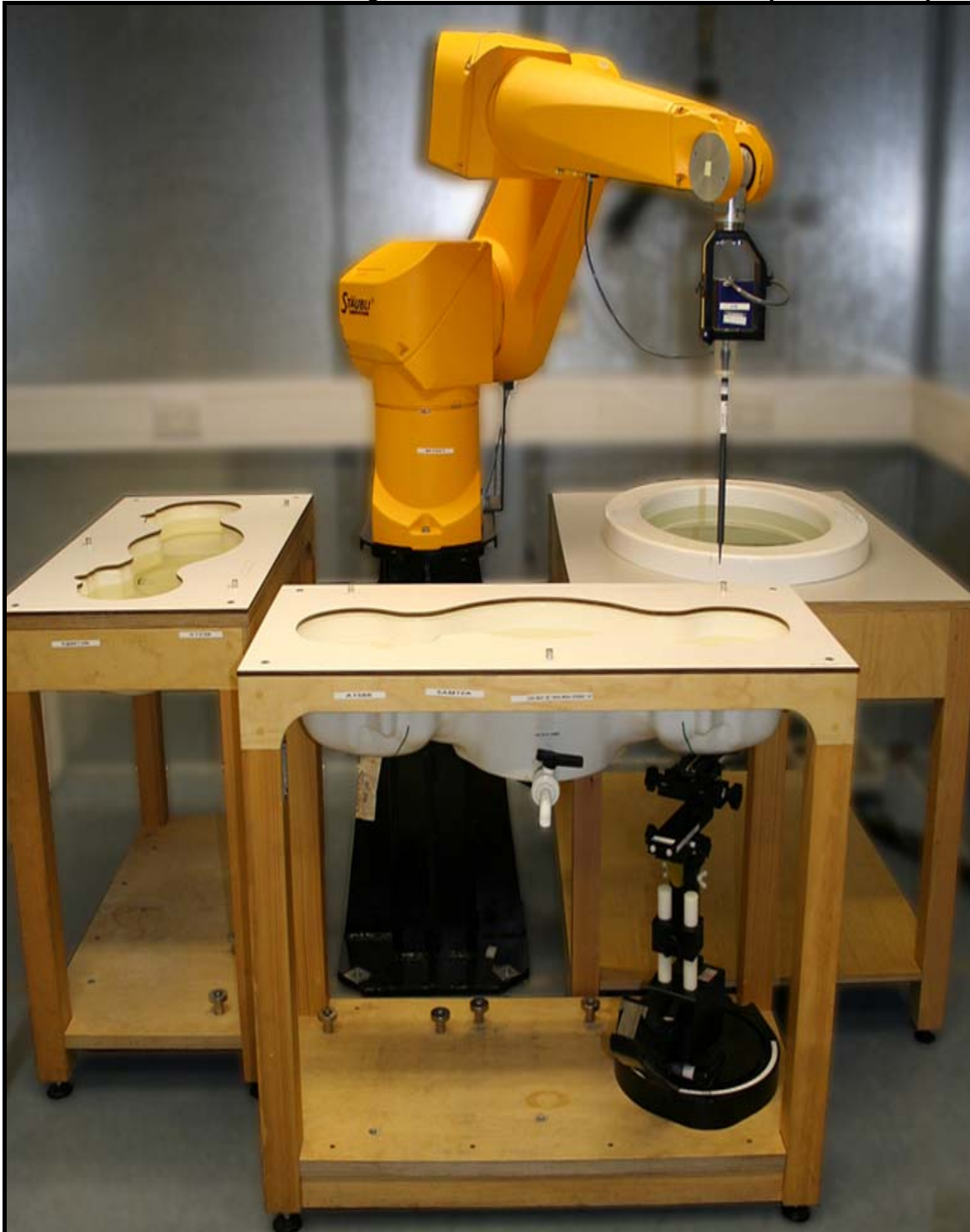
<b>Photo Reference Number</b>	<b>Title</b>
PHT/74162JD01/001	Test configuration for the measurement of Specific Absorption Rate (SAR)
PHT/74162JD01/002	Base of EUT Facing Phantom Direct Contact
PHT/74162JD01/003	Edge of EUT Facing Phantom Primary Portrait Direct Contact
PHT/74162JD01/004	Edge of EUT Facing Phantom Secondary Portrait Direct Contact
PHT/74162JD01/005	Edge of EUT Facing Phantom Landscape Configuration
PHT/74162JD01/006	Base of EUT Facing Phantom Direct Contact Close-up View
PHT/74162JD01/007	Base of EUT Facing Phantom With 5mm Separation Close-up View
PHT/74162JD01/008	Base of EUT Facing Phantom With 10mm Separation Close-up View
PHT/74162JD01/009	Screen of Tablet PC
PHT/74162JD01/010	Rear of Tablet PC
PHT/74162JD01/011	Screen and Keyboard View Laptop Mode
PHT/74162JD01/012	Base View Laptop Mode
PHT/74162JD01/013	Internal View
PHT/74162JD01/014	Battery View
PHT/74162JD01/015	Tablet Pen
PHT/74162JD01/016	850 and 900MHz Fluid Level
PHT/74162JD01/017	1800 and 1900 MHz Fluid Level

