

Title (en)
NANO-PRECIPITATION STRENGTHENED ULTRA-HIGH STRENGTH CORROSION RESISTANT STRUCTURAL STEELS

Title (de)
NANOAUSSCHIEDUNGSVERFESTIGTE ULTRAHOCHFESTE KORROSIONSBESTÄNDIGE BAUSTÄHLE

Title (fr)
ACIERS DE CONSTRUCTION ANTICORROSION A ULTRA-HAUTE RESISTANCE RENFORCE PAR NANO-PRECIPITATION

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Application
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Priority

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Abstract (en)
[origin: WO2004108970A2] A nanocarbide precipitation strengthened ultrahigh-strength, corrosion resistant, structural steel possesses a combination of strength and corrosion resistance comprising in combination, by weight, about: 0.1 to 0.5 % carbon (C), about 8 to 17 % cobalt (Co), 0 to about 10 % nickel (Ni), about 6 to 12 % chromium (Cr), less than about 1 % silicon (Si), less than about 0.5 % manganese (Mn), and less than about 0.15 % copper (Cu), with additives selected from the group comprising about: less than 3% molybdenum (Mo), less than 0.3 % niobium (Nb), less than 0.8 % vanadium (V), less than 0.2 % tantalum (Ta), less than 3 % tungsten (W), and combinations thereof, with additional additives selected from the group comprising about: less than 0.2 % titanium (Ti), less than 0.2 % lanthanum (La) or other rare earth elements, less than 0.15 % zirconium (Zr), less than 0.005 % boron (B), and combinations thereof, impurities of less than about: 0.02 % sulfur (S), 0.012 % phosphorus (P), 0.015 % oxygen (O) and 0.015 % nitrogen (N), the remainder substantially iron (Fe), incidental elements and other impurities. The alloy is strengthened by nanometer scale M₂C carbides within a fine lath martensite matrix from which enhanced chemical partitioning of Cr to the surface provides a stable oxide passivating film for corrosion resistance. The alloy, with a UTS in excess of 280 ksi, is useful for applications such as aircraft landing gear, machinery and tools used in hostile environments, and other applications wherein ultrahigh-strength, corrosion resistant, structural steel alloys are desired.

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C21B 3/00

IPC 8 full level
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CPC (source: EP)
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