Real-Time 1-MCP Treatment Confirmation

White Paper & Standard Operating Procedure for Distributors and End Users

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1. Purpose and Scope

1.1 Purpose

This white paper is the single reference document for distributors, warehouse operators, applicators, and end users of MaTri SURE™. It brings together, in Standard Operating Procedure (SOP) form, the commercial rationale, technical specification, storage and handling requirements, step-by-step instructions for use, and result-interpretation guidance for the product, and it sets out the provisions that govern responsibility when the product is stored, handled, applied, or interpreted outside of the conditions described here.

1.2 Scope

This document applies to MaTri SURE™ indicator strips used in conjunction with MaTri Powder or MaTri Tablet 1-MCP treatments, in cold-storage and transition treatment of apples. It is intended for use by commercial distributors, cold-storage warehouse personnel, and treatment applicators.

1.3 Status of This Document

MaTri SURE™ is a decision-support and treatment-confirmation tool. This white paper is a support and training reference; it is not itself a product label or a warranty document. This document consists of instructions, disclaimers, limitations, and provisions that apply to all use of the MaTriSURE.

2. Executive Summary

Confirming that a 1-MCP treatment has been correctly applied has traditionally relied on gas sample collection, precisely timed sampling, specialist equipment, transport to an external laboratory, and a multi-day wait for results, often arriving after the operational decision window has already closed.

MaTri SURE™ moves the confirmation step to the point of treatment. It is a modern, simple, and immediate decision-support tool that simplifies traditional air-sampling: the strip is placed in the treatment room, and a visual colour change provides an immediate, on-site indication within the 24-hour treatment window, turning days of waiting into hours, and giving distributors and end users more time to protect their crop.

2.1 Traditional Air-Sampling vs. MaTri SURE™

Traditional Air-Sampling Approach	MaTri SURE™
Gas sample collection required	Test strip placed directly in the treatment room
Correct sampling timing required	Visual confirmation, no sampling window to hit
Special equipment needed	No specialist equipment required on site
Sample transport to an external laboratory	Result read on site, immediately
Laboratory analysis and interpretation	Simple, visual decision support

Traditional Air-Sampling Approach	MaTri SURE™
Result often arrives after the operational decision window has closed	Result delivered within the operational decision window (~24h)

Source: MaTri SURE™ Product Specification and Corporate Deck, 2026.

2.2 Key Benefits

- Immediate confirmation after treatment — instant confidence instead of sample logistics.
- No specialist equipment required at the customer site.
- Result delivered within the operational decision window.
- Simple, photo-based documentation of conditions before and after treatment.
- Supported by a defined SOP and a full stewardship / quality-control process.
- Fast, reliable, simple, and efficient — designed for controlled use.

3. Product Overview

3.1 The MaTri System

MaTri SURE™ is one component of the broader MaTri System for 1-MCP cold-storage and transition treatment of apples:

- MaTri Generator — a corrosion-resistant, easy-to-use 1-MCP generator powered by long-lasting, rechargeable batteries; an easy and convenient cold-storage and transition treatment that requires no external generator infrastructure.
- MaTri Powder / MaTri Tablets — the premium-quality 1-MCP treatment products applied to the cold-storage chamber.
- MaTri SURE™ — the real-time treatment-confirmation strip that gives instant confidence that the MaTri Powder or Tablet application was successful and that the produce is protected.

3.2 What MaTri SURE™ Is

MaTri SURE™ is an advanced functional chemical indicator strip. It provides results immediately after the gassing process is completed, without the need for specialized laboratory services, and is designed to save time and cost relative to traditional air-sampling while supporting fruit protection decisions.

The strip changes colour in the presence of the treatment: from pink (Pantone 5035 C) before treatment to yellow (Pantone 7499 U) after a completed 24-hour treatment. This colour change is read and documented on site by the applicator.

