Annex K

Input for constraint analysis

K.1 Introduction

In assessing the integrity of structures containing defects, it has been found, by comparing predicted and observed behaviour of various structures containing defects, that there is inherent conservatism within the Options 0-4 of the procedures given in Section 6. A particular conservatism is that the material toughness is normally derived from deeply cracked bend specimens using recommended testing standards and validity criteria. These criteria are designed to ensure plane strain conditions and high hydrostatic stresses near the crack tip. However, there is considerable evidence that fracture resistance is increased when, for example, shallow cracked specimens, or specimens in tension, are tested. These conditions tend to reduce the peak hydrostatic stresses in front of the crack tip, referred to as lower constraint. This means that when using the conventional Failure Assessment Diagrams of Section 6, for assessing specimens under conditions of low constraint, reserve factors are underestimated. Procedures which include the effect of constraint are set down in Section 6.4.3.

K.2 Compendium of β solutions

K.2.1 Introduction

In Section 6.4.3, the level of constraint is taken into account in the normalised constraint parameter, β. This normalised constraint parameter is defined in terms of the constraint parameters T or Q, such that $\beta_T = T / L_r \sigma_y$, and $\beta_Q = Q / L_r$, where $L_r = \sigma_{ref} / \sigma_y$. T is the elastic constraint parameter and Q is the elastic-plastic constraint parameter.

Within section K.2, a compendium of β solutions is presented for various geometries, although only β_T solutions are included. The constraint information, for each geometry, is summarised in two pages. The pages show a figure of the geometry, the polynomial coefficients defining β_T in terms of a/W or a/t, the reference stress solution used, the source references, any additional information and lastly a plot of the derived solution for β_T against a/W or a/t. The values of T-stress used as input to β_T have been derived from finite element analyses for a range of a/W or a/t, with the value at $a/W \rightarrow 0$ or $a/t \rightarrow 0$ fitted to an analytical solution.

It should be noted that the value of β_T depends on the limit load used to evaluate L_r. The β_T solutions listed here assume plane strain conditions, consistent with the scope of the procedures of Section 6.4.3 and the von Mises yield criterion. The particular value of β_T required for application of Section 6.4.3 should use the same limit load as that used in the determination of L_r. Where necessary, the appropriate β_T may be derived from the solutions given here using simple scaling by the ratio of the respective limit loads.

Using this compendium, it is possible to determine a value of β, for a particular geometry with a particular crack size, and hence, in conjunction with the materials constraint-dependent toughness variation, apply the procedures of Section 6.4.3. It should be noted that in some cases the recommended solutions lead to values of $\beta \geq 0$, that is conditions of high constraint. In such cases, the procedures of Section 6.4.3 will not lead to an increase in reserve factors and Options 0-4 of the procedures given in Chapter 6 should be followed.

K.2.2 List of geometries

The geometries which are considered in section K.2 are listed below, and then are described in detail in the following sub-sections. For each of the geometries a solution for β_T is given for a range of normalised crack lengths.

Section K.2.2.1 EXTENDED FLAWS IN PLATES

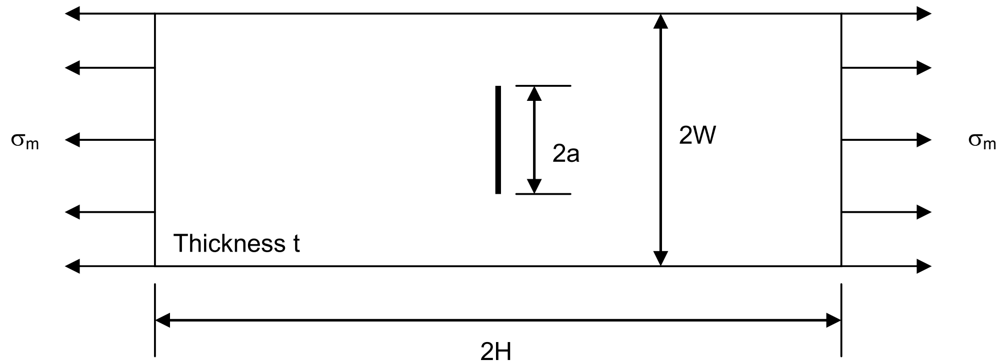
- K.2.2.1.1 Centre-cracked plate in uniaxial tension (CCT)
- K.2.2.1.2 Centre-cracked plate in equibiaxial tension (CCBT)
- K.2.2.1.3 Double edge-cracked plate in uniaxial tension (DECT)
- K.2.2.1.4 Single edge-cracked plate in uniaxial tension (SECT) I
- K.2.2.1.5 Single edge-cracked plate in pure bending (SEB)
- K.2.2.1.6 Single edge-cracked plate in 3 point bend (3PB)

Section K.2.2.2 CIRCUMFERENTIAL FLAWS IN CYLINDERS

Circumferentially cracked cylinder in tension (CCCT)

K.2.2.1 Extended flaws in plates

K.2.2.1.1 Centre-cracked plate in uniaxial tension (CCT)



Polynomial coefficients defining β_T :

Geometry	H/W	X_0	X_1	X_2	X_3	X_4
CCT	1	-1.1547	1.1476	-2.4091	4.059	-1.9907
CCT	> 1.5	-1.1547	1.1511	-0.7826	0.4751	-0.1761

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4 \tag{J.1}$$

for $0 \le a/W \le 0.6$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2\left(1 - a/W\right)} \tag{J.2}$$

where σ_{ref} is obtained using the plane strain von Mises limit load [K.6]

References: [K.1-K.3].

Additional information:

The open circles and triangles in Figure K.1 represent the raw data that were used to generate the polynomial fits. For the situation where 1 < $H/W \leq$ 1.5, the most conservative solution should be used, which in this case is the β_T solution for H/W > 1.5.

A weight function is also available for this geometry from work performed by Wang [K.4]. It is worth noting that the β_T value at a/W = 0 in Figure K.1 was calculated, whereas the β_T value at a/W = 0 in [K.4] was based on an engineering judgment.

Derived solution for β_T :

