

# OIS&Associates

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## The technology of the Infusion Spiral® (TIS®) Present:

## GUIDE FOR SPIRITS TREATMENT WITH TIS®



### WHAT IS TIS®?

TIS® is known as "The intelligent tool to age and ferment alcoholic beverages."

### WHY THE INTELLIGENT TOOL?

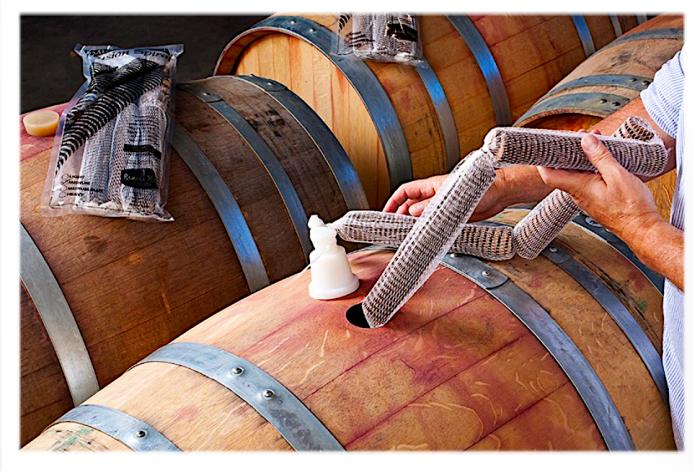
It's unique and patented design allows an accelerated process without losing essential quality. In fact TIS® has proven, among numerous trials and clients, to give the same quality or even greater than traditionally used, new wood barrels.

*"Spirits maturation in wooden barrels has been surrounded by romanticism and even some mysticism for a long time. What happens in a barrel is actually a set of chemical and physical phenomena between the multitude of congeners in the distillate and the wood compounds of the toasted staves of the barrel. TIS® is a tool available to distillers that allows incredible flexibility to replicate those same reactions in a controlled and more predictable way, offering the distiller the possibility of a more standardized, reliable and reproducible process. All of these benefits result in significant savings in money and time."*

### WHAT TYPES OF TIS® CAN BE FOUND ON THE MARKET?

TIS® is available in two different sizes:

- 9 x 1.5 inch Barrel Pack System: one (1) set brings six (6) individual inserts united by a food grade nylon netting. One (1) case brings fifteen (15) sets

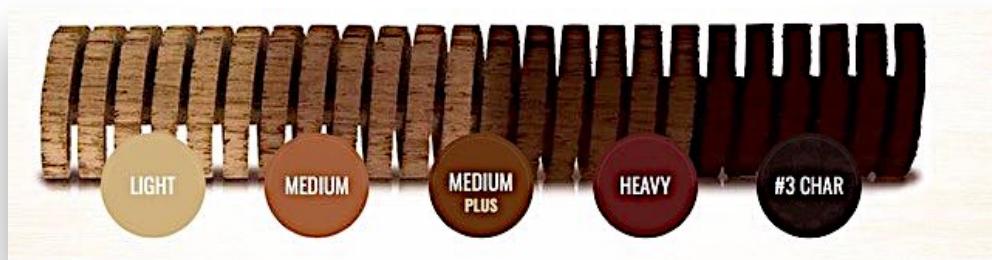


- 48 x 1.5 inch Tank Pack System: one (1) set brings five (5) individual inserts united by a food grade nylon netting. One (1) case brings ten (10) sets.



**TIS®** is available in several wood species:

- American Oak
- French Oak
- Eastern European Oak
- Sugar Maple
- Amburana
- Spanish Cedar
- Cypress
- Cherry
- Assorted Blended Toast Packs



**TIS®** is available in different toasts: Light, Medium, Medium Plus, Heavy and Char #3.

***"TIS® is a custom made product, we can adapt our production to our clients requirements by creating a toast level that better suits their desired profiles."***

