

A Guide to Fine Frozen Desserts

In this manual you will find general information for making high quality frozen desserts. The recipes are standard guidelines for making Hard Ice Cream, Frozen Custard, Gelato, Italian & Water Ices Sherbets and Sorbets.

GENERAL INFORMATION

The freezing of ice cream is accomplished in one of two freezers, a batch freezer, which makes a single batch of ice cream at a time, or a continuous freezer, which freezes continuously.

When using a continuous freezer, liquid flavors are added to the mix tank prior to freezing. Variegates, fruits and nuts are added after the freezing by a mechanical fruit feeder.

In the batch freezer the flavorings are added directly to the ice cream machine. Variegates, and some particulates are added by hand. The freezing process takes place as the blades in the freezer whip and aerate the product. For our purposes we will focus more specifically on the batch freezer operation.

The filling of bulk cans, quart and pint packages, sundae cups, and novelties are the next step of an ice cream operation. The ice cream is then placed in the Flash Freezer or Hardening Room where sub-zero temperatures complete the process by rapidly freezing the product. The ice cream is then tempered for dispensing.

SANITIZING AND STERILIZING BEFORE FREEZING

Shut the gate and pour three gallons of sterilizing solution into the cylinder. Turn on the machine for five (5) minutes. Agitate several times during that period then thoroughly drain. Do not rinse the machine with tap water after sterilization.

Ice cream cans should be rinsed with warm water and then scrubbed with a brush. Submerge them in water for five (5) minutes using the same kind of sterilizing solution that you use for the machine itself. Rinse and invert cans on a rack to drain and air-dry.

Not surprisingly many ice cream makers today use cardboard cartons.

FREEZING ICE CREAM - BATCH FREEZERS

Prepare the proper number of cans or cartons you intend to draw. The table below indicates the number of cartons you will need per batch (based on 20 quarts) for the various weights of finished ice cream.

<u>OVERRUN</u>	<u>PINTS</u>	<u>QUARTS</u>
80%	36	18
85%	37	18 ½
90%	38	19
95%	39	19 ½
100%	40	20

Note: Containers should be cold. Warm containers may result in icy finished product.

FREEZING ICE CREAM - BATCH FREEZERS

- 1.) Use all sanitary measures around the ice cream freezer.
- 2.) Make sure that the drive assembly is assembled correctly and the seals are in place. Close the door and the gate. Sanitize as instructed.
- 3.) Be sure the Flash Freezer or Hardening Cabinet is minus 15 degrees F or lower before you start to freeze ice cream.
- 4.) The walk-in cooler should be 30-35 degrees Fahrenheit. Ice cream mix should be used at 35-40 degrees Fahrenheit. If the mix is warmer than 40 degrees F but less than 45 degrees F it should be used immediately. Sample the mix first if it reaches this temperature, if the flavor is uncharacteristic or the color appears off throw the mix away.
 - A) Standard ice cream mix will last approximately 10-12 days properly refrigerated.
 - B) UHT mix will last up to 45 days under the same conditions.
- 5.) Turn the machine on. Pour in 2.5 gallons of ice cream mix. Next turn on the refrigeration unit (some machines may have only one switch).
- 6.) Add the required amount of flavoring ingredients a few minutes after the ice cream begins to freeze. The total volume of mix, flavor and color should be about half the total capacity of the freezing cylinder.
 - A) Acid fruits will coagulate the milk in the mix if they are added before the ice crystals start to form.
 - B) Nuts, candy and cookies will be less likely to dissolve if added late and fruits will remain in larger pieces. Therefore, such materials should be added as late as possible and still give time enough to have them uniformly distribute.
 - C) To avoid soggy particulates in the finished ice cream use frozen nuts, candies and cookie.
 - D) When adding these ingredients shut the machine off temporarily to incorporate them.

- 7.) Freeze the mix to a temperature of approximately 23 degrees F for Vanilla, a little colder for Chocolate and other flavors. At this temperature the ice cream will have the consistency of thick gravy and will stand up in a cup. When returned to the freezer it will not pour but will fall out. The temperature at which the refrigeration is turned off is very important. Under freezing will result in coarse, syrupy ice cream and over freezing will limit the amount of overrun and cause separation of the fat from the mix.
- 8.) Turn the refrigeration off but allow the blades to continue to operate while pulling the finished product. This continual whipping will increase the overrun. (Overrun is the percentage of air incorporated into the ice cream via agitation of the blades. It is equal to the weight of mix minus the weight of ice cream divided by the weight of the ice cream).
- 9.) When the desired overrun is obtained and the ice cream is stiff enough to hold its shape, draw off the ice cream as quickly as possible and cover with parchment paper. Place the ice cream in the flash freezer immediately with enough room between the cans to allow plenty of airflow. (The flash freezer drops the temperature rapidly to minus 15-20 degrees F. This process helps to eliminate ice crystals). Partially filled cans should also be placed in the flash freezer and not left waiting for the next batch.

