M.A.R.S.

Micro Alcohol Reaction System

by ND Pharma-INTABIOTECH



www.intabiotech.com

M.A.R.S.™

MICRO ALCOHOL REACTION SYSTEM

Advanced Technology for Alcoholic Matrices

Technological innovation for spirits, liqueurs, RTD and formulations containing alcohol.

ND PHARMA & BIOTECH CO. INTABIOTECH



A new way of working with alcoholic matrices

The alcoholic beverages industry is evolving towards increasingly sophisticated products. Achieving a given alcohol content is no longer sufficient: consumers demand more balanced drinks, better-integrated aromatic profiles, differentiated sensory experiences, and extraordinarily consistent quality across batches.

At the same time, manufacturers require tools that enable innovation without introducing unnecessary complexity into the production process. It is within this context that **M.A.R.S.™ — Micro Alcohol Reaction System** was born: a technology developed to optimise the behaviour of matrices containing ethanol from a **physicochemical, sensory, and technological** perspective.

> This is not about adding another ingredient. It is about introducing a new technological variable into the design of the beverage, transforming it in an effective and notable way.

What is M.A.R.S.™?

M.A.R.S.™ is a proprietary technology developed for application and evaluation in **systems containing ethyl alcohol**. It is integrated within a strategy of **technological optimisation of the matrix, evaluating its interaction with the hydroalcoholic system and with the remaining components of the formulation.**

Main fields of application

- Spirits and distillates
- Liqueurs and creams
- Cocktails and RTD
- Premixes and alcoholic extracts
- Aromatic preparations
- Food formulations containing alcohol

Why is it not simply water and ethanol?

An alcoholic beverage is a complex chemical system comprising alcohol, water, volatile compounds, aromas, extracts, acids, sugars, salts, and substances derived from fermentation, distillation, or ageing. Each application is studied in a specific manner because it is precisely upon that **complete matrix** where the technology must be evaluated.

The philosophy of M.A.R.S.™ consists in studying these interactions in a controlled manner and determining whether the technology makes it possible to obtain a matrix that is sensorially and technologically superior.

Beyond Alcohol

The true complexity lies in the matrix

In an alcoholic beverage, small variations in composition or process can produce perceptible differences across multiple parameters. This complexity increases further in modern products such as RTD, hard seltzers, packaged cocktails, or flavoured liqueurs.

Perception

- Alcoholic attack
- Sweetness
- Acidity
- Persistence

Aroma

- Aromatic profile
- Alcohol integration
- Volatile expression
- Aftertaste

Texture

- Mouthfeel
- Body
- Balance
- Overall acceptance

Stability

- Clarity
- Turbidity
- Batch-to-batch consistency
- Behaviour during storage

The Objective

Converting a perception into a measurable outcome

At INTABIOTECH, we do not position M.A.R.S.™ as a technology based solely on commercial claims. Its application must demonstrate its usefulness. That is why each project can be analysed through a combination of complementary tools:

Sensory evaluation

Structured tasting panel with blind methodology

Physicochemical characterisation

Analysis of the key parameters of the matrix

Instrumental analysis

Chromatography, turbidity, colour, and other parameters

Stability studies

Evaluation of behaviour during storage

> To verify whether M.A.R.S.™ produces a genuine, reproducible, and economically worthwhile improvement for that specific beverage.



What Can We Look For?

Depending on the product and the manufacturer's objective, a project with M.A.R.S.™ can be directed towards different technological and sensory variables.



Sensory Integration

Study improved integration between alcohol, water, aromas, extracts, and the remaining components of the formulation.



Balance

Analyse potential differences in the perception of alcohol, sweetness, acidity, body, and finish.



Aromatic Profile

Evaluate whether the intervention favourably modifies the aromatic expression or integration of the product.



Consistency

Investigate its capacity to contribute to greater sensory homogeneity between production batches.



Stability

Check turbidity, precipitation, colour, and aromatic behaviour during storage.



Product Development

Use M.A.R.S.™ as a technological tool during the creation of new beverages from scratch.

Distillates & Spirits

The natural territory of M.A.R.S.™

The major categories of distillates represent the most natural field of application for M.A.R.S.™. In these matrices, the technology can be incorporated into an optimisation programme aimed at studying aspects such as alcoholic perception, aromatic integration, overall balance, and consistency between batches.

1. Rum
2. Vodka
3. Gin
4. Whisky
5. Brandy
6. Tequila & Agave

Each category has its own specific identity and manufacturing standards. For this reason, INTABIOTECH combines technological development with a prior regulatory assessment when a project moves towards industrialisation.