#### **BENEFITS FROM USING TIS® RATHER THAN OTHER WOOD ALTERNATIVES**

- THE BARREL EITHER BECOMES A REACTOR OR CAN BE SUBSTITUTED ALTOGETHER.
- REDUCED COSTS PER VOLUME TREATED WHEN COMPARED TO NEW BARRELS AND STAVES.
- STORAGE AND LOGISTICS COSTS, BOTH EXTERNAL AND INTERNAL, ARE SIGNIFICANTLY LESS WHEN COMPARED TO THAT OF BARRELS MANAGEMENT.
- EASINESS OF MANIPULATION WHEN COMPARED TO BARRELS OR OTHER ALTERNATIVES.
- POSSIBILITY OF SIGNIFICANT MATURATION TIME REDUCTION.
- HIGH FLEXIBILITY OF DESIGN OF NEW PRODUCTS AND PROFILES, AND BLEND-ABILITY OF DIFFERENT SPECIES OF WOODS TO CREATE UNIQUE PROFILE.
- GREATER ECOLOGICAL SUSTAINABILITY.

## ADVANTAGES AND THE SCIENCE BEHIND THE USE OF TIS®

**TIS®** as previously mentioned, is a very flexible tool and can be easily adapted to achieve many different goals. It can be used to:

- Replicate an existing aged product
- Develop a new aged product
- Correct wood deficiency in an existing product

**TIS®** can be used either by directly inserting the spirals in the barrels, by infusing big volumes of spirits in stainless steel tanks, or even by preparing a base macerate than then can be blended with a bigger volume of spirits or transferred to exhausted wooden barrels for further aging.

All wood species offered by **TIS®** can be used in every mentioned way, after easy-to-perform lab trials to determine the desired outcome and establish the specific dosage required. Each species has different rates of transfer of wood compounds to the distillate, so it's recommended to perform trials at lab scale to explore the alternatives.

Here it's important to note that the strength of the distillate being treated also plays a key role in the specific compounds that are leached from the wood. Higher strength, let's say 70% abv will extract a very different matrix of wood compounds and lignin derivatives than a distillate at 55% abv.

The aging process is very complex and as any chemical reaction requires:

- The presence of the reactants in the right amounts.
- An appropriate reaction vessel.
- A specific period of time to allow the reactions to occur.

So, the use of **TIS®** provides a way to introduce in a controlled and predictable way, the right amount of wood compounds that will participate in the complex reactions of spirits maturation, ensuring high predictability of the final product.

This is something very difficult to achieve with barrels alone because the characteristics and conditions of the barrels usually sourced by distillers, are not consistent enough to guarantee the wood compounds contribution necessary for a consistent profile of the aged spirit. Thus, the necessity of complex and expensive blending operations (that often require high volumes of aged spirit) to be able to iron out the differences in profiles coming from the variety of barrels distillers need to manage in a traditional aging process.

The traditional aging process takes significant time for two main reasons: one is the rate of transfer of the wood compounds from the staves of the barrel to the liquid. And the older the barrel the longer the time it takes the compounds in the wood to move through the solid matrix of the staves and leach to the distillate.

The second reason it takes time to age a spirits is because the reactions between the wood compounds that have been extracted, and the distillate congeners, occur very slowly at normal pressure, temperature and humidity conditions. By introducing all the reactants at the beginning of the process, when **TIS®** is used, the only time required to achieve maturity is the time needed for the reactions to occur. This is why the use of **TIS®** can result in a shorter aging time, but care must be taken to allow for enough time for the reactions to occur and avoid the perception of immaturity in the spirit.

#### HOW TO USE TIS®:

Depending if you are working with smaller recipients or big tanks, you will use either the 9" Barrel System or the 48" Tank System. It is important to note that in the stainless steel tanks we suggest using the 48" spirals since it is convenient to use these over the 9" ones (for quantity reasons simply, since what a spiral of 48" provides is equivalent to 5.3 spirals of 9"). The process of inserting and removing the spirals is more efficient using the largest commercial measure.

If working with small containers, then the 9" System is ideal. The handling and even the cutting, if necessary, of the spirals would be easier.

**TIS®** has been designed with the clear purpose of maximizing the contact surface. No less important, is the spiraled -scientific helical shape of **TIS®**, which is meant to support the natural molecular movement inside any type of recipient. Creating a truly homogeneous liquid.