4. Technical and Product Specification

4.1 Colour Reference

Reading Stage	Plate Colour	Reference	Meaning
Before treatment	Pink	Pantone 5035 C	Strip unexposed; treatment not yet started
After 24h of treatment	Yellow	Pantone 7499 U	Expected colour change indicating treatment exposure was detected

4.2 Storage Conditions

- Store in a cold, dark, and dry place, protected from 1-MCP.
- Recommended storage temperature range as specified on the label: 36–43°F (2–6°C).

4.3 Use Period and Disposal

- The product remains suitable for use for up to 2 months from the date printed directly on the label (format: YYYY.MM.DD).
- After this period, the product should be destroyed and must not be used.

NOTICE
MaTri SURE™ is a functional advanced chemical indicator. The defined use period is part of the quality-control system — it is not an arbitrary administrative date, and use of the product beyond its printed date is outside the manufacturer's controlled-use specification.

4.4 Packaging and Handling Prior to Use

- Each MaTri SURE™ strip is supplied sealed in a zip-lock bag with inner packaging.
- The strip must remain sealed in its packaging until immediately before treatment; opening it earlier exposes it to ambient conditions outside the controlled chain described in Section 5.

5. Standard Operating Procedure. Instructions for Use

5.1 Purpose

To define the correct, repeatable procedure for placing, applying, reading, and documenting a MaTri SURE™ strip so that its result can be reliably interpreted.

5.2 Materials Required

- One (1) MaTri SURE™ strip, within its printed use period, stored per Section 4.2.
- MaTri Powder or MaTri Tablets for the 1-MCP application.
- A camera or smartphone capable of taking timestamped photographs.
- Means to record the treatment start date and time as an individual ID (dedicated software on request).

5.3 Procedure

1. Remove the MaTri SURE™ strip from the zip-lock bag and inner packaging immediately before treatment, not earlier.
2. Fold the MaTri SURE™ strip over the edge of the bin inside the treatment chamber. If the cold room has a window, hang the strip in a location that is visible from outside.
3. Write the date and time of treatment start as an individual ID number, and take a photograph of the pink plate 'before treatment' (timestamp format: YYYY.MM.DD HH:MM).
4. Complete the MaTri Powder or MaTri Tablets application per the product label.
5. After 24 hours of treatment, check whether the plate colour has changed from pink to yellow.
6. Take a photograph of the yellow plate 'after treatment,' making sure the treatment start-time record is visible in, or alongside, the photograph.

5.4 Documentation Requirements

Every application must be documented with: the individual treatment ID, the before-treatment photograph (pink plate, with timestamp), and the after-treatment photograph (yellow plate, with the start-time reference visible), logged through the dedicated MaTri quality-control software where available, description of the application procedures, communication with sales person or support. This documentation is what allows a result (typical or atypical) to be interpreted with confidence, and it is the primary evidence relied upon in any investigation under Section 8.

6. The Controlled Chain — Quality-Control System

Reliable performance depends on the whole controlled chain, not on the strip alone. The sensing chemistry requires controlled manufacture, storage, handling, and use; each stage below is a control point, and each has a party responsible for it.

#	Stage	Requirement	Responsible Party
1	**Manufacturing**	Controlled product characteristics; indicator manufactured to Fresh Inset specification	Fresh Inset S.A.
2	**Storage**	36–43°F (2–6°C), dark, dry, protected from 1-MCP, within the printed use period	Distributor / Warehouse
3	**Handling**	Kept sealed in zip-lock bag and inner packaging; opened only immediately before treatment	Distributor / Warehouse / Applicator
4	**Use**	Correct placement, correct timing, and full compliance with this SOP	Applicator / End User
5	**Reading**	Before/after conditions documented with photographs, ID, and timestamp	Applicator / End User

It is recommended that the process be recorded end-to-end in the dedicated software (available on request), which is the reference record for manufacturing lot, storage compliance (where captured), and the before/after documentation described in Section 5.4.

7. What the Result Means (and What It Does Not)

NOTICE
MaTri SURE™ should always be interpreted together with its treatment context, not in isolation.

7.1 What MaTri SURE™ Is

- Immediate visual information after treatment.
- A decision-support / treatment-confirmation tool.
- A simple way to document before-and-after conditions.
- A tool supported by an SOP and a full quality-control system.