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PHT/74162JD01/001: Test configuration for the measurement of Specific Absorption Rate (SAR)



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**PHT/74162JD01/002: Base of EUT Facing Phantom Direct Contact**



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**PHT/74162JD01/003: Edge of EUT Facing Phantom Primary Portrait Direct Contact**



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**PHT/74162JD01/004: Edge of EUT Facing Phantom Secondary Portrait Direct Contact**





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**PHT/74162JD01/005: Edge of EUT Facing Phantom Landscape Configuration**



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**PHT/74162JD01/006: Base of EUT Facing Phantom Direct Contact Close-up View**



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**PHT/74162JD01/007: Base of EUT Facing Phantom With 5mm Separation Close-up View**





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PHT/74162JD01/008: Base of EUT Facing Phantom With 10mm Separation Close-up View



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PHT/74162JD01/009: Screen of Tablet PC



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PHT/74162JD01/010: Rear of Tablet PC



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PHT/74162JD01/011: Screen and KeyBoard View Laptop Mode



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**PHT/74162JD01/012: Base View Laptop Mode**





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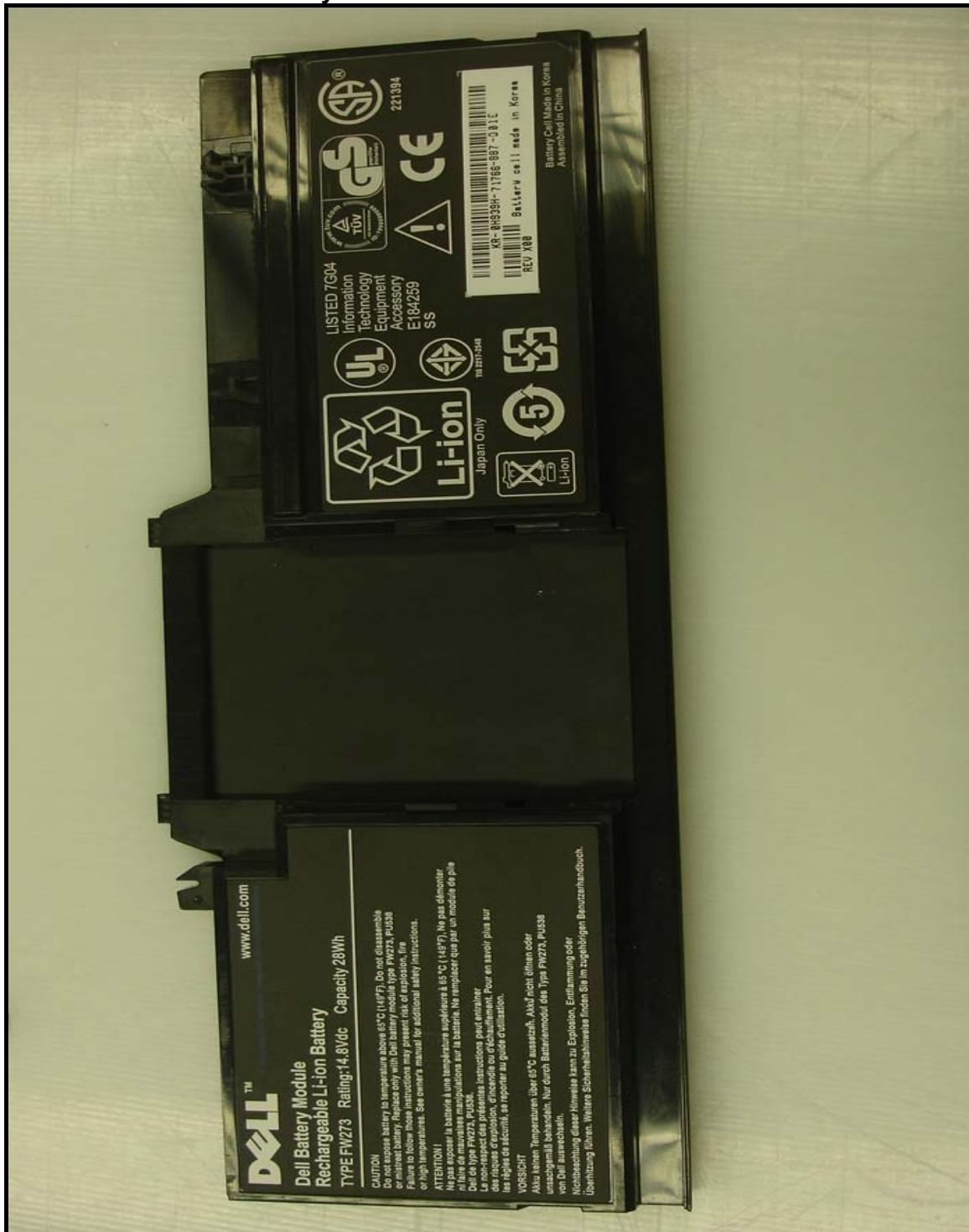
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PHT/74162JD01/013: Internal View



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PHT/74162JD01/014: Battery View



