

## Materials for Damascus Steel

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Many folks who are interested in producing Damascus (laminated) steel, especially those who are doing it for the first time, are often confused about what alloys to use. There are as many different favorite materials as there are Bladesmiths. One thing that I have learned over the years, that often time means the difference between success and failure, is the choice of alloys that you put into your Damascus Billets. The things to consider are: First and foremost... the alloys "compatible". By this I mean, do the materials that you're choosing have similar expansion and contraction coefficients? In other words, do the materials expand relatively the same when heated? And do they contract relatively the same when cooling or cooled? While all may not agree, I feel that this is one of the most important aspects of being successful in creating well made Damascus.

The trick is to find, and use alloys that will exhibit the properties that you desire in the finished blade, while at the same time being "compatible" with each other. Many Bladesmiths have chosen to utilize 1080/1084 and 15N20 for their Damascus. The reasons for this is the fact that the two alloys are very similar....1080 is of course a plain carbon steel, and the makeup of 15N20 is nearly identical, with the exception of a 1.5% nickel content (nominal). The nickel content in 15N20 gives us the contrast we desire in the finished blade, but more so the fact that the two alloys are so similar in other aspects, allows for more successful welds, and less overall issues. Something that some do not think about or realize, is that if you utilize alloys in your Damascus, that have very different expansion/contraction coefficients, a billet/blade can literally tear itself apart, especially during the quenching operation....when one alloy contracts considerably more than the other.

OK, now that I have said all of that. My advice, especially for those who are just starting out making Damascus, is to give yourself the best chances for success by using alloys such as 1080 and 15N20. (Or alloys that you KNOW are compatible with each other) They are very easy to weld, can literally be tied in knots without de-laminating, and with the proper thermal treatments, will make an excellent cutting tool.

The bottom line in being successful in creating Damascus is to learn about steel(s), understand how they are going to react with each other, and with the processes you utilize in your shop, and if something does go wrong...take the time to figure out why.

I'm sure we'll be talking more about this on the ABS Forum as time goes on.

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