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Subject: : Gear Talk

Topic: : Any idea on manufacturer?

Re: Any idea on manufacturer?

Author: : pcray1231

Date: : 2013/10/9 13:45:12

URL:

1st link does not call 17-4 a super alloy. The company's name who sells it is called "Super Alloys". It'd be like a golf company named "Drivers" who also sells putters. The putter would be a "Driver" by brand, but not by description.

2nd link does not call it a super alloy either. The company's tagline says they supply "exotic, high temperature, and Super Alloy products", but this is there for all alloys, not part of the description of 17-4. If that description of what they sell is all-encompassing, it would mean they consider 17-4 to be one of the above, not all of the above. I already allowed that I didn't have too much of a problem with calling it "exotic". More likely, that line merely states what the company focuses on, but is not all encompassing.

3rd link also does not call 17-4 a superalloy. They make superalloy castings. They also make austenitic alloy castings. They also make Inconel castings. They also make martensitic/precipitation hardenable alloy castings. 17-4 is put in that category, not the others. Correctly.

The term "super-alloy" very specifically relates to steels which are designed to maintain high tensile strength and exhibit low creep and high oxidation resistance (high temperature corrosion) in high temperature environments. The biggest use of them is generally in jet engines as well as power gen equipment, but some of the "lesser" ones are used in exhaust systems, fasteners in furnaces, etc. All of them are going to be austenitic. Many will be Ni or Co based, rather than iron based, and hence, not technically a "steel" at all. Some lump iron based high temp alloys, like A286, in the "super-alloy" group. But these type of alloys will still have 20+ % Ni. If you water the definition way down, you could almost lump alloys like 316L in there. Ni in the mid teens, austenitic, and you still have some temperature resistance as well as taking a fairly long time to form phases like sigma. Used often in kitchen type equipment.

Super-alloy metallurgists (which I am not) are often trained separately from other metallurgists, and hold different titles. Their alloy system is rather unique, being Ni or Co based. You have a gamma (austenitic) structure with gamma prime (also fcc or austenitic) precipitates, so controlling lattice parameters and such are paramount. They also do some funky stuff like directional solidification that you just don't see in other systems. Their world is just very different than other metallurgists.

17-4 is martensitic. With, umm, 4% Ni. There is no world in which this is a super-alloy. It is a nice alloy, with some attractive properties, and I work with it and similar alloys all the time. But it'd be hard to pick a worse option for high temperature use.