FEATURED APPLICATION

Rum

Much more than a historical application

Rum was one of the matrices initially considered for the use of M.A.R.S.™. But its potential does not end there. The enormous diversity among white, golden, aged, spiced, and premium formulation rums makes this category an excellent field of research.

M.A.R.S.™ can be evaluated both in existing projects and during the design of new concepts, exploring:

- Hydroalcoholic integration
- Sensory impact and attack
- Aromatic balance and finish on the palate
- Product consistency between batches
- Development of differentiated profiles





FEATURED APPLICATION

Liqueurs

A particularly complex matrix

Liqueurs commonly combine ethanol, water, sugars, flavourings, botanical extracts, fruits, coffee, cocoa, spices, and other ingredients. The interaction between all these components determines the final result, making them one of the potentially most interesting applications for M.A.R.S.™.

In these products, we do not analyse solely the alcoholic fraction. We analyse **the complete system**. Particular attention is given to parameters such as clarity, stability, precipitation, aroma evolution, and sensory balance throughout the product's shelf life.

RTD & Ready-To-Drink

One of the Greatest Opportunities for Innovation

The market for ready-to-drink alcoholic beverages is transforming the industry. RTD formulations present very different challenges to those of a traditional distillate: carbonation, acids, flavourings, sweeteners, electrolytes and other ingredients can radically modify the behaviour of the matrix.

- Canned Cocktails
- Hard Seltzers
- Premixes
- Spritz
- Low-ABV Cocktails
- Long Drinks

M.A.R.S.™ must be studied on the finished beverage, not solely on the alcohol used as an ingredient.

Aromas, Extracts and Macerations

When alcohol is also a technological tool

Ethanol is widely used as a vehicle or extraction medium for numerous compounds. In these applications, M.A.R.S.™ can be incorporated into projects aimed at investigating sensory integration, stability, compatibility and the subsequent behaviour of the extract within the final food or beverage.



Botanical extracts and tinctures

Aromas, macerations, fruit preparations and spice extracts where ethanol acts as a vehicle for extraction and stabilisation.



Aromatic ingredients

Aromatic preparations where the interaction between the extract and the matrix determines the sensory behaviour of the final product.

This considerably broadens its field of application beyond the traditional spirits industry.

Foods containing alcohol

M.A.R.S.™ can also be studied in food matrices where alcohol forms part of the formulation. In these applications the matrix changes completely: fat, proteins, emulsions, water activity, thermal treatments and the volatilisation of alcohol can all modify the behaviour of the system. For this reason, each application requires a specific experimental design.

Chocolate

Tablets, fillings and pralines with an alcoholic component

Confectionery

Desserts, ice creams and gourmet preparations

Gastronomy

Sauces, marinades and specialist culinary products

What about wine, beer, or cider?

Technically possible does not automatically mean authorised

These categories require particular caution. Wines and viticultural products are subject to very specific oenological practices. Beers and ciders may likewise be governed by national legislation and specific identity standards.

For this reason, INTABIOTECH does not present M.A.R.S.™ as a universal solution for these categories. The preliminary analysis always addresses four questions:

1 **What is the product and how is it manufactured?**

Legal category, production process, and current formulation.

2 **What would be the role of the technology?**

Clear definition of the technical objective within that specific matrix.

3 **In which country will it be commercialised?**

The market determines the technical and regulatory viability of the project.



The M.A.R.S.™ Method

We don't sell a promise. We design a test.

The introduction of M.A.R.S.™ into a new product follows a structured methodology that guarantees technical rigour at every stage of development.

01

Define

We identify the beverage, formulation, process, market, and technological objective.

02

Characterise

We analyse alcohol content, pH, composition, and technical constraints.

03

Design

We establish a comparative trial with a control sample and treatment conditions.

04

Measure

We evaluate relevant sensory, physicochemical, and analytical parameters.

05

Compare

Control and treated samples are studied in parallel via a blind trial.

06

Validate

When a relevant improvement is identified, the system advances to an industrial pilot.

07

Industrialise

Scale-up, stability, regulation, and routine application in production.

Control vs. M.A.R.S.™

Comparison is the key

The correct way to evaluate M.A.R.S.™ is through a rigorous comparative design. Samples must be evaluated, wherever possible, by means of a blind trial, in order to answer the only question that truly matters: is there a favourable difference attributable to the treatment?

CONTROL	M.A.R.S.™
Product manufactured using the client's standard process. It serves as the absolute reference for comparison.	The same matrix subjected to the defined technological intervention, under identical manufacturing conditions.

