APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
3) The complex admittance with respect to the probe aperture was measured.
4) The complex relative permittivity ε_r' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{\left[\ln(b/a)\right]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r'\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures
Description: Aqueous solution with surfactants and inhibitors
Declarable, or hazardous components:

CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000	**Ethanediol** STOT RE 2, H373; Acute Tox. 4, H302	>1.0-4.9%
CAS: 68608-26-4 EINECS: 271-781-5 Reg.nr.: 01-2119527859-22-0000	**Sodium petroleum sulfonate** Eye Irrit. 2, H319	< 2.9%
CAS: 107-41-5 EINECS: 203-489-0 Reg.nr.: 01-2119539582-35-0000	**Hexylene Glycol / 2-Methyl-pentane-2,4-diol** Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.9%
CAS: 68920-66-1 NLP: 500-236-9 Reg.nr.: 01-2119489407-26-0000	**Alkoxylated alcohol, > C_{16}** Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.0%

Additional information:
For the wording of the listed risk phrases refer to section 16.
Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential.
The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure D-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
www.speag.swiss, info@speag.swiss

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MBBL600-6000V6)**
Product No.	SL AAM U16 BC (Batch: 210621-3)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

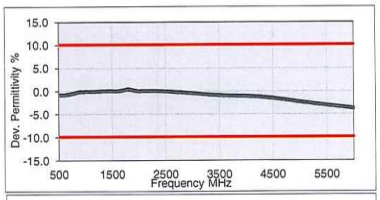
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	23-Jun-21
Operator	WM

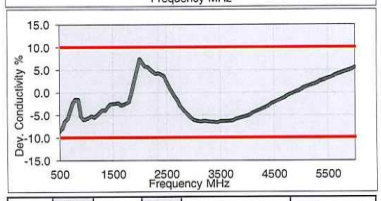
Additional Information

TSL Density
TSL Heat-capacity

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	55.7	26.7	0.89	56.1	0.95	-0.7	-6.3
750	55.3	22.5	0.94	55.5	0.96	-0.4	-2.1
800	55.1	21.5	0.96	55.3	0.97	-0.4	-1.0
825	55.1	21.1	0.97	55.2	0.98	-0.3	-1.0
835	55.1	20.8	0.97	55.1	0.99	0.0	-1.5
850	55.0	20.6	0.97	55.2	0.99	-0.3	-2.0
900	54.9	19.9	0.99	55.0	1.05	-0.2	-5.7
1400	54.1	15.9	1.24	54.1	1.28	0.0	-3.1
1450	54.0	15.7	1.27	54.0	1.30	0.0	-2.3
1600	53.8	15.3	1.36	53.8	1.39	0.0	-2.2
1625	53.8	15.2	1.38	53.8	1.41	0.1	-2.1
1640	53.8	15.2	1.39	53.7	1.42	0.1	-2.1
1650	53.7	15.1	1.39	53.7	1.43	0.0	-2.8
1700	53.7	15.0	1.42	53.6	1.46	0.3	-2.7
1750	53.6	14.9	1.45	53.4	1.49	0.3	-2.7
1800	53.5	14.9	1.49	53.3	1.52	0.4	-2.0
1810	53.5	14.9	1.50	53.3	1.52	0.4	-1.3
1825	53.5	14.8	1.51	53.3	1.52	0.4	-0.7
1850	53.5	14.8	1.52	53.3	1.52	0.4	0.0
1900	53.4	14.8	1.56	53.3	1.52	0.2	2.6
1950	53.4	14.7	1.60	53.3	1.52	0.2	5.3
2000	53.3	14.7	1.63	53.3	1.52	0.0	7.2
2050	53.3	14.7	1.67	53.2	1.57	0.1	6.4
2100	53.2	14.7	1.71	53.2	1.62	0.1	5.6
2150	53.1	14.7	1.75	53.1	1.66	0.0	5.4
2200	53.1	14.7	1.80	53.0	1.71	0.1	5.3
2250	53.0	14.7	1.84	53.0	1.76	0.1	4.5
2300	52.9	14.7	1.88	52.9	1.81	0.0	3.9
2350	52.9	14.8	1.93	52.8	1.85	0.1	4.3
2400	52.8	14.8	1.98	52.8	1.90	0.1	4.2
2450	52.7	14.8	2.02	52.7	1.95	0.0	3.6
2500	52.6	14.9	2.07	52.6	2.02	-0.1	2.5
2550	52.5	14.9	2.12	52.6	2.09	-0.1	1.4
2600	52.5	15.0	2.16	52.5	2.16	0.0	0.0





3500	50.9	15.9	3.10	51.3	3.31	-0.9	-6.3
3700	50.6	16.2	3.33	51.1	3.55	-1.0	-6.2
5200	47.7	18.6	5.39	49.0	5.30	-2.6	1.7
5250	47.6	18.7	5.46	49.0	5.36	-2.7	1.9
5300	47.5	18.8	5.54	48.9	5.42	-2.8	2.2
5500	47.1	19.1	5.83	48.6	5.65	-3.0	3.2
5600	46.9	19.2	5.98	48.5	5.77	-3.2	3.6
5700	46.7	19.3	6.13	48.3	5.88	-3.3	4.2
5800	46.5	19.4	6.27	48.2	6.00	-3.5	4.6
6000	46.1	19.7	6.57	47.9	6.23	-3.7	5.5
6500							
7000							
7500							
8000							
8500							
9000							
9500							
10000							

Figure D-2
600 – 6000 MHz Body Tissue Equivalent Matter