



FR 20.525257.0002

## FINAL REPORT N. 20.525257.0002

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### VALIDATION OF THE ANALYTICAL PROCEDURE FOR THE DETERMINATION OF ASSAY OF THE ACTIVE SUBSTANCE ETHANOL (CAS 64-17-5) IN THE PRODUCT "PMC-DISINFETTANTE MANI"

BY GC-FID;

### DETERMINATION OF ASSAY, CHEMICAL-PHYSICAL AND TECHNICAL PROPERTIES BEFORE AND AFTER AN ACCELERATED STABILITY STUDY AT 54°C FOR 14 DAYS.

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#### Date:

- o Starting date: 07/09/2020
- o Experimental phase starting date: 07/09/2020
- o Experimental phase completion date: 25/09/2020
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**COMPLIANCE STATEMENT**

This study was performed by Chelab GLP test facility under my direction (undersigned), according to the Study Plan 20.525257.0002, in compliance with Good Laboratory Practices principles reported in Italian Legislative Decree No. 50 dated March 2, 2007, in adoption of Directive 2004/10/EC.

The results of this report completely and faithfully reflect the raw data generated by the Study.

Date:

2/10/2026

The Study Director  
(Laura Zampieri)



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**QUALITY ASSURANCE STATEMENT**

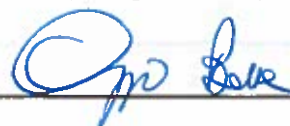
The Quality Assurance Unit has conducted the following inspections and submitted written reports to the to the Study Director and to the Test Facility Management in compliance with the Good Laboratory Practice Principles and Regulations and in accordance with Italian Decree law No. 50 of 2<sup>nd</sup> March 2007.

Type of inspection	Date of inspection	Inspector	Date reported to a:	
			Study Director	Test Facility Management
Verification of the Study Plan and of the analytical procedure applied	07/09/2020	G. BAZZA	07/09/2020	07/09/2020
Inspection of the analytical phase				
Verification of the Study Report, raw data and compliance to the Study Plan and analytical procedure adopted	01/10/2020	G. BAZZA	01/10/2020	01/10/2020

Date: 01/10/2020

Quality Assurance

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## 1. PURPOSE AND EXPERIMENTAL DESIGN FOR STUDY EXECUTION

Short term study for the validation of the analytical procedure, internally developed and codified as SOPa-LABCHI-79 for the determination of the assay of the active substance Ethanol (CAS 64-17-5) in the disinfectant topic product "PMC-Disinfettante mani".

The determination of stability of the test item was performed according to CIPAC MT 46.3 (HB O) "Accelerated storage procedure", storing the test item at 54 °C for 14 days.

In particular, the following tests were performed on the test item not subjected to accelerated stability study (t0):

- Assay of active substance
- Appearance (visual inspection)
- Reactivity towards container material (visual inspection)
- Density (liquids, EC method A.3 based on OECD Test Guideline No.109)
- pH (CIPAC MT 75.3, HB J)

The following test were performed on the test item subjected to accelerated stability study for 14 days at 54 °C (t14):

- Assay of active substance
- Appearance (visual inspection)
- Reactivity towards container material (visual inspection and weight change AP-LABCHI-348 rev.1)
- Density (liquids, EC method A.3 based on OECD Test Guideline No.109)
- pH (CIPAC MT 75.3, HB J)

## 2. INFORMATION ON THE ITEM

### 2.1. Test Item

Name: PMC Disinfettante mani

Batch: 20204408

Manufacturing date: 10/07/2020

Expiry date: 10/07/2022

Receiving date: 05/08/2020

Chelab ID: 20.525257.0002

Description and usage: sanitizing solution for topic use, PT1

The declared content of denatured Ethanol in the sample is 75 % w/w (see composition in Annex 1 to the Study Plan) that means 70.4 % w/w of pure Ethanol<sup>1</sup> in the sample.

The tolerance interval of pure Ethanol in the sample is 67.9 – 72.9 % w/w.

Packaging type and appearance of the test item received: 20 glass bottles containing about 100 ml of product.

<sup>1</sup> The alcoholic grade (v/v) of denatured ethanol used for sample formulation is 96 % v/v, corresponding to 93.84 % w/w.

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Storage in the laboratory: in a cool, dry place, away from direct light at room temperature.

2 bottles were stored at 54 °C for 14 days from 08/09/2020 to 22/09/2020 in the climatic chamber SRA 347.

## 2.2. Placebo

Name: Placebo PMC – Disinfettante mani

Batch: 200728\_02

Manufacturing date: 28/07/2020

Expiry date: 28/08/2020

Receiving date: 05/08/2020

Packaging type and appearance of the test item received: 2 glass bottles containing about 500 ml of placebo.

Storage in the laboratory: in a cool, dry place, away from direct light at room temperature.

## 3.ACTIVE SUBSTANCE AND ANALYTE TO BE DETERMINED

IUPAC name: Ethanol

Synonymous: Ethyl Alcohol

CAS nr.: 64-17-5

Molecular Weight: 46.07 g/mol

Molecular Formula: C<sub>2</sub>H<sub>6</sub>O

Structural Formula:



## 4.REFERENCE ITEMS

IUPAC name: Ethanol

Synonymous: Ethyl Alcohol

CAS nr.: 64-17-5

Manufacturer: Silcompa S.p.A.

Batch: 2058/200612

Purity: 96.5 % v/v (intended as alcoholic grade, corresponding to 94.57 % w/w<sup>2</sup>)

Internal ID: TI-0068074

<sup>2</sup> Value obtained by interpolation of the data reported in EP 01/2018: 50500.

**5.SOPa-LABCHI-79 REV.2 ETHANOL QUANTIFICATION BY GC-FID**

The analytical procedure for the quantification of the active substance Ethanol in the test item is described in the analytical method codified as SOPa-LABCHI-79 rev.2 "Determination of Ethanol (CAS 64-17-5) and Isopropanol (CAS 67-63-0) in sanitizing products by GC-FID", annexed to the Study Plan.

The validation of the analytical method was performed in terms of specificity, identification, linearity, accuracy and repeatability according to SANCO 3030/99 Rev.5.

**5.1. Instruments and Apparatus**

- Common laboratory glassware;
- Analytical balance ( $\pm 0.1$  mg) SRA 602;
- Automatic pipette SRA 848;
- GC-FID (SRA 240, Agilent model 7890) equipped with liquid autosampler;
- Column: DB-624 30m x 0.32 mm x 1.80  $\mu$ m (ID: GC 190);
- 0.45  $\mu$ m syringe filters;
- Inlet liner split 4 mm, single taper with deactivated glass wool, P/N 5183-4647.

Instruments were calibrated before use.

**5.2. Reagents and Materials**

- Tert-butanol, Internal Standard, TI-0015148
- Acetone, TI-0066108

**5.3. Solutions****5.3.1. Blank Solution (BS):**

Acetone.

**5.3.2. Placebo Solution (for Specificity):**

1.4024 g of placebo were accurately ( $\pm 0.1$  mg) weighed into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone. The solution was filtered before injection.