7.2 What MaTri SURE™ Is Not

- Not a stand-alone laboratory determination.
- Not proof that every treatment variable was correct.
- Not a basis for an automatic commercial conclusion when an atypical result appears.
- Not a substitute for a case-specific investigation.

8. Handling Atypical Results — Investigation Protocol

Atypical colour does not, by itself, equal an automatic conclusion.

A colour deviation, an incomplete change, no change, or any other unexpected reading is not automatically equivalent to treatment failure, product rejection, or grounds for commercial reconciliation.

Several circumstances — storage, handling, application, environmental, timing, and documentation factors — can influence an observed result. MaTri SURE™ supports the decision; it does not replace the investigation.

8.1 Investigation Checklist

Before any commercial conclusion is drawn from an atypical reading, the following should be verified and documented:

- Storage compliance — was the strip stored at 36–43°F (2–6°C), dark, dry, and protected from 1-MCP, and within its printed use period, at every stage of custody?
- Handling compliance — was the strip kept sealed until immediately before treatment, and was it opened, placed, and folded per Section 5.3?
- Application compliance — was the MaTri Powder or Tablet application completed correctly, at the correct dose, for the full treatment duration?
- Chamber conditions — were there any unusual conditions in the treatment chamber (door openings, ventilation, temperature excursions) during the treatment window?
- Documentation integrity — are the before/after photographs, individual ID, and timestamps complete, legible, and consistent with the SOP in Section 5.4?

- Label and packaging integrity — was the product used in its original, unaltered Fresh Inset packaging and labeling, with no relabeling, overlabeling, or repackaging.
- Communication records — description of the application procedures, communication with sales person or support.
- Escalation — unresolved or ambiguous cases should be referred to Fresh Inset technical support (Section 10) before any commercial position is taken.

Each atypical case should be analysed separately, on its own facts, before any conclusion is drawn about the underlying 1-MCP treatment or about the validity of the MaTri SURE™ product itself.

9. Roles and Responsibilities

MaTri SURE™ performance depends on correct action by multiple parties across the supply chain. The table below summarizes the responsibilities introduced in Sections 4–6 above.

Party	Responsibilities
Fresh Inset S.A. (Manufacturer)	Manufacture MaTri SURE™ to controlled specification; provide accurate labeling, Instructions for Use, SOP guidance, training materials, and the dedicated documentation software; provide technical support for atypical-result investigations.
Distributor / Warehouse	Store product at 36–43°F (2–6°C) in a dark, dry location protected from 1-MCP; observe first-expiry-first-out rotation within the printed use period; transport under conditions that preserve the sealed packaging; never relabel, overlabel, repackage, or otherwise alter Fresh Inset packaging, labels, or lot/date markings without prior written authorization from Fresh Inset; destroy product after its printed use period.
Applicator / End User	Keep the strip sealed until immediately before treatment; place the strip correctly (folded over the bin edge, visible from outside the chamber where applicable); record the treatment start date/time as an individual ID; photograph the plate before and after treatment per this SOP; read the colour change only after the full 24h treatment period; escalate any atypical, incomplete, or absent colour change for investigation rather than drawing an independent conclusion.

10. Support and Contact

Technical, commercial, and stewardship-process questions, including atypical-result escalations under Section 8, should be directed to:

- Keith Culver — +1 585 738 2189 — keith.culver@freshinset.com
- Scott Harker — +1 435 840 8153 — scott.harker@freshinset.com
- Your Provider Contact

11. Disclaimers, Limitations, and Legal Provisions

This section sets out the disclaimers, allocations of responsibility, and limitations that apply to the use of MaTri SURE™, this white paper, and any commercial or quality determination based on either.

11.1 Nature and Purpose of This Document

1. This white paper is a technical and commercial support tool provided by Fresh Inset S.A. for the convenience of distributors, warehouse operators, applicators, and end users. It is intended to consolidate publicly issued product materials and to promote correct, consistent use of MaTri SURE™.
2. This document is designed in line with the official MaTri SURE™ product label, the printed Instructions for Use, or the terms of any separately executed purchase, distribution, or supply agreement.
3. Distributors and end users remain responsible for their own actions, decisions, and compliance with applicable food-safety, agricultural-chemical, labeling, and trade regulations in their jurisdiction.

