ETV
VERIFICATION REPORT

Final

"GW Dryer"

Report N° 2015-DG-MP-141

Revision N° 02

Prepared by: Felice Alfieri

Approved by (ETV Technical Manager): Laura Severino

28/09/2016

Contents

1. INTRODUCTION

RINA, commissioned by the Institute for Agricultural and Fisheries Research (ILVO), has verified the performance claim of the technology "GW Dryer" according to the relevant procedures for EU ETV as for GVP Version 01 - July 7th, 2014 and the requirements set in the Specific Verification Protocol N° 2015-DG-MP-141, Revision N° 00.

ILVO, according to the objectives of the FP7 Noshan project (http://www.noshan.eu) is investigating the processes and technologies needed to use food waste for feed production at low cost, low energy consumption and with maximal valorisation of starting wastes. In this context moisture control and stabilization technologies are also analysed, including the "GW Dryer" technology.

The Noshan project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 312140

G3 Enterprises (G3) is the owner of the technology "GW Dryer" (formerly known as the Refractance Window® Dryer). G3 authorized the verification of the environmental performance of the GW Dryer as proposed by ILVO according to the EU ETV Programme.

1.1. NAME OF TECHNOLOGY

"GW Dryer"

1.2. NAME AND CONTACT OF PROPOSER

Name: INSTITUTE FOR AGRICULTURAL AND FISHERIES RESEARCH (ILVO)
Contact: Bart Van Droogenbroeck
Address: Burg. Van Gansberghelaan 115, 9820 Merelbeke
Telephone: +32 9 272 28 39
Email: bart.vandroogenbroeck@ilvo.vlaanderen.be

1.3. NAME OF VERIFICATION BODY/VERIFICATION RESPONSIBLE

RINA, accredited EU ETV Verification Body, conform to the requirements of ISO/IEC 17020 for inspection bodies type A and of the GVP version 1.

1.4. VERIFICATION ORGANISATION AND EXPERTS

ROLE – VERIFICATION BODY	LAST NAME	FIRST NAME
ETV TECHNICAL MANAGER / INTERNAL REVIEWER	SEVERINO	LAURA
ETV SERVICE COORDINATOR/ETV INSPECTOR	ALFIERI	FELICE
EXTERNAL REVIEWER	MAFFINI	ANDREA

G3 Enterprises, Inc., Delaware Corporation, located at 502 E. Whitmore Avenue, Modesto, California 95358 ("G3") was in charge of planning, performing and reporting the testing activities (Test Body).

ROLE – TEST BODY	LAST NAME	FIRST NAME
TEST RESPONSIBLE	BENAVIDES	ALFONSO
INTERNAL AUDITOR	ANDERSON	STEVEN

The proposer INSTITUTE FOR AGRICULTURAL AND FISHERIES RESEARCH (ILVO) was involved according to the EU ETV requirements.

ROLE – PROPOSER	LAST NAME	FIRST NAME
PROPOSER RESPONSIBLE	VAN DROGENBROECK	BART

- drafting the 'quick scan' and the proposal for verification, providing the information necessary to plan and implement the verification process,
- contracting with the Verification Body for the verification process
- reviewing and approving the ETV documents

The testing activities were conducted at the “San Joaquin Valley Concentrates’ (SJVC), 5631 E. Olive Ave. Fresno, CA 93727, where the the GW Dryer (Model 2) is used to concentrate and dry natural colors. SJVC operators and lab staff were involved in the testing activities under the supervision of the G3 test responsible.