**5.3.3. Test Solution:**

About 1.4 g of test item were accurately ( $\pm 0.1$  mg) weighed into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone. 5 different preparations were performed for repeatability evaluation. The solution was filtered before injection.

**5.3.4. Test Solution without IS:**

1.4341 g of test item were accurately ( $\pm 0.1$  mg) weighed into a 50 ml volumetric flask and diluted to volume with Acetone. The solution was filtered before injection.

**5.3.5. Reference Solution L1 (Ethanol at 16084 mg/l):**

850.4 mg of Ethanol reference standard were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone.

**5.3.6. Reference Solution L2 (Ethanol at 17980 mg/l):**

950.6 mg of Ethanol reference standard were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone.

**5.3.7. Reference Solution L3 (Ethanol at 20070 mg/l):**

1061.1 mg of Ethanol reference standard were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone.

**5.3.8. Reference Solution L4 (Ethanol at 22025 mg/l):**

1164.5 mg of Ethanol reference standard were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone.

**5.3.9. Reference Solution L5 (Ethanol at 24089 mg/l):**

1273.6 mg of Ethanol reference standard were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone.

**5.3.10. Reference Solutions for SST (Ethanol at ~ 20000 mg/l):**

About 1 g of Ethanol reference standard was accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1 ml of IS was added and the solution was diluted to volume with Acetone. 2 different preparations were performed for each analytical sequence for SST.

**5.3.11. Fortified placebo for accuracy verification:**

0.5727 g of placebo were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 0.8355 g of Ethanol reference standard were added; 1 ml of IS was added and the solution was diluted to volume with Acetone. The solution was filtered before injection.

Total weight of Fortified placebo was about 1.4 g; the % of Ethanol in the fortified placebo corresponds to about 80%.

0.3622 g of placebo were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1.0439 g of Ethanol reference standard were added; 1 ml of IS was added and the solution was diluted to volume with Acetone. The solution was filtered before injection.

Total weight of Fortified placebo was about 1.4 g; the % of Ethanol in the fortified placebo corresponds to about 100%.

0.1431 g of placebo were accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; 1.2610 g of Ethanol reference standard were added; 1 ml of IS was added and the solution was diluted to volume with Acetone. The solution was filtered before injection.

Total weight of Fortified placebo was about 1.4 g; the % of Ethanol in the fortified placebo corresponds to about 120%.

**5.4. Instrumental conditions**

Column:	DB-624 30 m x 0.32 mm x 1.80 µm
Liner:	Inlet liner split 4 mm, single taper with deactivated glass wool, P/N 5183-4647
Gas carrier:	Helium
Gas carrier flow:	1 ml/min (constant flow)
Injector temperature:	200 °C
Injection volume:	0.5 µl
Detector:	280 °C
Mode:	Split
Split ratio:	1:100
Gradient temperature:	35°C for 2.5 min; to 70°C at 4°C/min; 1 min at 70°C; to 220°C at 30°C/min, hold time 1 min at 220°C (total run time: 18.25 min)

**5.5. Data elaboration**

The quantification of Ethanol in the test item is performed by Internal Standard method (Ph. Eur. 2.2.26) and calculated using the following formula:

$$C \text{ (g/100g)} = \frac{A_{TS} \times K_{RS1} \times V}{W \times 10000}$$

Where:

$A_{TS}$	area ratio of the analyte in Test Solution
$K_{RS1}$	response factor K of RS1 = concentration in mg/l / average area ratio of the 3 injections
V	sample solving volume (50 ml)
W	sample weight (g)
10000	conversion factor from mg/kg to g/100g

**6.SOPa-LABCHI-79 VALIDATION RESULTS FOR ETHANOL DETERMINATION**

The analytical method was validated in terms of specificity, identification, linearity, repeatability and accuracy according to SANCO 3030/99 Rev.5 guidelines.

The determination of analyte at t0 was performed on 5 independent preparations of the test solution (repeatability test). Validation analysis and assay quantification were performed on 07/08/2020.

**6.1.System Suitability Test (SST)**

SST was performed by injecting at the beginning of the analytical sequence Blank Solution, Reference Solution (RS1) in triplicate and a second preparation of Reference Solution (RS2) in singlet.

It was verified that:

- In Blank Solution, no interferences were present at retention time of the analyte (acceptance criterion: any interfering peak  $\leq 0.5$  % of the analyte peak area in the Reference Solution see figure 1);
- %RSD of the analyte area ratios of n=3 consecutive injections of the Reference Solution RS1 at the beginning of the analytical sequence was NMT 2%;
- %ratio of the response factors (K) of the RS1 (the average area of the 3 consecutive injections at the beginning of the analytical sequence is considered) and RS2, within 98 and 102%.

In the following table, SST results obtained are reported.

**Table 1 - System suitability results: RS1 and RS2 (07/08/2020)**

	RS1	RS2	K Ratio
determination	Area ratio	Area ratio	%
1	0.808	0.816	---
2	0.808	---	---
3	0.808	---	---
average	0.808	---	---
Std. Dev.	0.000	---	---
%RSD	0.0	---	---
specification	%RSD $\leq 2$	---	---
Conformity	PASS	---	---
Concentration (mg/l)	20066	20055	---
Response factor K	24834	24577	99
specification	---	---	98-102
Conformity	---	---	PASS

## 6.2. Specificity

For specificity evaluation, the following solutions were injected: Blank solution, Placebo solution, Reference solution at target concentration, Test solution and Test Solution without IS. For the identification by GC-MS, see chapter 7.

The specificity was demonstrated, by verifying that:

