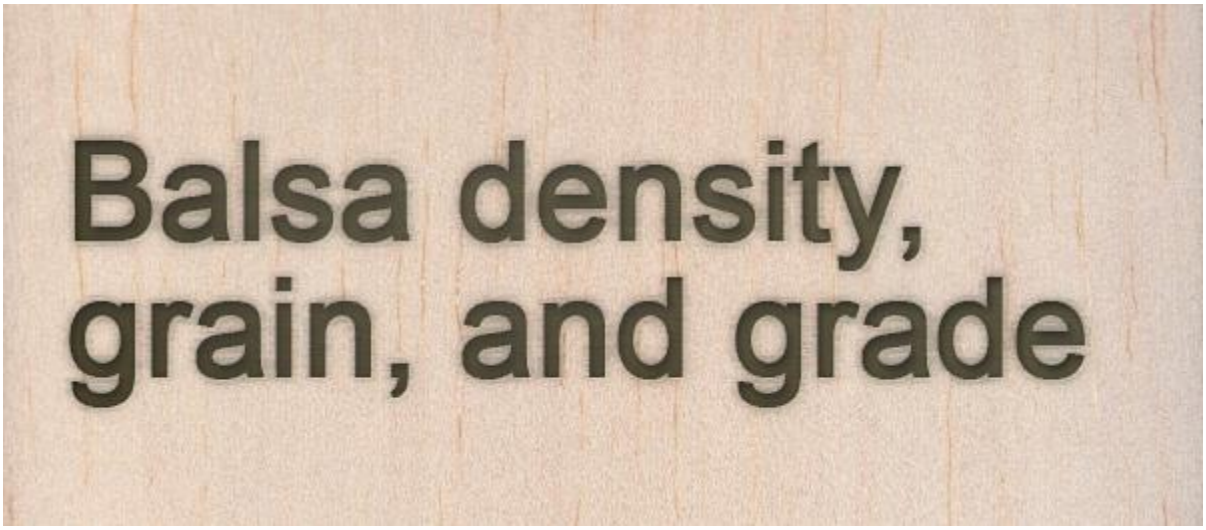
# Balsa Density, Grain, and Grade




**Written by Al and Rod Clark Learn about balsa, grades, densities, grains, and proper applications. Information and tips for any balsa kit, plans, or scratch build project.**
**When you are tackling your next balsa project, spend a few moments to learn about the different densities, grades, and grains of balsa. Not all balsa is created equal and its application depends on the characteristics.**