1.5. VERIFICATION PROCESS

The verification carried out by RINA included the following activities:

- Eligibility Assessment: The GW Dryer is the technology eligible for EU ETV. This technology falls within the scope of the EU ETV pilot programme and in particular in the Technological Area 2 “Material Waste and Resources” according to the GVP; it is already on the market and contributes to the efficient use of natural resources and a high level of environmental protection. G3 Enterprises (G3), owner of the refractance window drying technology “GW Dryer”. G3 authorized the verification of the environmental performance of the GW Dryer as proposed by ILVO according to the EU ETV Programme.
- Verification Proposal Assessment: The initial performance claim has been revised. RINA has provided a detailed cost estimate for the verification procedure. Based upon the cost estimate, the verification contract has been drafted and signed by ILVO.
- Specific Verification Protocol review: Upon successful completion of the contact phase and proposal phase RINA developed the specific verification protocol following the provisions of the GVP. The drafted SVP was reviewed by an internal and by an external technical expert. The SVP includes:
    - Summary description of the technology, its intended application and associated environmental impacts
    - Definition of verification parameters (revised performance claim)
    - Requirements on test design and data quality
    - Requirements on test and measurement methods, definition of calculation methods for performance parameters
    - Description of the way in which operational, environmental and additional parameters are to be dealt with in the verification process
    - Assessment of existing data and conclusions on the need or not for additional tests or measures
- Test plan review: the test plan, drafted by G3 Enterprises was subject to review and approval from RINA.
- Test system / test performance audit: a physical audit was conducted by RINA during the actual testing of the technology in order to perform a qualitative and quantitative evaluation of the measurement system as used in the specific test. The testing activities were performed on 28th of January 2016, coordinated by G3 Enterprises (as Test Body).

- Test report review: the test report, drafted by G3 Enterprises, was subject to review and approval from RINA.
- Verification reporting. Based on the outcome of the assessment of data and verification RINA drafted the Verification report and the Statement of Verification
- Verification Report / Statement of Verification review: the drafted Verification Report and Statement of Verification were reviewed by an internal and by an external technical expert. The verification report has been finally approved by the RINA's ETV Technical Manager Laura Severino.

A detailed time schedule of the activities carried out by RINA is available in the table 1 below.

Table 1: ETV Time Schedule

TASK	DATE
Eligibility Assessment	November 2015
Verification Proposal Assessment	December 2015
Specific Verification Protocol – Review	January 2016
Specific Verification Protocol – External Independent Review	January 2016
Test Plan Review	January 2016
Test System / Test Performance Audit	January 2016
Test Report Review	February 2016
Verification Reporting	February 2016
Verification Report / Statement of Verification - Review	February 2016

1.6. DEVIATIONS TO VERIFICATION PROTOCOL

No deviations from the specific verification protocol are reported from the implementation of the test activities.

2. DESCRIPTION OF THE TECHNOLOGY

2.1 SUMMARY DESCRIPTION OF THE TECHNOLOGY

GW Dryer is a novel drying technology for converting liquid foods and other related biomaterials into powders, flakes, or sheets with added value (see Fig. 1).

Principle used

GW Dryer utilizes hot water as the heat transfer medium to dry a wide variety of products carried by a belt conveyor.

How it Works

A liquid or puree is evenly applied on a moving, food grade belt (wet biomass in thin layer, 40 – 300 µm) (see Fig. 2). Hot water below the moving belt is used as the heat source. Heat transfer is achieved by convection, conduction and radiation through a polyester Mylar belt from the body of hot water to the product to be dried. Air circulation above the belt removes moisture from the drying tunnel. The dried product is cooled (cooling water) and removed from the belt.

GW Dryer is a modular technology and 5 models are available (GW Dryer is expandable from 1 to 5 modules). Model 2 (Size (L X W X H) = (14.94 x 2.44 x 2.59) m, belt length 112 feet (34 m), heating surface around 17,5 m^2) is the object of this EU ETV verification.