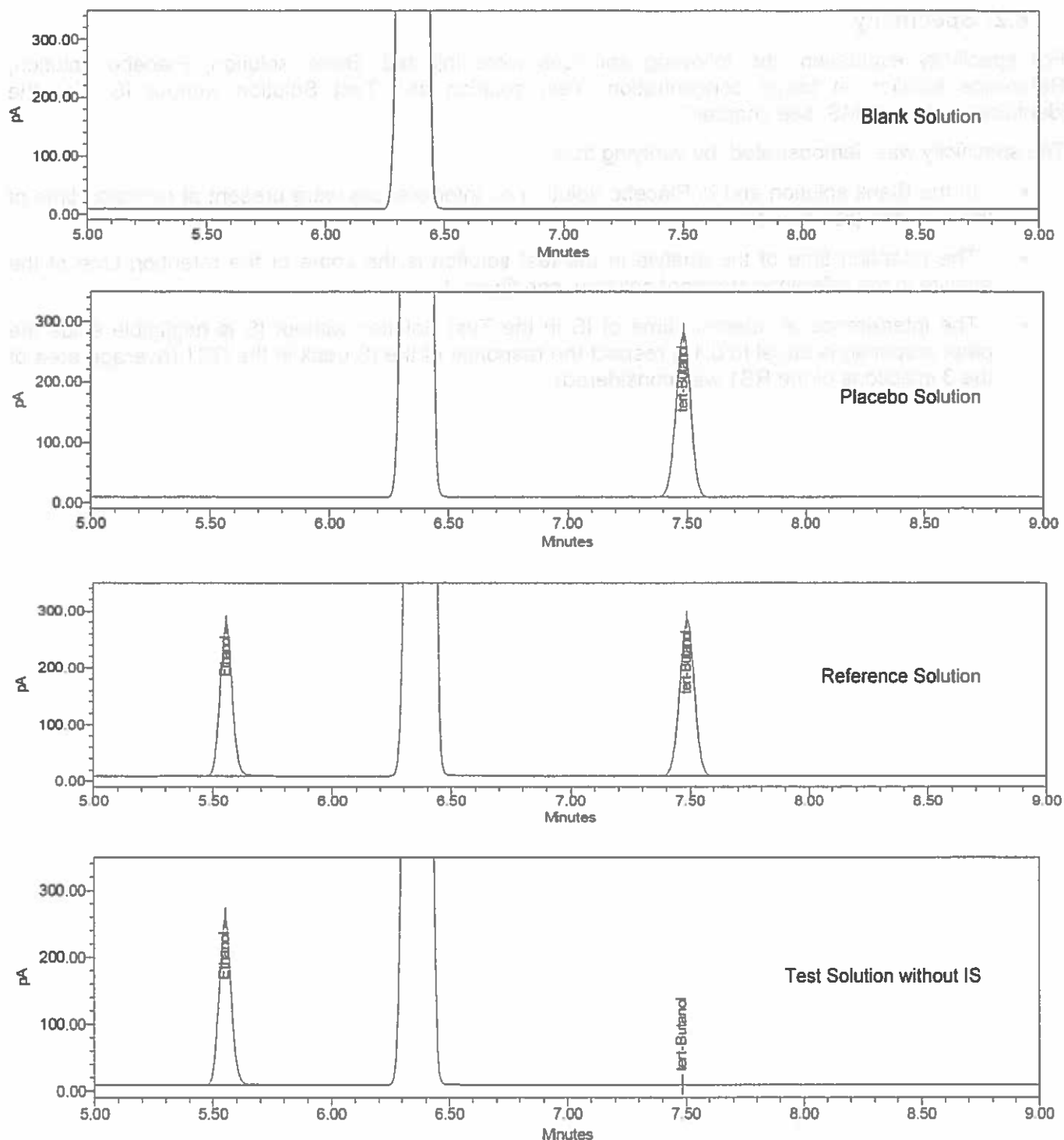
- In the Blank solution and in Placebo solution no interferences were present at retention time of the analytes (see figure 1);
- The retention time of the analyte in the test solution is the same of the retention time of the analyte in the reference standard solution, see figure 1;
- The interference at retention time of IS in the Test Solution without IS is negligible since the peak response is equal to 0.1% respect the response of the IS peak in the RS1 (average area of the 3 injections of the RS1 was considered).



Figure 1 – Blank, Placebo, Reference Solution and Test Solution without IS chromatograms

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**Figure 1 – Blank, Placebo, Reference Solution and Test Solution without IS chromatograms.**

### 6.3. Linearity

To evaluate linearity, the analysis of 5 Reference Solutions containing the analyte at 5 concentration levels was performed in order to cover the concentration range from at least 80% to 120% of the target concentration.

Using the experimental data of concentration as mg/l (x) and the peak area ratio (y), the equation of the regression curve ( $y = a + b \cdot x$ ) was calculated.

The obtained results and the statement of conformity to the acceptance criteria defined in the Study Plan are listed below.

**Table 2 – Linearity results**

ID RS	RS final concent.	% vs target	Conc. in the sample	Area ratio
	mg/l	%	g/100g	
L1	16084	80%	57	0.653
L2	17980	90%	63	0.726
L3	20070	100%	71	0.812
L4	22025	110%	78	0.892
L5	24089	120%	85	0.977

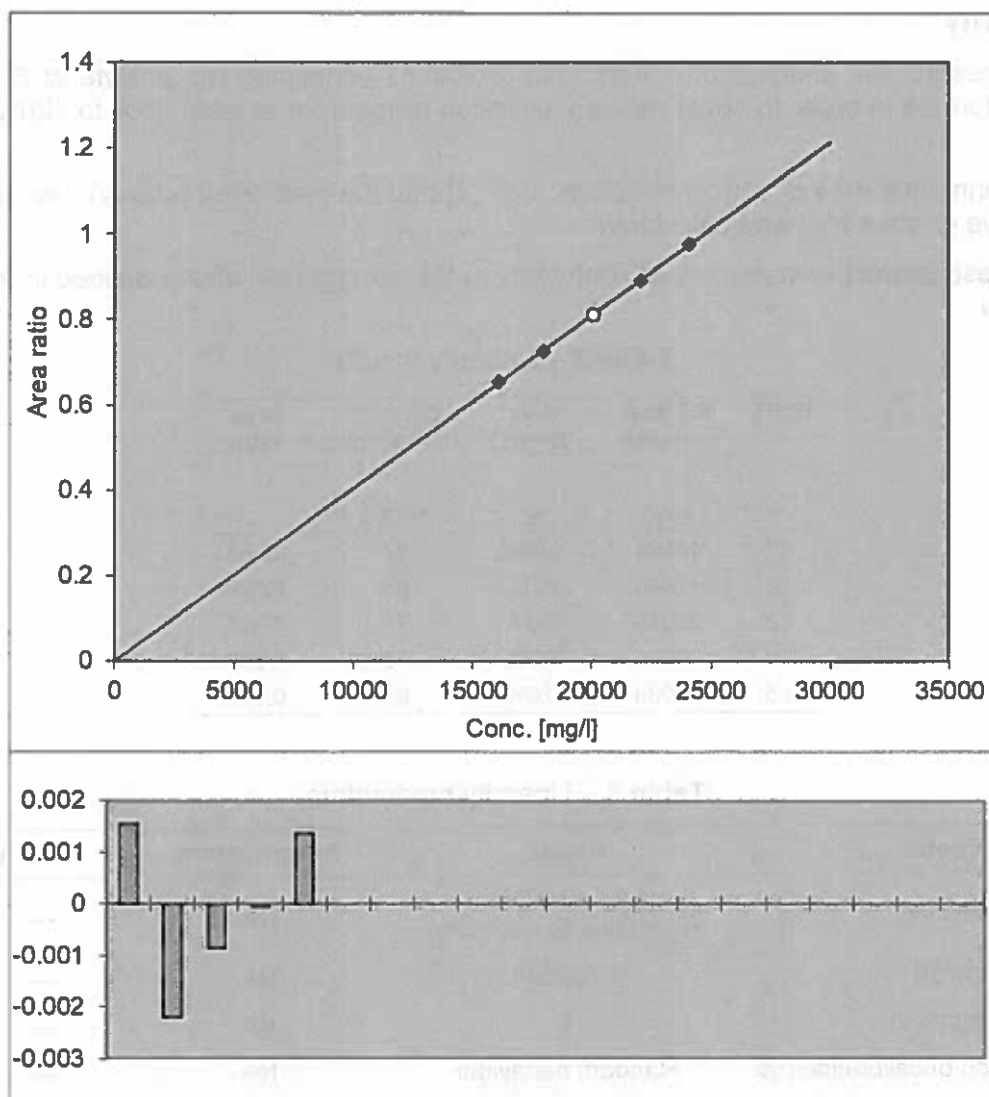
**Table 3 – Linearity parameters**

Parameter	Result	Specification	Conformity	
Model used	unweighed linear regression ( $y = a + b \cdot x$ )	NA	---	---
Slope (b)	0.000041	NA	---	---
Intercept <sup>3</sup> (a)	0	NA	---	---
Visual examination of calibration plot	Random behaviour	NA	---	---
Confidence interval of the intercept	-0.02 - 0.02	Includes 0	Pass <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Coefficient of correlation (R)	1.00	> 0.99	Pass <input checked="" type="checkbox"/>	No <input type="checkbox"/>