The following scale can be used to determine the weight of a pint of ice cream based on the weight of standard ice cream mix being 18 ounces to the pint.

NET WEIGHT OVERRUN	DIVISION 1 PINT	MIX FACTOR	FINISHED WEIGHT
100%	18	2.0	9.00 oz.
90%	18	1.9	9.47 oz.
80%	18	1.8	10.00 oz.
70%	18	1.7	10.59 oz.
60%	18	1.6	11.25 oz.
50%	18	1.5	12.00 oz.

A batch freezer operator can use an overrun scale to estimate the amount of air being incorporated into the ice cream mix.

Fill the container with finished ice cream then read the % overrun directly from the scale.

CLEANING AND STERILIZING AFTER FREEZING

CLEANING

Allow the freezer cylinder to warm up. Pour in three gallons of warm water. Turn on the agitator twice at 30-second intervals and draw off the remaining mix. Next, pour in three gallons of pre-mixed cleaning solution; turn on the agitator twice at 30-second intervals and drain.

All removable parts must be scrubbed with hot cleaning solution. This includes the following parts: blades, freezer door, seal and drive assembly. (The seal and drive assembly consists of three parts; drive shaft, rubber seal and retainer). Most of the parts are made of a soft dairy metal and extreme care should be exercised to avoid damage.

Cleaning solutions are available from most food and paper distributors or equipment suppliers. Dissolve the specified amount of powder in hot water (about 150 degrees F).

STERILIZING

After all the parts have been cleaned, submerge them in a sterilizing solution for five minutes, drain and lay out to air dry. (Handle parts only when necessary after cleaning or to reassemble).

Sterilizing Solutions should be available from the same sources as cleaning solutions. Make the solution with lukewarm water. Extremely hot water will cause the chlorine in the solution to evaporate.

TIME REQUIRED FOR HARDENING: at -20 degrees F

- 1.) Ice cream drawn from the freezer at one degree higher than 23 degrees F will increase the hardening time by about 10-15 percent.
- 2.) Doubling the size of the package increases the hardening time by 50 percent. If a 2.5-gallon package requires 2 hours to freeze then 5-gallon packages would require about 18 hours to freeze.
- 3.) Ice cream without added sugar, fruits, etc. will harden in 8 to 10 hours. Twelve hours freeze time however would be more efficient. Before removing ice cream or sherbets from the flash freezer test hardness by pressing down on top of the paper with your thumb. If the ice cream is hard enough it will feel solid.
- 4.) When the percentage of overrun decreases the hardening time will increase.

TEMPERING ICE CREAM: at 4-8 degrees F

After your ice cream has been hardened, place it in a Tempering Freezer at least 12 hours before you intend to use it. Ice cream keeps well under proper conditions and by rotating your stock a constantly fresh inventory can be insured.

TEMPERATURE

Maintaining ice cream at the proper temperature is probably the single most important point to remember. The perfect dipping temperature is 6-8 degrees Fahrenheit. At lower temperatures the ice cream will be hard and difficult to work with. Warmer ice cream will be coarse and become syrupy. The warmer ice cream is also likely to reduce the yield per container.

Reading the operating instructions that come with the dipping cabinets can save you time and money. When you change the control settings on the cabinets it will take approximately 24 hours before the temperature of your product changes.

PROPER REFRIGERATION

Storing mix under proper refrigeration is extremely important in maintaining its quality. Problems with high bacteria counts and flavor defects can be avoided if the mix is handled properly.

Ice cream mix is not sterile. Although the mix will have normally low bacteria count when it is delivered (the standard plate count should be less than 3,000 per gram of mix with a zero coliform count) not all bacteria are destroyed by pasteurization. The surviving bacteria can grow in cold mix but grow much slower than at optimum growth temperature of 70-80 degrees Fahrenheit.

Storage of ice cream mix at low temperatures (40 degrees F or below) is the only practical way of controlling the multiplication of bacteria. Therefore the prompt refrigeration of ice cream mix is essential in reducing spoilage. Other types of bacteria may be present if the mix cans are not cleaned or sanitized properly.