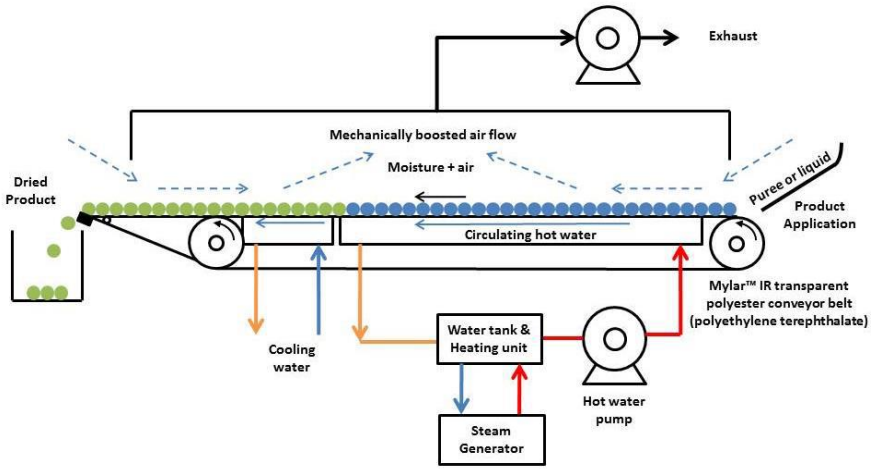


Figure 1: GW Dryer schematic diagram

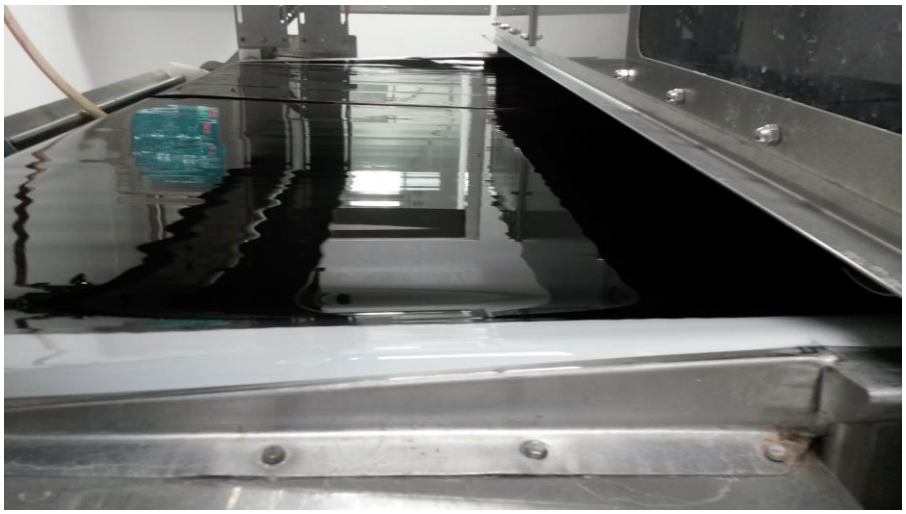


Fig.2: the thin layer of tested materials on the GW Dryer belt.

2.2. INTENDED APPLICATION (MATRIX, PURPOSE, TECHNOLOGIES, TECHNICAL CONDITIONS)

Table 2: Intended application of the technology		
Matrix	**Purpose**	**Technologies and technical conditions**
Liquids, slurries, pastes	To dry wet products (liquids, slurries, pastes) into a dry, stable products.	GW Dryer is a continuous process. The wet liquids, slurries, pastes are applied in a thin layer: 40 – 300 µm (Fig.2). Finished Product capacity: 5 – 50 (kg/h) dependent on feed solids and process conditions. Typical product temperature: 60 - 70°C. More information about the condition of operation and use for the specific GW Dryer's application tested are available in table 6.

2.3 VERIFICATION PARAMETERS DEFINITION

The list of parameters considered in the specific verification protocol is described in Table 3.

