

Process Manufacturing vs. Discrete / Kitting Software Comparison of a Fragrance Manufacturing Company

It is not uncommon to see a discrete / kitting system sold into a process manufacturing environment. To illustrate the limitations of an assembly-type system in a process manufacturing plant, we will use a fragrance manufacturer as an example. Typically in a fragrance company, customers call with sample requests, a few sample formulas are developed, approved by a chemist, produced (in a pilot quantity) and the samples are sent to the customer. When the customer chooses to purchase a sample, the sample becomes a live production formula. These companies have to enter, maintain and analyze a tremendous number of sample formulas and link them with the customers, chemists, quality control and production; formula life-cycle tracking is a nice feature to have in this industry. Typically, you will see thousands of formulas and at least as many raw materials. The actual production process is relatively simple – ingredients are mixed together and packaged. Since most fragrance manufacturers are “make to order” and typically need to have the product out within a couple of days from the customers order, MRP and production planning are not so important. Once a product is produced some type of Quality Control will be required, typically an MSDS and Certificate of Analysis will need to be produced.

People who try to sell a Kit system in the fragrance industry will show how they can create a kit, use raw materials and create finished goods; and this demo’s well since they sell the concept of simplicity. They will miss the fact that the process requires a laboratory and QA personnel and various compliance reporting. By missing these functions, they have immediately required a company to have minimum of 3 separate inventory control systems. They will demonstrate a couple kits and show how they can be set up as a “gallon” or “liter”. What they won’t show is how to manage tens of thousands of formulas with respect to security, revision history, mass changes, querying and analysis.

When comparing a kitting system vs. a process manufacturing system, keep in mind the structural differences in the systems. A Kit is designed to assemble discrete parts to create a unit of 1 each. A Formula is designed to show relationships of ingredients which will be mixed together. The formula creates a mixture which can then be filled into multiple finished goods; this is known as a split bill of materials. The structure of a kit system will make the process so inflexible that a client will need to develop work-arounds and use Excel spreadsheets or external databases for their ERP to function like their operations.

The second key difference between the two is management of the formulas. A Kit system will mix together samples and production kits into one large, unmanageable, unsecured mess of a database. O2 Process was developed to easily manage and maintain large numbers of formulas securely.

Some specific issues that a company should consider are:

- **Units of Measure.** Units of measure are typically important to fragrance manufacturers because they may purchase materials in one unit (weight or volume), stock in a different unit, formulate in another and use in production in another. By using a kitting-type system, they will lose the flexibility to switch between weight and volume units of measure throughout their operations. O2 will scale the production unit of measure to the appropriate unit for the required quantity.
- **Formulas vs. Kit.** A kit is designed for a simple assembly of parts and is defined to produce a unit of 1 (typically when used in a process environment 1 unit is usually a gallon). For instance, a kit includes 10 units of A, 5 units of B and 30 units of C to make 1 gallon of finished good. This is ok until someone wants to order in kilos, pounds or a unit of measure other than gallons, or maybe they want 1.5 gallons. A formula assists in the *mixing of ingredients* by percent. A formula doesn’t limit a user to a unit of measure. When a formula is used in production, it can produce 10 kilos as easily as it produced 10 gallons, liters, bags, totes, or drums. The unit of measure used for the finished good is irrelevant to the formula. This is especially important when samples are made for a customer. Typically the samples are very small amounts.