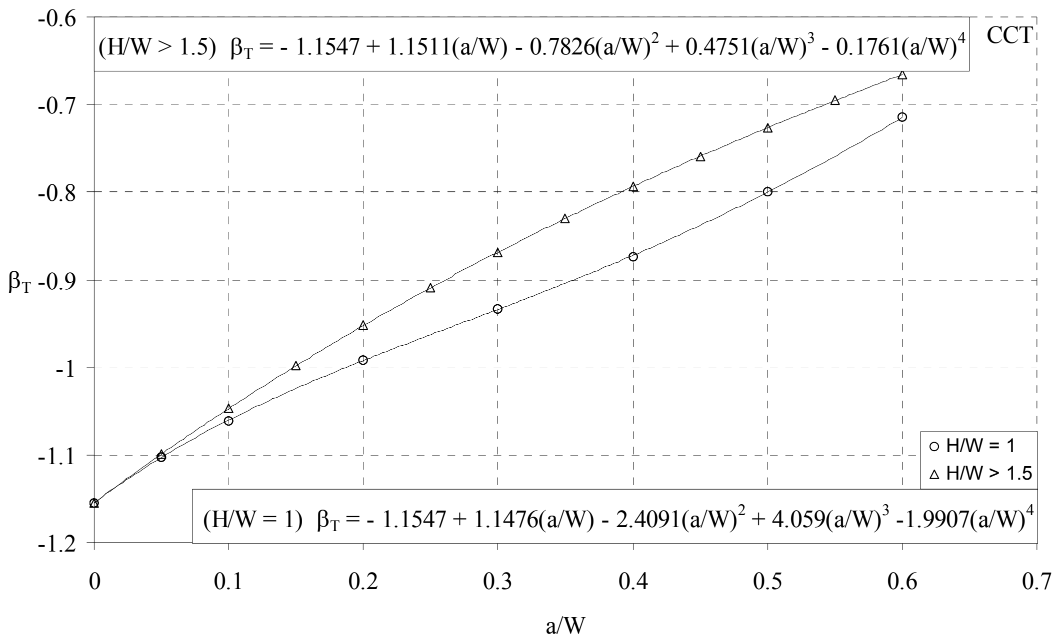
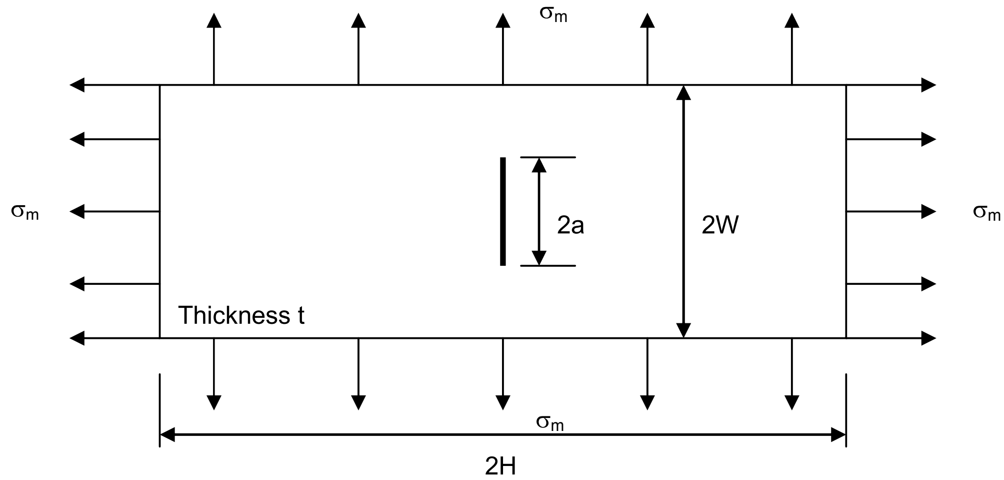


Figure K.1 –Plane strain β_T for CCT.

K.2.2.1.2 Centre-cracked plate: equibiaxial tension (CCBT)



Polynomial coefficients defining β_T:

Geometry	H/W	X_0	X_1	X_2	X_3	X_4
CCBT	1	0	-0.3642	2.423	-16.156	18.606
CCBT	> 1.5	0	-0.2777	2.6472	-12.499	12.122

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4 \quad (J.3)$$

for $0 \le a/W \le 0.6$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2} \qquad \text{for } a/W < 0.5$$

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2}\,\frac{a/W}{\left(1 - a/W\right)} \qquad \text{for } a/W \ge 0.5 \quad (J.4)$$

where σ_{ref} is obtained using the plane strain von Mises limit load [K.6].

References: [K.1-K.3].

Additional information:

The open circles and triangles in Figure K.2 represent the raw data that were used to generate the polynomial fits. For the situation where 1 < H/W ≤ 1.5, the most conservative solution should be used, which in this case is the β_T solution for H/W > 1.5.

Derived solution for β_T :

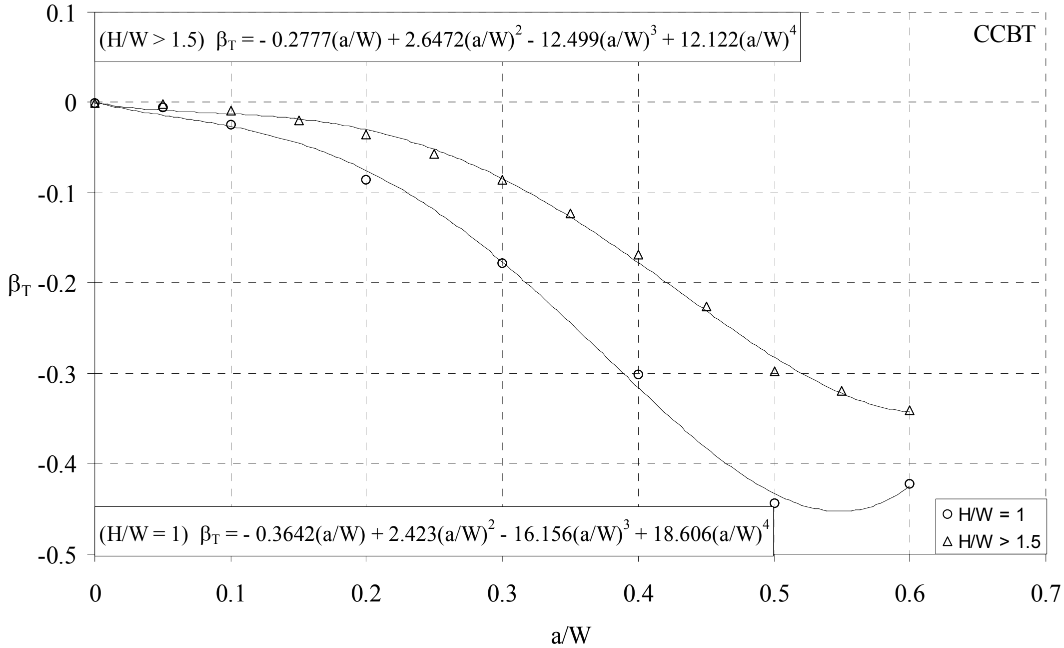
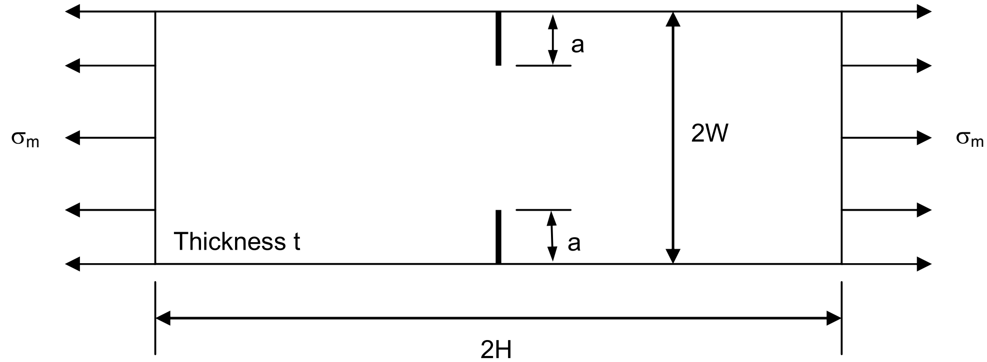


Figure K.2 – Plane strain β_T for CCBT.