Table 3: parameters considered in the specific verification protocol

Parameter	Value at the 95% confidence level	Existing legal Requirements and/or BAT values	Test or measurement method(s)	Test /available data
Water Temperature	Inlet Temperature: 80-98 °C Outlet Temperature: 80-98 °C	Not applicable	Electrical instrumentation for Temperature: ifm efector TD2817	No data available at the beginning of the ETV process
Moisture content	Finished product at 7% moisture	Not applicable	Thermogravimetric analysis: Lab Equipment for Moisture Measurement: Mettler Toledo MJ33.	
Water Flow	To be determined during testing	Not applicable	Dynasonics (now Badger Meter) DXNP-AHS-NN Doppler/Transit Time Flow Meter	
Weight	50 – 100 kg/h wet feed @ ~30% solids. 20 – 30 kgs/h of finished product at 7% moisture.	Not applicable	Weight of Barrels: Mettler Toledo IND560	
Color in finished product (Extinction Value Test)	EV @ pH 3.00 (λmax)	USA: 21 CFR 73.250. Fruit juice for color. EU: EU Commission Regulation N° 231/2012	Extinction Value Test Method at pH 3: λmax at 520 nm. Spectrophotometer Hewlett Packard 8453	

3. EXISTING DATA

3.1. ACCEPTED EXISTING DATA

No existing data was submitted by the proposer.

4. EVALUATION

The test was performed by G3 Enterprises with the GW Dryer machine available at the "San Joaquin Valley Concentrates' wholly owned by E & J Gallo Winery.

4.1. CALCULATION OF PERFORMANCE PARAMETERS

Material Balance

Starting from the measurement of weight and moisture content described above for wet feed (IN) and finished product (OUT) a material balance have been calculated according to the formulas below:

- Dry Mass IN = [Total Mass IN x (100 - % Moisture IN)] / 100
- Dry Mass OUT = [Total Mass OUT x (100 - % Moisture OUT)] / 100
- **Solids Yield (%) = Product Solids (kg) / Feed Solids (kg) x 100**
- **Solid Product Loss (%) = 100% - Solids Yield**
- Moisture in Product IN = [Dry Product Mass x (% Moisture IN) / (100 - % Moisture IN)]
- Moisture in Product OUT = [Dry Product Mass x (% Moisture OUT) / (100 - %Moisture OUT)]
- **Moisture Evaporated = Moisture in Product IN – Moisture in Product OUT**

Heat Balance

- Mass of Heating Water = Total Water Flow Rate x Product Drying Time
- **Heat Supplied = Mass Flow of Heating Water x (Temperature of Heating Water IN – Temperature of Heating Water OUT) X Specific heat of water**

Thermal Efficiency of the GW Dryer

- Heat for Drying = Moisture Evaporated x [Water Latent Heat of Evaporation + Water Specific Heat x (Drying Temperature – Feed Temperature)]
- **Thermal Efficiency (%) = [Heat for Drying / Heat Supplied] x 100**

Color Loss

Color Intensity is reported using the Extinction Value Method with the units of "EV @ pH 3.00 (λmax)". Color intensity in wet feed samples is corrected according to the different moisture content (Color DMB), thus the color loss has been calculated as below:

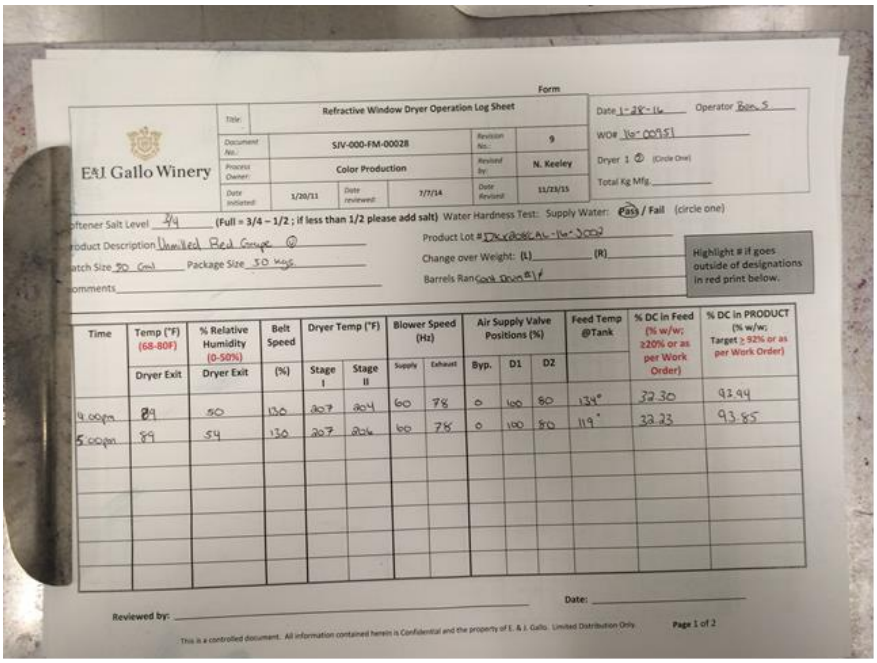
- Color DMB (EV) = EV λmax (IN) * (Moisture in Sample IN / Moisture in Sample OUT)
- Color Loss = EV λmax (OUT) / Color DMB (EV)