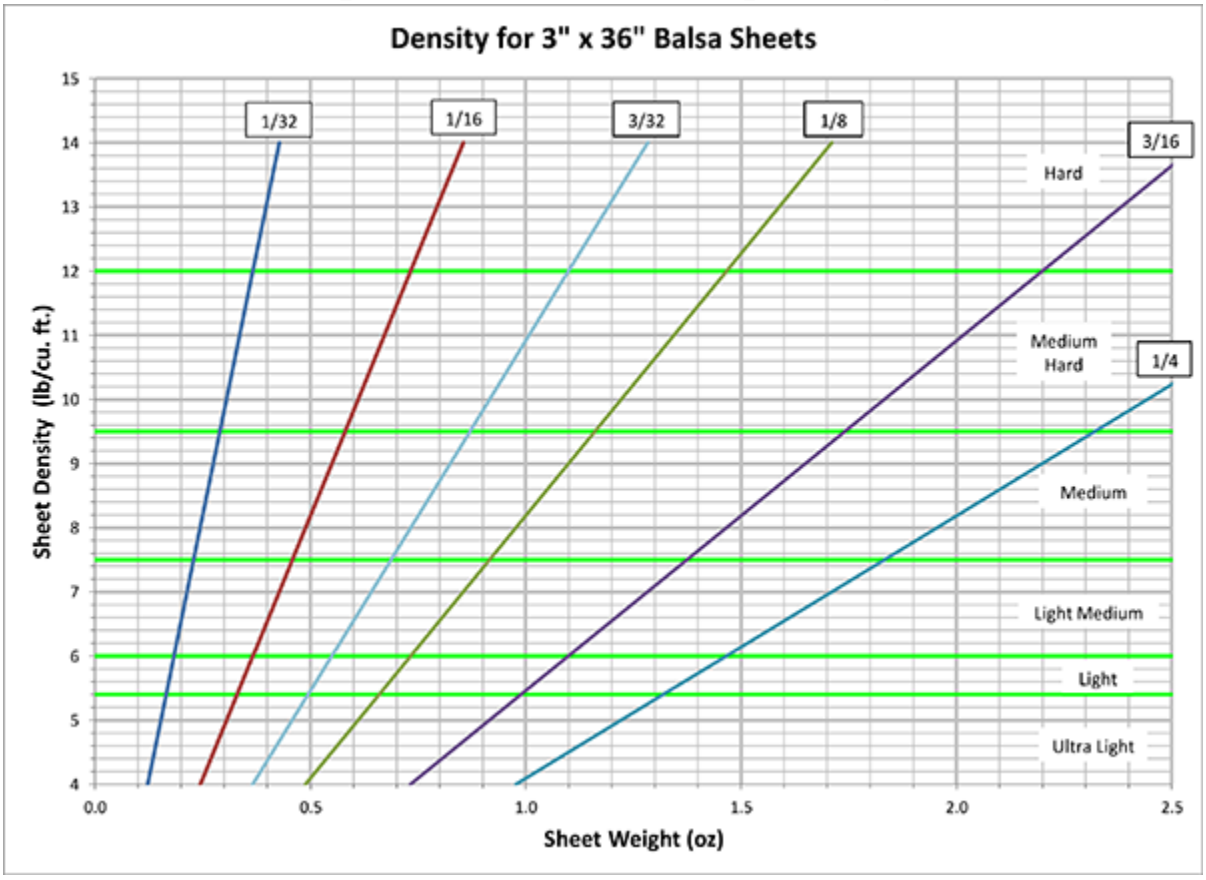
**Balsa Density**

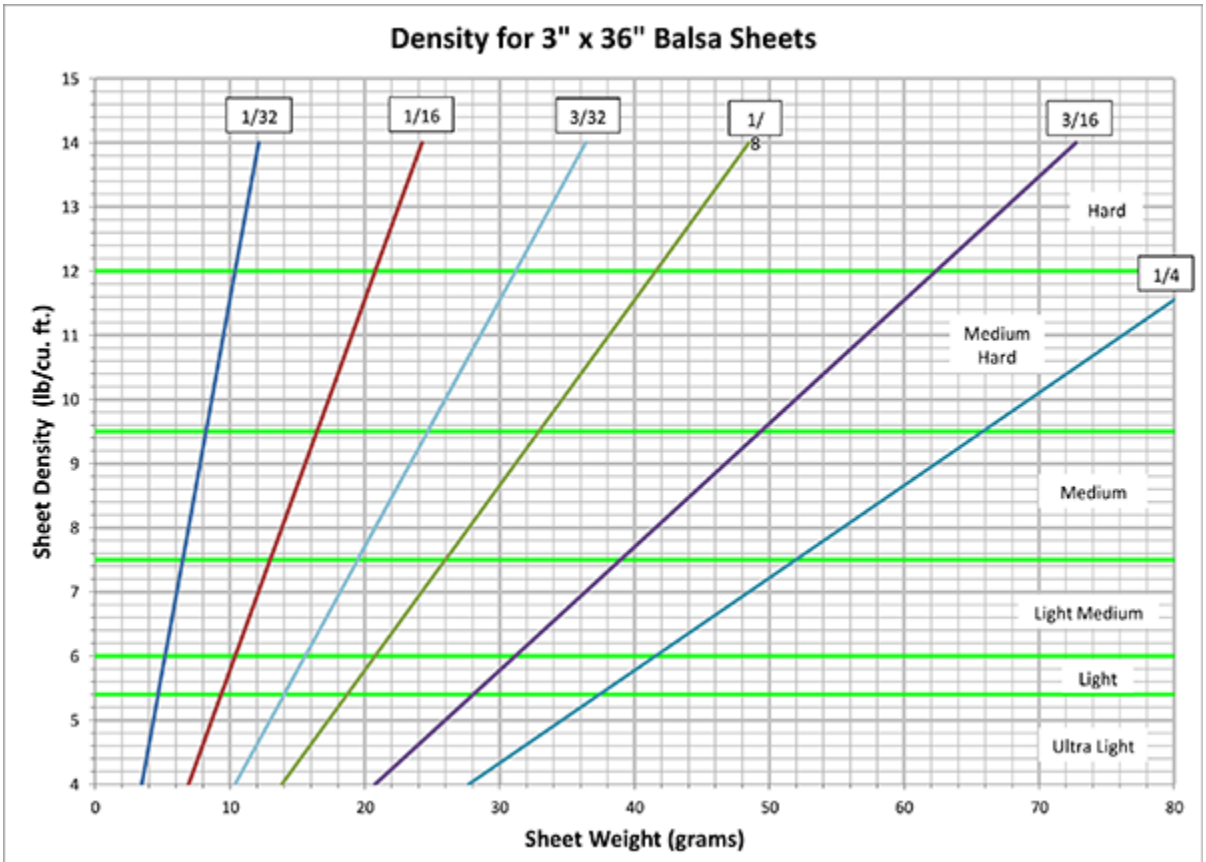
| Grade | Ultra Light | Light | Light Medium | Medium | Medium Hard | Hard |
|---|---|---|---|---|---|---|
| Density in lb/cu.ft | 4-5.4 | 5.5-6.0 | 6.1-7.5 | 7.6-9.5 | 9.6-12 | 14 + |
| | \|----Contest Grade Balsa----\| | | \|----------Non Contest Grade Balsa----------\| | | | |