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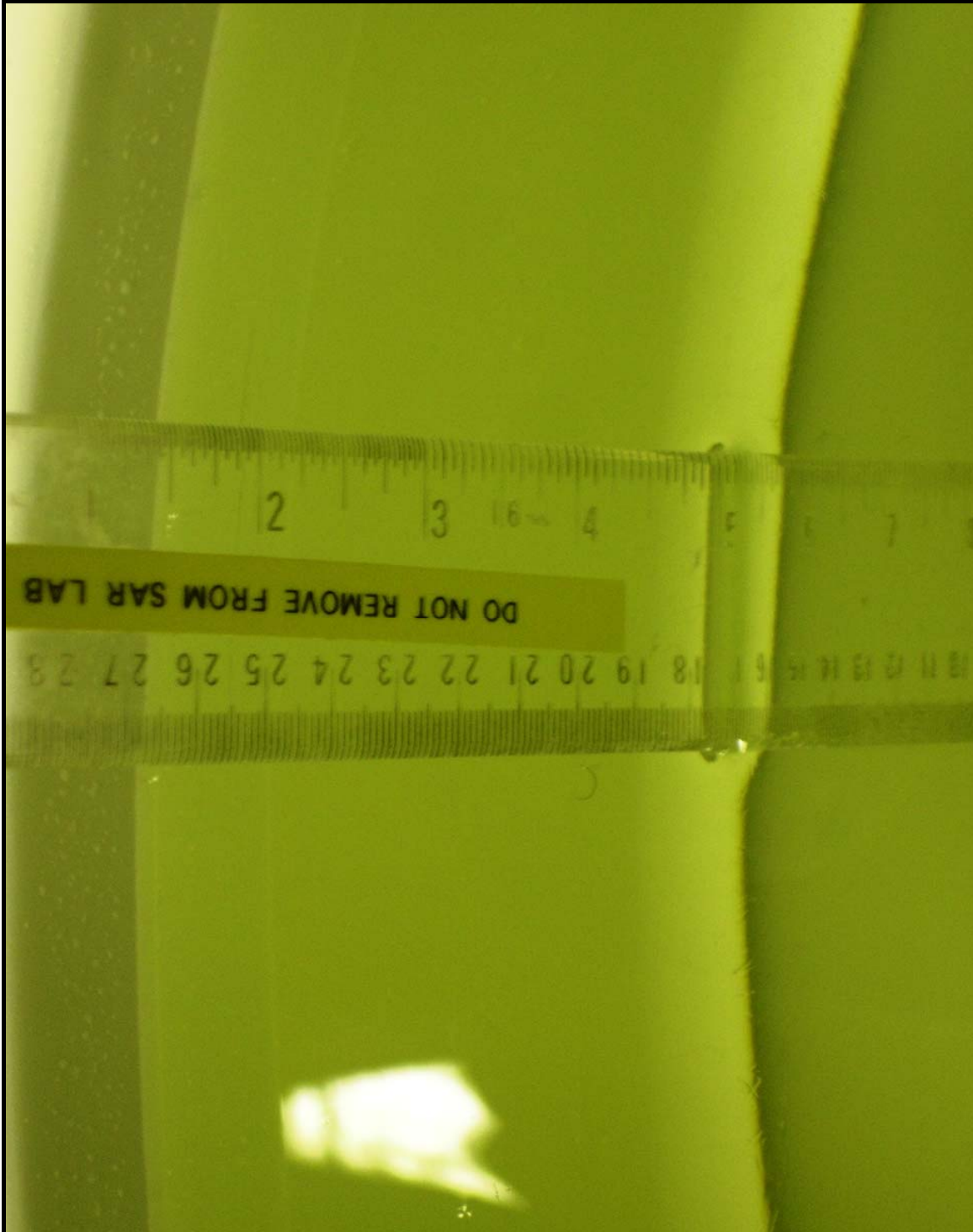
PHT/74162JD01/015: Tablet Pen



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PHT/74162JD01/016: 850 and 900MHz Fluid Level

