Ni230-RAM1™

(High Temperature Strength)

Product Information

Elementum 3D's Ni230-RAM1 is highly printable and free of microcracking with performance comparable to Haynes Alloy 230 wrought plate. Ni230-RAM1 is a solid solution strengthened nickel alloy that offers excellent strength and corrosion resistance at high temperatures. Reactive additive manufacturing (RAM) additions innoculate the alloy to eliminate microcracking and increase performance without the need for hot isostatic pressing (HIP).

Physical and Chemical Properties

Material composition: Based on Alloy 230 with a 1 volume % RAM addition	**Deposition rate[4]:** 4.2mm3/s. (Further print speed optimization possible)
Printed relative density: 8.96 g/cm^3 (>99.33%) ASTM B311	**Hardness ASTM[ASTM E18]:** • AS Fabricated (29 HRC) • Heat treated (26 HRC)

Surface roughness as built[10]:

Surface finish	Upskin	Downskin
45° angle	Ra µm	Ra µm
As-printed	9.6	21
Contour	5.7	19

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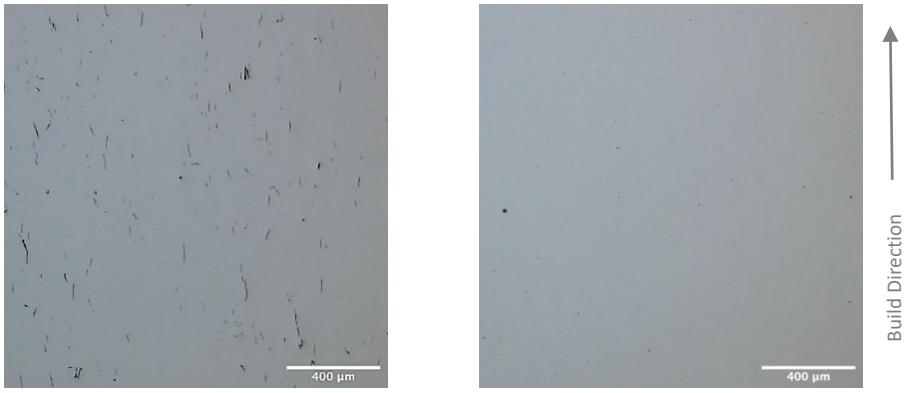

Unmodified Alloy 230 (printed)

Elementum 3D Ni230-RAM1 (Printed)

Figure 1: Optical micrographs of unmodified Alloy 230 and Ni230-RAM1. The Ni230-RAM1 microstructure is free of microcracking while the unmodified alloy shows extensive microcracking oriented in the growth direction.

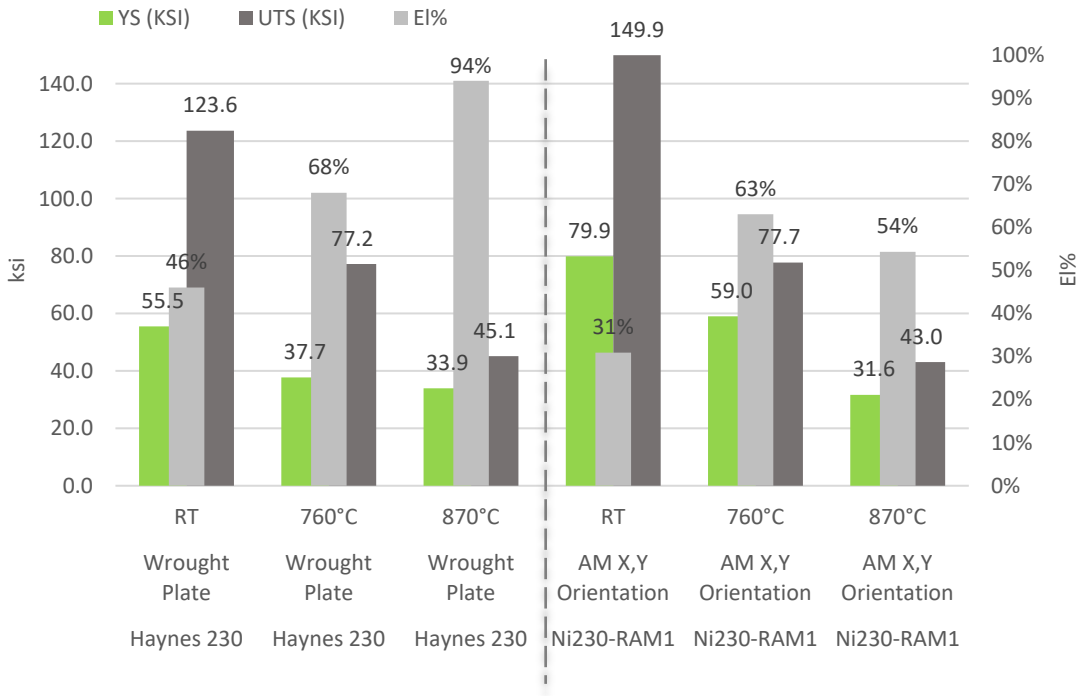

Figure 2: Haynes 230 data from their public datasheet. All sample were subjected to a 1230°C solution for 1 hour with a water quench. Alloy230-RAM1 mechanical testing followed ASTM E8 for RT and ASTM E21 for elevated temperature. All Alloy230-RAM1 samples were printed on an EOS M290.

Please contact us at sales@elementum3d.com for additional information.