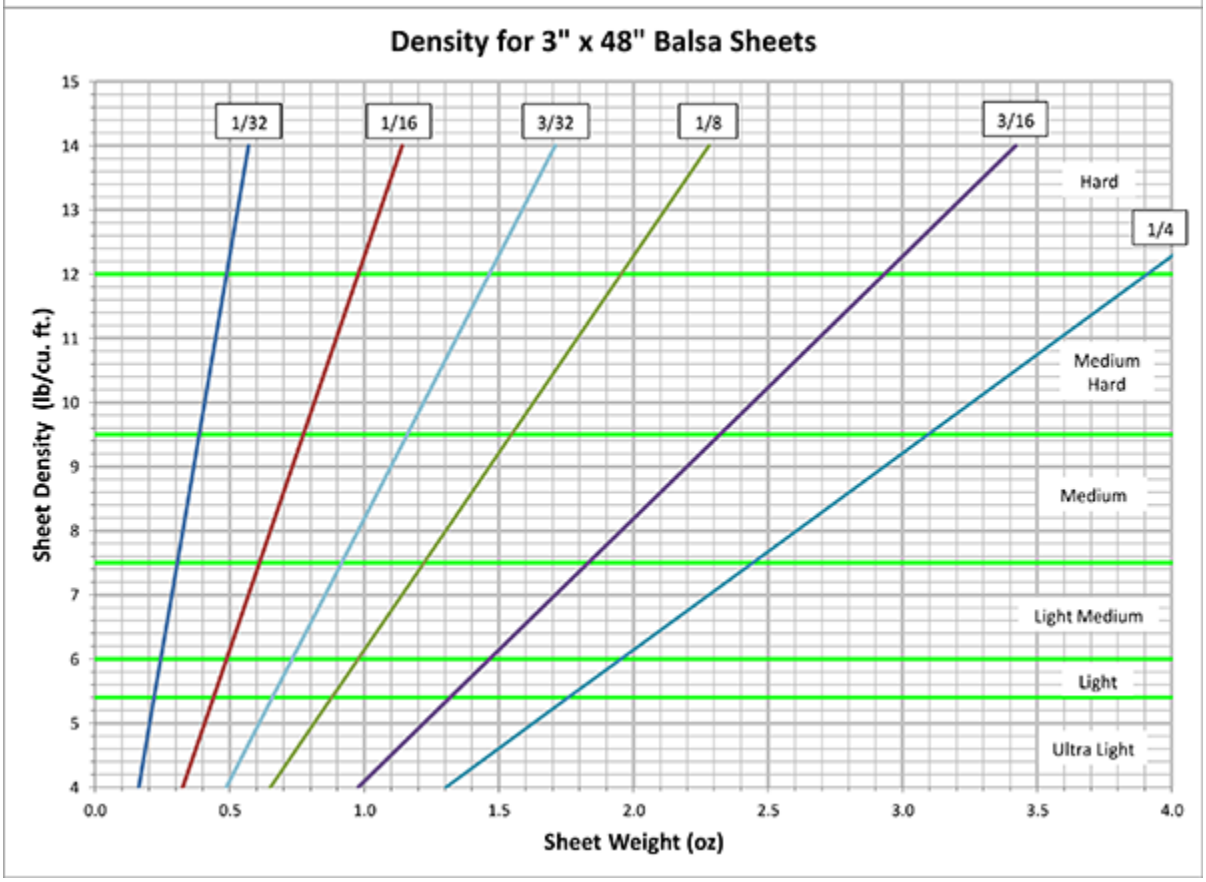
**So how do you determine the density and grade of balsa? It is a two step process to determine the various density ranges shown above. First, weigh the sheet of balsa. While there are very accurate electronic scales, I'd suggest you use a small postage scale (the kind with a weight and clip). Once you know the weight of the balsa refer to the nomographs below to determine the density.**