> Is there a favourable difference that can be attributed to the treatment? That is the only question that matters.

Sensory Evaluation

Tasting is the most direct instrument for measuring the impact of M.A.R.S.™. Where the project allows, we recommend blind panels and structured sensory methodology, because in premium beverages what ultimately determines consumer preference occurs through the senses.

Alcoholic Perception

Intensity, attack, and persistence of ethanol on the nose and palate

Aromatic Profile

Aroma, aromatic integration, and aftertaste

Gustatory

Sweetness, acidity, body, texture, and balance

Overall Acceptance

Comprehensive assessment by the evaluation panel



Beyond the senses

We can also measure

When the project objective justifies it, the study can be complemented by instrumental analysis. If the manufacturer wishes to investigate specific components, these must be quantified through a before/after design against a control.

Instrumental parameters

- pH and density
- Alcoholic strength
- Colour and turbidity
- Storage stability
- Chromatography of volatile compounds
- Aldehydes and higher alcohols
- Product-specific congeners

The fundamental principle

The result is not presupposed. It is demonstrated. Each parameter analysed forms part of a rigorous experimental design that makes it possible to attribute with confidence any observed difference to the technological intervention.

Instrumentation complements — and never replaces — sensory evaluation, since both dimensions are necessary in order to make a well-founded industrial decision.

We Investigate. We Measure. We Compare. We Validate.

Evidence-driven development

This principle distinguishes the INTABIOTECH approach from the rest of the market.

We do not claim automatic results

We do not claim that M.A.R.S.™ automatically reduces any particular compound, nor that every beverage will respond in the same way.

We do not generalise across markets

We do not claim that one application is valid across all markets, nor that results from one product are transferable to another.

We do generate our own evidence

Each manufacturer generates specific data on their own beverage. Only then do we convert the outcome into an industrial solution.

What M.A.R.S.™ is not

M.A.R.S.™ is not commercialised as a technology intended to make alcohol consumption healthy. The current positioning is deliberately robust and is based exclusively on its technological and sensory dimension.

Claims that M.A.R.S.™ does not make

- Reduction of intoxication
- Prevention of hangovers
- Hepatic protection
- Acceleration of ethanol metabolism
- General reduction of alcohol-related harm
- Physiological modification of the consumer

These claims require a level of clinical evidence and regulatory analysis very different from that of a food technology.

The actual positioning

> TECHNOLOGY.
> PROCESS.
> SENSORY SCIENCE.
> VALIDATION.

A positioning built on technical rigour, not commercial promises.

A Tool for R&D

M.A.R.S.™ is not intended solely to correct existing products. It can be incorporated from the earliest stages of innovation, becoming a strategic tool for exploring new sensory architectures and new product concepts.

Concept

Definition of the sensory objective

Prototyping

Initial formulations and trials

Optimisation

Fine-tuning of parameters

Scale-up

Piloting and industrialisation

Particularly relevant in categories such as **premium spirits, craft beverages, RTD, cocktails, botanical drinks** and new beverage hybrids.



Value for the Manufacturer



Differentiation

Ability to research sensory profiles distinct from those obtained through conventional processes.



Flexibility

Applicable to different types of alcoholic matrices, from distillates to food formulations.



Validation

The manufacturer can verify the real effect before incorporating it industrially.



Scalability

Development can evolve from laboratory scale to industrial production.



Own Evidence

Each manufacturer generates specific data on their own beverage, not generic data.



Innovation

M.A.R.S.™ incorporates a new variable into the technological arsenal available to R&D teams.

Quality and Consistency

A successful beverage must be reproducible. The consumer expects to find the same product bottle after bottle. But raw materials, fermentations, distillations, flavourings, and process conditions can introduce unwanted variability.

For this reason, one of the areas that can be investigated using M.A.R.S.™ is its use within strategies aimed at improving the **sensorial and technological consistency of the product**.

> Not as a replacement for quality control, but as an additional tool within the manufacturing system.



