

## FINAL REPORT

Report ID : 204774

### Report Information

**Submitting Organisation** : 00121970 : Tef-Gel Pty Ltd  
**Account** : 143012 : Tef-Gel Pty Ltd  
**AWQC Reference** : 143012-2017-CSR-1 : Prod Test: Tel-Gel  
**Project Reference** : PT-3092  
**Product Designation** : Tef-Gel Lubricant  
**Composition of Product** : PTFE.  
**Product Manufacturer** : Tef-Gel Pty Ltd., Queensland, AUSTRALIA.  
**Use of Product** : In-Line/Anti-Corrosive and Anti-Seize Lubricant.  
**Sample Selection** : As provided by the submitting organisation.  
**Testing Requested** : **AS/NZS 4020:2005 TESTING OF PRODUCTS FOR USE IN CONTACT WITH DRINKING WATER**  
**Product Type** : Composite  
**Samples** : Samples were prepared and controlled as described in Appendix A of AS/NZS 4020:2005  
**Extracts** : Extracts were prepared as described in Appendix C, D, E, F, G, H.  
**Project Completion Date** : 18-May-2017  
**Project Comment** : The results presented herein demonstrate compliance of Tef-Gel Lubricant to AS/NZS 4020:2005 when exposed at area to volume ratios up to 1000 mm<sup>2</sup>/L at 100°C ± 2°C.

PLEASE NOTE THAT THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL

THE RESULTS STATED IN THIS REPORT RELATE TO THE SAMPLE OF THE PRODUCT SUBMITTED FOR TESTING. ANY CHANGES IN THE MATERIAL FORMULATION, PROCESS OF MANUFACTURE, THE METHOD OF APPLICATION, OR THE SURFACE AREA-TO-VOLUME RATIO IN THE END USE, COULD AFFECT THE SUITABILITY OF THE PRODUCT FOR USE IN CONTACT WITH DRINKING WATER



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### Summary of Results

APPENDIX	RESULTS
C – Taste of Water Extract	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.
D – Appearance of Water Extract	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.
F – Cytotoxic Activity of Water Extract	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.
G – Mutagenic Activity of Water Extract	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.
H – Extraction of Metals	Passed at an exposure of 1000 mm <sup>2</sup> per Litre.

### Test Methods

Test(s) in Appendix	AWQC Test Method	Reference Method
C	T0320-01	AS/NZS 4020:2005
D	TO029-01 & TO018-01	APHA 2130b
E	TO014-03	APHA 4500 O C
F	TM-001	AS/NZS 4020:2005
G	TM-002	AS/NZS 4020:2005
H	TIC-006	EPA 200.8

**Summary Comment :** Product range to include 10g, 30g, 60g, 120g, 320g, 500g and 1kg quantities.

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### CLAUSE 6.2 Taste of Water Extract

<b>Sample Description</b>	The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm <sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperature</b>	100°C ± 2°C.
<b>Test Method</b>	Taste of Water Extract (Appendix C)
<b>Test Information</b>	
<b>Scaling Factor</b>	Not applied.
<b>Results</b>	Not detected.
<b>Evaluation</b>	The product passed the requirements of clause 6.2 when tested at an exposure of 1000 mm <sup>2</sup> per Litre.
<b>Number of Samples</b>	2.
<b>Test Comment</b>	Not applicable.



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### CLAUSE 6.3 Appearance of Water Extract

**Sample Description** The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm<sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperatur** 100°C ± 2°C.

**Test Method** Appearance of Water Extract (Appendix D)

**Scaling Factor** Not applied.

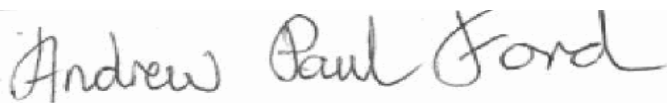
#### Results

	<u>Test (- Blank)</u>	<u>Maximum Allowed</u>	<u>Units</u>
Colour	<1	5	HU
Turbidity	0.2	0.5	NTU

**Evaluation** The product passed the requirements of clause 6.3 when tested at an exposure of 1000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.4 Growth of Aquatic Micro-organisms

**Sample Description** The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm<sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of test water.

**Test Method** Growth of Aquatic Micro-organisms (Appendix E)

**Inoculum** The volume of the inoculum was 100 mL

**Scaling Factor** Not applied.

#### Results

Mean Dissolved Oxygen	Control	7.6 mg/L
Mean Dissolved Oxygen Differenc	Positive Reference	5.0 mg/L
	Negative Reference	0.1 mg/L
	Test	0.10 mg/L

**Evaluation** The product passed the requirements of clause 6.4 when tested at an exposure of 1000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.5 Cytotoxic Activity of Water Extract

<b>Sample Description</b>	The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm <sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.
<b>Extraction Temperatur</b>	100°C ± 2°C.
<b>Test Method</b>	Cytotoxic Activity of Water Extract (Appendix F)
<b>Scaling Factor</b>	Not applied.
<b>Results</b>	Non-cytotoxic.
<b>Evaluation</b>	The product passed the requirements of clause 6.5 when tested at an exposure of 1000 mm <sup>2</sup> per Litre.
<b>Number of Samples</b>	1.
<b>Test Comment</b>	The test extracts and blank extracts were used to prepare nutrient growth medium and subsequently used to grow a cell line (ATCC Number CCL 81) in the analysis. In addition zinc sulphate (0.4 mmol) was used for the positive control in the analysis.



