

## Material Specification Data Sheet

### Product Identification and Manufacturer

Item	Muscle Tissue Simulation Liquid MSL 5800
Type No	SL AAM 580 A
Series No	N/A
Manufacturer / Origin	Schmid & Partner Engineering AG Zeughausstrasse 43 8004 Zürich Switzerland

### Appearance and use of the product

MSL 5800 is a light brown, transparent to opaque liquid used to simulate the electromagnetic characteristics of the homogeneous muscle tissue. Its parameters shall match the requirements according to OET 65 Supplement C, at 22 deg C in the frequency range of 4.9 to 6.0 GHz.

Goal parameters (linear interpolation / extrapolation for other frequencies):

5200 MHz relative permittivity = 49.0, conductivity = 5.3 S/m  
5800 MHz relative permittivity = 48.2, conductivity = 6.0 S/m

### Chemical Composition

The product is composed of the following ingredients:

Water	78%
Mineral Oil	11%
Emulsifiers	9%
Additives and Salt	2%

Safety relevant ingredients according to EU directives:

CAS-No 107-41-5	< 3%	2-Methyl-2,4-pentandiol (Hexylene Glycol) Xi irritant R36/38 irritant for eyes and skin
CAS-No 770-35-4	< 2%	1-Phenoxy-2-propanol (Propylene Glycol Phenyl Ether) Xi irritant R36 irritant for eyes
CAS-No 93-83-4	< 1%	N,N-bis(2-Hydroxyethyl)oleamide Xi irritant R36/38 irritant for eyes and skin
CAS-No 9004-95-9	< 0.5%	Polyethylene glycol cetyl ether Xi irritant R22 harmful if swallowed R36/38 irritant for eyes and skin R50 Very toxic to aquatic organisms

According to EU guidelines and Swiss rules, the product is not a dangerous mixture and therefore not required to be marked by symbols.

## Emergency & First Aid Procedures

The product reacts slightly alkaline.

Skin contact	Wash with fresh water and mild soap.
Eye contact	Rinse with plenty of fresh water for several minutes. Consult physician if necessary.
Ingestion	After accidental ingestion, do not induce vomiting. Get medical attention.
Firefighting media	CO <sub>2</sub> , foam, dry chemical
Combustion products	Carbon oxides, nitrogen and traces of oxides of chlorine and sulfur, HCl

## Ecological information

Do not allow to enter waters, waste water, or soil as for other mineral oil containing products.

## Safe Handling, use and disposal

Protection measures are not generally required. For eye protection, industrial safety glasses are recommended. Personal hygiene and clean working practices are sufficient.

Use oil-binding agents. Spills may cause slippery conditions. Prevent material from getting into water! Avoid direct solar irradiation of the storage containers.

The product is not compatible with strong oxidizers or magnesium.

Disposal is possible by splitting the mineral oil from the emulsion with absorbing agents, with salt or ultra-filtration. Dispose as other mineral oil containing products according to local regulations.

## Handling and Transport information

Not subject to transport regulations.

Storage temperature	>0 to 40 deg C
Stir after storage.	

## Health and Hazard data

LD <sub>50</sub>	> 68 g/kg
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Date	22.07.2003
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Signature / Stamp

f (MHz)	e'	e''	conductivity	Date: August 7, 2003		
4600	50.59	17.91	4.58	T=22°C		
4650	50.47	17.98	4.65	M 5800		
4700	50.36	18.08	4.73			
4750	50.26	18.19	4.81	f (MHz)	e'	conductivity
4800	50.11	18.28	4.88	4900	49.88	5.01
4850	50.01	18.32	4.94	5000	49.62	5.15
4900	49.88	18.38	5.01	<b>5100</b>	<b>49.36</b>	<b>5.29</b>
4950	49.75	18.47	5.09	5150	49.24	5.36
5000	49.62	18.53	5.15	<b>5200</b>	<b>49.11</b>	<b>5.42</b>
5050	49.50	18.57	5.22	5250	48.99	5.49
<b>5100</b>	<b>49.36</b>	<b>18.66</b>	<b>5.29</b>	<b>5400</b>	<b>48.64</b>	<b>5.69</b>
5150	49.24	18.68	5.35	<b>5800</b>	<b>47.81</b>	<b>6.22</b>
<b>5200</b>	<b>49.09</b>	<b>18.76</b>	<b>5.43</b>	6000	47.41	6.48
5250	48.97	18.80	5.49			
5300	48.88	18.86	5.56	P/N		
5350	48.73	18.91	5.63	SL AAM 580 AD		
<b>5400</b>	<b>48.63</b>	<b>18.95</b>	<b>5.69</b>			
5450	48.53	19.00	5.76	Batches used		
5500	48.42	19.05	5.83	030806_1...3		
5550	48.32	19.11	5.90			
5600	48.21	19.13	5.96	<b>Extrapolation/Interpolation</b>		
5650	48.12	19.17	6.03	5th polynomial parameters		
5700	48.00	19.22	6.09		e'	conductivity
5750	47.92	19.25	6.16	x^5	2.757E-16	2.109E-17
<b>5800</b>	<b>47.82</b>	<b>19.32</b>	<b>6.23</b>	x^4	-7.931E-12	-6.607E-13
5850	47.68	19.35	6.30	x^3	9.074E-08	8.090E-09
5900	47.59	19.34	6.35	x^2	-5.159E-04	-4.869E-05
5950	47.50	19.38	6.41	x	1.455E+00	1.459E-01
6000	47.42	19.42	6.48	const	-1.575E+03	-1.716E+02