Premiumisation

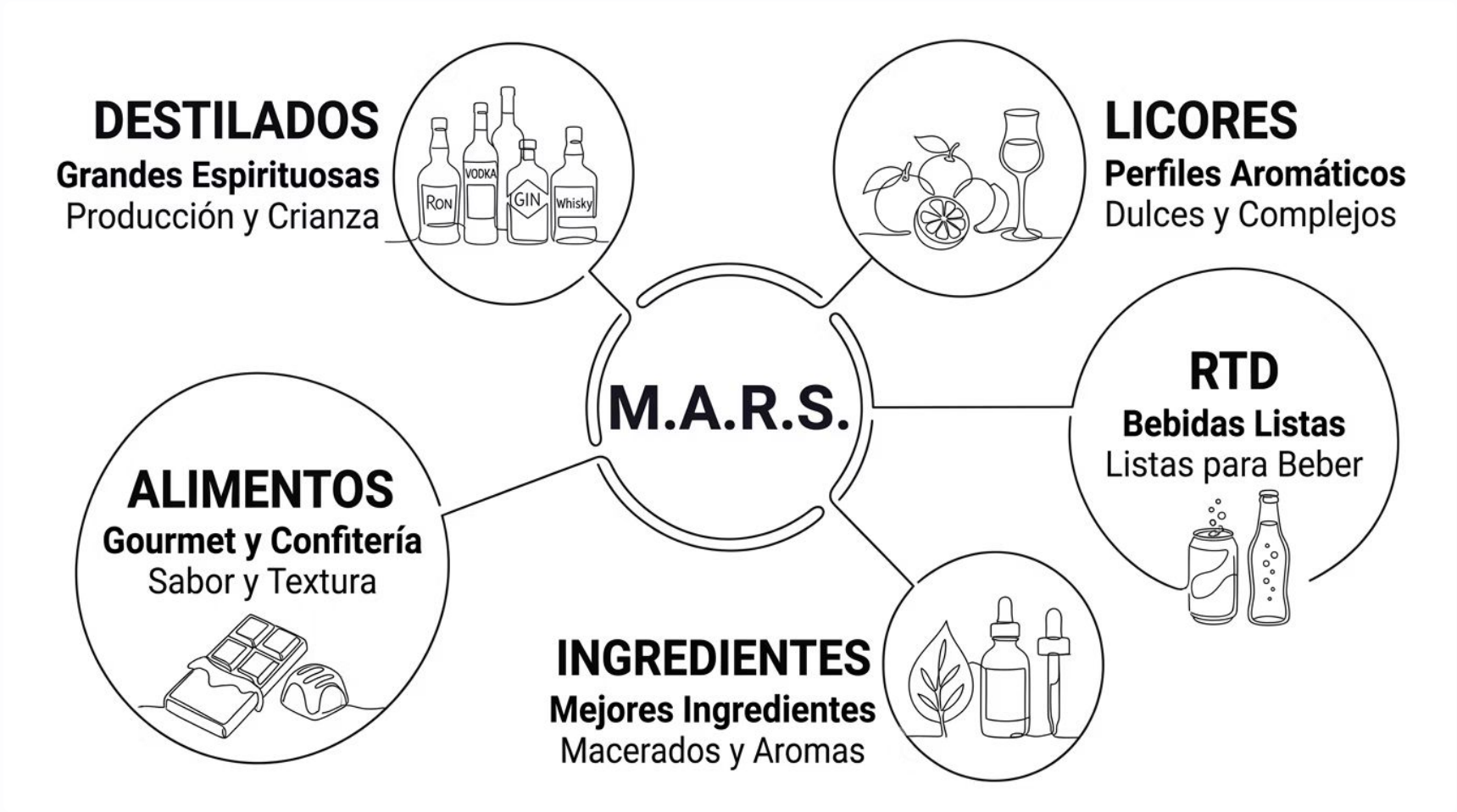
The consumer does not buy merely alcohol

> They buy an experience.

The premiumisation of spirits has raised expectations to an unprecedented level. The modern consumer evaluates every aspect of the experience: from the first contact on the nose to the final finish. M.A.R.S.™ offers developers an additional platform from which to explore that differentiation.

Perceived smoothness	Aromatic complexity	Balance	Persistence
Differentiation			

One Technology. Multiple Markets.



Regulatory by design

Regulation is part of the development process

The use of any technology in alcoholic beverages must be analysed according to multiple regulatory variables. For this reason, INTABIOTECH does not use generic statements such as "authorised in any beverage" or "does not need to appear on labelling".

Composition

Analysis of the composition of M.A.R.S.™ and its declared technological function

Legal category

Precise identification of the legal category of the beverage and production process

Final presence

Evaluation of the possible presence or function of the technology in the finished product

Target market

Determination of the country of commercialisation and applicable regulations

The regulatory classification must be determined specifically for each project. There is no single generic answer that is universally valid.

The M.A.R.S.™ Package

An industrial project may incorporate, depending on its phase, the following elements of documentation and technical support. We do not offer merely a product: we offer **technology + knowledge + validation + development support**.