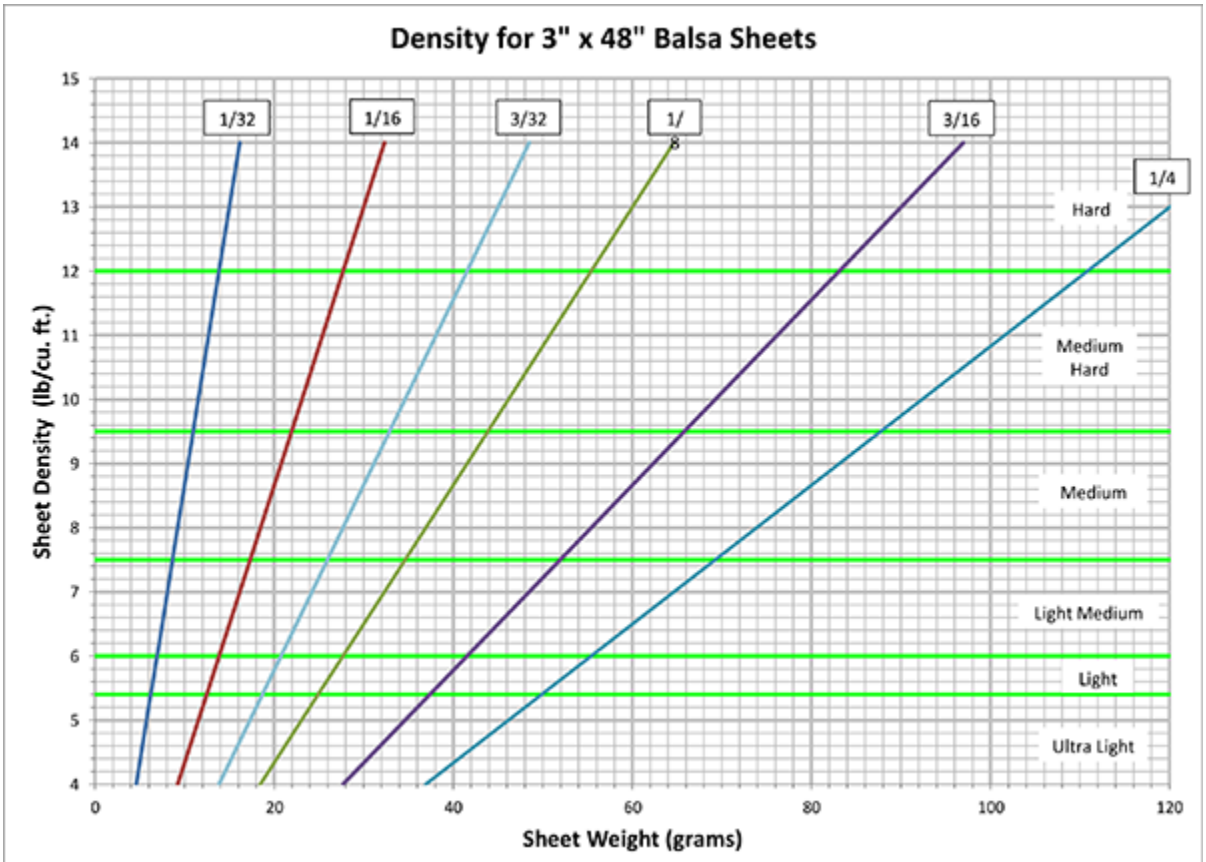
# Balsa Density Nomographs

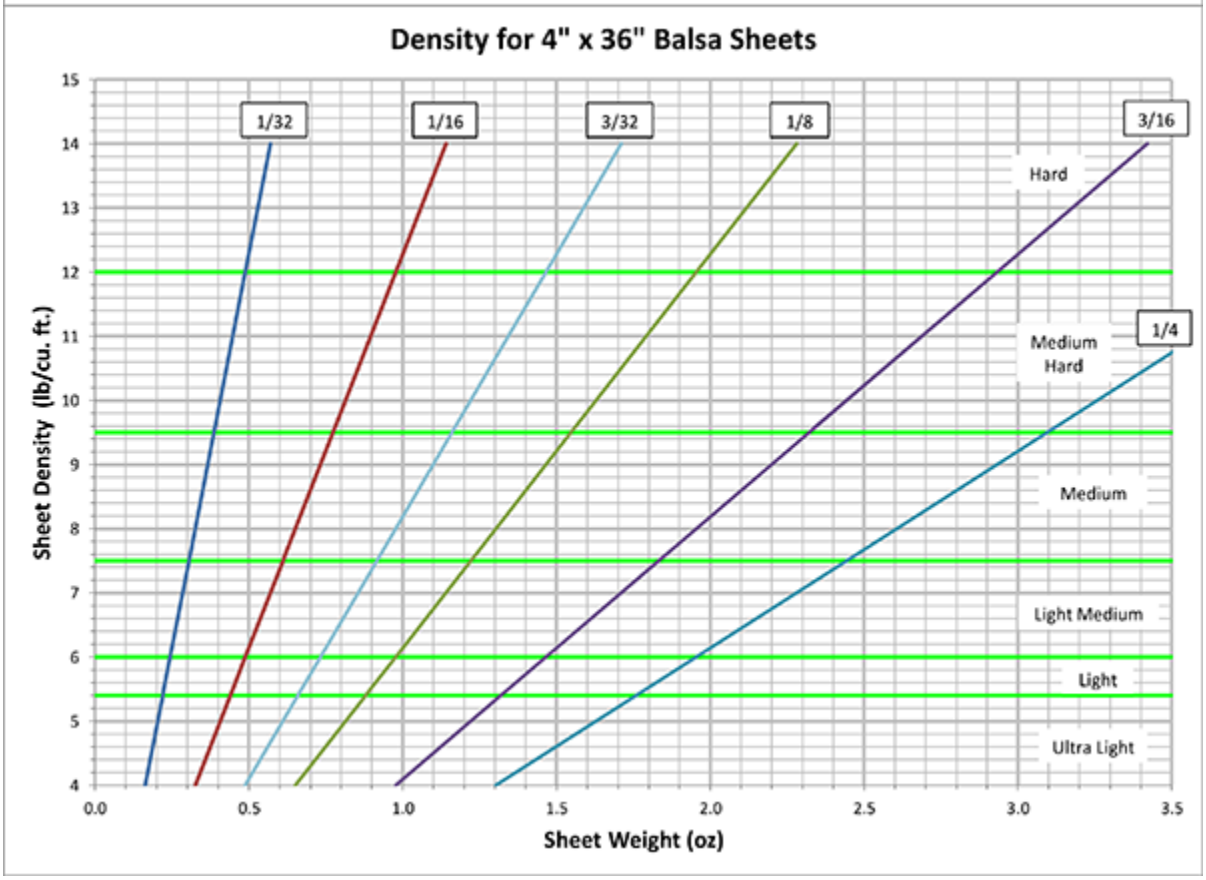
**After you weight a sheet of balsa the following nomographs are used to identify the balsa density and grade.**