K.2.2.1.3 Double edge-cracked plate: uniaxial tension (DECT)



Polynomial coefficients defining β_T :

Geometry	H/W	X_0	X_1	X_2	X_3	X_4
DECT	2	-0.5889	-0.0097	1.1103	-1.3852	0.6573

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4 \qquad \text{(J.5)}$$

for $0 \le a/W \le 0.6$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2}\,\frac{1}{\left[1+\ln\left(\frac{2W-a}{2(W-a)}\right)\right]\left(1-\frac{a}{W}\right)} \qquad \text{(J.6)}$$

for $0 < a/W < 0.884$

where σ_{ref} is obtained using the plane strain von Mises limit load [K.6].

References: [K.1, K.3, K.5].

Additional information:

The open circles in Figure K.3 represent the raw data that were used to generate the polynomial fit.

A weight function is also available for this geometry from work performed by Wang [K.4]. It is worth noting that the β_T value at a/W = 0 in Figure K.3 was calculated, whereas the β_T value at a/W = 0 in [K.4] was based on an engineering judgement.

Derived solution for β_T :

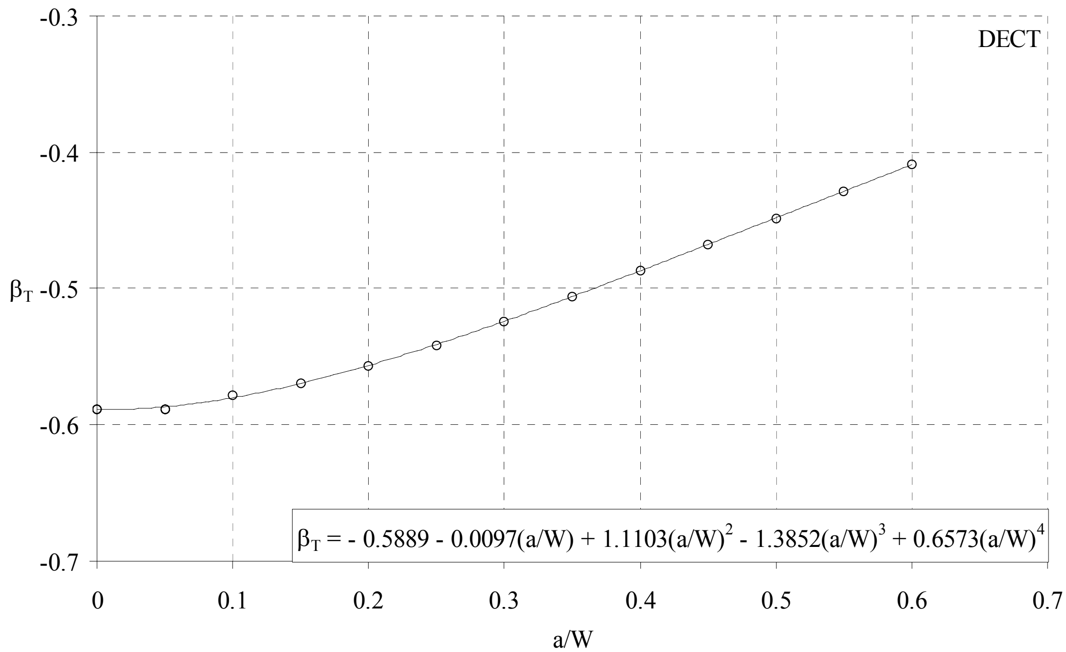
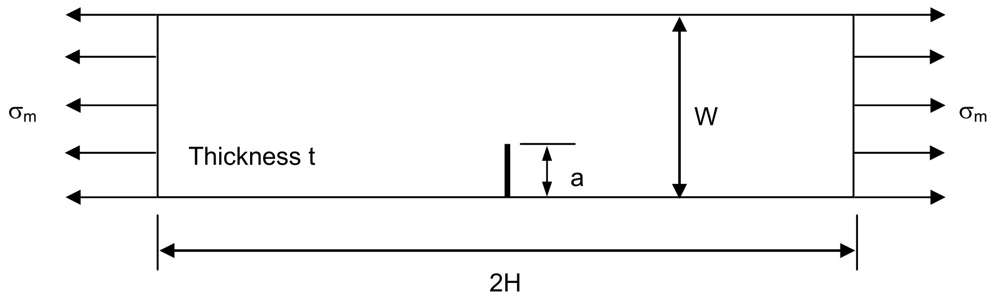


Figure K.3 – Plane strain β_T for DECT (H/W = 2).

K.2.2.1.4 Single edge-cracked plate: uniaxial tension (SECT)



Polynomial coefficients defining β_T :

Geometry	H/W	X_0	X_1	X_2	X_3	X_4
SECT	6	-0.5889	-0.0128	0.5512	4.651	-4.6703

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4 \quad (J.7)$$

for $0 \le a/W \le 0.8$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2}\frac{1}{\left[1 - x - 1.232x^2 + x^3 + 22x^3(0.545 - x)^2\right]} \quad (J.8)$$

for $x \le 0.545$

$$\sigma_{ref} = \frac{\sqrt{3}\,\sigma_m}{2}\frac{1}{1.702\left\{\left[(0.794 - y)^2 + 0.5876y^2\right]^{0.5} - [0.794 - y]\right\}} \quad (J.9)$$

for x > 0.545

where $x = a/W$, y = (1 – x), and σ_{ref} is obtained using the plane strain von Mises limit load [K.6] for pin loading.

References: [K.1, K.3, K.5].

Additional information:

The open circles in Figure K.4 represent the raw data that were used to generate the polynomial fit.

A weight function is also available for this geometry from work performed by Wang [K.4]. It is worth noting that the β_T value at a/W = 0 in Figure K.4 was calculated, whereas the β_T value at a/W = 0 in [K.4] was based on an engineering judgement.

Derived solution for β_T :