11.2 Product Nature and Limitation of Function

4. MaTri SURE™ is a functional chemical indicator that provides immediate visual information after a 1-MCP treatment. It is a decision-support and treatment-confirmation tool only.
5. MaTri SURE™ is not a stand-alone laboratory determination, is not proof that every treatment variable was correct, is not a basis for an automatic commercial conclusion when an atypical result appears, and is not a substitute for a case-specific investigation. Any interpretation of a MaTri SURE™ result must be made together with the treatment context and, where the result is atypical, through the investigation protocol (Section 8).

11.3 No Overlabeling, Relabeling, or Repackaging

6. MaTri SURE™ must be used only in its original Fresh Inset packaging and with its original Fresh Inset labeling, including lot identifiers and the printed manufacture and use-by dates.
7. No distributor, warehouse, applicator, or other third party may overlabel, relabel, repackage, alter, obscure, or reprint any label on MaTri SURE™ packaging without the prior written authorization of Fresh Inset S.A.
8. Fresh Inset S.A. assumes no responsibility or liability for the performance, reading, interpretation, or any consequence arising from a MaTri SURE™ unit that has been overlabeled, relabeled, mislabeled, repackaged, or otherwise altered from the condition in which it left Fresh Inset's control. The party that performed, authorized, instructed, or knowingly permitted such alteration assumes full responsibility for it and shall indemnify Fresh Inset S.A.

11.4 Storage, Handling, and Application Responsibility

9. Fresh Inset S.A. is responsible for the product's characteristics as manufactured and for the accuracy of its labeling and Instructions for Use at the time the product leaves Fresh Inset's control.
10. From the point the product is received by a distributor, warehouse, or applicator, compliance with the storage conditions, use period, handling, placement, timing, and documentation requirements of Sections 4 and 5 is the sole responsibility of the party in possession of the product at each stage.
11. Fresh Inset S.A. disclaims responsibility for any outcome, reading, or commercial consequence attributable to a deviation from this SOP by a warehouse, distributor, or applicator, including without limitation: incorrect storage temperature or conditions; use of product beyond its printed use period; premature opening of the sealed packaging; incorrect strip placement; incorrect or incomplete treatment application; reading the result before the full treatment period has elapsed; or incomplete, missing, or inconsistent documentation.

11.5 Colour Change and Result-Validity Disclaimer

12. An atypical, partial, absent, or otherwise unexpected colour change or reading does not, by itself, establish that: (a) the underlying 1-MCP treatment failed; (b) the produce was left unprotected; or (c) the MaTri SURE™ product was defective or invalid.
13. Atypical readings may result from a range of factors outside the strip itself, including but not limited to storage deviations, handling errors, application errors, chamber or environmental conditions, timing errors, and documentation errors, as well as normal product and process variability.
14. No party — including a distributor, warehouse, applicator, or end user — may treat an atypical reading as an automatic basis for a claim, rejection, price adjustment, chargeback, or other commercial dispute against Fresh Inset S.A. without first completing a documented, case-specific investigation consistent with Section 8.

11.6 Documentation and Burden of Proof

15. Any claim relating to the performance of MaTri SURE™ must be supported by complete SOP documentation: the individual treatment ID, before-treatment photograph, after-treatment photograph, and applicable storage and handling records, description of the application procedures, communication with sales person or support.
16. The absence of such documentation, or evidence that the SOP in Sections 4–5 was not followed, or that the product was overlabeled, relabeled, repackaged, or otherwise altered in breach of Section 11.3, shall constitute a complete defense to any claim brought against Fresh Inset S.A. in connection with the product's performance or reading.

11.7 No Warranty Beyond the Label

17. MaTri SURE™ is warranted only to conform to Fresh Inset S.A.'s published specification when stored, handled, and used strictly in accordance with the Product Specification, the Instructions for Use, and this SOP, and prior to the expiry of its printed use period.

