ACCLIMATION/CONDITIONING

The process of aligning the wood flooring and the environment it is to be installed in is defined as acclimation, or more accurately, conditioning. This process involves understanding that the wood flooring and the facility are compatible. Unless otherwise directed by the flooring manufacturer, the following guidelines should be followed for acclimation/conditioning of each type of wood flooring.

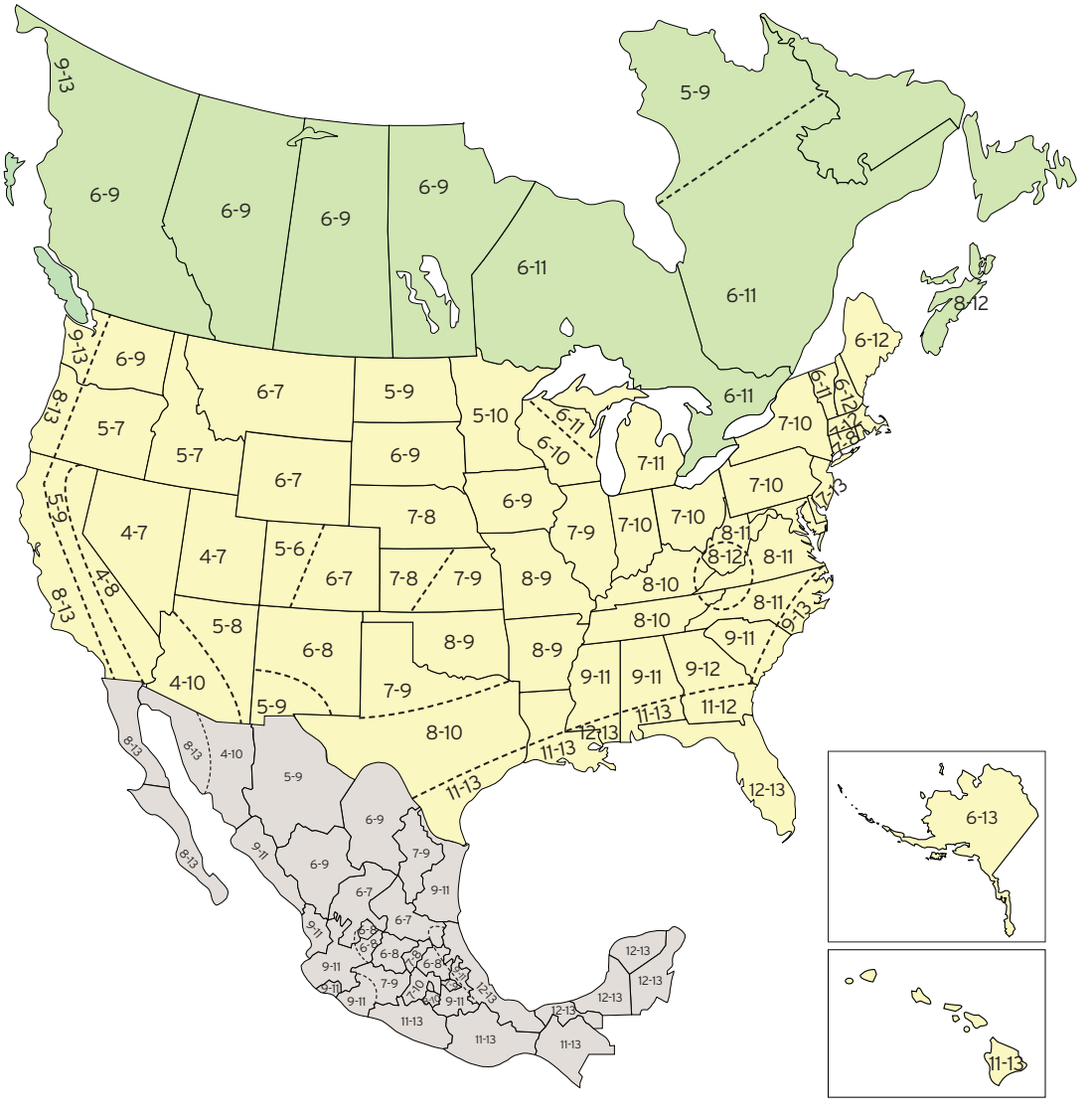
The values on the accompanying map provide examples of how average moisture contents (MC) for interior use of wood products vary from one region to another, and from one season to another within a region.