<sup>3</sup> The intercept (a) can be set equal to 0, since the confidence interval of the intercept includes 0.

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**Figure 2 – Linearity regression and residual plots**

**6.4. Accuracy**

Accuracy evaluation was performed by analysing 3 independent preparations of Placebo fortified with the analyte at 3 concentration levels corresponding to about 80%, 100% and 120% of the target concentration.

Recovery was calculated as follows:

$$\% \text{ Recovery} = (\text{measured concentration} / \text{theoretical concentration}) * 100$$

The results obtained and the statement of conformity to the acceptance criteria defined in the Study Plan are listed below.

Statistical elaboration was done using validated Excel sheets that perform calculation considering all decimal figures. The results included in this document are rounded according to the limits of specification.

**Table 4 – Accuracy results**

Level	Placebo weight	Ethanol added	Total weight	Theoretical added conc.	% vs target	Solving volume	Area ratio	Measured conc.	Recovery
	g	g	g	g/100g	%	ml		g/100g	%
80%	0.5727	0.8355	1.4082	56.1	80	50	0.643	56.7	101
100%	0.3622	1.0439	1.4061	70.2	100	50	0.796	70.3	100
120%	0.1431	1.2610	1.4041	84.9	121	50	0.964	85.2	100
Average value									100
Acceptance criteria									
%Rec.									98-102
Conformity									PASS

Results are in compliance with the acceptance criterion (recovery between 98% and 102%).

### 6.5. Repeatability and assay determination

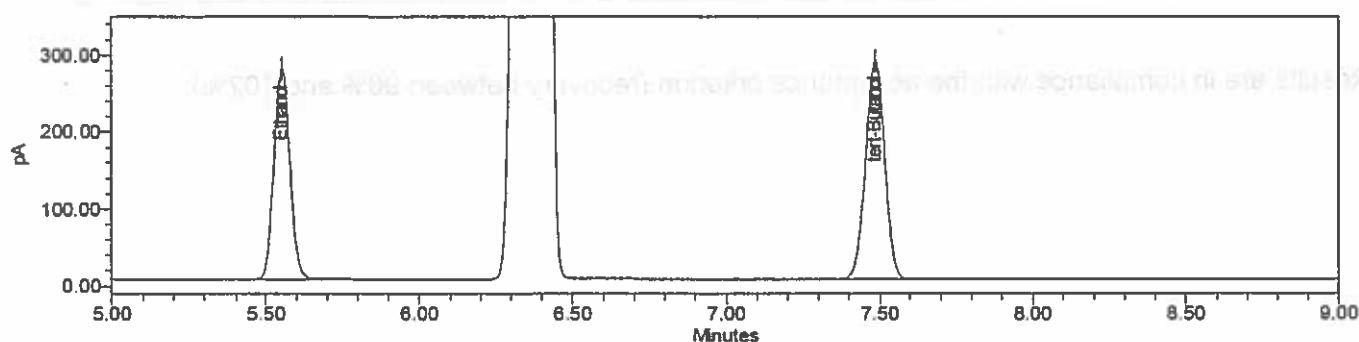
Repeatability and assay determination were performed on 5 independent preparations of Test Solution of the same test item.

The repeatability result complies with the acceptance criteria defined in the Study Plan corresponding to %RSD ( $n=5$ )  $\leq 1.4\%$  (Horwitz value).

The results obtained and the statement of conformity to the acceptance criteria are detailed in the following table.

**Table 5 – Repeatability and assay results at t0**

Replicate	Sample weight	Solving volume	Area ratio	Measured conc. (% w/w)
	g	ml		g/100g
1	1.4055	50	0.802	70.9
2	1.4063	50	0.803	70.9
3	1.4086	50	0.806	71.0
4	1.4040	50	0.804	71.1
5	1.4030	50	0.804	71.2
average				71.0
std dev				0.1
% RSD				0.2
Acceptance criteria: % RSD $\leq 1.4$				
Acceptance criteria: Pure Ethanol included between 67.9 – 72.9 g/100g				
Conformity to the Acceptance criteria				PASS



**Figure 3 – Representative zoomed chromatogram of Test Solution**

Assay measured for the unaged test item t0, obtained from the average of 5 independent analyses, corresponds to 71.0 g/100g (% w/w) of Ethanol in the sample.

## 6.6. Analysis of the aged sample

The determination of Ethanol in the aged sample after 14 days at  $54 \pm 2^\circ\text{C}$  was performed on 24/09/2020 on 3 independent preparations of the Test Solution.

The % variation of assay in the aged sample (t14) respect the unaged sample (t0) was calculated according to the following formula:

$$\% \text{Variation} = \frac{|\text{assay in the unaged test item} - \text{assay in the aged test item}|}{\text{assay in the unaged test item}} \times 100$$

For SST, it was verified that:

- In Blank Solution, no interferences were present at retention time of the analyte (acceptance criterion: any interfering peak  $\leq 0.5\%$  of the analyte peak area in the Reference Solution);
- %RSD of the analyte area ratios of  $n=3$  consecutive injections of the Reference Solution RS1 was NMT 2%;
- %ratio of the response factors (K) of the RS1 (the average area of the 3 consecutive injections at the beginning of the analytical sequence is considered) and RS2, within 98 and 102%.

**Table 6 – SST results, sequence 24/06/2020 (analysis t14)**

	RS1	RS2	K Ratio
determination	Area ratio	Area ratio	%
1	0.771	0.772	---
2	0.771	---	---
3	0.771	---	---
average	0.771	---	---
Std. Dev.	0.000	---	---
%RSD	0.0	---	---
specification	%RSD $\leq 2$	---	---
Conformity	PASS	---	---
Concentration (mg/l)	18920	19022	---
Response factor K	0.771	0.772	100
specification	---	---	98-102
Conformity	---	---	PASS

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The concentration of the analyte in the aged sample t14 and the % variation respect the t0 are reported in the following table.

As shown, all acceptance criteria were met and the variation of assay of the analyte in the aged sample was lower than 10% respect that obtained at t0.

