

# ROMTEC

WWW.ROMTEC.COM

541-496-3541

SERVICE@ROMTEC.COM

## GLULAM BEAMS & COLUMNS

by Les Murphy

Romtec's Engineering Department has incorporated a new standard specification for the glulam beams and columns we use in our public restrooms and other structures. All glue lam beams are now specified as 24F-V4 unless otherwise noted. Curious why? What in the heck do those numbers and letters mean? Well maybe we can help you out a little.

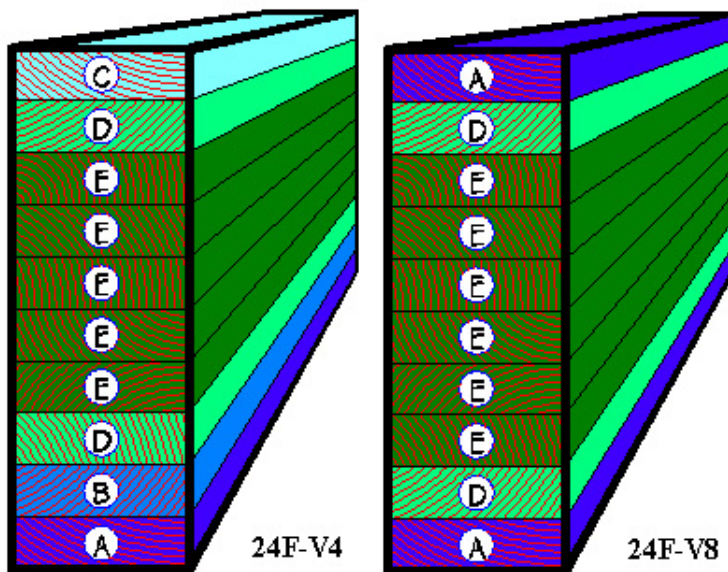
### Dimensions

What are glulams made of? Well, it depends on where the beams are made. On the west coast, most glulam beams are made of Western Douglas Fir. Sizes include 3-1/8", 3-1/2", 5-1/8", 5-1/2" & 6-3/4" widths, and there is a standard 1-1/2" increment depth. In the East, Southern Pine is used. Sizes include 3", 3-1/2", 5", 5-1/2" & 6-3/4" widths, and there is a standard 1-3/8" increment depth.

### Load Characteristics

There are 4 different types of glulam beams: simple span beams supported on both ends; continuous or cantilevered beams that extend beyond the support wall or post; tension beams that keep something from expanding or moving away; and compression beams, otherwise known as columns. Romtec uses all four types of beams in our structures.

In the 24F-V4 specification, the first part, 24F, stands for 2400 psi allowable bending stress. A 26F would mean 2600 psi allowable bending stress. You can order several different stress levels such as 16F, 20F, 24F, 26F, 30F, but 24F is the industry standard and is what our engineers design.



"V4" In this case, the "V" stands for visually inspected or graded. An "E" would mean mechanically graded. The 4 in the V4 stands for an "Un-Balanced" beam, which are mostly used for simple span beams, which can also be used to cantilever, and as long as the cantilever isn't very big. Now obviously there are other designations; sometimes we will designate a V8 (not the drink), which stands for a "Balanced" beam. But what does that mean? To compare Balanced and Un-Balanced, notice the differences in the two figures below.

An "Un-Balanced" beam (or simple span beam) is designed for loading in the middle of the beam, which will bend or deflect as a result of the load. Look at Figure 24F-V4. Notice that the bottom cord, or "A" part, is made from a higher grade wood than what is on the top "C", so that when the middle of the beam is

bending down (like the straw) the major of the resistance is on the bottom and thus it will resist and won't break.

"Balanced" or cantilevered beams are held at a fixed point by the wall. The load is on the cantilevered end of the beam. The tension this time is on the top, so the higher grade lumber, "A" is on both the top and the bottom cords, as shown in Figure 24F-V8. The beam is "balanced."