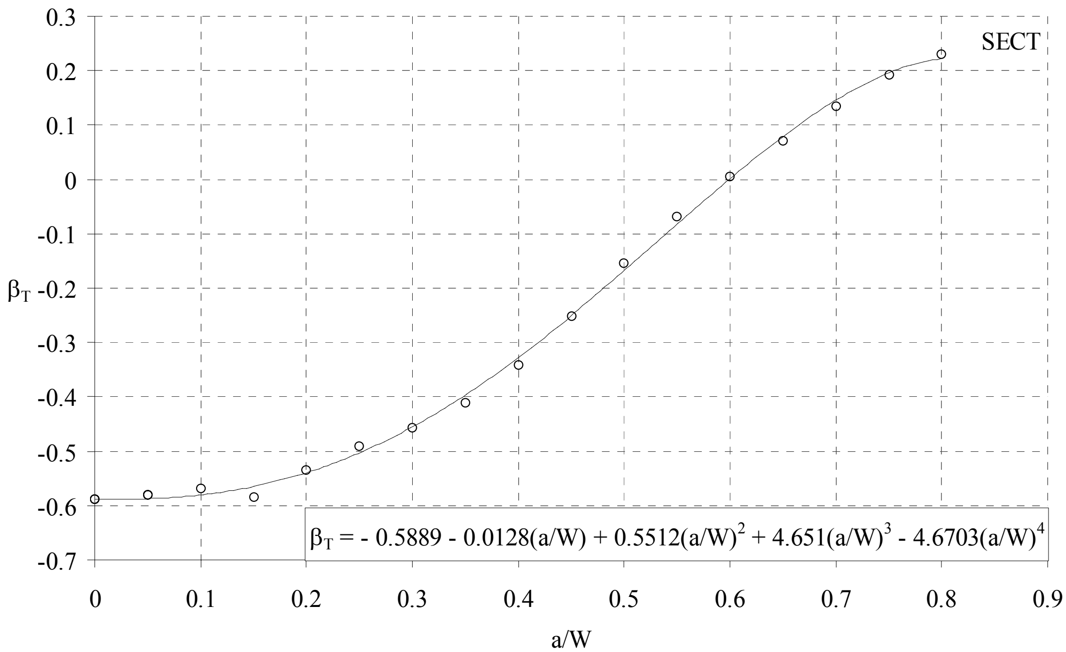
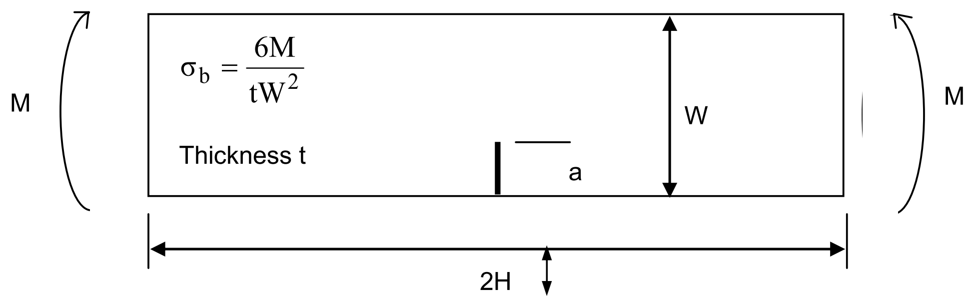


Figure K.4 – Plane strain β_T for SECT (H/W = 6).

K.2.2.1.5 Single edge-cracked plate: pure bending (SEB)



Polynomial coefficients defining β_T :

Geometry	H/W	X_0	X_1	X_2	X_3	X_4
SEB	6	-0.8833	2.8825	0.5863	-5.7069	3.5896

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4$$

for $0 \le a/W \le 0.8$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sigma_b}{\sqrt{3}} \frac{1}{\left(1 + 1.686x - 2.72x^2\right)\left(1 - x\right)^2} \quad \text{(J.10)}$$

for x $\le$ 0.295

$$\sigma_{ref} = \frac{\sigma_b}{\sqrt{3}} \frac{1}{1.2606\left(1 - x\right)^2} \quad \text{(J.11)}$$

for x > 0.295

where $x = a/W$, and σ_{ref} is obtained using the plane strain von Mises limit load [K.6].

References: [K.1, K.3, K.5].

Additional information:

The open circles in Figure K.5 represent the raw data that were used to generate the polynomial fit.

Derived solution for β_T :

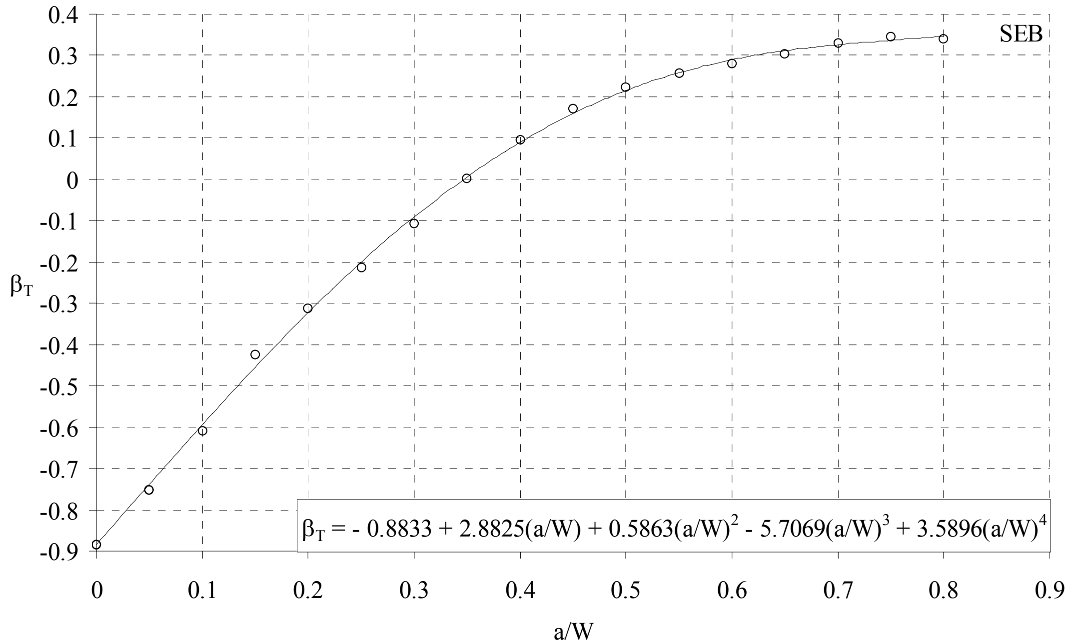
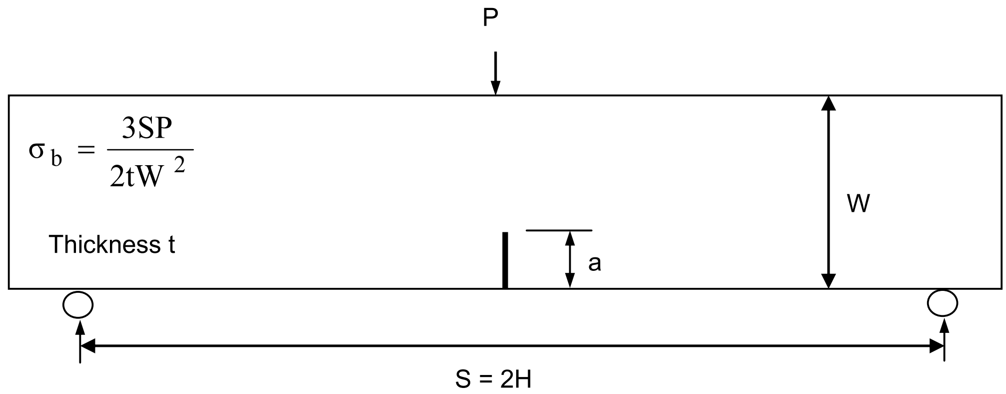


Figure K.5 – Plane strain β_T for SEB (H/W = 6).

