

Up-Goer Five Challenge: Accelerated Design and Testing of New Nickel-Based Superalloys

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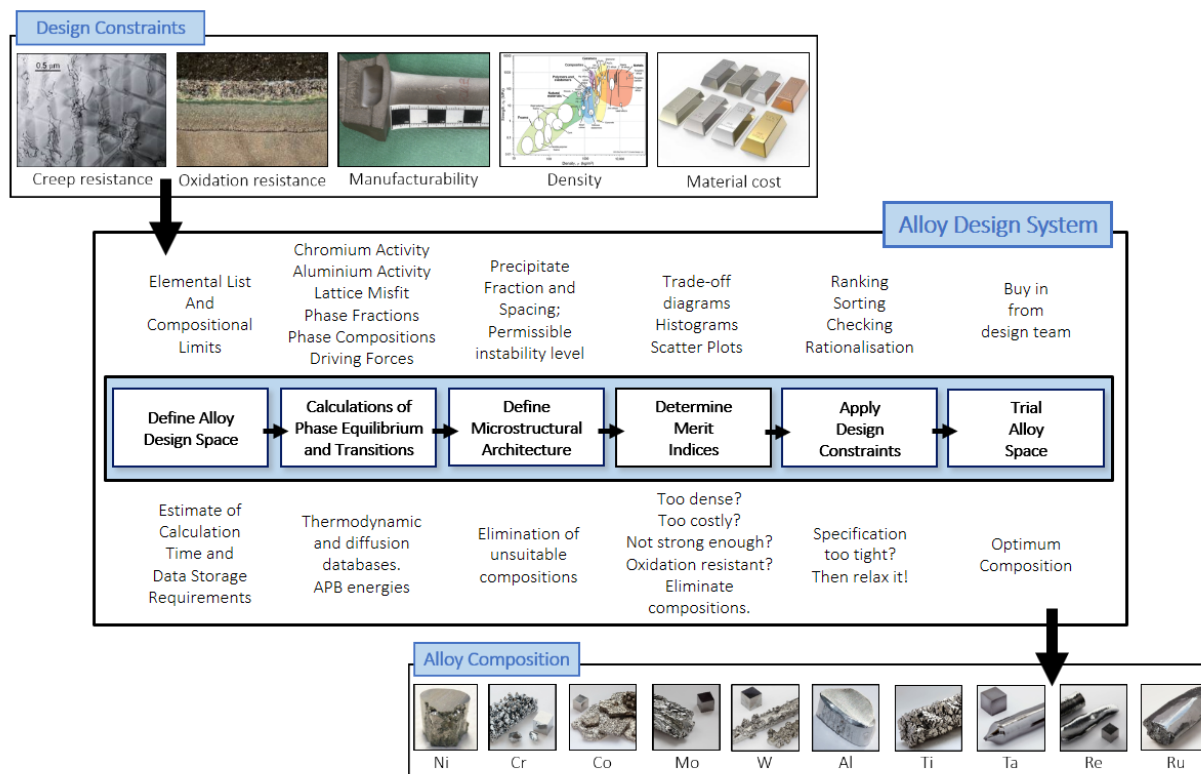
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Abstract

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As more people want to fly each year, it is important to make "flying things" work better. A great way to do this is to make the "fire" which keeps them in the air burn hotter. With a hotter fire, we need less stuff for burning and we can save money. However, a hotter fire also means that stuff around it might become hotter than it should, which is a big problem.

My work is coming up with new types of stuff to be used in the area close to the fire. First, I use big computers to get an idea of what kind of new stuff might work well. Second, with help from some friends, I make it. Third, I use new ways of checking how good this stuff really is by making it hot and then pulling it until it breaks. Last, I talk to other people and hope they will use this new stuff inside their "flying things" soon.



Overall diagram adapted from: Reed et al. *Isolation and testing of new single crystal superalloys using alloys-by-design method*. Mater. Sci. Eng. A 667, 261-278 (2016).
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Figure 1: Drawing of the idea behind making new types of stuff for “flying things”