**Table 7 -- Assay results for t14**

Replicate	Sample weight	Solving volume	Area ratio	Measured conc. (% w/w)
	g	ml		g/100g
1	1.4046	50	0.803	70.1
2	1.4204	50	0.814	70.3
3	1.4089	50	0.807	70.3
average				70.2
std dev				0.1
% RSD				0.1
%difference vs t0				1
Acceptance criteria: % RSD $\leq 1.4$				
%difference vs t0 $\leq 10$				
Acceptance criteria: Pure Ethanol included between 67.9 – 72.9 g/100g				
Conformity to the Acceptance criteria				PASS

Assay measured for the test item after storage for 14 days at 54°C, obtained from the determination in triplicate, corresponds to 70.2 g/100g (% w/w) of Ethanol in the sample, included in the interval 67.9 and 72.9 g/100g.

No significant difference in terms of assay respect to the unaged sample was observed (absolute %difference = 1).

**7.IDENTIFICATION OF ETHANOL BY GC-MS**

Analysis performed on 10/09/2020.

The identification of Ethanol was performed by means of capillary gas chromatography coupled with a mass spectrometer (GC-MS). In this case a GC-MS instrument (SRA 156) was used. The identification was performed by analysis of Test Solution and Reference Solution prepared as described below.

Ethanol analyte in test sample was univocally identified by comparison of MS spectrum with Ethanol spectrum in Reference Solution and with MS spectra library.

**7.1.Instruments and Apparatus**

- Common laboratory glassware;
- Analytical balance ( $\pm 0.1$  mg) SRA 768;
- GC-MS (SRA 156) equipped with liquid autosampler;
- 0.45  $\mu$ m syringe filters;
- Column: DB-624 30m\*0.32mm\*1.80 $\mu$ m (ID: GC 140).

Instruments were calibrated before use.

**7.2.Reagents and Materials**

- Acetone, TI-0066109
- Ethanol TI-0068074

**7.3.Reference Solutions and Test Solution****7.3.1. Test Solution for GC-MS identification (Ethanol at about 1000 mg/l):**

1.4089 g of test item were accurately ( $\pm 0.1$  mg) weighed into a 50 ml volumetric flask; then the solution was diluted to volume with Acetone, filtered and analysed.

**7.3.2. Reference Solution for GC-MS identification (Ethanol at about 1000 mg/l):**

1.0077 g of Ethanol reference standard was accurately weighed ( $\pm 0.1$  mg) into a 50 ml volumetric flask; then the solution was diluted to volume with Acetone.

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**7.4. Instrumental conditions**

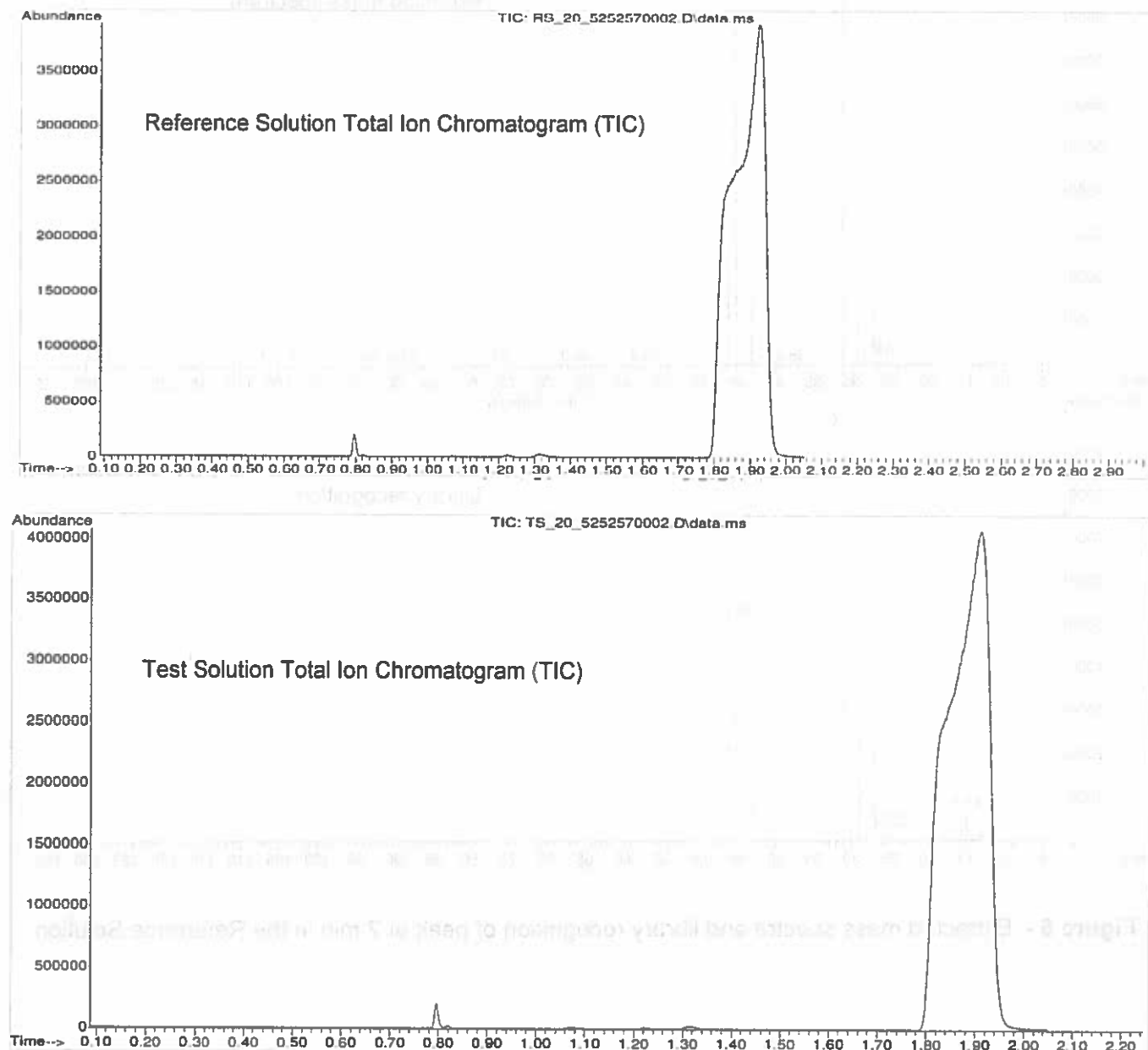
Column:	DB-624 30 m x 0.32 mm x 1.80 µm	
Liner:	Inlet liner split 4 mm, single taper with deactivated glass wool, P/N 5183-4647	
Gas carrier:	Helium	
Gas carrier flow:	1 ml/min (constant flow)	
Injector temperature:	200 °C	
Injection volume:	1 µl	
Mode:	Split	
Split ratio:	1:100	
Gradient temperature:	35°C for 2.5 min; to 70°C at 4°C/min; 1 min at 70°C; to 220°C at 30°C/min, hold time 1 min at 220°C (total run time: 18.25 min)	
MS parameters:	Full scan m/z range:	20-150
	MS Source T:	230 °C
	MS Quadrupole T:	150 °C
	Detector off:	2.05 min
	EMV mode	Gain factor
	Gain factor	1.00
	Resulting EMVoltage	1129