**"TIS® has a competitive reuse potential depending on how it is used previously. Lesser contact times or when used for maturation/aging will allow for additional implementation of spirals. For reuse, just retrieve it from the recipient by pulling from the string and secure and submerge it again into another Barrel or Tank of spirit."**

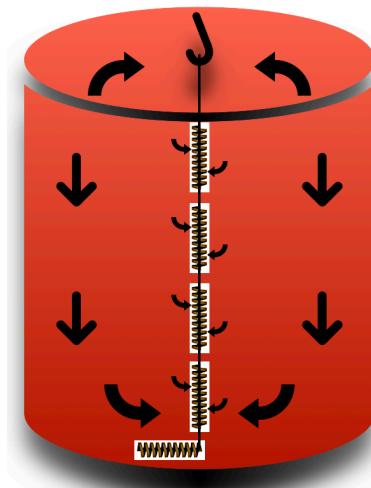


FIG.1 TIS® SUBMERSION RECOMMENDATION

(\*) Note flow of liquid in container in relation to TIS® incorporation

**(\* FIG.1:**

- It is recommended to secure them with a string (**TIS®** will not float and it will sink to the bottom shortly) somewhere at the top of the tank or the barrel.
- To retrieve the **TIS®** from the recipient, just pull the string used to secure them in the beginning stage.

***"When working in containers smaller than 50 liters, it is not necessary to tie the spiral. Due to the small size of the container and the less liquid inside, the spiral will still achieve the expected results".***

**DOSING**

As mentioned previously, **TIS®** is a very flexible tool that can be used for different objectives, and as such, no one fit all dosing recommendation can be recommended. Some general guidelines are presented here but the best course of action is to clearly define the purpose. For a full replacement of the impact of a 225 liter new barrel, the following can be used:

<b>TIS® SYSTEM</b>	<b>LITERS TO TREAT</b>	<b>TIS® SYSTEM</b>	<b>LITERS TO TREAT</b>
One 9" Barrel System Insert	200 up to approx. 400	One 48" Tank System Insert	500 up to approx. 1000

The Barrel System set brings 6 inserts and Tank System set brings 5 inserts

Experiences with spirits producers confirm that contact ratios are very different between each customer.

***It is recommend to run several trials using different contact ratios. After several tastings, you will be able to notice the TIS® profiles and in position to improve the process considering the expectations about the final product desired. As any decision, the more information you have, the better result, that is why several trials are always recommended.***

***A good starting approach is to prepare a macerate at lab scales and then blend with fresh distillate to reach the color you want in your product, and then do the math to translate into plant scale numbers. But always bear in mind that color is only one aspect, you need to allow time for the wood compounds to react with the distillate compounds until the***

***rough edges of young wood and congeners are polished by the chemical reactions that result in a smooth, balanced and complex aged product.***

### **HOW SOON CAN I SEE RESULTS FROM THE TIS®?**

The end time of this process, depends only upon the distiller taste and the profile goals set to achieve. This will heavily depend on the type of project. In the case of replicating a 4 year old rum, for example, you might discover that once the dosage to reach the target color has been defined, you could achieve the integration of the wood and the spirits in 2.5 to 3 years. On the other hand, if you use **TIS®** only to adjust the wood expression of a product that is deficient in wood because of old and exhausted barrels, six months wood be enough. The key will be a regular and timely tasting of the spirit at least once a month until satisfied.

### **TIPS TO ENSURE FRESHNESS OF TIS®:**

TIS® is a custom made product design as mentioned previously. Spirals are kept in bags that are sealed considering some humidity degree. By keeping the bag closed, TIS® can be used for up to two years safely.

***"If the bag has been opened for use and some spirals are still remaining, please seal the bag in the best possible way to keep the humidity controlled. Humidity plays a key role in the quality because it ensures that clients will not find 'overly woody' attributes in their beers. It also allows the spiral to submerge into the recipient faster."***

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TIS® Made In USA

US Patent 7357069

Infusion Spiral is a registered trademark of The Barrel Mill