The United States Department of Agriculture (USDA) Forest Products Laboratory suggests the following MC average and ranges for interior wood products:

- Most areas of the United States: average = 8% MC, ranging from 6-10% MC
- Dry southwestern regions: average = 6% MC, ranging from 4-9% MC
- Damp, warm coastal areas: average = 11% MC, ranging from 8-13% MC

Actual interior MC conditions in any location may differ significantly from these numbers.

MOISTURE MAP OF NORTH AMERICA



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PART I
Solid Wood Flooring

A. Prior to delivery of the wood flooring, check and record the jobsite ambient conditions and the subfloor moisture to ensure they coincide with the wood flooring requirements that have been selected.

B. Upon delivery of the flooring to the jobsite, recheck and record the temperature and relative humidity in the space receiving the wood floor. The temperature and humidity must be within the manufacturer's requirements.

C. Upon delivery of the flooring to the jobsite, recheck and record the MC of multiple boards of flooring from a variety of bundles. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood species being tested.

   1. Take MC readings of the wood flooring on a minimum of 40 boards for up to the first 1,000 square feet, and an additional 4 readings per 100 square feet thereafter, and average the results. With pin-type moisture meters, tests should be taken on the back of the boards to avoid damage to the face of the flooring. In general, more readings will result in a more-accurate average. Record, date, photograph, and document all results.
   2. The readings should coincide with the required temperature and humidity in the facility receiving wood flooring. The table below indicates the predicted equilibrium moisture content of wood at any given combination of temperature and relative humidity.
   3. Any unusually high or low moisture readings should be isolated and not installed in the floor.

D. Upon delivery of the flooring to the jobsite, recheck and record the MC of the subfloor. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood subfloor being tested.

   1. After calibrating your meter to the subfloor material being tested, take MC readings in a minimum of 20 test locations for up to the first 1,000 square feet, and an additional 4 readings per 100 square feet thereafter, and average the results. Testing locations should be representative of the entire project and include a minimum of three tests per room receiving wood. Pay special attention to exterior walls and plumbing. Elevated readings should be addressed prior to delivery and installation of any wood flooring. In general, more readings will result in a more-accurate average. Record, date, photograph, and document all results.
   2. The average of the wood subfloor readings should coincide with the manufacturer-required temperature and humidity levels in the facility receiving wood flooring. Where the wood subfloor MC is not aligned with the required conditions in the facility receiving wood, the general rule of thumb is to ensure the MC of the wood subfloor is no more than 4% greater than the MC of solid strip (<3" widths) wood flooring, and no more than 2% greater than the MC of solid plank (≥3" widths) wood flooring being installed.
   3. Concrete subfloors must be moisture tested, and adequate moisture control systems should be in place prior to installation of any solid wood floor.
   4. Any unusually high or low subfloor moisture readings should be isolated and addressed prior to wood floor installation.

E. When the wood flooring is delivered at a MC that coincides with the expected in-use (e.g., normal living) and manufacturer's required ambient conditions within the facility, and this coincides with the subfloor moisture conditions, and these conditions are being maintained, the flooring may be installed immediately.

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MOISTURE CONTENT OF WOOD AT VARIOUS TEMPERATURE AND RELATIVE HUMIDITY READINGS

°F	°C																		
30	-1.1	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3
40	4.4	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3
50	10	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3
60	15.6	1.3	2.5	3.6	4.6	5.4	6.2	7.0	7.8	8.6	9.4	10.2	11.1	12.1	13.3	14.6	16.2	18.2	20.7	24.1
70	21.1	1.3	2.5	3.5	4.5	5.4	6.2	6.9	7.7	8.5	9.2	10.1	11.0	12.0	13.1	14.4	16.0	17.9	20.5	23.9
80	26.7	1.3	2.4	3.5	4.4	5.3	6.1	6.8	7.6	8.3	9.1	9.9	10.8	11.7	12.9	14.2	15.7	17.7	20.2	23.6
90	32.2	1.2	2.3	3.4	4.3	5.1	5.9	6.7	7.4	8.1	8.9	9.7	10.5	11.5	12.6	13.9	15.4	17.3	19.8	23.3
100	37.8	1.2	2.3	3.3	4.2	5.0	5.8	6.5	7.2	7.9	8.7	9.5	10.3	11.2	12.3	13.6	15.1	17.0	19.5	22.9
120	48.9	1.1	2.1	3.0	3.9	4.7	5.4	6.1	6.8	7.5	8.2	8.9	9.7	10.6	11.7	12.9	14.4	16.2	18.6	22.0
140	60	0.9	1.9	2.8	3.6	4.3	5.0	5.7	6.3	7.0	7.7	8.4	9.1	10.0	11.0	12.1	13.6	15.3	17.7	21.0
160	71.1	0.8	1.6	2.4	3.2	3.9	4.6	5.2	5.8	6.4	7.1	7.8	8.5	9.3	10.3	11.4	12.7	14.4	16.7	19.9
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95