Process Manufacturing vs. Discrete / Kitting Software – continued

- **Intermediate Cost Roll-up.** Many times, produced products are used as an ingredient in another formula. Sometime this goes many layers deep. To analyze the cost of the finished good, a system needs to be able to drill through the layers and calculate the costs.
- **Lot Properties.** As finished goods are produced, many fragrance companies need to track certain information about the lot, i.e. % alcohol, pH level, etc. which may be used for an MSDS or Certificate of Analysis. For raw materials, lot properties are important since many times ingredients are “organic” and have fluctuating properties. By having lot properties for raw materials, production engineers can determine a lot which will give appropriate results in production.
- **Lot Traceability.** Lot traceability is a requirement for fragrance companies since they may have to recall product. A recall must be able to search where a raw material lot was used in production and trace the finished goods to the customers who purchased them. If the ingredient was used in an intermediate product, the system must be able to track through intermediates to the ultimate finished good. Also, a system must be able to track from a finished good backward to lots of ingredients used in that finished good.
- **Formula Analysis.** Chemists typically perform calculations on formulas to verify that they have the proper chemical makeup. O2 Process can perform the calculations automatically and do “what-if” scenarios by changing ingredients, ingredient mix, or lots. A kit-type system cannot do this function.
- **Formula Search Capabilities.** Fragrance manufacturers typically have tens of thousands of formulas. When a new scent is requested from a customer, typically formulators search the existing database for similar formulas as a starting point. With O2 Process, the client can quickly search the database for formulas that have attributes similar to that of the requested formula. For instance, query formulas that are 20% or greater alcohol content, rose scent, used for candles. This is typically not possible in a kit-type system.
- **Changing ingredients.** With tens of thousands of formulas, what if you wanted to substitute Ingredient A with Ingredient B in all alcohol-based scents? With a kit-type program, you would do it one at a time. With O2 Process, you would use the “Material Substitution” function to query all your formulas within your request and make the change based on the ratio that you define. Say, replace A with B in a 1:.75 ratio. O2 Process can do this type of function, kit-type systems cannot.
- **Substitutions in a Batch.** When creating a production batch, it is common for companies to substitute ingredients and/or change the quantity of an ingredient. O2 Process will allow this type of substitution at the production batch level, kit-type systems typically do not.
- **Sample Database.** Typically a fragrance manufacturer has exponentially more sample formulas than actual production formulas. To keep the production database “clean”, a sample database is usually preferred. When a sample becomes a production formula, move the formula to the production database.
- **Formula Security.** Formulas are the “life-blood” of a fragrance manufacturer. Typically someone who has access to the kit function can see all kits. This provides poor security to such a vital piece of the organization. O2 formulas allow users to have access to formulas based on their user security rights. There may be a group of formulas that are for east coast sales which the west coast sales people shouldn’t see and vice versa. There could also be formulas that are extremely sensitive that only certain executives should see. With O2 Process, you can have access control over your formulations.
- **Multiple Finished Goods.** A fragrance manufacturer may need to package a finished good in various types of packaging and fill levels, i.e. a customer wants a 1 gallon pail, 2 pints and a quart of their specific fragrance. The kit scenario would require 3 “production runs.” With O2 Process, a formula can create multiple finished goods in a single batch. This will assist in production planning, material requirement planning and batch yield reporting.
- **Batch Yield.** To manage costs, plan inventory purchases and analyze production efficiency, fragrance manufacturers should analyze batch yield. Batch yield assumes that if you add ingredients into a mixer, you will not fill 100% of the inputs into finished goods. Since kits are an assembly of parts, they assume you will always have a 1 to 1 ratio of inputs to outputs (less scrap). O2 Process is more realistic in that



Process Manufacturing vs. Discrete / Kitting Software – continued

materials are applied, finished goods are produced (which have a fill volume or weight) and the ratio of finished goods filled / materials applied is calculated. This provides a “true” cost of the batch, relieves inventory correctly and produces the correct amount of finished goods to inventory.

- **Quality Control.** Typically some types of quality control testing are performed on raw materials and/or finished goods. A kit-type system typically doesn’t have such a function. O2 Process allows QC results to be added to lots and/or batches.
- **Substitutions and QC Adds.** Quality and consistency are very important to fragrance manufacturers. If a customer orders a scent multiple times and the scent is different each time, they will probably not be a customer for long. The quality assurance step above is vital to the process. Recording the results and tracking QA adds to the batch are equally as important. If a manager sees that a formula is consistently requiring QA adds to the batch, they may consider changing the formula.
- **Formula Revision Tracking.** When a formula changes, Best Manufacturing Processes require a company to keep track of the changes. Typically kit systems do not provide this type of history tracking; O2 Process does.