K.2.2.1.6 Single edge-cracked plate: 3 point bend (3PB)



Polynomial coefficients defining β_T :

Geometry	H/W	X_0	X_1	X_2	X_3	X_4	X_5	X_6
3PB	2	-0.7887	-0.1795	32.904	-153.45	316.11	-308.47	115.18

$$\beta_T = X_0 + X_1\left(a/W\right) + X_2\left(a/W\right)^2 + X_3\left(a/W\right)^3 + X_4\left(a/W\right)^4 + X_5\left(a/W\right)^5 + X_6\left(a/W\right)^6 \quad \text{(J.12)}$$

for $0 \leq a/W \leq 0.8$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sigma_b}{\sqrt{3}} \frac{1}{\left(1.12 + 1.13x - 3.194x^2\right)\left(1-x\right)^2} \quad \text{(J.13)}$$

for $0 < x \leq 0.18$

$$\sigma_{ref} = \frac{\sigma_b}{\sqrt{3}} \frac{1}{1.22\left(1-x\right)^2} \quad \text{(J.14)}$$

for $0.18 \leq x < 1$

where x = a/W, and σ_{ref} is obtained using the plane strain von Mises limit load from [K.6].

References: [K.1, K.3, K.5].

Additional information:

The open circles in Figure K.6 represent the raw data that were used to generate the polynomial fit.

Derived solution for β_T :

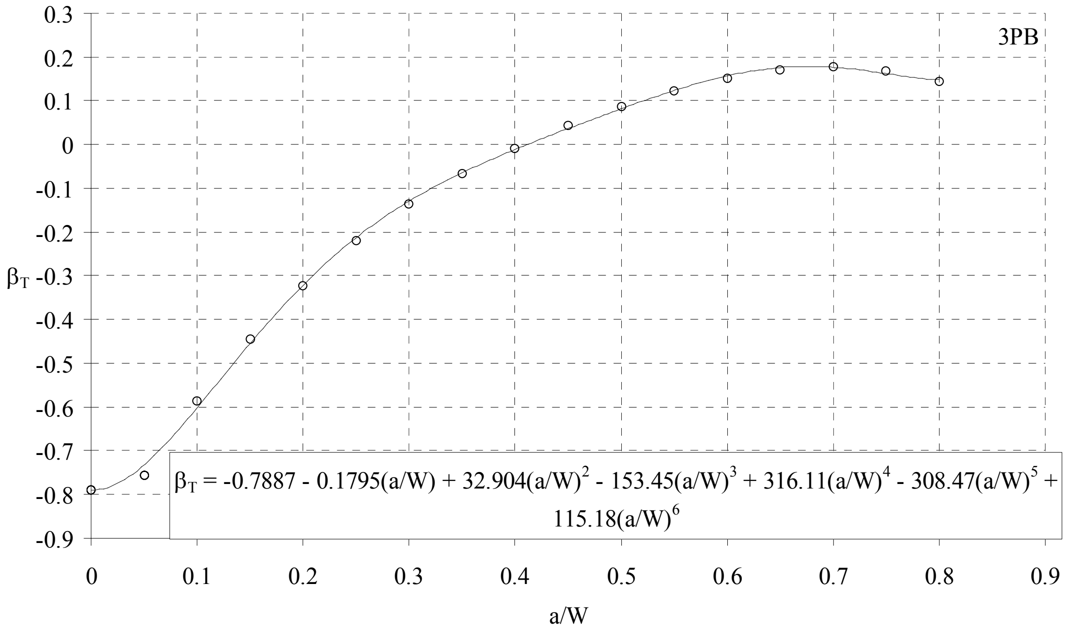


Figure K.6 – Plane strain β_T for 3PB (H/W = 2)

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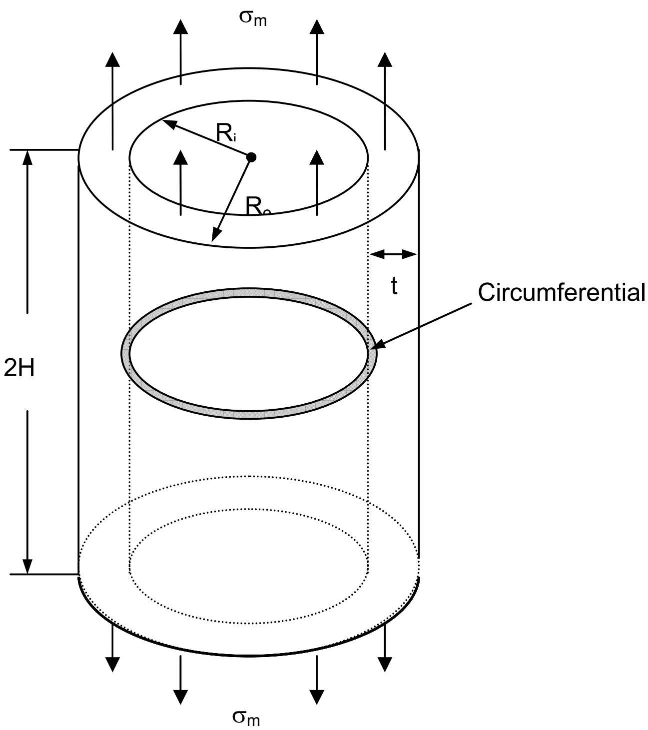
K.2.2.2 Cylinder

K.2.2.2.1 Circumferentially cracked cylinder: tension (CCCT)



Polynomial coefficients defining β_T (H/t = 10):

Geometry	R_i/t	X_0	X_1	X_2	X_3	X_4	X_5	X_6
CCCT	2.5	-0.51	-0.5247	5.2871	-19.103	36.294	-35.242	13.536
CCCT	5	-0.51	-0.4074	4.0608	-13.768	27.014	-28.024	11.33
CCCT	10	-0.51	-0.349	3.3111	-11.111	24.588	-27.936	11.687
CCCT	20	-0.51	-0.3175	2.7925	-9.3521	23.048	-26.86	10.808

$$\beta_T = X_0 + X_1\left(a/t\right) + X_2\left(a/t\right)^2 + X_3\left(a/t\right)^3 + X_4\left(a/t\right)^4 + X_5\left(a/t\right)^5 + X_6\left(a/t\right)^6 \quad \text{(J.15)}$$

for $0 \leq a/t \leq 0.8$

Reference stress solution used:

$$\sigma_{ref} = \frac{\sigma_m}{(1 - a/t)\left\{\left[\frac{a}{2(t-a)}\right] + \left[1 - \frac{3}{4}\left(\frac{a}{t-a}\right)^2\right]^{1/2}\right\}} \quad \text{(J.16)}$$

for a/t $\le \dfrac{1}{1+\sqrt{3}}$

$$\sigma_{ref} = \frac{\sqrt{3}\ \sigma_m}{2}\frac{1}{(1-a/t)} \qquad \text{(J.17)}$$

for a/t $\ge \dfrac{1}{1+\sqrt{3}}$

where σ_{ref} is obtained from Annex B, which has used the von Mises yield criterion.

References: [K.1, K.7]

Additional information:

The closed triangles, circles, squares and diamonds in **Error! Reference source not found.** represent the raw data that were used to generate the polynomial fits.

