



STEAM REFORMER PACKAGE, CHARGE
HEATER AND COMBINED FEED HEATER
NATIONAL REFINERY LIMITED
UPDATED PROJECT

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CATALYST TUBE THICKNESS CALCULATION

DESIGN DATA			
DATA SHEET	K196-305-SP-0113-001	REFERENCE DRAWING	K196-305-DW-0121-001
		ITEM	305-F01

DESIGN BASIS

DESIGN PRESSURE

DESIGN TUBE METAL TEMPERATURE

PIPE MATERIAL (ASTM SPECIFICATION AND GRADE)

Outside Nominal Diameter

Nominal Thickness (=Min purchased Thk)

Tube thk to outside diameter ratio

API 530

(Prupt) 3070 kPa (g)

(Tdes) 930 °C

Manaurite XM

(Do) TUBE

(M Thk) MSW

(M Thk / Do) 0.08 < 0.15

3.07 MPa (g)

1706 °F

Corrosion Allowance C.A.

0 mm

118.00 mm

ID 100 mm

9.00 mm

S_{average} @ 100000h 25.3 Mpa

S_{min} @ 100000h 22.1 Mpa

S allowable Rupture Design @ Design Temp. (Srupt) 20.24 MPa

= lesser between S_{minimum} @ 100000h and 80% S_{average} @ 100000h

PIPE CALCULATION. Design rules: API 530, 6th edition, September 2008, 4.4

RUPTURE DESIGN

STRESS THICKNESS

= Prupt x Do / (2 x Srupt + Prupt)

MINIMUM REQUIRED THICKNESS

= SThk + PCA

8.32 mm

f (corrosion fraction) 1 (assumed, conservative)
(from Figure 1)

8.32 mm

Checked OK