Calculation of performance parameters are in line with the specific verification protocol and test methods applied.

4.2 EVALUATION OF THE TEST QUALITY

4.2.1 CONTROL DATA

Collected data is noted in the log book (figure 2) and transferred to the Laboratory Information Management System Software for the review and approval process according to the SJVC procedures. A further data integrity check was performed by the RINA inspector Felice Alfieri that witnessed the testing activities.



Form

E&J Gallo Winery

Refractive Window Dryer Operation Log Sheet

Document No.:	SJV-000-FM-00028	Revision No.:	9
Process Owner:	Color Production	Revised by:	N. Keeley
Date Initiated: 1/20/11	Date reviewed: 7/7/14	Date Revised:	11/23/15

Date 1-28-16 Operator Ben S

WO# 16-00951

Dryer 1 ② (Circle One)

Total Kg Mfg.

Softener Salt Level 34 (Full = 3/4 – 1/2 ; if less than 1/2 please add salt) Water Hardness Test: Supply Water: Pass / Fail (circle one)

Product Description Unmilled Red Grape ②

Batch Size 30 Gal Package Size 30 kgs

Comments

Product Lot # 16x@08CAL-16-3002

Change over Weight: (L) (R)

Barrels Ran Cook Oven #1

Highlight # if goes outside of designations in red print below.

Time	Temp (°F) (68-80F)	% Relative Humidity (0-50%)	Belt Speed	Dryer Temp (°F)		Blower Speed (Hz)		Air Supply Valve Positions (%)			Feed Temp @Tank	% DC in Feed (% w/w; ≥20% or as per Work Order)	% DC in PRODUCT (% w/w; Target ≥ 92% or as per Work Order)
	Dryer Exit	Dryer Exit	(%)	Stage I	Stage II	Supply	Exhaust	Byp.	D1	D2			
9:00pm	89	50	130	207	204	60	78	0	100	80	134°	32.30	92.94
5:00pm	89	54	130	207	206	60	78	0	100	80	119°	33.23	93.85

Reviewed by: Date:

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Figure 2: log book - moisture measurement

4.2.2 AUDITS

The test was performed on 28th of January 2016 according to the time schedule below (Table 4). The ETV Inspector Felice Alfieri witnessed the key phases of the testing procedure. Three test runs were conducted: Test # 1 and # 2 with Liquid Purple Grape followed by Test # 3 with Liquid Red Grape.

During each test run the following data / samples were collected:

- Initial and final weight of each feed drum;
- one 3-3.5 minute cumulative heating water flow for each heat exchanger;
- two sets of heating water temperatures for each heat exchanger;
- at least two moisture analysis of feed and product;
- collection of two values of the feed material temperature;
- initial and final product drum weight for each drum;
- two samples for color loss(feed and product)

Table 4: parameters considered in the specific verification protocol

Timetable	Activity	Personnel Involved
7:30 am – 08:30 am	Start at Fresno Facilities, 5631 E Olive Ave, Fresno, CA 93727	
07:30 am – 08:30 am	Test system control	Alfonso Benavides (G3)
8:30 am – 06:00 pm	Testing and Data Collection: Sampling activities of feed and dried product / Readout of water flow and temperatures Test run # 1 conducted from 9:00 am to 11:22 AM Test run # 2 conducted from 11:41 AM to 2:02 PM Test run # 3 conducted from 3:14 pm to 5:55 PM	Alfonso Benavides (G3) Dryer Operator (SJVC) SJVC Lab Staff
6:00 pm – 7:00 pm:	Wrap up discussions on test status, determine if any additional data may be needed.	Alfonso Benavides (G3)