Realitive Humidity (percent)

F. Adjusting the MC of the solid wood flooring may be necessary under either of the following circumstances: 1 - When the MC of the wood flooring product is different from the expected in-use conditions of the facility, or 2 - In extreme environments.

1. CAUTION: Altering the MC of any wood product, in order to accommodate extreme conditions, involves introducing or removing moisture from the wood prior to installation. When doing so, the change in moisture may cause the floor boards to shrink or swell outside of the manufactured dimension. Solid wood generally will not take-on or give-up moisture, nor will it change dimension, uniformly. This may adversely affect the installation, and should be taken into account when bidding the project and installing the flooring.



2. Conditioning of solid wood in these environments can be facilitated by separating the flooring into small lots and/or completely opening the packaging. Then cross stack the materials with spacers (3/4" to 1" stickers) between each layer of flooring to allow air circulation on all sides of all boards until EMC has been reached.
3. Off-site conditioning of the flooring material in a controlled environment is possible when the off-site conditions reflect the flooring manufacturer's requirements and the expected in-use (normal living) conditions.
4. Imported/tropical species often require two to three times longer equilibrating to their surroundings than most domestic species due to higher overall density, oil, and resin content, and their interlocking cell structure. Take this additional time into account when scheduling the project.

G. With unfinished solid wood flooring, after installation and before sanding and finishing takes place, and when scheduling allows, allow the flooring to stabilize in its new environment for 5-7 days. Flooring installed using an adhesive application system may require a longer post-installation conditioning period to allow all residual off gassing to occur prior to application of a finish. Follow the adhesive manufacturer's recommendations for dry times and off-gassing prior to sanding and finishing.

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PART II
Engineered Wood Flooring

A. Prior to delivery of the wood flooring, check and record the jobsite ambient conditions and the subfloor moisture to ensure they coincide with the wood flooring requirements that have been selected.

B. Upon delivery of the flooring to the jobsite, recheck and record the temperature and relative humidity in the space receiving the wood floor. The temperature and humidity must be within the manufacturer's requirements.

C. Upon delivery of the flooring to the jobsite, recheck and record the MC of the subfloor. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood subfloor being tested.
   1. Take MC readings of the wood subflooring at a minimum of 20 test locations per 1,000 square feet, and an additional 4 readings per 100 square feet thereafter, and average the results. In general, more readings will result in a more-accurate average. Any unusually high or low moisture readings should be isolated and addressed individually. Record, date, photograph, and document all results.
   2. The average of the wood subfloor readings should coincide with the manufacturer-required temperature and humidity levels in the facility receiving wood flooring. (Refer to the MC chart in Part I of this chapter.)
   3. Concrete subfloors must be moisture tested, and adequate moisture control systems should be in place prior to installation of any solid wood floor.
   4. Any unusually high or low subfloor moisture readings should be isolated and addressed prior to wood floor installation.

D. Follow the flooring manufacturer's moisture testing, acclimation, installation, and maintenance instructions to retain all warranty coverage.

E. When the wood flooring is to the expected in-use (e.g., normal living) and manufacturer's required ambient conditions within the facility, and this coincides with the subfloor moisture conditions, and these conditions are being maintained, the flooring may be installed immediately.

F. With unfinished engineered wood flooring, after installation and before sanding and finishing takes place, and when scheduling allows, let the flooring stabilize in its new environment for a period of time. Flooring installed using an adhesive application system may require a longer post-installation conditioning period to allow all residual off-gassing to occur prior to application of a finish. Follow the adhesive manufacturer's recommendations for dry times and off-gassing.

PART III
Parquet and End-Grain Wood Flooring

A. Prior to delivery of the wood flooring, check and record the jobsite ambient conditions and the subfloor moisture to ensure they coincide with the wood flooring requirements that have been selected.

B. Upon delivery of the flooring to the jobsite, recheck and record the temperature and relative humidity in the space receiving the wood floor. The temperature and humidity must be within the manufacturer's requirements.

