

# Kanapower S-120 LT-BIO

## Electrostatic Properties Testing

<b>Client</b>	KANAFLEX ESPAÑA, S.A.
<b>Client location</b>	Barcelona, Spain
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## 1. PROJECT DETAILS AND TEST WORK APPROVAL STATEMENT

<b>Quotation Number</b>	3016001408
<b>Job Number</b>	4028001257
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<b>Reviewer</b>	Simon Shepherdson Team Leader – Electrostatics Laboratory
<b>Peer Reviewer</b>	Michael Merritt Process Safety Specialist
<b>Study Initiation date*</b>	03/04/2017
<b>Start Date of Experimental Work</b>	12/04/2017
<b>Completion Date of Experimental Work</b>	12/04/2017
<b>Completion Date of Additional Work</b>	15/05/2017

\* Sample, purchase order or last information receipt date, whichever is the latter.

This report has been issued in digital format. In order to ensure that the integrity of the data is maintained, the signed hard copy (in the CTL archive) will be considered the source document and digital versions will be considered copies. All original test records are kept in a locked archive for a minimum of 10 years after the date of this report. Any remaining material will be stored for a minimum of 1 month after the issue date of this report. This report was prepared by Christine Simmons & Carys Bushnell.

## 2. INTRODUCTION

This report contains test data for KANAFLEX ESPAÑA, S.A. regarding the electrostatic properties of Kanapower S-120 LT-BIO Assembly. Specifically, the following work has been undertaken:

- Electrical Resistance of Rubber & Plastic Hoses as per BS EN ISO 8031.

This work is in response to quotation number 3016001408. A formal hazard assessment of the process / plant has not been conducted by Chilworth Technology and the consequences of specific process deviations have not been examined<sup>1</sup>.

Detailed characterisation of the material tested in this study is provided in Section 3 of this report (with results summarised in the conclusions section)<sup>2</sup>.

The materials used in this assessment were supplied by KANAFLEX ESPAÑA, S.A.

This report has been issued as a version 2 as a new hose assembly was submitted for testing. The version one of this report should now be considered defunct and any remaining copies should be destroyed.

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<sup>1</sup> Process safety requires that all possible explosion, thermal stability and chemical reaction hazards are evaluated and that a suitable basis for safe operation is determined and implemented. Should the materials or processing conditions change then consideration should be given to re-assessment.

<sup>2</sup> A description of the test procedures together with full test results and information on their interpretation is given in the test sections of this report. Chilworth Technology's Laboratories are GLP (Good Laboratory Practice) compliant and this study was carried out to the principles of GLP.

**3. SAMPLE INFORMATION**

Product name	Kanapower S-120 LT-BIO Assembly
CTL sample reference	400004925
Appearance	Black hose with orange helical exterior hose assembly capped with male and female couplings
Product Dimensions	77mm internal diameter, 85mm external diameter of black hose 96mm external diameter of orange corrugated helix



**Photograph 1: Kanaflex S-120 LT-BIO Assembly Male Coupling.**



**Photograph 2: Female Coupling**



#### 4. ELECTRICAL RESISTANCE OF RUBBER & PLASTIC HOSES AND HOSE ASSEMBLIES

##### Test Objective and Information

The test is conducted to determine the electrical resistivity through the wall of a hose material and therefore describes its ability to accumulate charge under specified test conditions.

The electrodes, consisting of a band of copper strip (diameter 25mm) are firmly attached around the outer and inner circumference of the hose with a conductive wetting agent to ensure adequate contact. A DC Voltage of nominal value 500V is applied to the internal electrode using a suitable insulation tester and the resultant resistance measured from the external electrode of the hose. This is then repeated with the electrode placements elsewhere along the length of hose. Further measurements can be made on varying configurations dependant on the type and nature of the material in question; these can include continuity checks between fittings for example.

Atmospheric temperature and levels of humidity can greatly affect the overall resistivity; therefore testing is conducted after a period of conditioning of no less than 16 hours at  $23 \pm 2 \text{ }^\circ\text{C}$  and  $50 \pm 5 \%$  relative humidity.

The test is conducted in accordance with BS EN ISO 8031:2009.

Generic equipment information is contained below in the equipment and configuration table.

**Table 4.1: Equipment Configuration**

Parameter	Setting / Configuration
Direct resistance measurement	Megger BM80/2 insulation tester
Humidity control	Munters ML350 dehumidifier / humidifier
Humidity monitoring	Testo 625 Hygrometer

#### 4.1 Test Results for Kanapower S-120 LT-BIO Assembly

Date	15/05/2017 – 16/05/2017
Operator	S. Shepherdson
Preparation	Tested as received
Test Standard	BS EN ISO 8031:2009
Relative Humidity	50%
Test Temperature	23°C

**Full Test – All measurements (except those measuring continuity) at 500V DC, taken at 5 seconds after energisation**

Test Electrodes Position	Measured Resistance ( $\Omega$ )
<b>Continuity Test</b>	
Male Bracket → Female Bracket	0.64
Male Coupling → Female Coupling	0.62
<b>End to End Resistance</b>	
Internal Female → External Male	$1.1 \times 10^8$
Internal Male → External Female	$9.5 \times 10^8$
<b>Resistance Through Hose Wall</b>	
Male End	$2.1 \times 10^5$
Female End	$3.1 \times 10^7$

#### Comments

Conductivity measurements through the hose wall have been observed to be  $<10^9$  Ohm and resistance measured between the end fittings observed as  $<10^2$  Ohm and therefore in line with the requirements of BS EN 8031 and guidance given in BS EN 12115, the hose assembly can be marked as M/T.

The results of testing are highly dependent on the composition and physical nature of the sample. For this reason, any change in manufacturing / handling procedures or composition should be accompanied by a review of the relevant data.

Chilworth Technology Ltd would be pleased to provide specific advice, including interpretation and application of experimental data. Site visits to discuss operational safety or to perform plant inspections and measurements can be arranged on request.