Derived solution for β_T :

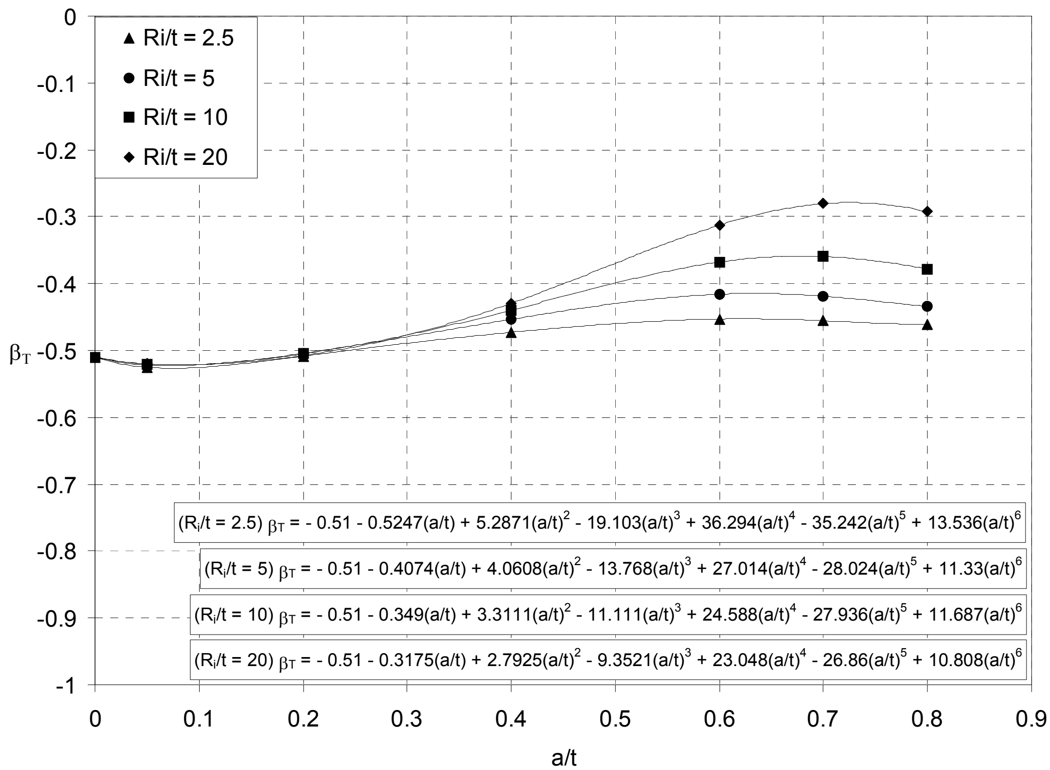


Figure K.7 – Plane strain βT for CCCT (H/t = 10).

K.2.3 Bibliography

[K.1] G Harlin and J R Willis, The influence of crack size on the ductile-brittle transition, Proc R Soc Lond A 415, 197-226 (1988).

[K.2] T Fett, T-Stresses in rectangular plates and circular disks, Engng Fract Mech 60, 631-652 (1998).

[K.3] R D Patel, Determination of bT solutions for various geometries using elastic finite element analyses, British Energy Report E/REP/ATEC/0040/GEN/02 (2002).

[K.4] X Wang, Elastic *T*-stress for cracks in test specimens subjected to non-uniform stress distributions, Engng Fract Mech **69**, 1339-1352 (2002).

[K.5] A H Sherry, C C France and M R Goldthorpe, Compendium of T-stress solutions for two and three dimensional cracked geometries, Fatigue Fract Engng Mater Struct 18, 141-155 (1995).

[K.6] A G Miller, Review of limit loads of structures containing defects, 3rd edition, CEGB Report TPRD/B/0093/N82 – Revision 2 (1987); see also Int J Pres Ves Piping 32, 191-327 (1988).

[K.7] R D Patel, Determination of bT solutions for various geometries using elastic finite element analyses – part II, British Energy Report E/REP/BDBB/0019/GEN/03 (2003).

[K.8] D J Sanderson, A H Sherry and N P O'Dowd, Compendium of b solutions for use with the R6 constraint modified framework, AEA Technology Report AEA-TSD-0981 (1996).

K.3 Look-up tables for constraint corrected FAD.

K.3.1 Introduction

This section provides two sets of Lookup Tables that define the material parameters α and k used within Section 6.4.3 (Equation 6.72) to define the constraint sensitivity of material toughness. The Lookup tables were developed by Sherry et al [K.9] within the framework of the recently completed project VOCALIST [K.10].

The material parameters α and k are given as a function of tensile properties (E/σ_Y and n) and the Weibull model exponent (m) with constraint quantified in terms of T/σ_Y (K.4.2) and in terms of hydrostatic Q-stress (K.4.3). Once identified, these parameters may be applied within Eq. (6.72) to define the ratio K_{cmat}/K_{mat} for the material and at the temperature of interest. This ratio has been shown to be largely independent of cleavage fracture probability and hence may be used to assess the influence of constraint on lower-bound, mean and/or upper bound toughness properties as appropriate.

To use the Lookup Tables, values of the Young's modulus (E), yield strength (σ_Y), strain hardening exponent (n) and the Weibull model exponent (m) are required for the material and at the temperature of interest.

Note: that calibration of the Weibull exponent m is a subject of ongoing debate. Early guidance on calibration advocated the use of notched specimen data [K.11]. However, it is now recommended that, where possible, the parameter m should be calibrated against pre-cracked specimen data [K.12]. Current best practice is to use data derived from both high and low constraint fracture toughness specimens, such as deep and shallow-cracked bend specimens. This enables the calibrated model to be applied to interpolate between constraint states, rather than to extrapolate outside the range of applicability. A review of the calibration methods available is provided in [K.13, K.14].

K.3.2 Lookup Tables for a and k defined with respect to T/σ_Y

n = 5	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_0	α	k	α	k	α	k	α	k	α	k	α	k	α	k
450	0.708	2.13	1.013	1.67	1.087	1.41	1.017	1.30	0.889	1.28	0.789	1.30	0.806	1.29
475	0.761	2.15	1.036	1.68	1.091	1.41	1.010	1.30	0.878	1.28	0.778	1.30	0.793	1.30
500	0.797	2.14	1.053	1.67	1.097	1.41	1.009	1.30	0.873	1.28	0.772	1.30	0.786	1.30
525	0.826	2.11	1.069	1.66	1.103	1.41	1.010	1.30	0.871	1.28	0.768	1.30	0.783	1.31
550	0.851	2.08	1.083	1.65	1.110	1.41	1.012	1.30	0.870	1.29	0.766	1.31	0.781	1.31
575	0.874	2.04	1.097	1.64	1.117	1.41	1.014	1.31	0.870	1.29	0.765	1.31	0.780	1.32
600	0.894	2.00	1.110	1.62	1.125	1.41	1.018	1.31	0.870	1.29	0.764	1.31	0.780	1.33
625	0.913	1.95	1.123	1.61	1.132	1.41	1.021	1.32	0.872	1.30	0.764	1.31	0.781	1.33
650	0.930	1.90	1.135	1.59	1.140	1.41	1.025	1.32	0.873	1.30	0.765	1.32	0.782	1.34
675	0.946	1.85	1.147	1.58	1.148	1.41	1.030	1.33	0.875	1.30	0.765	1.32	0.783	1.35
700	0.962	1.80	1.159	1.56	1.156	1.41	1.034	1.33	0.877	1.31	0.767	1.32	0.785	1.36
725	0.976	1.74	1.171	1.54	1.164	1.41	1.039	1.34	0.880	1.31	0.768	1.32	0.787	1.36
750	0.990	1.69	1.182	1.52	1.172	1.41	1.044	1.34	0.882	1.31	0.769	1.33	0.790	1.37