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### CLAUSE 6.6 Mutagenic Activity of Water Extract

**Sample Description** The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm<sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperatur** 100°C ± 2°C.

**Test Method** Mutagenic Activity of Water Extract (Appendix G)

**Scaling Factor** Not applied.

#### Results

Bacteria Strain	Number of Revertants per Plate				
	S9	Blank	Sample Extract	Positive Controls	
<i>Salmonella typhimurium</i> TA98	-	40, 41, 40	42, 34, 44	2884, 2905, 2895	<u>NPD</u> (20µg)
Mean ± Standard deviation		40.3 ± 0.6	40.0 ± 5.3	2894.7 ± 10.5	
	+	54, 35, 56	30, 39, 29	2551, 2276, 2962	<u>2-AF</u> (20µg)
Mean ± Standard deviation		48.3 ± 11.6	32.7 ± 5.5	2596.3 ± 345.2	
<i>Salmonella typhimurium</i> TA100	-	631, 663, 620	619, 541, 598	1277, 1286, 1316	<u>Azide</u> (1.0µg)
Mean ± Standard deviation		638.0 ± 22.3	586.0 ± 40.4	1293.0 ± 20.4	
	+	333, 356, 337	330, 349, 348	1623, 1575, 1585	<u>2-AF</u> (20µg)
Mean ± Standard deviation		342.0 ± 12.3	342.3 ± 10.7	1594.3 ± 25.3	
<i>Salmonella typhimurium</i> TA102	-	654, 592, 697	617, 690, 631	2562, 2630, 2669	<u>Mitomycin C</u> (10µg)
Mean ± Standard deviation		647.7 ± 52.8	646.0 ± 38.7	2620.3 ± 54.2	
	+	619, 773, 838	766, 650, 695	2446, 2422, 2533	
Mean ± Standard deviation		743.3 ± 112.5	703.7 ± 58.5	2467.0 ± 58.4	

**Comments** S9 was used as a metabolic activator. NPD (4-nitro-o-phenylenediamine), Azide, and Mitomycin C are specific positive controls for strains TA98, TA100 and TA102 respectively while 2 - AF (2-aminofluorene) when used in conjunction with S9 is a positive control for both TA98 and TA100

**Evaluation** The product passed the requirements of clause 6.6 when tested at an exposure of 1000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.



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### CLAUSE 6.7 Extraction of Metals

**Sample Description** The sample was applied on to a glass slide with dimensions 20 mm x 50 mm providing a surface area of approximately 1000 mm<sup>2</sup> per Litre. Extracts were prepared using 1000 mL volumes of 50 mg/L hardness water.

**Extraction Temperatur** 100°C ± 2°C.

**Test Method** Extraction of Metals (Appendix H)

**Scaling Factor** Not applied.

**Method of Analysis** All methods used to determine concentrations of metals are based on those described in the 21st edition of Standard Methods for the Examination of Water and Wastewater published by the APHA, AWWA and WEF (2005). The methods have been adapted for the instrumentation in use at the Australian Water Quality Centre. Concentration of the metals described in Table 2 of the AS/NZS 4020:2005 are determined as follows:

Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium and Silver by Inductively Coupled Plasma Mass

Results	Limit of Reporting mg/L	Blank mg/L	Test 1 mg/L	Test 2 mg/L	Max Allowed mg/L
<b>Final Extract</b>					
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	<0.0003	0.007
Barium	0.0005	0.0239	0.0218	0.0214	0.7
Cadmium	0.0001	0.0002	<0.0001	<0.0001	0.002
Chromium	0.0001	0.0001	<0.0001	<0.0001	0.05
Copper	0.0001	0.0850	<0.0001	<0.0001	2.0
Lead	0.0001	0.0009	0.0002	<0.0001	0.01
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	<0.0001	<0.0001	<0.0001	0.05
Nickel	0.0001	0.0043	<0.0001	<0.0001	0.02
Selenium	0.0001	<0.0001	<0.0001	<0.0001	0.01
Silver	0.00003	<0.00003	<0.00003	<0.00003	0.1

**Evaluation** The product passed the requirements of clause 6.7 when tested at an exposure of 1000 mm<sup>2</sup> per Litre.

**Number of Samples** 1.

**Test Comment** Not applicable.



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