freshtime
Infratab

How Can Freshtime™ Benefit Me?

The answer is higher revenues, reduced waste, consumer perceptions about your brand, and consumer willingness to buy your products. Add to this: your ability to pay by outcome, scorecard suppliers, compare packaging designs, compare additives, answer "I wonder?", and produce compliance reports.

Higher revenues result from higher prices for freshness or from repeat purchases when buyers trust that products are consistently fresh.

Reduced waste results from a lower toss rate due to selling low quality product at its freshest. Returns and rejects at buyers' are reduced when you set performance standards based upon shelf life for you transporters.

Because Freshtime tags can track budget and actuals by business step—you can pay by outcome. Use Freshtime to compare organic versus non-organic, compare different additives or compare different packaging designs. Not to be ignored, Freshtime can produce compliance reports, automatically.

How Can I Estimate What My Benefits Will Be?

To document and place a value on the gold in in your perishable's cold chain, start by baselining those operations where your perishable loses most of its freshness. This baseline will be the basis for determining what dollar benefits accrue from Freshtime tagging.

If you are a product brand owner or manufacturer, do a baseline of several of your suppliers—your highest quality/best performer, your lowest quality/worst performer and your most typical supplier. If you are concerned about the transport of your perishable, baseline different carriers, different routes or different departure times.

How Do I Do a Baseline?

Simple. Take several Freshtime tags, attach them to products in boxes or shipping containers to monitor shelf life and product temperature. Start the tags. Take several more Freshtime tags and attach them to the outside of a container, on a pallet rack or on the wall to monitor the ambient temperature the product is experiencing. Start these tags. Retrieve the tags when your perishables reach their destination. Stop the tags at this time.

To get good data from a baseline, you must set up the tag with sufficient data so that when you look at a tag report, you know what was tagged, who handled it and where it went.

If you have Freshtime Go, you do this using its Profile dashboard. You use Profile to set up a sensing model, alerts and add business data pertinent to the "tag run". If you do not have Freshtime Go, Infratab can set up the tags for you.

You do not need Freshtime software no a reader to run the baseline. The baseline can be done using "buttonware"-i.e. pushing the tag's button. Buttonware baselining does require that you have someone push the tag's button:

- when the tag is placed on your perishable,
- when your perishable gets to a different business location or business step and
- when the tag is taken off your perishable.

If you have Freshtime Go and a reader at a business step, tag data will be uploaded to your Freshtime cloud database—so that you can see what is happening to the perishable in near real-time.

NOTE: At your last business step, get the tags returned to you so that you can read tag history using Freshtime Go and log the tag data to your Freshtime cloud. Alternatively, you can send the tag back to Infratab. Infratab will read the tag and log the tag's data to your Freshtime tag cloud database.

Before you begin, we suggest that you take time to note down what you expect the temperature and the time duration of each of the business steps your perishable will be experiencing—from its creation to its use by a consumer. You do this with Freshtime Planner™.

Freshtime Planner

Freshtime Planner is a web app (http://planner.infratab.com). Its purpose is to show you the benefits of incorporating shelf life into your planning, budgeting and quality assurance systems.
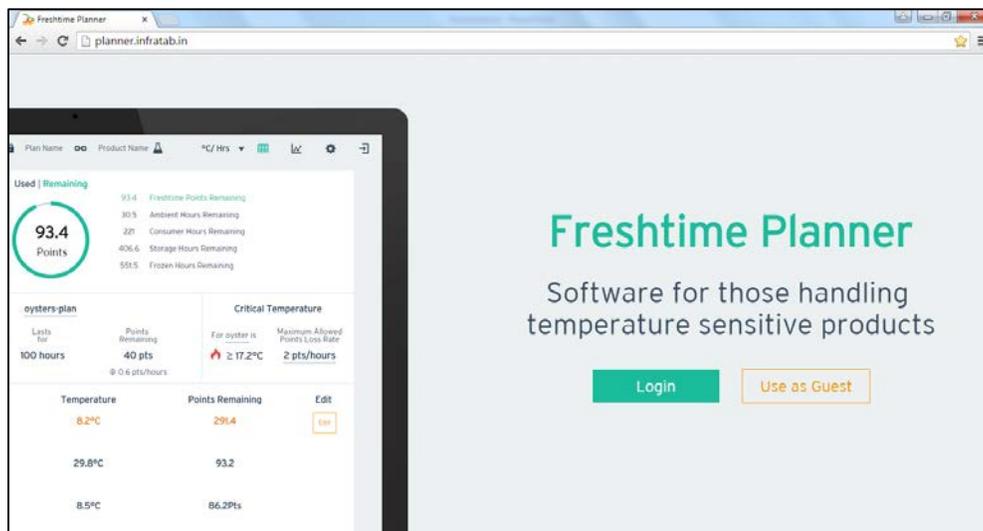
Shelf Life Model

If you are unfamiliar with shelf life modeling, please refer to our whitepaper, Freshtime Shelf Life Primer, (www.infratab.com/resources).

The shelf life of most products depends on the initial product characteristics, processing parameters, packaging characteristics and environmental conditions that a product is exposed to during production and through distribution to the final user.

For Freshtime the product's end of life is its quality end of life or Use-by date.   This quality date is set by the brand owner and represents the taste, feel, smell of the perishable after which the brand owner does not wish its customers to experience. This end of life is not the product's safety or expiration date. It is much earlier—and has the customer in mind.