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**7.5. Results**

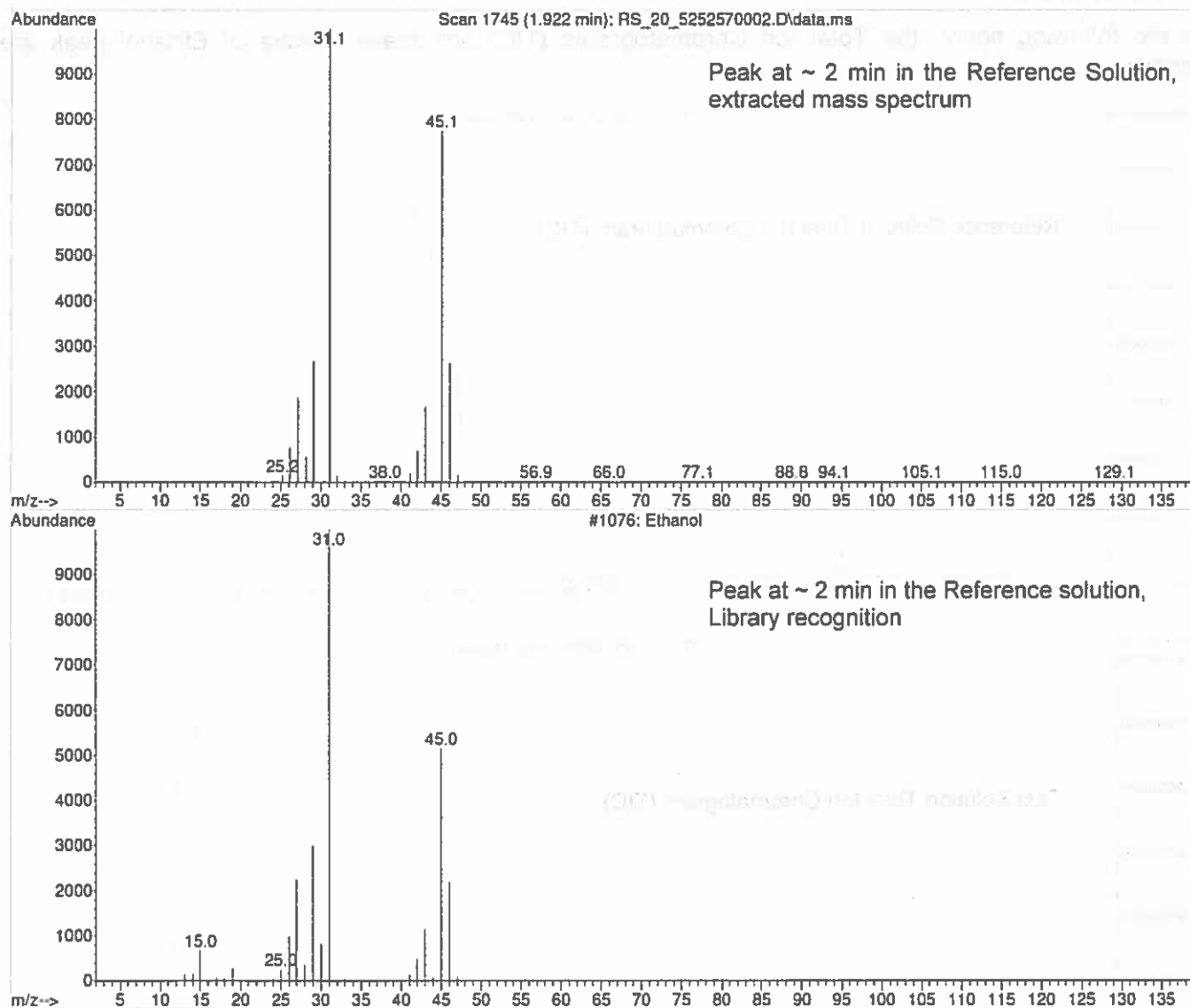
In the following figure, the Total Ion Chromatograms (TIC) and mass spectra of Ethanol peak are reported.



**Figure 4 – Total Ion Chromatograms (TIC) of the Reference and Test Solution.**

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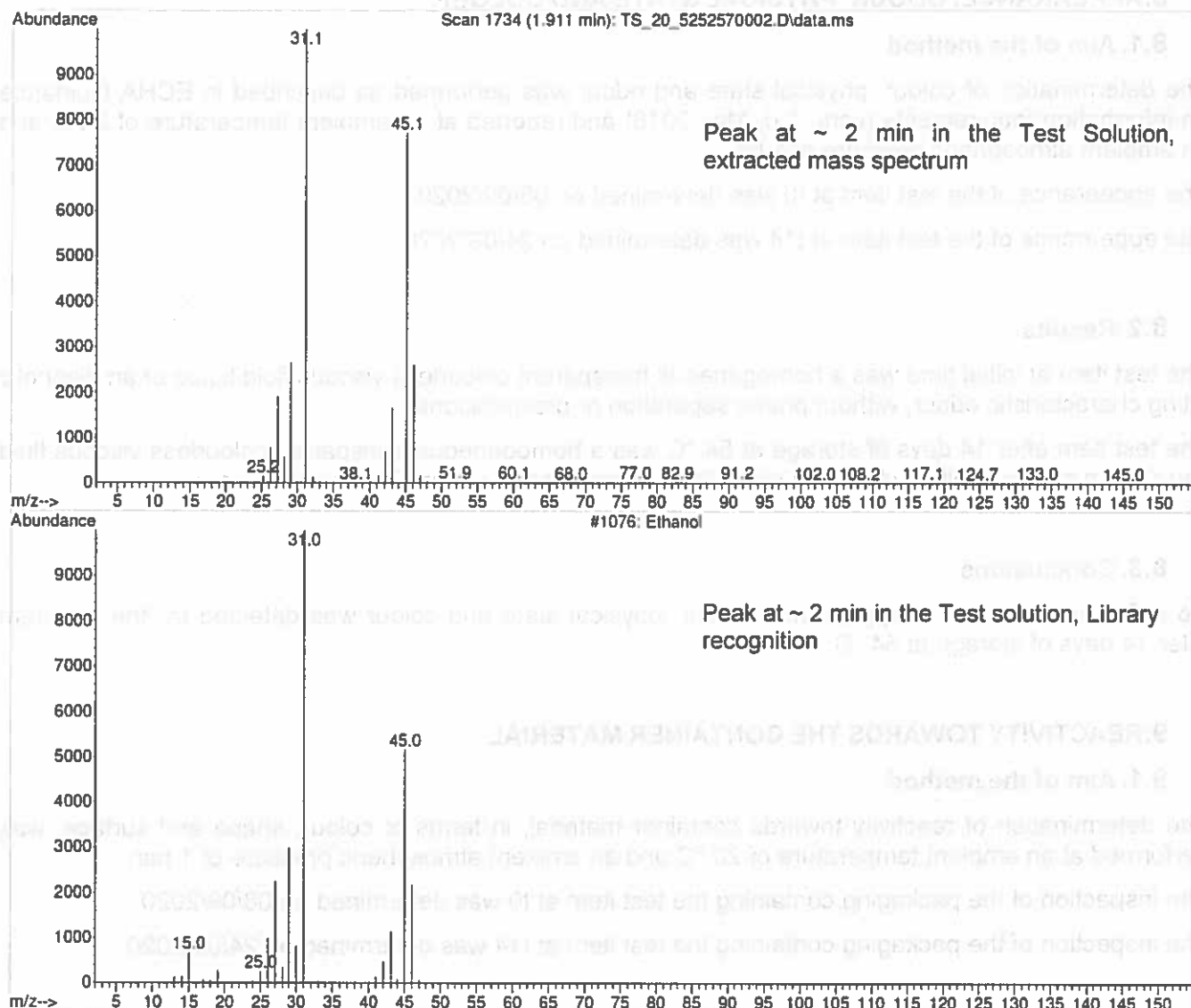
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**Figure 5 – Extracted mass spectra and library recognition of peak at 2 min in the Reference Solution.**