STABILIZED FRUIT

The use of fresh or frozen fruit in ice cream is certainly cost efficient, however, it will not necessarily make the best ice cream. Fresh or frozen fruit will be extremely hard in the finished ice cream and will leave considerable crystallization surrounding the fruit.

Processed, stabilized fruit on the other hand will make an excellent finished product almost every time. Processed, stabilized fruit is cooked with sugar and stabilizer. When the product is cooked excess water is driven off. The resulting product will be softer in the frozen ice cream and will leave very little crystallization.

If you still desire to use fresh or frozen fruit, use it at a 50% ratio with processed, stabilized fruit. Prepare this a minimum of 12 hours in advance to allow the sugar and stabilizers to combine with the fresh or frozen fruit. If you must use fresh or frozen fruit by itself, prepare it with simple syrup, enough to cover the fruit.

VARIEGATING

Draw off 1/3 of a can of ice cream. Pour or spoon the variegates (fruits, nuts, candy, etc.) over each section being liberal enough to achieve adequate distribution. Using a spatula, blend the variegate with 8-10 downward sweeping movements. Follow this routine two more times. The top should then be covered lightly with variegate.

THE BASICS

All the following recipes are based on 2.5 gallons (10 quarts) of 12%-14% mix.

VANILLA

4 - 6 oz. Rice BFVANR Pure Vanilla Extract

CHOCOLATE

1.5 quarts [ZRC206 Ice Cream Chocolate Base](#)

STRAWBERRY

1.5 quarts Rice ICSP Strawberry Puree

1.5 fl. oz. [ZRC495 Citric Acid Solution](#)

1.5 quarts [ZRC218 Strawberry Solid Pack](#)

COFFEE

4 - 5 oz. Rice BFEC Espresso Coffee Fl.

Add all of the above to the machine at the beginning of the run except the ICSSP Strawberries. The important step here is to add the ICSSP Strawberries in variegate fashion when drawing off the finished ice cream.

EDITOR'S INSIDE INFORMATION

A half-ounce of citric acid solution to all your fruit products will draw out the natural fruit flavor and increase the quality of your finished product.

Recipes for Ice Cream and Frozen Desserts

APPLE PIE

1 - 1.5 quarts Rice ICAPP Apples for Ice Cream
16 oz. crushed graham crackers

Add Graham Crackers on the draw into the finished product.

CARAMEL APPLE

1 - 1.5 quarts Rice ICAPP Apples for Ice Cream
1.5 quarts Rice ICCVAR Caramel Variegate

Variegate Caramel Variegate into the finished product as instructed.

BANANA CREAM PIE

1.5 quarts [ZRC002 Banana WIB](#)
1-quart I. Rice TMARIR Marshmallow Topping
1-quart crushed graham crackers

Add Banana WIB at the beginning of the run.
Variegate marshmallow and graham crackers into the finished product.

BLACK RASPBERRY

1 quart [ZRC202 Black Raspberry Puree](#)
1.5 fl. oz. [ZRC495 Citric Acid Solution](#)

BUBBLEGUM

1 - 2 oz. I. Rice WIBUB Bubblegum Flavor
1-quart Bubblegum Pieces

Add all ingredients at the beginning of the run or
Variegate the Bubblegum Pieces into the finished product.

BUTTER CRUNCH

16 - 20 oz. I. Rice ICBB Butterscotch/Butter Pecan Base
1-quart butter crunch candy

Add all ingredients at the beginning of the run.

BUTTER PECAN

32 fl. oz. [ZRC204 Butter Pecan Base](#)
1-quart frozen salted pecans

Add all ingredients at the beginning of the run.

SALTY CARAMEL

24 fl. oz. [ZRC221 Salty Caramel Variegate](#)
Add at the beginning of the run.

32 fl. oz. [ZRC221 Salty Caramel Variegate](#)
Variegate Salty Caramel Variegate into the finished product

CHOCOLATE CHIP

4 – 6 fl. oz. I. Rice BFVANR Pure Vanilla
1- quart Chocolate Chips

Add all ingredients at the beginning of the run.

CHOCOLATE FUDGE RIPPLE

4 – 6 fl. oz. I. Rice BFVANR Pure Vanilla
1.5 - quarts [ZRC222 Chocolate Variegate](#)

Variegate Chocolate Variegate into the finished product.