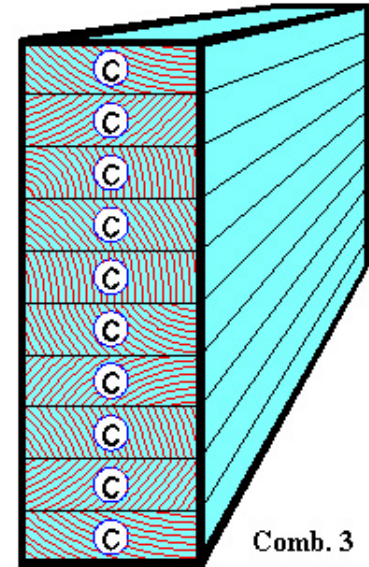
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## Columns

What about columns? They are not in tension or compression in the same way a beam is. A column's load is distributed over the full length of the column, so it can be made from "C" grade lumber throughout. See Figure Comb. 3.

## Appearance

Ok is that all there is to it? Nope. What kind of appearance do you want? There are 4 different grades, Framing, Architectural, Industrial and Premium. Romtec typically supplies Architectural appearance beams, high-quality beams for use where appearance is important but not an overriding consideration. All exposed knot holes and voids measuring over 3/4" are filled with wood-tone filler (putty). Exposed surfaces are smooth, and the bottom edges are eased (rounded). Framing beams are usually full width beams where additional furring or framing is not required, but the finish can be varied. Industrial grade beams are used where appearance is not a priority. There can be voids on edges of laminations, which don't have to be filled. Premium grade beams are made of the highest quality lumber and are used where the best specially where visual appearance is required.



## Location

The location of a beam must also be considered. The wood species and adhesives for laminating the beam depend on whether the beam will be in a "wet" or "dry" location. A "wet" location is one where a beam is directly exposed to the elements. For such applications, Romtec might specify a beam made of Port Orford Cedar, which is considered one of the best for decay resistance and is the strongest of the cedars. Romtec also uses Alaskan yellow cedar, which is valued for its appearance and decay resistance.

## Camber

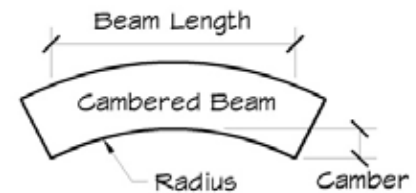
Camber, all glulam beams (not columns) have camber. What is a camber? It is a "crown" purposely manufactured into a glulam beam. It is most often desired in long span applications to counteract deflection. Camber does not affect the strength of the beam. Glulam beams typically have a 3500' radius. This is sometimes called "zero camber." See figure below for standard camber sizes.

Beams wit camber have "top" and "bottom" surfaces. Most beams are stamped "TOP." Getting the top right is important, since the strength of the beam is reduced by 25 percent if it installed upside down.

## Labeling

The last thing I will cover is what does that stamp on the glulam mean? See the figure below. The first line is APA EWS, that means the "American Plywood Association Engineered Wood Systems". Line two is "B" for simple span or "C" – Compressive member, "T" – tension member, and "CB" – cantilevered span member. The next tree letters indicate the appearance: IND stands for Industrial finish; PREM is premium; ARCH is architectural grade; and FRAM is framing grade.

The EWS Y117 is a lamination specification dealing with the process and glues used for manufacture of the beam. Line three, EWS 24F-1.8E is the beam specification as we have been discussing. In this case its 2400 psi unbalanced beam mechanical graded. DF means this beam is made from Douglas Fir, AC or AYC would mean Alaskan Yellow Cedar and so forth... Line four, MILL 0000 is just that, it designated the specific mill where the beam was manufactured. ANSI A190.1-1992 is the American National Standard for Glulam Beams identification of ANSI standards.



Stock 3500' Camber								
Span in Feet:	10'	12'	14'	16'	18'	20'	22'	24'
Camber in Inches:	.04"	.06"	.08"	.11"	.14"	.17"	.21"	.25"

