APPENDIX C DESCRIPTION OF SAR MEASUREMENT SYSTEM

Probe Positioning System

The measurements were performed with the state of the art automated near-field scanning system **DASY5 Version 52 (Build 1258)** from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision 6-axis robot (working range greater than 1.1m), which positions the SAR measurement probes with a positional repeatability of better than ±0.02 mm. The DASY5 fully complies with the IEEE 1528 and EN62209 SAR measurement requirements.

E-Field Probe Type and Performance

The SAR measurements were conducted with the dosimetric probe ET3DV6 (manufactured by SPEAG). The SAR probes are designed in the classical triangular configuration and optimised for dosimetric evaluation. The probe has been calibrated and found to be accurate to better than ±0.25 dB. The probe is suitable for measurements close to material discontinuity at the surface of the phantom.

Data Acquisition Electronics

The data acquisition electronics (DAE3) consists of 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. The input impedance of the DAE3 box is 200 MΩ; the inputs are symmetrical and floating. Common mode rejection is above 80dB.Transmission to the PC-card is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The mechanical probe-mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

Device Holder for DASY5

The DASY5 device holder supplied by SPEAG is designed to cope with different positions given in the standard.
The DASY5 device holder is made of low-loss material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device.

Refer to Appendix A for photograph of device positioning.

Liquid Depth 15cm

During the SAR measurement process the liquid level was maintained to a level of 15cm with a tolerance of 0.5cm.

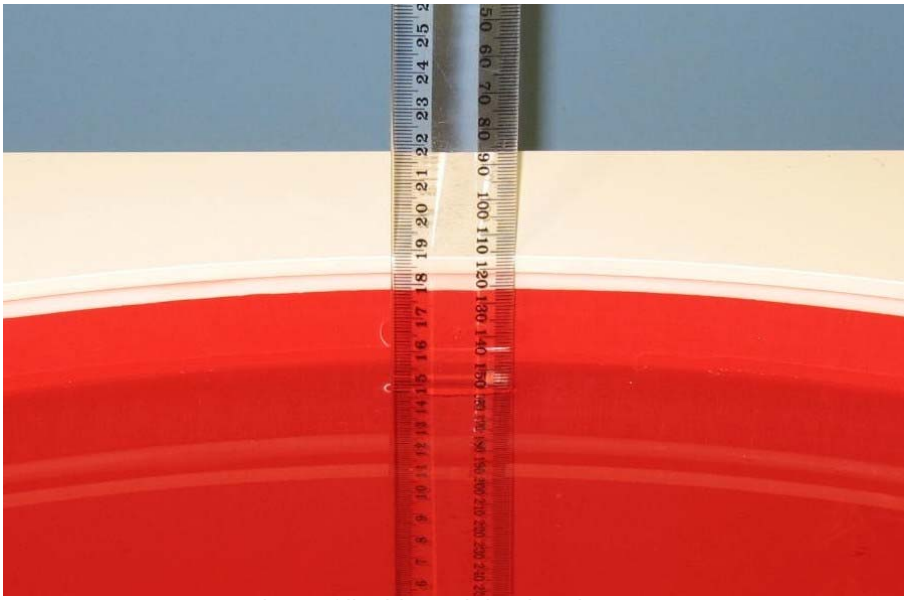

Photo of liquid Depth in Flat Phantom

Phantom Properties

The phantom used during the testing complies with the IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

Table 38 Phantom Properties

Phantom Properties	
Depth of Phantom	19 cm
Width of flat section	40 cm
Length of flat section	60 cm
Thickness of flat section	2.0mm +/-0.2mm (flat section)
Dielectric Constant	<5.0
Loss Tangent	<0.05

Tissue Material Properties

The dielectric parameters of the human tissue simulating liquid were measured prior to SAR assessment using the HP85070A dielectric probe kit and HP8753D Network Analyser. The actual dielectric parameters are shown in the following table.

Table: Measured Head Simulating Liquid Dielectric Values at 850MHz

Table 39

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
825 MHz	41.5 ±5%	0.90 ±5%	1000
835 MHz	41.5 ±5%	0.90 ±5%	1000
850 MHz	41.5 ±5%	0.90 ±5%	1000

Note: The head liquid parameters were within the required tolerances of ±5

Table: Measured Body Simulating Liquid Dielectric Values at 850MHz

Table 40

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
825 MHz	55.2 ±5%	0.97 ±5%	1000
835 MHz	55.2 ±5%	0.97 ±5%	1000
850 MHz	55.2 ±5%	0.97 ±5%	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

Table: Measured Head Simulating Liquid Dielectric Values at 1880MHz

Table 41

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
1850 MHz	40.0 ±5%	1.40 ±5%	1000
1880.0 MHz	53.3 ±5%	1.49 ±5%	1000
1910 MHz	53.3 ±5%	1.49 ±5%	1000

Note: The head liquid parameters were within the required tolerances of ±5%.

Table: Measured Body Simulating Liquid Dielectric Values at 1880MHz

Table 42

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
1850 MHz	53.3 ±5%	1.52 ±5%	1000
1880.0 MHz	53.3 ±5%	1.52 ±5%	1000
1910 MHz	53.3 ±5%	1.52 ±5%	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

Simulated Tissue Composition Used for SAR Test

The tissue simulating liquids are created prior to the SAR evaluation and often require slight modification each day to obtain the correct dielectric parameters.

Table: Tissue Type: Brain @ 850MHz Volume of Liquid: 30 Litres

Table 43

Approximate Composition	% By Weight
Distilled Water	41.05
Salt	1.35
Sugar	56.5
HEC	1.0
Bactericide	0.1

Table: Tissue Type: Brain @ 1880MHz MHz Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	61.17
Salt	0.31
Bactericide	0.29
Triton X-100	38.23

Table: Tissue Type: Body @ 850MHz Volume of Liquid: 30 Litres

Table 44

Approximate Composition	% By Weight
Distilled Water	56
Salt	0.76
Sugar	41.76
HEC	1.21
Bactericide	0.27

Table: Tissue Type: Body @ 1880MHz MHz Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	40.4
Salt	0.5
Sugar	58
HEC	1
Bactericide	0.1