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**Figure 6 – Extracted mass spectra and library recognition of peak at 2 min in the Test Solution.**

The retention time of the peak at ~ 2 min in the Test Solution is the same of that in the Reference Solution; the mass spectrum of the peak in the Test Solution is the same of that in the Reference Solution; moreover the peak has been attributed to Ethanol by the mass library.

Therefore, Ethanol peak is univocally identified in the Test Solution.

## **8. APPEARANCE, ODOUR, PHYSICAL STATE AND COLOUR**

### **8.1. Aim of the method**

The determination of colour, physical state and odour was performed as described in ECHA Guidance on information requirements (vers. 2.0, May 2018) and reported at an ambient temperature of 20°C and an ambient atmospheric pressure of 1 bar.

The appearance of the test item at t0 was determined on 08/09/2020.

The appearance of the test item at t14 was determined on 24/09/2020.

### **8.2. Results**

The test item at initial time was a homogeneous transparent colourless viscous fluid liquid of an alcoholic biting characteristic odour, without phase separation or precipitations.

The test item after 14 days of storage at 54 °C was a homogeneous transparent colourless viscous fluid liquid of an alcoholic biting characteristic odour, without phase separation or precipitations.

### **8.3. Conclusions**

No difference in terms of appearance, odour, physical state and colour was detected for the test item after 14 days of storage at 54 °C.

## **9. REACTIVITY TOWARDS THE CONTAINER MATERIAL**

### **9.1. Aim of the method**

The determination of reactivity towards container material, in terms of colour, shape and surface, was performed at an ambient temperature of 20 °C and an ambient atmospheric pressure of 1 bar.

The inspection of the packaging containing the test item at t0 was determined on 08/09/2020.

The inspection of the packaging containing the test item at t14 was determined on 24/09/2020.

### **9.2. Results**

Packaging description at initial time point: glass bottle containing about 100ml of liquid; no sample leaks or signs of deformation, discolouration, foulings, bulges or spots on the packaging.

Packaging description after 14 days at 54 °C: glass bottle containing about 100ml of liquid; no sample leaks or signs of deformation, discolouration, foulings, bulges or spots on the packaging.

### **9.3. Conclusions**

No difference in terms of appearance of the container material was detected for the test item after 14 days of storage at 54 °C.

## 10. WEIGHT CHANGE

### 10.1. Aim of the method

The determination of the weight change of the packaging containing the test item was performed according to internal method AP-LABCHI-348 rev.1 after the accelerated storage for 14 days at  $54 \pm 2$  °C.

### 10.2. Instrument

Technical balance SRA 685.

Instrument was calibrated before use.

### 10.3. Results

3 bottles were weighed before being introduced in the climatic chamber ( $t_0$ ), SRA 347 (08/09/2020) and at the end ( $t_n$ ) of the accelerated storage 14 days at  $54 \pm 2$  °C (22/09/2020).

The weight change was calculated as follows:

$$\text{Weight change (\%)} = \frac{t_0 - t_n}{t_0} * 100$$

Where:

$t_0$ : initial weight of the packaging containing the unaged sample (g)

$t_n$ : weight of the packaging containing the aged sample (g).

The results are reported in the table below.

**Table 8 – Weight change determination**

Bottle	Weight		Weight change
	$t_0$ (g)	$t_n$ (g)	%
1	256.83	256.38	0.2
2	255.54	255.18	0.1
	Average		0.2

### 10.4. Conclusion

No significant difference in terms of weight change between the test item at  $t_0$  and  $t_{14}$  (average %diff = 0.2).

**11. PH DETERMINATION****11.1. Aim of the method**

The aim of the method is the determination of pH of the pure test item at  $25 \pm 2$  °C in accordance to the CIPAC MT 75.3 (HB J) method on the test item at initial time (08/09/2020) and at t14 (24/09/2020).

The pH determination was performed in triplicate on the undiluted test item at t0 and t14.

**11.2. Instruments**

- Common laboratory glassware;
- Thermostatic bath (SRA 648);
- pH-meter (SRA 597) with accuracy of  $\pm 0.01$ , equipped with thermometer and automatic correction system of the reading (temperature at which the electrode is working).

Instruments were calibrated before use.

**11.3. Results**

pH results obtained are reported in the table below.

**Table 9 - pH results obtained at t0 and t14**

Replicate	t0	t14
1	7.75	8.10
2	7.82	8.10
3	7.83	8.03
average	7.80	8.08
Std. Dev.	0.04	0.04
%RSD	1	1

**11.4. Conclusions**

Initial time point: mean pH value at 25 °C is 7.80.

T14: mean pH value at 25 °C is 8.08.

pH is included between 7.50 – 9.00 both at initial time point and both at t14.

## 12. DENSITY

### 12.1. Aim of the method

The aim of the method is the determination of density of the unaged test item (08/09/2020) and aged test item (25/09/2020).

The relative density determination (respect water density at 20 °C) was done according to EC method A.3 (based on OECD Test Guideline No 109) by pycnometric method in triplicate.

### 12.2. Instruments and materials

- Pycnometer equipped with a thermometer 0 - 40 °C ( $\pm 0.1^\circ\text{C}$ ) DIN 12809;
- Analytical balance ( $\pm 0.1$  mg), SRA 917;
- Thermostatic Water bath, SRA 648;
- milliQ water, SRA 692.

Instruments were calibrated before use.

### 12.3. Results

Water and the test item were equilibrated at 20 °C and the empty pycnometer was weighed ( $P_0$ ). The pycnometer was filled with water and weighed ( $P_1$ ) and then filled with test item and weighed ( $P_2$ ).

At each recording of the different masses, the temperature was visually checked.