n = 6	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
425	0.704	2.13	1.177	1.76	1.397	1.54	1.453	1.43	1.433	1.39	1.425	1.38	1.517	1.37
450	0.760	2.18	1.202	1.78	1.403	1.54	1.453	1.43	1.442	1.39	1.461	1.39	1.600	1.38
475	0.799	2.18	1.224	1.78	1.409	1.54	1.449	1.42	1.435	1.39	1.460	1.39	1.615	1.39
500	0.832	2.17	1.243	1.77	1.415	1.54	1.444	1.42	1.421	1.39	1.441	1.39	1.598	1.39
525	0.859	2.15	1.260	1.77	1.421	1.54	1.437	1.42	1.402	1.38	1.412	1.38	1.562	1.38
550	0.884	2.12	1.277	1.76	1.427	1.53	1.429	1.42	1.380	1.38	1.376	1.38	1.513	1.38
575	0.907	2.09	1.294	1.74	1.433	1.53	1.421	1.42	1.356	1.37	1.335	1.37	1.455	1.37
600	0.927	2.05	1.309	1.73	1.439	1.53	1.413	1.41	1.331	1.37	1.290	1.36	1.389	1.37
625	0.947	2.01	1.325	1.72	1.444	1.53	1.404	1.41	1.303	1.36	1.241	1.35	1.318	1.36
650	0.965	1.96	1.340	1.70	1.450	1.52	1.395	1.41	1.275	1.35	1.190	1.34	1.241	1.35
675	0.982	1.91	1.355	1.69	1.455	1.52	1.385	1.41	1.245	1.35	1.136	1.32	1.160	1.34
700	0.998	1.86	1.369	1.67	1.461	1.52	1.376	1.41	1.215	1.34	1.081	1.31	1.075	1.33

n = 7	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
425	0.756	2.24	1.409	1.90	1.765	1.69	1.916	1.56	1.954	1.50	1.972	1.47	2.062	1.43
450	0.801	2.27	1.434	1.91	1.775	1.69	1.916	1.56	1.951	1.50	1.973	1.47	2.076	1.43
475	0.838	2.28	1.457	1.91	1.784	1.69	1.914	1.55	1.940	1.49	1.958	1.46	2.062	1.43
500	0.870	2.26	1.479	1.91	1.794	1.68	1.911	1.55	1.926	1.48	1.934	1.45	2.031	1.43
525	0.898	2.24	1.499	1.90	1.803	1.68	1.907	1.55	1.909	1.48	1.904	1.44	1.990	1.42
550	0.924	2.22	1.519	1.89	1.812	1.68	1.903	1.55	1.889	1.47	1.869	1.43	1.941	1.41
575	0.948	2.18	1.538	1.88	1.821	1.68	1.899	1.54	1.869	1.46	1.831	1.42	1.886	1.40
600	0.971	2.14	1.556	1.87	1.830	1.67	1.894	1.54	1.847	1.46	1.791	1.41	1.826	1.39
625	0.992	2.10	1.575	1.86	1.839	1.67	1.889	1.54	1.824	1.45	1.748	1.40	1.763	1.38
650	1.013	2.06	1.593	1.84	1.848	1.67	1.883	1.53	1.800	1.44	1.703	1.38	1.695	1.37
675	1.032	2.01	1.610	1.83	1.857	1.67	1.877	1.53	1.776	1.43	1.657	1.37	1.625	1.36
700	1.051	1.96	1.628	1.81	1.866	1.66	1.872	1.53	1.751	1.42	1.609	1.36	1.553	1.35

n = 8	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
400	0.733	2.28	1.584	2.02	2.109	1.83	2.385	1.71	2.491	1.63	2.504	1.58	2.503	1.52
425	0.785	2.34	1.614	2.03	2.123	1.83	2.384	1.70	2.472	1.62	2.460	1.56	2.421	1.50
450	0.825	2.36	1.640	2.04	2.139	1.83	2.392	1.70	2.472	1.62	2.448	1.56	2.393	1.49
475	0.861	2.36	1.665	2.04	2.156	1.83	2.404	1.70	2.480	1.61	2.452	1.55	2.391	1.49
500	0.893	2.35	1.687	2.04	2.173	1.83	2.418	1.70	2.493	1.61	2.465	1.55	2.403	1.49
525	0.924	2.33	1.710	2.03	2.190	1.83	2.434	1.70	2.510	1.61	2.484	1.55	2.426	1.49
550	0.953	2.30	1.731	2.02	2.208	1.83	2.452	1.70	2.529	1.61	2.508	1.55	2.456	1.49
575	0.980	2.27	1.752	2.02	2.226	1.83	2.470	1.70	2.551	1.62	2.536	1.55	2.493	1.50
600	1.007	2.24	1.773	2.01	2.244	1.83	2.489	1.71	2.575	1.62	2.567	1.55	2.535	1.50
625	1.032	2.20	1.793	1.99	2.263	1.83	2.509	1.71	2.599	1.62	2.601	1.56	2.580	1.51
650	1.057	2.16	1.813	1.98	2.281	1.84	2.530	1.72	2.626	1.62	2.637	1.56	2.630	1.52
675	1.082	2.11	1.833	1.97	2.300	1.84	2.550	1.72	2.653	1.63	2.674	1.56	2.682	1.53

n = 9	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
400	0.756	2.33	1.701	2.09	2.372	1.94	2.813	1.84	3.068	1.77	3.184	1.70	3.203	1.62
425	0.798	2.36	1.728	2.10	2.389	1.94	2.822	1.83	3.068	1.76	3.168	1.70	3.162	1.61
450	0.835	2.37	1.752	2.11	2.408	1.94	2.841	1.83	3.087	1.76	3.184	1.69	3.171	1.61
475	0.870	2.37	1.776	2.11	2.429	1.94	2.864	1.83	3.116	1.76	3.220	1.70	3.210	1.61
500	0.903	2.36	1.799	2.11	2.451	1.94	2.892	1.84	3.153	1.77	3.268	1.70	3.268	1.62
525	0.936	2.35	1.822	2.10	2.474	1.94	2.922	1.84	3.195	1.77	3.325	1.71	3.341	1.63
550	0.967	2.33	1.844	2.10	2.496	1.95	2.953	1.85	3.242	1.78	3.390	1.72	3.425	1.65
575	0.998	2.30	1.865	2.09	2.520	1.95	2.987	1.85	3.292	1.79	3.461	1.73	3.518	1.66
600	1.028	2.27	1.887	2.08	2.544	1.95	3.022	1.86	3.345	1.80	3.536	1.74	3.618	1.68
625	1.058	2.24	1.908	2.08	2.568	1.96	3.058	1.87	3.400	1.81	3.615	1.75	3.725	1.70
650	1.087	2.21	1.929	2.07	2.592	1.96	3.095	1.88	3.457	1.82	3.698	1.77	3.837	1.71
675	1.116	2.17	1.950	2.06	2.616	1.96	3.133	1.89	3.516	1.83	3.784	1.78	3.954	1.73

