

MMPDS-09
1 April 2014

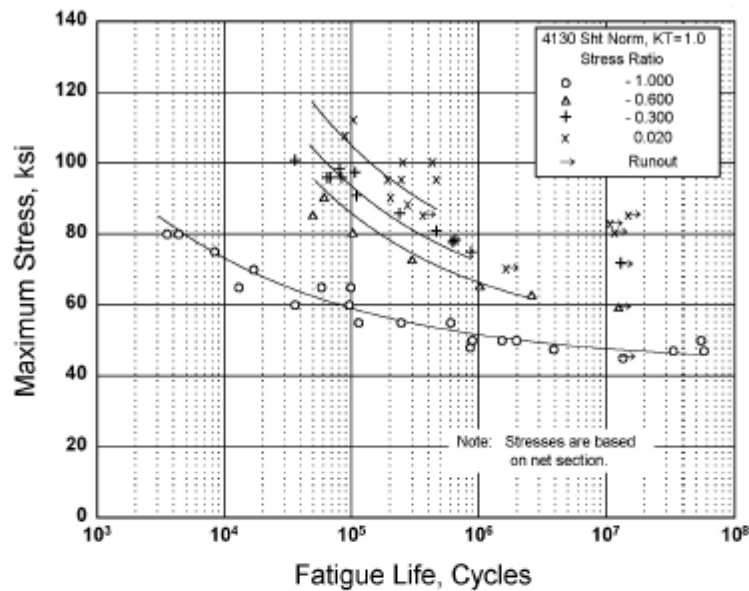


Figure 2.3.1.2.8(a). Best-fit S/N curves for unnotched AISI 4130 alloy steel sheet, normalized, longitudinal direction.

Correlative Information for Figure 2.3.1.2.8(a)

Product Form: Sheet, 0.075 inch thick

Properties: TUS, ksi 117 TYS, ksi 99 Temp., °F RT

Specimen Details: Unnotched
2.88-3.00 inches gross width
0.80-1.00 inch net width
12.0 inch net section radius

Surface Condition: Electropolished

References: 3.2.4.1.8(a) and 3.2.4.1.8(f)

[Caution: The equivalent stress model may provide unrealistic life predictions for stress ratios beyond those represented above.]

Test Parameters:

Loading - Axial
Frequency - 1100-1800 cpm
Temperature - RT
Environment - Air

No. of Heats/Lots: Not specified

Equivalent Stress Equations:

For stress ratios of -0.60 to +0.02
 $\log N_f = 9.65 - 2.85 \log (S_{eq} - 61.3)$
 $S_{eq} = S_{max} (1-R)^{0.41}$
Std. Error of Estimate, $\log (\text{Life}) = 0.21$
Standard Deviation, $\log (\text{Life}) = 0.45$
 $R^2 = 78\%$

Sample Size = 23

For a stress ratio of -1.0
 $\log N_f = 9.27 - 3.57 \log (S_{max} - 43.3)$

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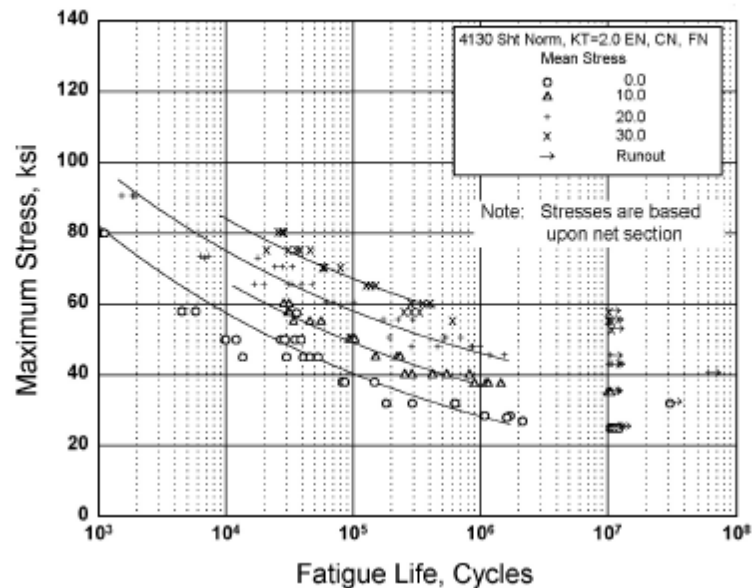


Figure 2.3.1.2.8(c). Best-fit S/N curves for notched, $K_t = 2.0$, AISI 4130 alloy steel sheet, normalized, longitudinal direction.

Correlative Information for Figure 2.3.1.2.8(c)

Product Form: Sheet, 0.075 inch thick

Properties:

TUS, ksi	TYS, ksi	Temp., °F
117	99	RT
		(unnotched)
120	-	RT
		(notched)
		K_t 2.0

Specimen Details: Notched, $K_t = 2.0$

Notch Type	Gross Width	Net Width	Notch Radius
Edge	2.25	1.500	0.3175
Center	4.50	1.500	1.500
Fillet	2.25	1.500	0.1736

Surface Condition: Electropolished

References: 3.2.3.1.8(b) and 3.2.3.1.8(f)

Test Parameters:

Loading - Axial
Frequency - 1100-1800 cpm
Temperature - RT
Environment - Air

No. of Heats/Lots: Not specified

Equivalent Stress Equation:

$\log N_f = 17.1 - 6.49 \log (S_{eq})$

$S_{eq} = S_{max} (1-R)^{0.86}$

Std. Error of Estimate, $\log (\text{Life}) = 0.19$

Standard Deviation, $\log (\text{Life}) = 0.78$

$R^2 = 94\%$

Sample Size = 107

[Caution: The equivalent stress model may provide unrealistic life predictions for stress ratios beyond those represented above.]