CHOCOLATE MOUSSE

1.5 - quarts [ZRC206 IC Chocolate Base](#)
1.25 - quarts [ZRC200 Bavarian Base](#)

Add all ingredients at the beginning of the run.

CHOCOLATE MINT

1.5 - quarts [ZRC206 IC Chocolate Base](#)
½ oz. I. Rice Alpha White Mint Emulsion
1- quart I. Rice TMARIR Marshmallow Topping

Add all ingredients at the beginning of the run except Marshmallow.
Variegate Marshmallow into the finished product.

CARAMEL MACHIATTA

3 - 4 oz. I. Rice BFEC Espresso Coffee Flavor
1 quart I. Rice TMARIR Marshmallow Topping
1 quart [ZRC220 Caramel Variegate](#)

Add Espresso Coffee Flavor and Marshmallow at the beginning of the run.
Variegate Caramel Variegate into the finished product.

COCONUT MACADAMIA

1.5 quarts [ZRC210 Coconut Base](#)
3 fl. oz. I. Rice BFVANR Pure Vanilla
1-quart frozen macadamia nuts

Add all ingredients at the beginning of the run.

COFFEE HEATH CRUNCH

3 - 4 oz. I. Rice BFEC Espresso Coffee Flavor
1-quart crushed Heath Bars

Add all ingredients at the beginning of the run.

COFFEE 'N' COOKIES

3 - 4 oz. I. Rice BFEC Espresso Coffee Flavor
2 quarts crushed oreo type cookies

Add all ingredients at the beginning of the run.

COOKIES 'N' CREME

4 – 6 fl. oz. I. Rice BFVANR Pure Vanilla
2 quarts oreo style cookies

Add all ingredients at the beginning of the run.

FRENCH VANILLA

4 – 6 fl. oz. I. Rice BFVANR Pure Vanilla
1.25 - quarts [ZRC200 Bavarian Base](#)

Add all ingredients at the beginning of the run.

KEY LIME PIE

4 – 6 fl. oz. I. Rice WIKL Key Lime Fl.
1 oz. I. Rice WIPINNC Pineapple Flavor
1.5 fl. oz. [ZRC495 Citric Acid Solution](#)
1-quart crushed graham crackers

Add all ingredients at the beginning of the run.
Variegate the graham crackers into the finished product.

LEMON CUSTARD

1 - 2 oz. [ZRC416 Lemon Emulsion](#)
1.25 - quarts [ZRC200 Bavarian Base](#)
1 - quart graham crackers

Add all ingredients at the beginning of the run.
Variegate the graham crackers into the finished product.

MAPLE WALNUT

1.5 quarts [ZRC615 Walnut Topping](#)
3 – 4 fl. oz. I. Rice BFMAP maple Fl.

Add all ingredients at the beginning of the run.

MINT CHIP

1 - 2 oz. I. Rice Alpha White Mint Emulsion
1-quart Chocolate Chips

Add all ingredients at the beginning of the run.

MOCHA

1 quart [ZRC206 IC Chocolate Base](#)
3 - 4 oz. I. Rice BFEC Espresso Coffee Flavor

Add all ingredients at the beginning of the run.

MUD PIE

3 - 4 oz. I. Rice BFEC Espresso Coffee Flavor
1.5 - quarts [ZRC222 Chocolate Variegate](#)
1-quart oreo style cookies
1-quart frozen salted peanuts

Add all ingredients at the beginning of the run except variegate. Variegate the Chocolate variegate into the finished product as instructed.

ORANGE PINEAPPLE

1 quart I. Rice ICOP Orange Pineapple Base
1.5 fl. oz. I. Rice Citric Acid Solution

Add all ingredients at the beginning of the run.

PEACH

1 quart [ZRC214 Peach Puree](#)
1 quart I. Rice FILPED 20 Peaches for Ice Cream
1 fl. oz. [ZRC495 Citric Acid Solution](#)

Add all ingredients at the beginning of the run except Peaches.
Variegate Peaches into the finished product

PEANUT BUTTER CUP

1 lb. I. Rice TLPB Peanut Butter
1 quart I. Rice ICCHOCC IC Chocolate Base
1-quart TLPB Peanut Butter as Variegate

Add Peanut Butter and Chocolate at the beginning of the run.
Variegate the additional Peanut Butter into finished product.

PEANUT BUTTER FUDGE

2 lbs. [ZRC604 Peanut Butter](#)
1.5 - quarts [ZRC222 Chocolate Variegate](#)

Variegate Chocolate into the finished product as instructed.