A test system audit was conducted by Felice Alfieri (ETV Inspector) during the test performance on 28th of January 2016. The test system audit aimed to ensure that the test performance is in line with good practice, with this GVP, the specific verification protocol, and the test plan.

The test system audit included two phases:

- the test system performance audit
- the quality management system audit

The test system performance audit included the following activities:

- the review of relevant procedures (methods, instructions for the operators, forms, book logs);
- verification of personnel involved in testing
- control of the lab practices (e.g.: sampling and handling of samples);
- check of the calibration of the test equipment and measurement devices;
- check of the testing premise and environmental conditions
- Measurement traceability / quality control / result reporting

It can be concluded that the testing performed by G3 Enterprises was done according to the requirements specified in the test plan and in the specific verification protocol. It was concluded from the audits that there was consistency with the test plan; set up and that handling of measurements were carried out as described; testing premise and environmental conditions were in line with the SVP requirements; the sampling was performed according to the test plan approved; the relevant procedures were followed; measurement traceability was ensured; quality control and test reporting were in line with the GVP requirements.

Also the quality management system of G3 Enterprises (test body) was object of audit. Organizational documents were checked including the organizational charts, staff training and qualification registrations. In conclusion the quality management system complies with the requirements set out in C.III. of the GVP. SJVC Lab Staff was involved in the test (in particular the GW Dryer operators). SJVC has been awarded with and maintained the Food Safety System Certification (FSSC) according to the ISO 22000 - Food safety management systems - Requirements for any organization in the food chain.

4.2.3 DEVIATION

No deviations from the Specific verification protocol are reported.

4.3. VERIFICATION RESULTS (VERIFIED PERFORMANCE CLAIM)

4.3.1. PERFORMANCE PARAMETERS

The verified performance (Table 6) is in line with the GW Dryer.

Type of input material

Two types of Natural Color from Grape Skins (Anthocyanins) were tested: “Liquid Purple Grape” and “Liquid Red Grape”. These tested products are natural colors produced from California grapes (Fig.3). They are concentrated and dried in crystal form without the use of any carriers. The dry products are non-hygroscopic and readily soluble. The materials tested are in line with the SVP.

Figure 3: Tested material (liquid purple grape)

Thermal Efficiency of the GW Dryer

Verified thermal efficiency **(60 – 65%)** is in line with the claimed range **(52 – 77%)** (see Table 5). It is important to take in mind that many factors can influence the thermal efficiency performance (e.g thickness and consistency at deposition, Nindo et al., 2007). The verified performance is thus related only to the specific application object of verification. The verified average thermal energy consumption is 3876 kJ/kgH_2O with a surface evaporation capacity of 3,2 kgH_2O/ hm^2 (based on a evaporation surface of the GW Dryer of 17,466 m^2)[1].

The evaporation of water from the product at the air–puree interface constitutes a major part of energy consumption in RW drying (Nindo et al., 2007). For this reason, the verification activities focused on the "thermal efficiency" expressed as the ratio of the theoretical thermal energy for drying the wet products to the actual thermal energy supplied to by the heating unit. Efficiency of the steam generator is not included in the thermal balance. Air to remove moisture was to be considered in the drying heat balance.

Air to remove moisture was not heated, maintained as constant as possible in all tests and over the duration of each test and was lower than the product feed temperature so it was not considered in the drying heat balance as for the SVP.

Color Loss

The Color Loss parameter shows the ability of the GW Dryer to maintain color of initial feed material. The test results show a color loss value slightly bigger than expected, however Extinction Value (EV) on a dry basis at (λ_{max}) of the products is in line with the expected performance. It means that the color intensity meets the performance claimed.

