

440C / AMS5880 / 9Cr18 / 9Cr18Mo 材料对比技术报告

一、材料概念说明 (Conceptual Explanation)

440C (AISI 440C)

中文：美国 AISI 标准的高碳高铬马氏体不锈钢轴承钢，具有高硬度与高耐磨性。

English: AISI 440C is a high-carbon, high-chromium martensitic stainless steel widely used for high- precision bearings due to its high hardness and wear resistance.

9Cr18

中文：中国 GB 标准材料，与 440C 化学成分几乎完全相同，可视为中国版本的 440C。

English: 9Cr18 is the Chinese GB equivalent of AISI 440C, sharing nearly identical chemical composition.

9Cr18Mo

中文：在 9Cr18 的基础上加入 Mo (钼) ，提高耐腐蚀性、耐磨性与回火稳定性。

English: 9Cr18Mo is an improved version of 9Cr18 with added molybdenum, providing enhanced corrosion resistance and wear performance.

AMS5880

中文：航空航天材料规范（不是材料牌号），以 440C 为基础，但要求使用 VIM/VAR 冶炼、极高纯度、严格无损检测。

English: AMS5880 is an aerospace material specification (not a steel grade), based on 440C but requiring VIM/VAR melting, high purity, and strict inspection.

二、化学成分对比表 (Chemical Composition Comparison)

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材料 / Material	C %	Cr %	Mo %	Mn %	Si %	Ni %	备注 / Notes
440C (AISI)	0.95– 1.20	16–18	≤0.75	≤1.0	≤1.0	≤0.75	AISI 标准 / Industrial grade
9Cr18 (GB)	0.95– 1.10	17–19	≤0.6	≤1.0	≤1.0	≤0.6	中国 GB 标准 / Chinese GB
9Cr18Mo (GB)	0.95– 1.10	17–19	0.4–0.8	≤1.0	≤1.0	≤0.6	Mo 加强版 / Mo- enhanced
AMS5880	≈440C	≈440C	≈440C	严格控制	严格控制	严格控制	航空级 440C / Aerospace grade

三、性能与应用对比 (Performance & Application Comparison)

 SHANDONG FODA BEARING TRANSMISSION CO., LTD				
性能 /Performance	440C	9Cr18	9Cr18Mo	AMS5880

硬度 Hardness	高 / High	高 / High	高且更稳定 / More stable	最高且更均匀 / Highest stability
耐磨性 Wear Resistance	很好 / Good	很好 / Good	更佳 / Better	极佳 / Excellent
耐腐蚀性 Corrosion Resistance	中等 / Medium	中等 / Medium	优秀 / High	优-特优 / High-Premium
材料纯净度 Purity	工业级 / Standard	工业级 / Standard	工业级 / Standard	极高 / Aerospace level
典型应用 Application	工业轴承 Industrial bearings	轴承与刀具 Bearings & tools	腐蚀工况轴承 Corrosive environments	航空发动机、航天轴承 Aerospace bearings

四、总结 (Summary)

中文总结：

440C = 国际通用高碳高铬不锈钢轴承材料

9Cr18 = 中国版 440C

9Cr18Mo = 加强型 440C, 添加 Mo 提升耐腐蚀性与耐磨性

AMS5880 = 航空级 440C, 采用 VIM/VAR 冶炼, 纯度高, 性能最优

English Summary:

440C = International standard martensitic stainless bearing steel

9Cr18 = Chinese GB equivalent of 440C

9Cr18Mo = Mo- enhanced version with better corrosion resistance

AMS5880 = Aerospace- grade 440C with VIM/VAR melting and highest purity