

Inputs governing grade selection

Subject	Engineering question	Selection impact	Reference document
Pressure and temperature	What are the most severe coincident design conditions?	Constrains allowable strength, wall, creep behavior and toughness	Process datasheet and design code
Fluid and environment	Which corrosive or cracking agents may be present?	Defines the material group and grade together with corrosion allowance and hardness limits	Fluid analysis and corrosion philosophy
Product form	Is the requirement pipe, tube, U tube or a welded component?	Defines the applicable product specification and acceptable manufacturing route	Technical product definition
Fabrication and welding	Are preheat, PWHT or hardness controls required?	Changes fabrication cost, cracking risk and repairability	Welding procedures and material specification
Inspection and traceability	Which examinations and material certificate type are required?	Defines delivery conditions, supplementary requirements and acceptance records	Inspection and test plan

Source / basis: <https://niktrd.com/material-selection-guide>