The density was calculated as follows, using the density of water at 20 °C (0.9982 g/cm<sup>3</sup>):

$$\rho(\text{g/cm}^3) = \frac{(P_2 - P_0)_{20^\circ\text{C}}}{(P_1 - P_0)_{20^\circ\text{C}}} \times 0.9982$$

Results obtained are reported in the following table.

**Table 10 - Density results at t0**

Analyte:	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Density
determination	g	g	g	g/cm <sup>3</sup>
1	39.4041	63.5113	60.4035	0.8695
2	39.4041	37.1375	60.3931	0.8691
3	39.4041	37.1375	60.3948	0.8692
			average	0.8693
			Std. Dev.	0.0002
			%RSD	0.03

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**Table 11 - Density results at t14**

Analyte:	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	Density
determination	g	g	g	g/cm <sup>3</sup>
1	27.1549	37.5162	36.2352	0.8680
2	27.1549	37.5162	36.2312	0.8676
3	27.1549	37.5162	36.2298	0.8675
			average	0.8677
			Std. Dev.	0.0003
			%RSD	0.03

**12.4. Conclusion**

Initial time point: mean density value at 20 °C is 0.8693 g/cm<sup>3</sup> (approximated value 0.869 g/cm<sup>3</sup>).

T14: mean density value at 20 °C is 0.8677 g/cm<sup>3</sup> (approximated value 0.868 g/cm<sup>3</sup>).

Density is included between 0.850 - 0.890 g/ml (or g/cm<sup>3</sup>) both at initial time point and both at t14.

## 13. CONCLUSIONS

### 13.1. Validation summary results

The validation of the analytical method SOPa-LABCHI-79 rev.2 was performed in terms of specificity/identification, linearity, accuracy and repeatability according to SANCO 3030/99 Rev.5.

All acceptance criteria were met and no deviations were observed during the execution of this validation, therefore the method is suitable for the determination of Ethanol (CAS 64-17-5) in the disinfectant topic product "PMC-Disinfettante mani".

**Table 12 – Validation summary results**

Parameter	Operative Conditions	Acceptance criteria	Results
<b>Specificity (6.2)</b>	Analysis of blank, placebo, reference item and test item solutions.	No interference or interferences from other substances present in the blank and placebo should influence the determination of the analyte (interferences lower than 0.5% vs target concentration).  The retention time of the analyte in the test solution has to be the same of the retention time of the analyte in the reference standard solution.	No interferences were observed in placebo and blank solutions at retention times of the analyte/IS.  Retention times of analyte/IS peaks in the Reference Solution is equivalent to that of the correspondent peak in the Test Solution.  No significant interference of IS in the Test Solution.
<b>Identification (7)</b>	GC-MS SCAN analysis of the Reference and Test Solutions.	The MS spectra of the analyte peak in the Test Solution has to be the same to the Reference Solution (peaks must have also the same retention time).	PASS
<b>Linearity (6.3)</b>	Analysis of 5 reference solutions prepared from at least 80% to 120% of target concentration.	Correlation coefficient (R) should be > 0.99  The confidence interval of the intercept has to include 0	R = 1.00  PASS
<b>Accuracy (6.4)</b>	Analyses of 3 reconstituted samples (placebo spiked with known amount of reference item at the 80%, 100% and 120% of nominal concentration) or 3 independent preparations of placebo spiked with known amount of reference item at 100% of the nominal concentration.	Recovery between 98 and 102%.	%Recovery = 100  PASS
<b>Repeatability / Precision (6.5)</b>	5 independent analyses of test item solution	%RSD (n=5) ≤ 1.4	%RSD = 0.2  PASS

### 13.2. Test item characterization and stability results

Stability was evaluated after storage for 14 days at 54°C in terms of assay, aspect, reactivity towards container material, weight change, density and pH.

The test item was stored at 54 °C in the climatic chamber SRA 347 from day 08/09/2020 to the day 22/09/2020.

Stability summary results are reported in the following table.

**Table 13 - Summary results**

Test	Time point 0	After storage 14 days 54 °C	Comparison vs t0
<b>Assay</b>	71.0% w/w (pure Ethanol)	70.2% w/w (pure Ethanol)	$\Delta$ vs t0: 1% Not significant difference
<b>Aspect</b>	Homogeneous transparent colourless viscous fluid liquid of an alcoholic biting characteristic odour, without phase separation or precipitations.	Homogeneous transparent colourless viscous fluid liquid of an alcoholic biting characteristic odour, without phase separation or precipitations.	Not significant difference
<b>Reactivity towards container material</b>	Transparent glass bottle, no sample leaks or signs of deformation, discolouration, foulings, bulges or spots on the packaging.	Transparent glass bottle, no sample leaks or signs of deformation, discolouration, foulings, bulges or spots on the packaging.	Not significant difference
<b>Weight change</b>	Bottle 1: 256.83 g Bottle 2: 255.54 g	Bottle 1: 256.38 g Bottle 2: 255.18 g	$\Delta$ vs t0: 0.2% Not significant difference
<b>Density (20 °C)</b>	0.869 g/cm <sup>3</sup>	0.868 g/cm <sup>3</sup>	-
<b>pH</b>	7.80	8.08	-

The test item can be considered stable after the accelerated storage for 14 days at 54°C.

Moreover the test item resulted in compliance with the acceptance criteria given by the Sponsor at both time points (concentration of pure Ethanol included between 67.9 – 72.9 g/100g).

**14. AMENDMENTS AND/OR DEVIATION FROM THE STUDY PLAN**

The guideline "ECHA Guidance on the Biocidal Products Regulation, Volume I, Part A, vers. 1.1, Nov. 2014" is reported in the validation protocol with the wrong revision; the correct version is "ECHA Guidance on the Biocidal Products Regulation (Volume I, Parts A + B + C, vers. 2.0, May 2018)", that is the version used by the analyst.

**15. REFERENCES**

- SANCO 3030/99 Rev.5: "Technical Material and Preparations: Guidance for generating and reporting methods of analysis in support of pre- and post-registration data requirements for Annex II (part A, Section 4) and Annex III (part A, Section 5) of Directive 91/414"
- CIPAC MT 46.3 HB O method "Accelerated storage procedure"
- ECHA Guidance on the Biocidal Products Regulation (Volume I, Parts A + B + C, vers. 2.0, May 2018)
- SOPa-LABCHI-79 rev.2 "Determination of Ethanol (CAS 64-17-5) and Isopropanol (CAS 67-63-0) in sanitizing products by GC-FID".
- CIPAC MT 75.3 (HB J) method "Determination of pH values"
- AP-LABCHI-348 rev.1 "Analytical Procedure for the determination of weight loss"
- EC method A.3 (2008) and OECD Test Guideline No.109 (2012) "Density of Liquids and Solids"

**16. ARCHIVING**

Document/Registration	Archiving period
Study Plan original, amendments to the Study Plan, Original Final Report, Method of Analysis, inspection reports, raw data	10 years
Sample of test item	No reserve samples were committed to the Testing Facility by the sponsor
Support materials needed for the study	10 years

**17. ANNEXES AND/OR ATTACHMENTS**

**Attachment 1: Study Plan**