18. Except as expressly stated on the product label or in a separately executed written agreement, or as required by applicable mandatory law, Fresh Inset S.A. makes no other warranty, express or implied, including as to merchantability or fitness for a particular purpose.

11.8 Limitation of Liability

19. To the maximum extent permitted by applicable law, Fresh Inset S.A.'s liability arising from or relating to MaTri SURE™ shall be limited to the replacement of the affected product unit(s) or, at Fresh Inset's election, refund of the purchase price paid for those units.

20. Fresh Inset S.A. shall not be liable for indirect, incidental, consequential, or special damages of any kind, including without limitation lost or damaged crop, lost profits, storage or logistics costs, or reputational harm, except to the extent such exclusion is not permitted by applicable mandatory law or the parties have otherwise agreed in a separately executed written agreement.

11.9 Indemnification

21. Each distributor, warehouse operator, and applicator agrees to indemnify and hold harmless Fresh Inset S.A. from and against claims, losses, and costs arising out of: (a) that party's non-compliance with the storage, handling, use, or documentation requirements of this SOP; (b) unauthorized overlabeling, relabeling, repackaging, or alteration of the product under Section 11.3; or (c) a commercial conclusion or claim asserted against Fresh Inset S.A. without completing the investigation required under Section 8.

11.10 Precedence

22. If any provision of this white paper conflicts with the official MaTri SURE™ product label, the printed Instructions for Use, or a separately executed written purchase or distribution agreement, the label, Instructions for Use, or written agreement shall control, in that order.

11.11 Governing Law and Severability

23. This document, and any dispute concerning MaTri SURE™ not otherwise governed by a separately executed written agreement, shall be governed by the laws of Poland, without regard to its conflict-of-law principles.

24. If any provision of Section 11 is held invalid or unenforceable, that provision shall be limited or eliminated to the minimum extent necessary, and the remaining provisions shall continue in full force and effect.

11.12 Disclaimers

MaTri SURE Indicator, Decision-Support Only: an atypical or absent colour change is not, by itself, proof the treatment failed or the product was defective.

No Overlabeling, Relabeling, or Repackaging: Fresh Inset owes nothing on a unit that's been altered downstream, and the customer indemnifies for it.

Downstream Storage, Handling, and Application: once delivered, storage/handling/application errors by a warehouse, distributor, or applicator are that party's responsibility, not a product defect.

Documentation Required for a Claim: no photographic before/after record, description of the application procedures, communication with sales person or support, and treatment ID, no valid complaint.

No Warranty of Treatment Outcome: Fresh Inset doesn't warrant that a reading is unaffected by chamber/environmental conditions outside its control.

A Correct Reading Does Not Warrant Produce Performance. A colour change confirming a completed treatment (or any other correct, on-specification reading) on an Indicator confirms only that the Indicator was exposed to, and reacted to, the treatment atmosphere in the location where it was placed. IT DOES NOT CONFIRM, AND FRESH INSET MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, THAT THE TREATMENT ACHIEVED ANY PARTICULAR CONCENTRATION, DOSE, DISTRIBUTION, OR DURATION THROUGHOUT THE CHAMBER, THAT THE CUSTOMER'S PRODUCE OR OTHER GOODS RECEIVED AN EFFECTIVE OR UNIFORM TREATMENT, OR THAT THE PRODUCE WILL STORE, RIPEN, OR OTHERWISE PERFORM AS EXPECTED. The Customer acknowledges that produce storage outcomes depend on numerous factors outside the Indicator's scope and outside Fresh Inset's, including variety, maturity and condition at harvest, pre-treatment handling, chamber loading and airflow, temperature and humidity management, and storage duration, and that a correct Indicator reading is not a guarantee of any of the foregoing. NO CLAIM MAY BE BROUGHT AGAINST FRESH INSET ON THE BASIS THAT THE CUSTOMER OR ANY THIRD PARTY RELIED ON A CORRECT INDICATOR READING AS AN ASSURANCE OF PRODUCE PERFORMANCE, QUALITY, OR STORABILITY.