



# Artisan Bread Making

*with Peter Reinhart*

Tips &  
Techniques

## The 12 Stages of Bread

In its transformative journey from “wheat to eat,” bread passes through 12 distinct stages. It is not necessary to know these stages by heart, but I find that in understanding the general structure within which the process unfolds, knowing these stages offers a way to get your mind around it and to enjoy the journey even more.

.....

### **Stage 1: Mise en Place (gathering and measuring the ingredients).**

Of course, much of the gathering has been done for you by farmers and millers who grew the wheat, harvested it and ground it into flour. Your work begins by measuring all of the ingredients and getting organized. *Mise en place* is a French term that means “everything in its place.” In other words, it means, “Get organized.”

### **Stage 2: Mixing.**

Three objectives are met during the mixing stage: even distribution of the ingredients; activation of the yeast; and development of the gluten. We discuss all of these in more depth, including the stretch and fold technique, in the video.

### **Stage 3: Primary Fermentation.**

Much of the flavor development takes place during this stage, which can last anywhere from an hour to many hours and even overnight. The yeast and, to a lesser extent, bacteria digest the sugars found in the grain to create acidity, ethyl alcohol and carbon dioxide.

### **Stage 4: Dividing.**

The bulk dough is divided into smaller, individual units.

### **Stage 5: Pre-Shaping (aka Rounding).**

The dough pieces are formed into rounds or preliminary shapes prior to final shaping.

### **Stage 6: Resting.**

The gluten proteins become tight after they are handled, so this stage, which can last from a few seconds to 20 or more minutes, allows the gluten to relax prior to final shaping.

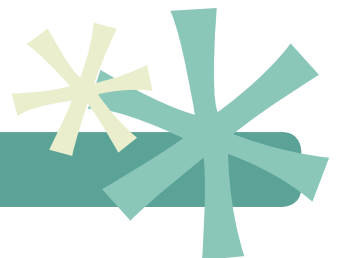
### **Stage 7: Final Shaping.**

The dough pieces are formed into their final shape, whether baguette, *bâtard*, *boule*, sandwich loaf or roll.

### **Stage 8: Panning.**

The shaped dough is placed into some type of pan or form. This might include sheet pans, loaf pans, proofing baskets (aka *bannetons*) or linen beds (aka *couches*).

*Next* →





# Artisan Bread Making

*with Peter Reinhart*

Tips &  
Techniques

## The 12 Stages of Bread

### Stage 9: Final Fermentation, or Proofing.

During this stage the dough rises to its proper size just prior to baking. Flavor development continues.

### Stage 10: Baking.

The dough goes into the oven, where three oven transformations occur: The proteins coagulate; the starches gelatinize; and the sugars on the surface caramelize. Here, the final, radical change occurs: Dough is transformed into bread as the yeast sacrifices its life in order to fulfill its mission (to raise the dough so it can become bread). In other words, it goes into the oven alive but comes out dead; it goes in as dough but comes out as bread.

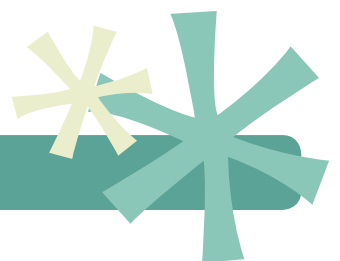
### Stage 11: Cooling.

The bread should cool an appropriate amount of time before it is cut or consumed, as it continues to evaporate moisture, and the protein firms up, creating the structure we call "the crumb."



### Stage 12: Packaging or Eating.

The textbooks refer to this stage as packaging because that's what happens in production baking. But for home bakers, Stage 12 is all about the eating. Enjoy!





# Artisan Bread Making

*with Peter Reinhart*

Tips &  
Techniques

## The 240 Factor

### What is the 240 Factor?

Home bakers often ask how to determine the proper water temperature when they make their bread doughs, especially if it is not specified in the instructions.

Professional bakers use a method known as the 240 Factor as one of the ways to figure this out. It is based on the premise that the ideal dough temperature, after the dough comes off the mixer, should be approximately 80 degrees Fahrenheit. The actual fermentation temperature may vary (for example, if a proof box is used) but most time estimates are based on the notion that the starting point of the dough is around 80 F.

The dough temperature as it comes off the mixer is determined by the accumulated temperatures of the room and the various ingredients, mainly the flour and the liquid, as well as the intensity of the mixer. Mixing dough, whether by hand or by machine, creates friction, which also increases temperature, so this aspect is called the "friction factor." All of these are factored into the equation. Since the room and flour temperature are somewhat out of our control, the one ingredient we can control is the liquid temperature, and this is where we can take some action.

### How Does the 240 Factor Work?

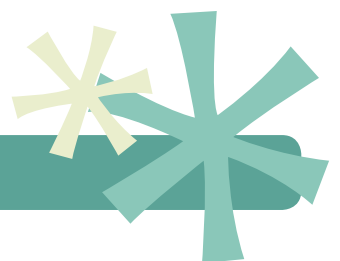
Add together the room temperature, the flour temperature and the friction factor. Subtract the total from 240 to determine the water or liquid temperature.

For example, suppose the room is 70 F. If the flour has been sitting at room temperature (as opposed to, say, in the refrigerator) it probably is the same. From trial and error, I have determined that the friction factor for us is 30 – that is, the friction will raise the dough temperature by this factor (not 30 degrees, just the factor 30).

**So:  $70 + 70 + 30 = 170$ . Subtract 170 from 240 and you get 70. Therefore, the water temperature should be 70 F.** You will note that in many of the recipes in this course, especially those that don't use refrigerated ingredients, the water temperature is listed as "room temperature," which is typically about 70 F. When refrigerated ingredients are used, such as a piece of cold pre-fermented dough, the water temperature is listed as lukewarm or warm.

You will not be required to use this method to determine your water temperature, since the instructions give you guidelines. However, this technique is very useful if

*Next* →





# Artisan Bread Making

*with Peter Reinhart*

Tips &  
Techniques

## The 240 Factor

you do a lot of baking and especially as you create recipes of your own. Most of the time, unless you are working with cold ingredients, the water temperature will be room temperature (around 70 degrees F) but, occasionally, lukewarm or warm liquid is called for. The main goal is to obtain a dough that is in the neighborhood of 80 degrees F (plus or minus a few degrees) so that the fermentation times are somewhat predictable. Knowing the 240 Factor method just gives you an added tool in your baking toolbox.