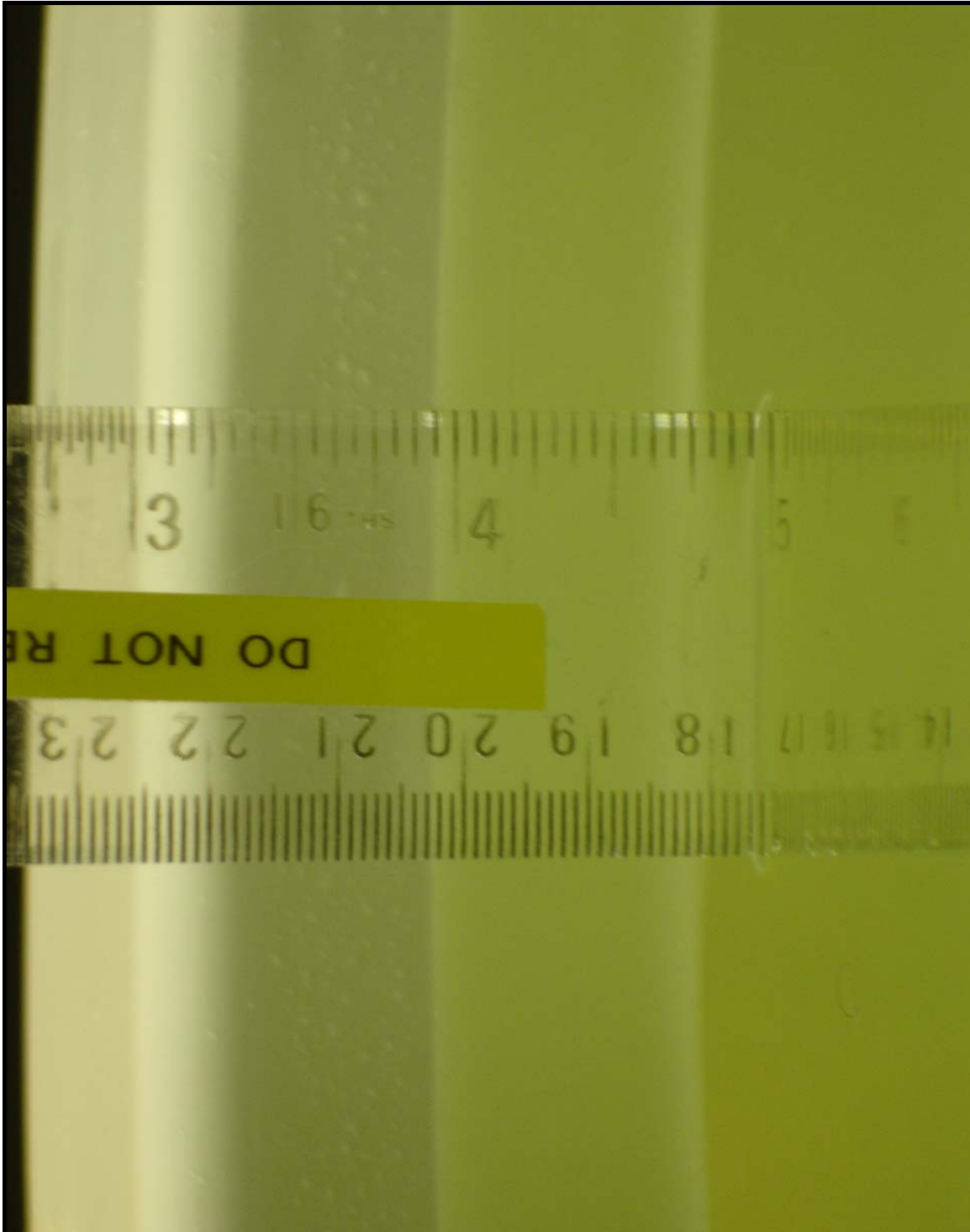




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PHT/74162JD01/017: 1800 and 1900 MHz Fluid Level





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## **Appendix 5. Validation of System**

Prior to the assessment, the system was verified in the flat region of the phantom. A 900 MHz and 1900 MHz dipoles were used. A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of  $\pm 5\%$  for the 900 MHz and 1900 MHz dipole. The applicable verification (normalised to 1 Watt).

**Date: 13/11/2008**

**Validation Dipole and Serial Number: D900V2 SN:185**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	24.0 °C	$\epsilon_r$	55.00	52.72	-4.14	5.00
				$\sigma$	1.05	1.00	-4.69	5.00
				1g SAR	10.50	10.32	-1.17	5.00
				10g SAR	6.89	6.80	-1.30	5.00

**Date: 17/11/2008**

**Validation Dipole and Serial Number: D900V2 SN:185**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	24.0 °C	$\epsilon_r$	55.00	52.89	-3.83	5.00
				$\sigma$	1.05	1.03	-1.50	5.00
				1g SAR	10.50	10.36	-1.33	5.00
				10g SAR	6.89	6.84	-0.72	5.00

**Date: 18/11/2008**

**Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0 °C	24.0 °C	$\epsilon_r$	53.30	51.91	-2.61	5.00
				$\sigma$	1.52	1.59	4.88	5.00
				1g SAR	38.00	39.68	4.42	5.00
				10g SAR	20.70	20.32	-1.83	5.00

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**Date: 26/11/2008****Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	25.0 °C	25.0 °C	$\epsilon_r$	53.30	51.32	-3.72	5.00
				$\sigma$	1.52	1.58	4.20	5.00
				1g SAR	38.00	38.84	2.21	5.00
				10g SAR	20.70	19.84	-4.15	5.00

