



S-TEN® Steel Engineering & Selection Cheat Sheet

Acid Dew-Point Corrosion Resistant Steels | Engineering Quick Guide

KUMAGAI SPECIALTY STEEL CO., LTD.
Est. 1913 | Nagoya, Japan | Global Stock & CNC Cutting

RULE 1 Quick Grade Selection: Which S-TEN Grade Matches Your Flue Gas Environment?

JIS G 3106 SM400A Class

S-TEN 1

Target Conditions: Both Sulfuric (H₂SO₄) & Hydrochloric (HCl) Dew-Point Corrosion.

Key Alloying: Antimony (Sb ≤0.15%) + Copper (Cu 0.25–0.50%) to suppress active acid condensation.

Tensile: 400–510 N/mm²

Yield: ≥245 N/mm² (≤16mm)

Waste Incinerators & Pickling Tanks

JIS G 3106 SM490A Class

S-TEN 2

Target Conditions: Severe Sulfuric Dew-Point Corrosion with High Structural Loads.

Key Alloying: Chromium (Cr 0.50–1.00%) + Titanium (Ti ≤0.15%) for enhanced mechanical strength.

Tensile: 490–610 N/mm²

Yield: ≥325 N/mm² (≤16mm)

Heavy Boilers, Stacks & Ducts

RULE 2 Material Benchmarking: Why S-TEN Outperforms Standard Carbon & Stainless Steels

Material	Structural Base	Sulfuric Dew Point (120–150°C)	Hydrochloric Dew Point (50–60°C)	Engineering / Cost Verdict
SS400	Carbon Steel	Poor (Rapid wall thinning)	Poor (Severe acidic pitting)	Low initial cost, but causes frequent unplanned plant shutdowns.
S-TEN 1	SM400A Class	Excellent Resistance	High Resistance (via Sb)	Optimal choice for mixed waste incineration ducts & flues.
S-TEN 2	SM490A Class	Superior High-Temp Resistance	Not specifically designated	Ideal for heavy boiler ductwork & tall exhaust stacks.
SUS304 / 316	Stainless Steel	Prone to severe attack in conc. H ₂ SO ₄	Conditional (risk of pitting/SCC)	High material cost; unsuited for hot condensed sulfuric acid.

RULE 3 Kumagai Specialty Steel: In-House Fabrication & Global Export Capabilities

Certified Stock

Prime Nippon Steel plates stocked in Japan. Thickness range up to 25.4mm+.

CNC Laser & Plasma

High-precision cutting directly to CAD drawings (DXF/DWG) with clean bevel edges.

Press Brake Bending

Secondary forming for cylindrical duct casings, conical liners & flue shells.

Global Export

Full MTC (EN 10204 3.1), seaworthy wooden crating, 1-piece to full container FOB/CIF.

Need S-TEN Plate Pricing, Custom CAD Cutting, or Global Export Support?

Contact Kumagai Specialty Steel