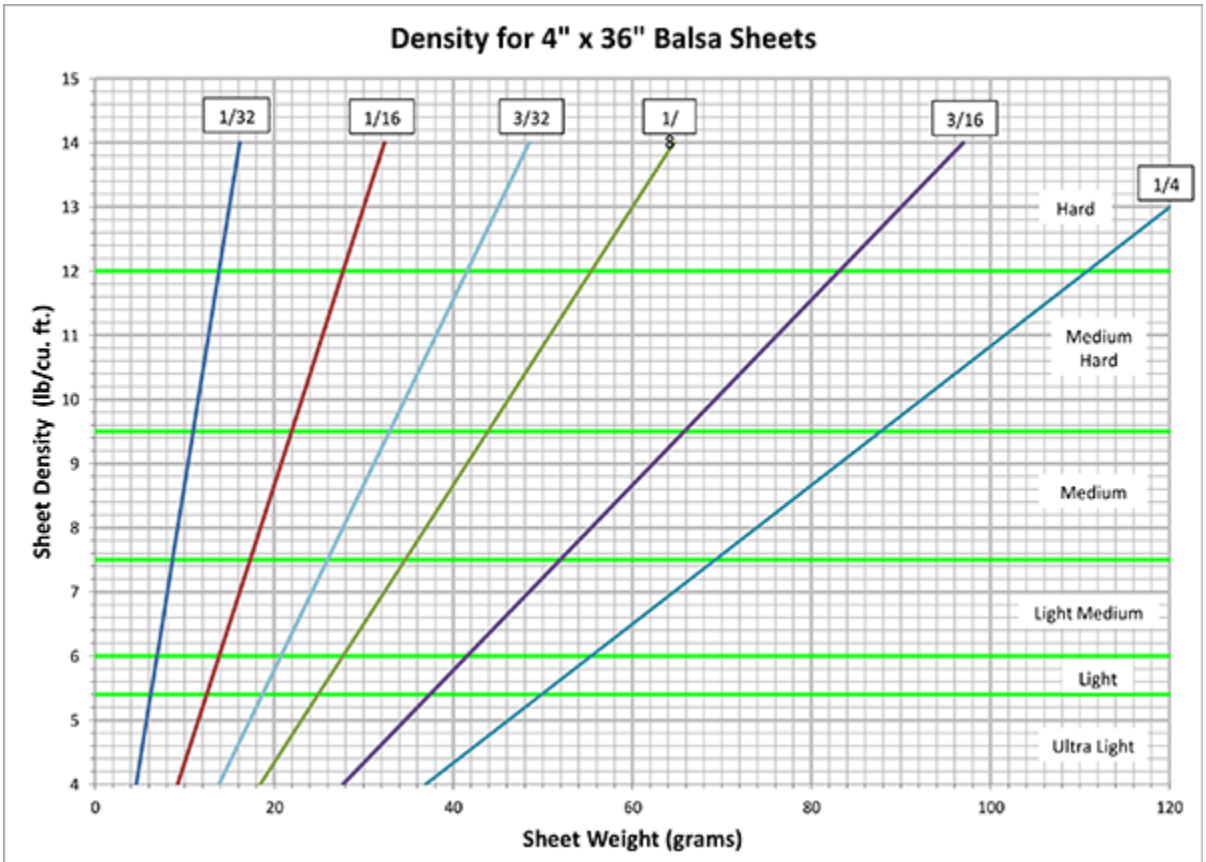


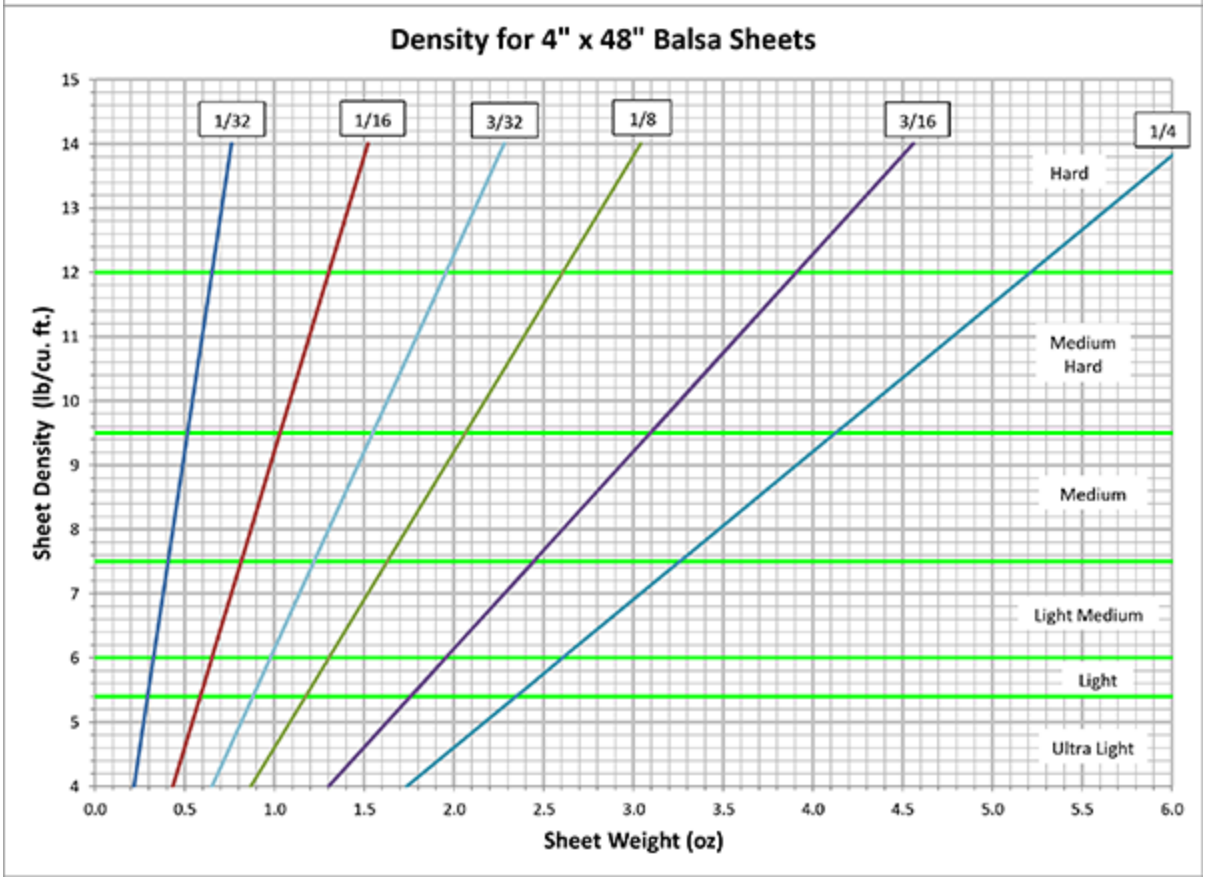

Density for 3" x 36" Balsa Sheets
Sheet Density (lb/cu. ft.)
Sheet Weight (grams)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0
10
20
30
40
50
60
70
80
4
5
6
7
8
9
10
11
12
13
14
15


Density for 3" x 48" Balsa Sheets
Sheet Density (lb/cu. ft.)
Sheet Weight (oz)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4
5
6
7
8
9
10
11
12
13
14
15


Density for 3" x 48" Balsa Sheets
Sheet Density (lb/cu. ft.)
Sheet Weight (grams)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0
20
40
60
80
100
120
4
5
6
7
8
9
10
11
12
13
14
15


Density for 4" x 36" Balsa Sheets
Sheet Density (lb/cu. ft.)
Sheet Weight (oz)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4
5
6
7
8
9
10
11
12
13
14
15


