

Macarons

As a Pastry Chef, I tend to look at ingredients (weight) in terms of percentages. As with baker's percentage, I use the flour (in this case almond flour) as my base 100%. The remaining weights of the ingredients are a percentage of the almond flour weight.

For my Macaron formulas, the percentages look like the following.

Almond Flour	100%
10X Powder Sugar	100%
Granulated Sugar	91%
Egg Whites	70%
Salt	Pinch
Coloring	As Needed

What does this mean to mathematically?

Let's use 150g for my weight of almond flour.

Almond Flour	150g
10X Powder Sugar	150g
Granulated Sugar	136g
Egg Whites	105g
Coloring	As Needed

For the math, we take the percentage associated with the ingredient and multiply it to the weight of the flour.

For Example: Egg White
 $150\text{g} \times 70\% = 105\text{g}$ (This is the weight you need to use)

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The following formulas will make 48 1” Sandwiched Macarons

French Meringue Method

Almond Flour	200g
10X Powder Sugar	200g
Granulated Sugar	182g
Egg Whites	140g
Coloring	As Needed

Swiss Meringue Method

Almond Flour	200g
10X Powder Sugar	200g
Granulated Sugar	182g
Egg Whites	140g
Coloring	As Needed

Italian Meringue Method

Almond Flour	200g
10X Powder Sugar	200g
Granulated Sugar	182g
Water	60g
Egg Whites	140g
Coloring	As Needed

Why would I use one method over the other?

As we heat the egg whites more, the protein structure in the meringue becomes stronger. The Italian Meringue will produce the strongest structure which will result in less spreading of batter and produce a higher shine. The Swiss Meringue is the second strongest. This batter may appear stiffer and require harder pressure when piping. The French Meringue is the easiest or should I say the quickest to make.

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Mixing Methods

French Meringue

- Place almond flour and powdered sugar in food processor and pulse for about 30 seconds
- Sift this mixture to eliminate any larger particles or impurities.
- Make a French or common meringue with granulated sugar and egg whites
- Whip until stiff peaks form (this should take less than 10 minutes)
- Fold flour mixture into meringue using a J shape motion. Try not to fold more than 10-12 times. When you are at about 85% - 90% folded in, add your color. Mixture should want to slowly fall back into itself.
- You are ready to pipe your macarons. Follow steps on page 4 for BAKING.

Swiss Meringue

- Place almond flour and powdered sugar in food processor and pulse for about 30 seconds
- Sift this mixture to eliminate any larger particles or impurities.
- Heat egg whites and granulated sugar over a double boiler until 120F.
- Whip mixture until stiff peaks form.
- Fold flour mixture into meringue using a J shape motion. Try not to fold more than 10-12 times. When you are at about 85% - 90% folded in, add your color. Mixture should want to slowly fall back into itself.
- You are ready to pipe your macarons. Follow steps on page 4 for BAKING

Italian Meringue

- Place almond flour and powdered sugar in food processor and pulse for about 30 seconds
- Sift this mixture to eliminate any larger particles or impurities.
- Place 2/3 of granulated sugar and water in a pot and begin cooking to 238F (soft ball stage). When mixture reaches 225F begin making common meringue with remaining 1/3 of sugar and egg whites. When sugar mixture reaches 238F, slowly stream into whipping whites.
- Whip until stiff peaks form
- Fold flour mixture into meringue using a J shape motion. Try not to fold more than 10-12 times. When you are at about 85% - 90% folded in, add your color. Mixture should want to slowly fall back into itself.
- You are ready to pipe your macarons. Follow steps on page 4 for BAKING.

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Baking the Macarons

When it comes to baking the macaron, I have seen many techniques and nuisances from different chefs. The one common component by most of them is that macarons need to dry out and form a skin after piping. They all say this will result in a proper shell and foot on the macaron.

A couple techniques I've used and continue to use are:

1 - Once the macarons are piped:

I let them sit for approximately 30 minutes at room temperature. I then bake them at 300F for 14 minutes. This method has seemed to work for me quite successfully.

2 - Once the macarons are piped:

I place the macarons in a 200F oven and let them slowly bake for those 14 minutes, then turn the oven up to 325F and bake for an additional 10 minutes.

I would use this baking technique if the kitchen has a high humidity that day. By placing in the 200F, it allows them to form the skin in a dry environment

Once the macarons have baked (both techniques), remove from the warm sheet pan and place on a table or another cool sheet pan to allow the macarons to cool. Cool completely before removing from parchment or silpat and filling.

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Troubleshooting Guide

Macarons have a reputation for being finicky. They work perfectly one day and fail the next. Here is a basic troubleshooting guide. I will say that these are from my experience and other factors may play a role in why a macaron does not turn out. Also note that there may be more than one item that causes the same result.

I have trained under different chefs as well as taking classes by many others. It seems that each one of those chefs tell me “they have the best macaron formula”. Even the most experienced chefs will admit that their macarons do not come out perfect every day.

I’ve listed some of the things I’ve experienced in the past. I would start with the ovens when first troubleshooting and then move on to mixing and scaling. I bake my macarons differently at my house as compared to my school.

The weather also plays an important role. I learned this when I moved from the south to the north. The humidity difference in the 2 climates affected how my macarons turned out.

IMPROPER SCALING

-TOO MUCH EGG WHITES

High dome results and cracking occurs
Air pocket forms under shell

-TOO MUCH ALMOND FLOUR

Batter will be stiff and tips appear on the top of macaron
Shell appears to slide off feet

-TOO MUCH POWDERED OR GRANULATED SUGAR

Macarons will appear darker as a result of caramelization
Macarons may be thin and run into different shapes

-TOO LITTLE GRANULATED SUGAR

No feet will form on macaron

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MIXING AND PIPING

-EXCESSIVE FOLDING

Macarons will crack

-DRY INGREDIENTS NOT FINE ENOUGH AFTER ROBOCOUP/SIFTING

Macarons will appear grainy

Macarons may be misshaped

-WHIPPING TIME FOR MERINGUE TOO LONG

Feet may appear to large

Macrons may crack

-BAKING SHEETS NOT SLAMMED AFTER PIPING

Macaron will form air pocket

-BATTER IS TOO THICK OR STIFF

-Macarons will have points on top

BAKING THE MACARON

-OVEN HEAT IS TOO LOW

Macarons may crack from batter being too wet too long

Macarons may appear chewy

Macarons may appear to slide off feet

-OVEN HEAT TOO HIGH

Air pocket may form under shell

Shell is not shiny or appears dull

Too much browning occurs and interior raw as result of removing from oven to soon

-OVEN HEAT NOT EVEN

Macarons may appear to slide off feet

Some Macarons crack and others don't