PEPPERMINT STICK

1 - 2 oz. I. Rice Alpha White Mint Emulsion
1-quart crushed Peppermint Candy

Add all ingredients at the beginning of the run.

PINA COLADA

1.5 quarts [ZRC210 Coconut Base](#)
1.5 quarts [ZRC618 Pineapple Topping](#)
2 – 4 fl. oz. I. Rice WIRUM Rum Flavor

Add all ingredients at the beginning of the run.

PISTACHIO

2 - 3 fl. oz. I. Rice Pistachio Flavor no color
1-quart salted frozen pistachios

Add all ingredients at the beginning of the run.

PUMPKIN PIE

1.5 quarts I. Rice Pumpkin Base
2 fl. oz. I. Rice BFVANR Pure Vanilla
1 quart crushed graham crackers

Add all ingredients at the beginning of the run.
Variegate the graham crackers into the finished product.

RASPBERRY CHIP

32 fl. Oz. [ZRC216 Red Raspberry Puree](#)
or 32 fl. oz. [ZRC202 Black Raspberry Puree](#)
1 quart Chocolate Chips

Add all ingredients at the beginning of the run.

RASPBERRY TRUFFLE

1.5 - quarts [ZRC206 IC Chocolate Base](#)
1-quart Chocolate Chips
1.5 quarts I. Rice Red Raspberry Variegate

Add the Chocolate and the Chocolate Chips at the beginning of the run.
Variegate the Raspberry into the finished product.

RUM RAISIN

1 - 1.5 quarts I. Rice Rum Raisin Base
3 - 4 oz. I. Rice WIRUM Rum Extract

Add all ingredients at the beginning of the run.

STRAWBERRY SHORTCAKE

1.5 quarts Rice ICSP Strawberry Puree
1.5 fl. oz. I. Rice Citric Acid Solution
1.5 quarts [ZRC218 Strawberry Solid Pack](#)
1-quart vanilla wafer cookies

Add all ingredients at the beginning of the run except Strawberries.
Variegate Strawberries into the finished product.

SHERBETS

A sherbet is a frozen dairy dessert. Sugar content is much higher than ice cream (up to 50 %) and it is at least twice as acidic. The product is therefore much sweeter and tarter than ice cream. Standards of identity include total milk solids of 5% and 2% maximum milk fat solids. Fruit juice will be 2% minimum as citrus, 6% minimum as berry and 10% minimum as other flavors. Overrun will be no more than 50%.

Neutral Sherbet

1 gallon I. Rice Neutral Sherbet/Sorbet Base
10 lbs. sugar
4.5 gallons warm water
1.5 gallons ice cream mix
6 fl. oz. Citric Acid Solution
(Marinate in cooler no less than 4 hours)

WATER ICES - ITALIAN ICE - SORBET

A sorbet is a non-dairy frozen dessert. Typically considered a high quality dessert treat a sorbet has no dairy product in it. I. Rice Sorbet Base is designed to create a soft, creamy finished product every time and can be dipped at the same temperature as ice cream.

Typically served in warmer temperatures this is a non-dairy frozen treat. Production time is approximately 18 - 20 minutes. Water Ices are not usually placed in a flash freezer prior to dipping but are placed directly in the dipping cabinet at a temperature of approximately 15 degrees Fahrenheit.

Mango Sorbet/ Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC018 Mango WIB](#)
2.5 gallons water
2-3 fl. oz. [ZRC495 Citric Acid Solution](#)

Lemon Sorbet/ Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC016 Lemon WIB](#)
2.5 gallons water
6 fl. oz. [ZRC495 Citric Acid Solution](#)
Zest of 3 lemons

Cherry Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC006 Cherry WIB](#)
2.5 gallons water
3-4 fl. oz. [ZRC495 Citric Acid Solution](#)

Orange Sorbet/ Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC028 Orange WIB](#)
2.5 gallons water
6 fl. oz. [ZRC495 Citric Acid Solution](#)

Raspberry Sorbet/ Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC042 Raspberry WIB](#)
2.5 gallons water
2-3 fl. oz. [ZRC495 Citric Acid Solution](#)

Blue Raspberry Ice

1 gallon [ZRC054 Sorbet Base](#)
1 gallon [ZRC038 Blue Rasp. WIB](#)
2.5 gallons water
2-3 fl. oz. [ZRC495 Citric Acid Solution](#)