Freshtime's sensor model is based upon expressing temperature dependence using the Q10 approach. Q10 is defined as the ratio of the reaction rate constants at temperatures differing by 10°C. Equivalently

Q10 has been defined as the change of shelf life Q_s, i.e. the time for the product to reach an unacceptable level when it is stored at a temperature higher by 10°C.

For those familiar with this Q10 approach, Planner's starting point is a sensor model for the perishable to be tagged consisting of:

- A reference temperature,
- The life of the perishable at that reference temperature (i.e. how long in hours or days does it last at this temperature),
- Q10.
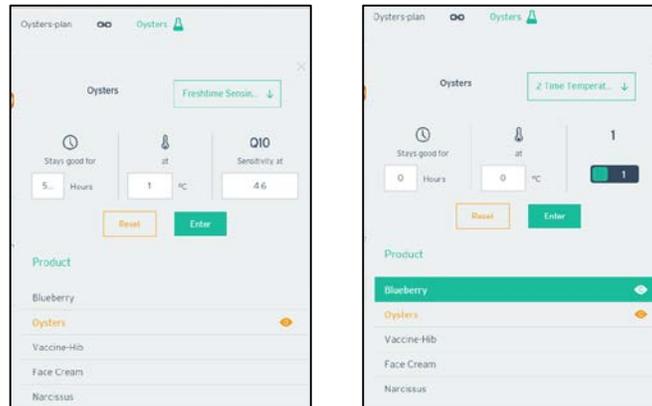
If you are just getting started in shelf life modeling, Planner asks you for:

- A reference temperature (for example, storage temperature, refrigerator temperature, room temperature).
- The life of the perishable at that reference temperature,
- A second reference temperature, at least 10°C degrees higher or lower than the first reference temperature,
- The life of the perishable at that reference temperature.

Planner will automatically calculate a Q10. This will be your starting sensor model. Over time you can refine it. You can set up test to get more accurate endpoints so that you can validate your model. For those just getting started with shelf life, the two temperature pairs, should give you sufficient insight into the power of shelf life metrics for you to want to know more.

Plan

After you have entered a sensing model, you then tell Planner the business steps and/or business locations that your product will experience. For each business step, enter:

- Expected temperature,
- Expected time duration at the business step.

For each business step, Planner calculates:

- Shelf life used,
- Shelf life left,

- Hours left at the business step temperature,
- Hours left at storage temperature,
- Hours left at consumer's temperature.
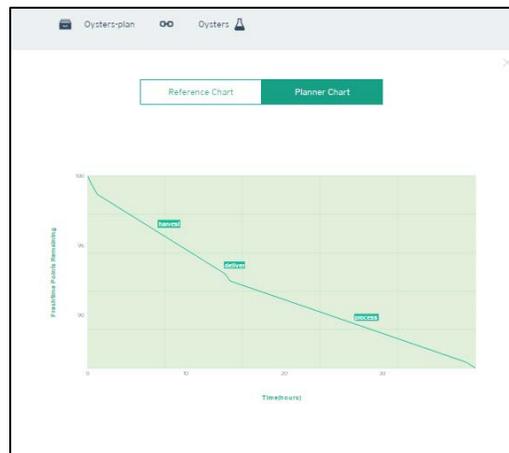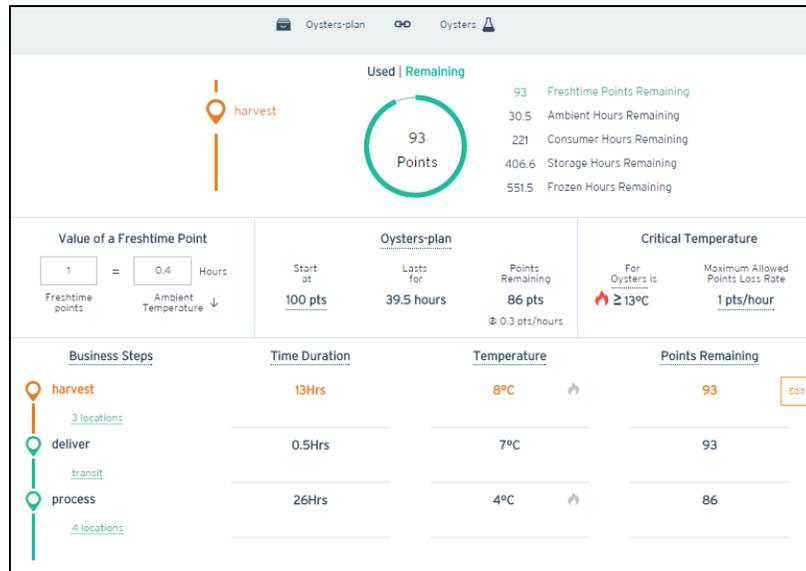
You use Planner's calculations for the shelf life-used by business step to set up alerts in Freshtime tags. Life alerts represent shelf life budgets for each business step. When the Freshtime tag's button is pressed at each new business step, the tag puts a marker into its in-tag history file. This marker saves the actual shelf life used since the last marker as well as the high and low temperatures experienced in that business step.

See Freshtime Planner Excel worksheet for suggested data you include in the setup of your Freshtime tags.

Baseline Results

To read tag history you will need Freshtime Go and an RFID reader. When Freshtime Go "gets" tag history, it logs this data in your Freshtime cloud. You can see this data using Freshtime Go's Show dashboard. Or you can get reports using the Report dashboard.