C. Upon delivery of the flooring to the jobsite, recheck and record the MC of multiple panels or blocks from a variety of packages. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood species being tested.
   1. For parquet or end-grain flooring, take MC readings on a minimum of 40 panels/blocks per 1,000 square feet, and an additional 4 readings per 100 square feet thereafter, and average the results. With pin-type moisture meters, tests should be taken on the back of the wood to avoid damage to the face of the flooring. In general, more readings will result in a more-accurate average. Record, date, photograph, and document all results.
   2. The readings should coincide with the required temperature and humidity in the facility receiving wood flooring.
   3. Any unusually high or low moisture readings should be isolated and not installed in the floor.

D. Upon delivery of the flooring to the jobsite, recheck and record the MC of the subfloor. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood subfloor being tested.
   1. Take MC readings of the wood subflooring at a minimum of 20 test locations per 1,000 square feet, and an additional 4 readings per 100 square feet thereafter, and average the results. In general, more readings will result in a more-accurate average. Any unusually high or low moisture readings should be isolated and addressed individually. Record, date, photograph, and document all results.
   2. The average of the wood subfloor readings should coincide with the manufacturer required temperature and humidity levels in the facility receiving wood flooring. Where the wood subfloor MC is not aligned with the required conditions in the facility receiving wood, the general rule of thumb is to ensure the MC of the wood subfloor is no more than 4% greater than the MC of parquet wood

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flooring, and no more than 2% greater than the MC of end-grain wood flooring being installed.

3. Concrete subfloors must be moisture tested, and adequate moisture control systems should be in place prior to installation of any solid wood floor.
4. Any unusually high or low subfloor moisture readings should be isolated and addressed prior to wood floor installation.

E. When the wood flooring is delivered at a MC that coincides with the expected in-use (e.g., normal living) and manufacturer's required ambient conditions within the facility, and this coincides with the subfloor moisture conditions, and these conditions are being maintained, the flooring may be installed immediately.

F. In cases where the MC of parquet or end-grain flooring is outside of the range of the expected in-use (e.g., normal living) conditions, or in extreme environments, conditioning of the flooring may be necessary.

1. Altering the MC of the flooring, in order to accommodate extreme conditions, involves introducing moisture or removing moisture from the flooring prior to installation. When doing so, the change in moisture may cause the material to shrink or swell outside of the manufactured dimension. This may adversely affect the installation, and should be taken into account when bidding the project and installing the flooring.



2. Due to the orientation of the grain, end-grain flooring tends to equilibrate at a relatively fast rate (depending on thickness and species) as compared to other solid sawn boards. Conditioning end-grain flooring can be facilitated by separating the individual blocks into small lots and then restacking them, on-edge, in the expected in-use (e.g., normal living) conditions of the facility. The lower and more spread out the blocks are laid out, the faster the conditioning process will take.
3. Imported/tropical species often require two to three times longer equilibrating to their surroundings due to higher overall density, oil and resin content, and their interlocking cell structure. Take this additional time into account when scheduling the project.
4. Off-site conditioning of the flooring material in a controlled environment is possible when the off-site conditions reflect the expected in-use (normal living) conditions.

G. After installation, and before sanding and finishing takes place, allow the flooring to stabilize in its new environment for 5-7 days, when scheduling allows. Flooring installed using an adhesive application system may require a longer post-installation conditioning period to allow all residual off-gassing to occur prior to application of a finish. Follow the adhesive manufacturer's recommendations for dry times and off-gassing.

PART IV
Reclaimed Wood Flooring

A. Reclaimed lumber that has been milled into solid wood flooring must be dried to a MC that coincides with the home and the environment in which it is being installed.

B. Prior to delivery of the wood flooring, check and record the jobsite ambient conditions and the subfloor moisture to ensure they coincide with the wood flooring requirements.

C. Upon delivery of the flooring to the jobsite, recheck and record the temperature and relative humidity in the space receiving the wood floor. The temperature and humidity must be within the manufacturer's requirements and the requirements that the facility can sustain year-round.

D. Upon delivery of the flooring to the jobsite, recheck and record the MC of multiple boards of flooring from a variety of bundles. Check with your moisture meter manufacturer to determine the correct setting on your meter for the wood species being tested.

E. Any reclaimed wood flooring should be acclimated the same as detailed in the applicable wood flooring section (e.g., reclaimed solid, reclaimed engineered, reclaimed parquet, or reclaimed end-grain).

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