**Date: 27/11/2008****Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	25.0 °C	25.0 °C	$\epsilon_r$	53.30	53.46	0.31	5.00
				$\sigma$	1.52	1.60	4.98	5.00
				1g SAR	38.00	39.04	2.73	5.00
				10g SAR	20.70	20.00	-3.38	5.00

**Date: 29/11/2008****Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	25.0 °C	25.0 °C	$\epsilon_r$	55.00	53.00	-3.58	5.00
				$\sigma$	1.05	1.01	-3.81	5.00
				1g SAR	10.50	10.52	0.19	5.00
				10g SAR	6.89	6.92	0.43	5.00

**Date: 13/12/2008****Validation Dipole and Serial Number: D900V2 SN:185**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	24.0 °C	$\epsilon_r$	55.00	55.44	0.80	5.00
				$\sigma$	1.05	1.04	-1.33	5.00
				1g SAR	10.50	10.20	-2.86	5.00
				10g SAR	6.89	6.72	-2.46	5.00

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**Date: 14/12/2008****Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	25.0 °C	24.5 °C	$\epsilon_r$	53.30	53.04	-0.50	5.00
				$\sigma$	1.52	1.58	3.69	5.00
				1g SAR	38.00	39.32	3.47	5.00
				10g SAR	20.70	20.16	-2.60	5.00

**Date: 18/12/2008****Validation Dipole and Serial Number: D900V2 SN:185**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	24.0 °C	$\epsilon_r$	55.00	52.96	-3.71	5.00
				$\sigma$	1.05	1.01	-4.24	5.00
				1g SAR	10.50	10.80	2.86	5.00
				10g SAR	6.89	7.12	3.34	5.00

**Date: 18/12/2008****Validation Dipole and Serial Number: D1900V2:SN:540**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	25.0 °C	25.0 °C	$\epsilon_r$	53.30	51.34	-3.67	5.00
				$\sigma$	1.52	1.56	2.30	5.00
				1g SAR	38.00	38.80	2.10	5.00
				10g SAR	20.70	19.88	-3.96	5.00

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## Appendix 6. Simulated Tissues

The body mixture consists of water and glycol. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient	Frequency
	1800/1900 MHz Body
De-Ionised Water	69.79%
Diglycol Butyl Ether (DGBE)	30.00%
Salt	0.20%

Ingredient	Frequency
	835/850/900 MHz Body
De-Ionised Water	50.75%
Sugar	48.21%
Salt	0.94%
Kathon	0.10%

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## **Appendix 7. DASY4 System Details**

### **A.7.1. DASY4 SAR Measurement System**

RFI Global Services Ltd, SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM and OVAL phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller; teach pendant (Joystick), and remote control. This is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. The data acquisition electronics (DAE) performs signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection etc. The DAE is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.



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### A.7.2. DASY4 SAR System Specifications

#### Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of Axis:	6
Serial Number:	F00/SD89A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+

#### Data Acquisition Electronic (DAE) System

Serial Number:	DAE3 SN:394
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#### Cell Controller

PC:	Dell Precision 340
Operating System:	Windows 2000
Data Card:	DASY4 Measurement Server
Serial Number:	1080

#### Data Converter

Features:	Signal Amplifier, multiplexer, A/D converted and control logic.
Software:	DASY4 Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.

#### PC Interface Card

Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.
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**DASY4 SAR System Specifications (Continued)****E-Field Probe**

Model:	EX3DV3
Serial No:	3508
Construction:	Triangular core
Frequency:	10 MHz to >6 GHz
Linearity:	±0.2 dB (30 MHz to 6 GHz)
Probe Length (mm):	330
Probe Diameter (mm):	12
Tip Length (mm):	20
Tip Diameter (mm):	2.5
Sensor X Offset (mm):	1
Sensor Y Offset (mm):	1
Sensor Z Offset (mm):	1

**Phantom**

Phantom:	OVAL Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

Phantom:	SAM Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

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