Technical Documentation

- Technical Data Sheet
- Safety Documentation
- Product Specification
- Certificate of Analysis
- Food Suitability Documentation
- Traceability Information
- Quality Documentation

Development Support

- Application Protocol
- Laboratory Trial
- Sensory Evaluation
- Stability Study
- Technical Report
- Regulatory Assessment
- Industrial Scale-Up Support

How to Start a Project with Us and M.A.R.S.

We First Need to Understand the Product

Before any technical proposal, a good M.A.R.S.™ project begins with five fundamental questions that define the scope, method, and criteria for success.

What do you manufacture?

Rum, vodka, gin, whisky, aguardiente, liqueur, RTD, extract, cocktail, or another alcoholic matrix.

What do you want to improve?

Alcoholic profile, integration, balance, stability, consistency, or the development of a new product.

How do you manufacture it?

The current process, formulation, and treatments that define the technological starting point.

Where do you sell it?

The target market determines part of the project's regulatory strategy.

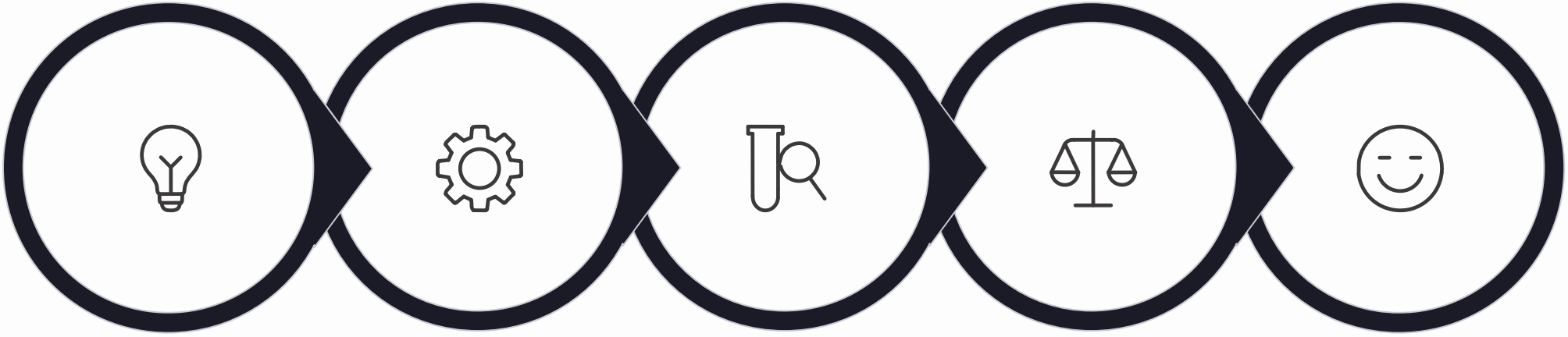
How will we measure success?

Before we begin, we define what outcome would justify adopting the technology on an industrial scale.

From lab to market

A complete development process

M.A.R.S.™ accompanies the manufacturer at every stage of the process, from the initial idea through to the commercialisation of the improved product. Each phase generates data and evidence that informs the next.



Idea

Technical Evaluation

Laboratory Trial

Control Comparison

Sensory Evaluation

Why M.A.R.S.™?

Because the next generation of alcoholic beverages will not be developed solely by changing aromas or packaging. It will also be developed by better understanding **the structure and behaviour of the matrix itself**.

M.A.R.S.™ introduces a new tool for exploring that territory. A technology aimed at manufacturers who want to go beyond conventional solutions.

Investigate	Differentiate	Measure
Validate	Create better products	

M.A.R.S.™

MICRO ALCOHOL REACTION SYSTEM

> Rethinking Alcoholic Matrix Technology.

Advanced Technology for Spirits, Liqueurs, RTD & Alcohol-Based Formulations

Developed for professional industrial evaluation.

ND Pharma & Biotech Co. | INTABIOTECH

INGREDIENTS | TECHNOLOGY | INNOVATION

Innovation starts with a sample

Every beverage presents a different challenge. Every formulation has its own chemistry. Every market has its own rules.

> What can we improve in your product?

Development begins with that question. **M.A.R.S.™** — *From matrix understanding to industrial innovation.*

- Technical development
- Application support
- Regulatory assessment
- Industrial scale-up

ND Pharma & Biotech Co. | INTABIOTECH

Let's Talk About Your Project

Our commercial team is ready to assist you



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