Solid Yield / Loss

The Solid Yield parameter shows the ability of the GW Dryer to perform the drying process without any relevant product loss. The test results show that the drying process of the tested products do not involve any significant product loss, with a solid yield bigger than 96,6% at the 95% confidence level. The Dry Product Loss is the balance to 100% of the Solid Yield.

[1] The range claimed was probably too conservative. According to (Nindo et al., 2007) typical surface evaporation capacity is in the range 1-10 kgH_2O/ hm^2

Table 5: Verified performance for the selected performance parameters (95 % confidence intervals are shown in brackets).

Parameter	Claimed Performance	Verified Performance
Type of Input material	ANTHOCYANINS (E 163) Natural Color from Grape Skins	Two different types of input materials have been tested: Liquid Purple Grape Liquid Red Grape
Thermal Efficiency of the GW Dryer	**52-77%, (Nindo et al., 2007)**	**63% [60 – 65]**
Thermal Energy consumption	3320 – 4920 kJ/kgH2O	3876 kJ/kgH2O [3715 – 4037]
Evaporation capacity	1,5 – 2,5 kgH_2O/ hm^2	3,2 kgH_2O/ hm^2 [2,6 – 3,8]
Color Loss (ability of the GW Dryer to maintain color of initial feed material)	***6%***	**10%** **[0 – 21]**
Extinction Value (EV) on a dry basis at (λmax)	*20 – 23*	21,50 [21,38 – 21,75]
Solid Yield / Loss Solids Yield : Product Solids (kg)/Feed Solids (kg)	95 – 99,5 %	100 % [96,6 – 100]
Dry Product Loss	0,5 – 5 %	0 % [0 – 3,4]
Feed material	50 – 100 kg/h wet feed	87 kg/h [74 – 99]
Input moisture content	~70% moisture	69% [67 – 72]
Product material	20 – 30 kg/h of finished product	28 kg/h [27 – 30]
Product moisture content	product at ~7% moisture	7,4% [6,6 – 8,2]

4.3.2 OPERATIONAL PARAMETERS

Appropriate environmental and operational conditions were ensured for the test performance. See the details in table 6. Air to remove moisture was not heated above hot water temperature, was kept as constant as possible in all and lower than the product feed temperature over the duration of the test. It was not considered in the drying heat balance.

Table 6: Operational Parameters

Operational and Environmental Conditions	Value
Duration of the process	In average 148 min to treat 50 gallons (189,27 liters)
Temperature of Feed to Dryer after pre-heating	52 °C
Environmental Conditions	T > 0 °C
Water Temperature at 4 Inlets of Dryer	96,5°C
Water Temperature at 4 Outlets of Dryer	95,5 °C
Flow Rate of Water at 4 Inlets of Dryer	223 Liters/min for each of the 4 inlets
Temperature of Dryer Room	32 °C
Humidity of Dryer Room	54%
Ambient Temperature of Outside Air	10 °C
Humidity of Outside Air	50%
Initial color in feed materials: Extinction Value (EV) on a dry basis at (λmax)	23-27

4.3.3 ENVIRONMENTAL PARAMETERS

The relevant environmental parameters are included in table 6 above. Data on general ambient conditions was taken during test, please see detailed lab data table for more information.

4.4. RECOMMENDATIONS FOR STATEMENT OF VERIFICATION

Based on the verified performance described in section 4.3 above it is recommended to issue a Statement of Verification including results for the following aspects:

- Energy efficiency
- Color Loss
- Solid Yield / Loss

5. QUALITY ASSURANCE

The personnel and experts responsible for quality assurance as well as the different quality assurance activities are described in table 8.

