

Hand Tempering Methods

Seed Tempering

This method of tempering chocolate uses the assistance of already well-tempered chocolate as “seed”. The well-tempered chocolate can take various forms: chunks/blocks, finely ground, or wafer. Little equipment is required — a microwave, a plastic bowl, a spatula, and a thermometer — but it can be difficult to control and if the seed chocolate is not well-tempered, the finished chocolate will not be either.

Using finely ground chocolate

1. Melt untempered chocolate to between 105 and 115° F.
2. Allow the chocolate to cool to a temperature of 92-93° F for dark chocolate and 91-92° F for milk and white chocolate. Always make sure the chocolate is stirred and uniform so temperature readings are accurate.
3. Add finely ground chocolate (4 oz. per 5 lbs. melted chocolate) and stir continuously.
4. As the finely ground chocolate melts, it cools the liquid chocolate and the temperature should drop to 88-90° F for dark chocolate and 86-88° F for milk and white chocolate.
5. Allow 10-15 minutes for the chocolate to stabilize, continuing to stir for the duration, and the chocolate will be in good temper.



Seed Tempering (continued)

Using chocolate chunks

1. Melt untempered chocolate to between 105 and 115° F.
2. Place 3 or 4 large chunks of tempered chocolate into the melted chocolate and stir constantly. The solid chunks will cool the chocolate and provide “seed” crystals as they melt.
3. Continue stirring until the temperature reaches 86-88° F for milk and white chocolate, or 88-90° F for dark chocolate.
4. Remove the remaining chunks; these can be cooled and reused. The chocolate in the bowl is now tempered. Keep tempered chocolate mixed by stirring.
5. As production continues, chocolate should be warmed to avoid overseeding, 88-90° F for milk and white chocolate and 89-91° F for dark chocolate. Chocolate should be mixed occasionally to maintain a consistent temperature.

This method of tempering chocolate mimics the actions of some batch tempering machines. Many tempering machines use a rotating bowl with a baffle across the middle. The baffle separates the chocolate chunks from the liquid chocolate and the rotation of the bowl provides the agitation. A cooling fan and heating element keep the chocolate at the correct temperature.

Mush Method



Tempered Chocolate

This method of precrystallizing chocolate does not require the assistance of well-tempered chocolate as “seed”. In warm, untempered chocolate between 110-115° F, all of the cocoa butter is completely melted and in the liquid phase. We cool chocolate while mixing/agitating until it turns to “mush,” thus the name. The change in color and significant thickening of this mush tells us that we have crystallized some of the cocoa butter in the chocolate from liquid to solid. The mush chocolate is approximately 76-80° F. The chocolate can be cooled by a number of methods, including moving it around on a cool marble slab or mixing in a pan over cold water.

At this point, the solid cocoa butter crystals in the mush are a blend of both stable and unstable crystals. If we stop here and allow the chocolate to solidify to completion, the end product will be streaky and bloomed because the cocoa butter crystals will not finish solidifying in an orderly and stable manner. This is because of the unstable cocoa butter crystals in the mush.



Untempered Chocolate

To correct this, the mush chocolate is warmed to 86-88° F for milk and white chocolate and 88-90° F for dark chocolate, by the addition of some warmer chocolate. This melts away the unstable crystals but leaves behind the desirable ones. Ending the process below this important temperature leaves too many unstable cocoa butter crystals; too warm a temperature melts away too many cocoa butter crystals.

Mush Method (continued)

Instructions:

1. Start with melted chocolate between 110-115° F (heat to 120° F if starting with bloomed chocolate). Pour approximately $\frac{3}{4}$ of the melted chocolate onto a marble slab or cooling table. Room temperature should be 62-68° F for the marble slab. Water running through the cooling table should be 55-65° F.
2. Cool the chocolate “mush” by moving the chocolate back and forth across the cool marble or table; a spatula works well for this. Continue with this until the chocolate is visually thickened and very viscous, but has not yet solidified. The temperature should be 76-80° F.
3. Move the “mush” back into the bowl with the remaining warm chocolate (temperature should be 90° F for milk and white chocolate and 92° F for dark) and mix until uniform. Measure the temperature, which should be 88-90° F for dark chocolate and 86-88° F for milk and white chocolate. If too warm, put some of the chocolate back onto the cooling table and repeat the process. If too cold, microwave for a few seconds to reach the desired temperature.
4. To test temper, dip a metal spatula or knife blade into the chocolate and leave a small film on the blade. If the chocolate is firm, glossy and not tacky to the touch in 5 minutes at normal room temperature (68° F), it is in good temper.
5. At this point, the chocolate is now precrystallized with the correct amount of good, stable cocoa butter crystals. Over time, these crystals will grow, so it is important to stir the chocolate occasionally to keep the crystals blended. The chocolate should be warmed slowly – a degree or two at a time – to a maximum of 90° F for dark chocolate and 88° F for milk and white chocolate. To replenish supply during usage, slowly incorporate 90° F milk or white chocolate or 92° F dark chocolate. This will keep the chocolate from getting too thick but still allow enough of the good, stable crystals to remain in the mix.

This method of tempering chocolate simulates how many automatic tempering machines work. In the machines, warm, untempered chocolate is pumped in and then through a heat exchanger with cooling zones; the ‘mush’ is created in one of these cooling zones. The ‘mush’ is then warmed up to the proper endpoint temperature in another warming zone. Tempered chocolate then exits the machine, ready for use.

Learn more at
www.cargill.com/cocoa-chocolate

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