

THE SOLUTION TO THIS PROBLEM IS EXACTLY LIKE 6-34 EXCEPT STRESS CONCENTRATION FACTORS AND C_{surf} ARE SET TO 1

SINCE CAST IRONS "INTERNAL FLAWS" MASK THESE EFFECTS, DON'T FORGET THAT $S_e' = 0.4 S_{ut}$ FOR IRONS.

SEE ATTACHED SPREADSHEET FOR ANSWERS (METHOD PARALLELS THE SOLUTION FOR 5-34).

NOTE: A SIGNIFICANT IMPROVEMENT TO THIS METHOD WOULD BE TO USE THE MODIFIED-MOHR FAILURE THEORY OVER VON MISES.

Prob. 6-36

Data from Table P5-3					Stress Conc. Factors				Stresses at Point A (Mpa)						Endurance limit and corrections					
ROW	I (m)	a (m)	F (N)	od (m)	ld (m)	Kt _b	Kt _t	Kt _b	Kt _t	Tau mean	Tau alt	Sigma mean	Sigma alt	eq mean	eq alt	Csize	Sut Guess	Csurf	Se/Sut	Sut (Mpa)
a	0.100	0.400	50	0.020	0.014	1.0	1.0	1.0	1.0	8.4	8.4	4.2	4.2	15.1	15.1	0.89	275	1.0	0.356	115
b	0.070	0.200	85	0.020	0.006	1.0	1.0	1.0	1.0	5.5	5.5	3.8	3.8	10.2	10.2	0.89	184	1.0	0.356	78
c	0.300	0.100	95	0.025	0.017	1.0	1.0	1.0	1.0	2.0	2.0	11.8	11.8	12.3	12.3	0.87	204	1.0	0.348	95
d	0.800	0.500	160	0.046	0.022	1.0	1.0	1.0	1.0	2.2	2.2	7.1	7.1	8.0	8.0	0.82	142	1.0	0.328	65
e	0.085	0.350	900	0.055	0.024	1.0	1.0	1.0	1.0	5.0	5.0	2.4	2.4	9.0	9.0	0.81	175	1.0	0.322	74
f	0.050	0.180	950	0.050	0.030	1.0	1.0	1.0	1.0	4.0	4.0	2.2	2.2	7.3	7.3	0.81	140	1.0	0.325	59
g	0.160	0.280	850	0.045	0.019	1.0	1.0	1.0	1.0	6.9	6.9	7.9	7.9	14.3	14.3	0.82	266	1.0	0.329	115
h	0.200	0.100	800	0.040	0.024	1.0	1.0	1.0	1.0	3.7	3.7	14.6	14.6	15.9	15.9	0.83	276	1.0	0.333	128
i	0.400	0.150	950	0.065	0.037	1.0	1.0	1.0	1.0	1.5	1.5	7.9	7.9	8.3	8.3	0.79	146	1.0	0.317	69
j	0.200	0.100	600	0.045	0.032	1.0	1.0	1.0	1.0	2.3	2.3	9.0	9.0	9.8	9.8	0.82	171	1.0	0.329	79
k	0.120	0.180	880	0.060	0.047	1.0	1.0	1.0	1.0	3.0	3.0	4.0	4.0	6.6	6.6	0.80	123	1.0	0.320	54
l	0.150	0.250	750	0.052	0.028	1.0	1.0	1.0	1.0	3.7	3.7	4.5	4.5	7.8	7.8	0.81	147	1.0	0.324	64
m	0.070	0.100	500	0.036	0.030	1.0	1.0	1.0	1.0	5.3	5.3	7.4	7.4	11.7	11.7	0.84	213	1.0	0.336	93
n	0.085	0.150	820	0.040	0.015	1.0	1.0	1.0	1.0	5.0	5.0	5.7	5.7	10.3	10.3	0.83	191	1.0	0.333	83