- Review of the SVP: an internal technical review and an external technical review from an external technical expert. The internal review was performed by Laura Severino (qualified as ETV Inspector). External review was performed by Andrea Maffini (qualified as Technical Expert).
- test plan and test report review: the test plan and the test report was subject to a review by the inspector Felice Alfieri (Coordinator for this specific inspection activity) that also approved the documents.
- test system control: it was performed by Alfonso Benavides (G3 Enterprices) as described in the section 4.2.1
- test system audit / test performance audit: a physical audit was conducted by the ETV Inspector Felice Alfieri during the actual testing of the technology;
- The verification report and the statement of verification will require an external review according to EU ETV pilot programme GVP. External review will be performed by Andrea Maffini. The verification report will be finally approved by the RINA's ETV Technical Manager Laura Severino.

Table 8: Verification and Quality Assurance plan

	ETV Inspector	**ITR**	**E-ITR**	**Test Body**	**Test Body (Internal Auditor)**
Personnel Responsible	Felice Alfieri	Laura Severino	Andrea Maffini	Alfonso Benavides (G3)	Steven Anderson (G3)
Specific Verification Protocol	Draft	Review	Review		
Test Plan	Approve			Draft	Review
Test System at test site	Audit				
Test Performance	Audit			Test System Control	
Test Report	Approve			Draft	Review
Verification Report	Draft	Review	Review		
Statement of Verification		Review	Review	Acceptance	

6. REFERENCES

(EU Environmental Technology Verification Pilot Programme) General Verification Protocol, version 1.1 of 07-July-2014

(Nindo et al., 2007) Refractance Window Dehydration Technology: A Novel Contact Drying Method - Drying Technology, 25: 37–48, 2007

APPENDIX 1 TERMS, DEFINITIONS AND ABBREVIATIONS

"Accreditation" has the meaning assigned to it by Regulation (EC) No 765/2008.

"Deviation" is a change to a specific verification protocol or a test plan done during the verification or test step performance.

"EU ETV – European Environmental Technology Verification" is the EU programme providing for third-party verification, on a voluntary basis, of the performance claims made by technology manufacturers in business-to-business relations.

"FP7" European Union's Seventh Framework Programme

"IEC" International Electrotechnical Commission

"ILVO" is Institute for Agricultural and Fisheries Research

"ISO" International Standard Organization

"GVP – General verification protocol" means the description of the principles and general procedure to be followed by the ETV pilot programme when verifying an environmental technology.

"Performance claim" means a set of quantified and measurable technical specifications representative of the technical performance and environmental added value of a technology in a specified application and under specified conditions of testing or use.

"RINA" is RINA Services S.p.A.

"**SJVC**" "San Joaquin Valley Concentrates"

"SVP – Specific verification protocol" means the protocol describing the specific verification of a technology and applying the principles and procedures of the General verification protocol.

"Test performance audit" means the quantitative evaluation of a measurement system as used in a specific test, e.g. evaluation of laboratory control data for relevant period, evaluation of data from laboratory participation in proficiency test and control of calibration of online measurement devices.

"Test system audit" is the qualitative on-site evaluation of test, sampling and/or measurement systems associated with a specific test.

"Test system control" is the control of a test system as used in a specific test. E.g. test of stock solutions, evaluation of stability of operational and/or on-line analytical equipment, test of blanks and reference technology tests.

"Verification" means the provision of objective evidence that the technical design of a given environmental technology ensures the fulfilment of a given performance claim in a specified application, taking any measurement uncertainty and relevant assumptions into consideration.

APPENDIX 2 QUICK SCAN

The report from the quick scan is attached to the verification report as a separate file.

APPENDIX 3 PROPOSAL

The verification proposal is attached to the verification report as a separate file.

APPENDIX 4 SPECIFIC VERIFICATION PROTOCOL

The specific verification protocol is attached to the verification report as a separate file.

APPENDIX 5 AMENDMENT AND DEVIATION REPORT FOR VERIFICATION

No amendment report has been made for the verification of the GW Dryer.

APPENDIX 6 TEST PLAN (WHERE RELEVANT)

The test plan is attached to the verification report as a separate file.

APPENDIX 7 TEST REPORT (WHERE RELEVANT)

The test report is attached to the verification report as a separate file.