



BLOMMER CHOCOLATE COMPANY

COOLING TUNNELS AND STORAGE TEMPERATURES

COOLING TUNNELS:

Once coatings are tempered and used in an application, the remaining heat left in the coating must be removed properly to ensure that the product maintains its temper and forms the correct crystal structure. The cooling tunnel and the temperatures used are critical in achieving an ideal appearance for the final product and are dependent on the type of coating and equipment used.

The crystallization behaviors of cocoa butter and vegetable oils are so different that chocolate and compound coatings require different temperatures for the cooling tunnel process. To promote the growth of stable crystals and prevent bloom, tempered chocolate requires gentle cooling conditions. Cooling the coating too fast could produce pores or hair cracks on the surface along with unstable crystals, while cooling too slowly can enhance bloom. Unlike chocolate products, compounds made with fractionated oils prefer a quick “cold shock” of cold temperatures when entering the cooling tunnel as they are more likely to crystallize in a stable form spontaneously. Compounds made with hydrogenated oils perform better when cooled at slightly higher temperatures than fractionated oils. Table 1 below shows ranges of typical suggested temperatures for the different cooling tunnel zones.

There are different types of cooling tunnels, but multi-zone type tunnels are the best for chocolate and compound coatings as they allow more controlled conditions for optimal cooling and crystal formation. When product enters the cooling tunnel, crystallization is still taking place. The first stage of the cooling tunnel allows the heat from the core to escape and typically requires mild air flow. The middle zone requires moderate air flow and further cools and completely solidifies the product. The third or last zone (depending on the cooling tunnel) still cools the product while also increasing the temperature above that of the dew point of the packaging room. If the exit temperature of the product is below the dew point of the room, the humidity from the environment could condense on the surface of the coating potentially resulting in drying marks or sugar bloom.

Table 1: Cooling Tunnel Parameters

	Zone 1	Zone 2	Zone 3
Chocolate	60-65°F	45-50°F	60-65°F
Compounds with Fractionated Oil	40-45°F	39-43°F	55-65°F
Compounds with Hydrogenated Oil	50-55°F	40-45°F	55-65°F

Data in this table will vary based on the coating and equipment used, length and air flow of the cooling tunnel.

STORAGE:

Ideal storage conditions for finished products are in dry odor free environments away from direct sources of light or sunlight and around 60-70°F with relative humidity around 60% or less. It is not recommended to store chocolate or compounds in the refrigerator or freezer as moisture will negatively affect the coatings, however you can as long as you follow correct thawing procedures. When freezing coatings the main concern is keeping moisture away, especially when they are removed from the freezer. To minimize the amount of condensation, it is best to bring the product to room temperature very slowly and allow space in between the cartons so air can circulate. Fans can also be used to assist in evaporating and carrying away the moisture.

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