Density for 4" x 36" Balsa Sheets
Sheet Density (lb/cu. ft.)
Sheet Weight (grams)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0
20
40
60
80
100
120
4
5
6
7
8
9
10
11
12
13
14
15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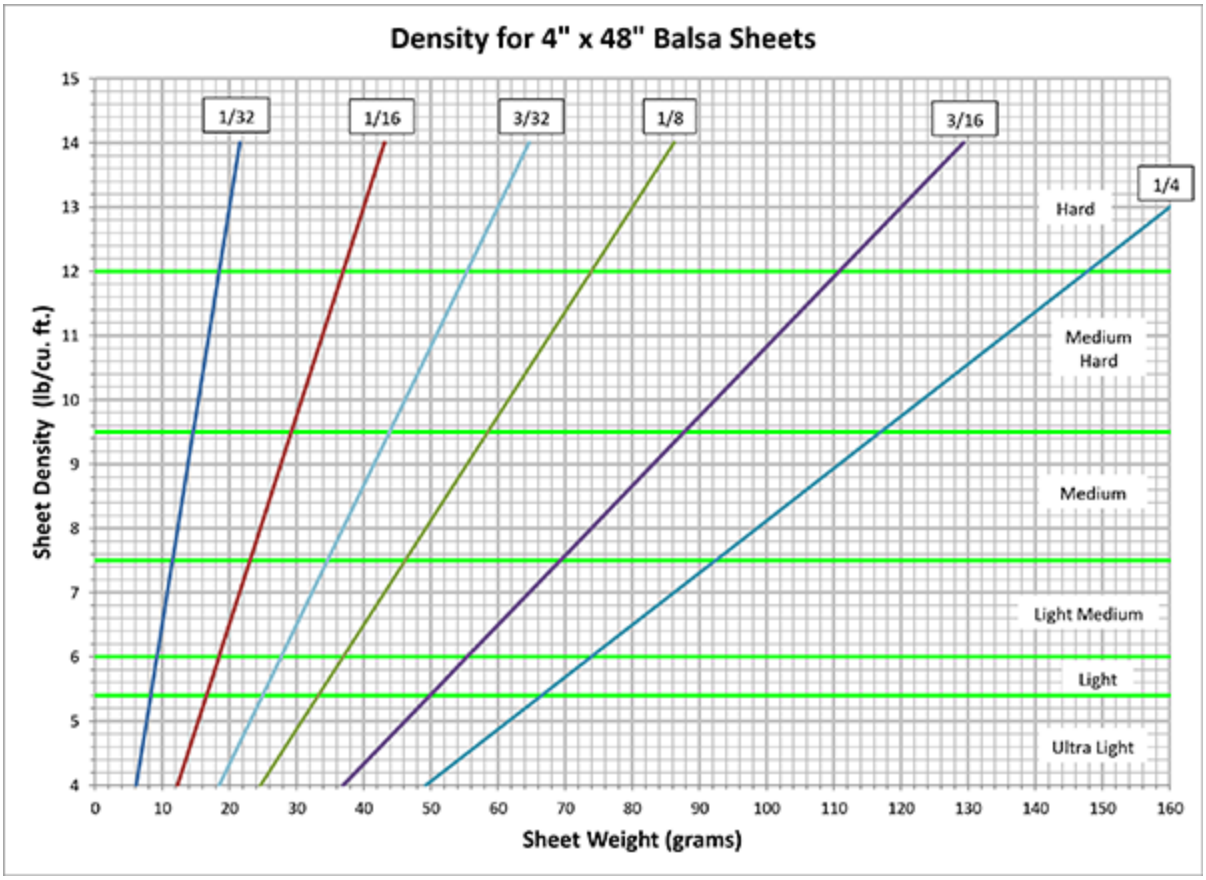
Sheet Density (lb/cu. ft.)
Sheet Weight (oz)
1/32
1/16
3/32
1/8
3/16
1/4
Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
4
5
6
7
8
9
10
11
12
13
14
15


Density for 4" x 48" Balsa Sheets
Sheet Density (lb/cu. ft.)
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1/32
1/16
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Hard
Medium Hard
Medium
Light Medium
Light
Ultra Light
15
14
13
12
11
10
9
8
7
6
5
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

# Balsa Grains




**Builders should take note of the different balsa grains. Each grain type has different characteristics and should be used in different applications. Notice that the C-grain balsa sheet has a mottled appearance and distinct checkerboard pattern. It is very stiff across the sheet and splits easily. It will not easily wrap around curved surfaces without cracking. C-grain is used for sheet balsa wings and tails, flat fuselage sides, wing ribs, formers, and trailing edges. C-grain is usually hard to find in local hobby shops. I mainly use it for sheet tail surfaces. B-grain grain lines are shorter than A-grain and it is less stiff than C-grain. If you look at the narrow edge of the balsa sheet, B-grain will look the same as it does on the wide, flat side. B-grain can go around soft curves without cracking. This grain is used for flat fuselage sides, wing ribs, formers, planking gradual curves, and wing leading edge sheeting. A-grain has long fibers that show up as long grain lines. If you look at the narrow edge of the balsa sheet, A-grain will have a checkerboard appearance. This is the most flexible of all grains, and it is quite easy to wrap around curved surfaces. A-grain is typically used for sheet covering rounded fuselages and wing leading edges, planking fuselages, forming tubes, strong flexible spars, and hand launch glider fuselages.**

**By Al and Rod Clark**