n =10	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
350	0.681	2.17	1.722	2.10	2.565	2.03	3.225	1.98	3.720	1.93	4.064	1.87	4.276	1.79
375	0.727	2.27	1.750	2.12	2.575	2.03	3.214	1.96	3.682	1.91	3.992	1.85	4.160	1.76
400	0.768	2.32	1.776	2.14	2.591	2.03	3.225	1.96	3.689	1.90	3.993	1.85	4.147	1.76
425	0.806	2.35	1.800	2.15	2.611	2.03	3.247	1.95	3.715	1.90	4.022	1.85	4.177	1.76
450	0.843	2.36	1.824	2.15	2.633	2.03	3.275	1.96	3.752	1.91	4.070	1.85	4.231	1.76
475	0.879	2.36	1.847	2.15	2.656	2.03	3.306	1.96	3.797	1.91	4.129	1.86	4.303	1.77
500	0.914	2.36	1.870	2.15	2.680	2.03	3.340	1.97	3.847	1.92	4.197	1.87	4.387	1.79
525	0.948	2.35	1.893	2.15	2.705	2.04	3.377	1.97	3.902	1.93	4.272	1.88	4.481	1.80
550	0.982	2.33	1.915	2.15	2.730	2.04	3.415	1.98	3.960	1.94	4.353	1.90	4.582	1.82
575	1.016	2.32	1.937	2.14	2.755	2.04	3.455	1.99	4.021	1.95	4.438	1.91	4.690	1.84
600	1.049	2.30	1.959	2.14	2.781	2.05	3.496	2.00	4.084	1.96	4.527	1.92	4.804	1.86
625	1.083	2.28	1.981	2.13	2.808	2.05	3.538	2.01	4.150	1.98	4.619	1.94	4.922	1.88
650	1.115	2.25	2.003	2.13	2.834	2.06	3.581	2.02	4.217	1.99	4.714	1.96	5.045	1.90

n =11	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
325	0.656	2.11	1.761	2.12	2.747	2.11	3.599	2.09	4.300	2.06	4.837	2.00	5.193	1.92
350	0.699	2.21	1.785	2.15	2.756	2.11	3.597	2.08	4.292	2.05	4.824	1.99	5.177	1.91
375	0.739	2.27	1.808	2.16	2.772	2.11	3.613	2.07	4.312	2.05	4.850	2.00	5.209	1.91
400	0.778	2.31	1.831	2.18	2.792	2.11	3.637	2.07	4.345	2.05	4.894	2.00	5.262	1.91
425	0.816	2.33	1.855	2.18	2.813	2.11	3.666	2.07	4.387	2.05	4.949	2.01	5.328	1.92
450	0.854	2.34	1.878	2.19	2.836	2.11	3.698	2.08	4.434	2.06	5.012	2.02	5.402	1.93
475	0.892	2.35	1.901	2.19	2.860	2.11	3.733	2.08	4.485	2.07	5.080	2.03	5.484	1.94
500	0.929	2.36	1.924	2.19	2.884	2.12	3.769	2.09	4.539	2.07	5.153	2.04	5.571	1.96
525	0.966	2.35	1.947	2.19	2.910	2.12	3.807	2.09	4.596	2.08	5.229	2.05	5.661	1.97
550	1.003	2.35	1.970	2.19	2.935	2.12	3.847	2.10	4.654	2.09	5.308	2.07	5.756	1.99
575	1.039	2.34	1.994	2.19	2.962	2.13	3.887	2.11	4.715	2.10	5.389	2.08	5.853	2.00
600	1.076	2.33	2.017	2.19	2.988	2.13	3.929	2.12	4.777	2.11	5.473	2.09	5.953	2.02

n =12	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
300	0.630	2.05	1.792	2.14	2.916	2.19	3.958	2.20	4.872	2.18	5.616	2.13	6.143	2.05
325	0.670	2.15	1.810	2.17	2.925	2.18	3.968	2.19	4.895	2.18	5.660	2.14	6.220	2.05
350	0.710	2.22	1.831	2.19	2.940	2.18	3.988	2.19	4.929	2.18	5.713	2.14	6.294	2.06
375	0.750	2.26	1.853	2.20	2.959	2.18	4.014	2.19	4.968	2.19	5.770	2.15	6.367	2.06
400	0.790	2.30	1.876	2.21	2.979	2.18	4.043	2.19	5.012	2.19	5.829	2.16	6.440	2.07
425	0.830	2.33	1.899	2.22	3.001	2.18	4.074	2.19	5.057	2.20	5.890	2.17	6.511	2.08
450	0.870	2.35	1.923	2.23	3.024	2.19	4.106	2.19	5.105	2.20	5.952	2.18	6.583	2.09
475	0.909	2.36	1.946	2.23	3.047	2.19	4.140	2.19	5.154	2.21	6.016	2.19	6.654	2.10
500	0.949	2.37	1.970	2.24	3.071	2.19	4.175	2.20	5.204	2.22	6.080	2.20	6.724	2.11
525	0.989	2.38	1.994	2.24	3.096	2.19	4.211	2.20	5.255	2.22	6.145	2.21	6.795	2.12
550	1.028	2.39	2.018	2.24	3.122	2.20	4.248	2.21	5.308	2.23	6.210	2.22	6.865	2.13
575	1.068	2.39	2.043	2.24	3.147	2.20	4.285	2.21	5.360	2.24	6.276	2.23	6.935	2.15

n =13	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
275	0.603	1.98	1.816	2.15	3.074	2.26	4.306	2.31	5.438	2.30	6.398	2.26	7.112	2.18
300	0.642	2.09	1.830	2.18	3.083	2.25	4.328	2.30	5.488	2.31	6.491	2.28	7.261	2.19
325	0.683	2.17	1.849	2.20	3.098	2.25	4.352	2.30	5.534	2.31	6.567	2.29	7.371	2.20
350	0.724	2.22	1.869	2.22	3.115	2.25	4.379	2.29	5.579	2.32	6.633	2.30	7.460	2.21
375	0.765	2.27	1.891	2.23	3.134	2.25	4.407	2.29	5.622	2.32	6.694	2.31	7.535	2.22
400	0.807	2.31	1.914	2.25	3.154	2.25	4.435	2.29	5.665	2.33	6.750	2.32	7.600	2.22
425	0.848	2.34	1.938	2.26	3.176	2.25	4.464	2.29	5.706	2.33	6.803	2.33	7.658	2.23
450	0.890	2.37	1.962	2.26	3.198	2.26	4.494	2.30	5.747	2.34	6.854	2.33	7.710	2.24
475	0.933	2.39	1.987	2.27	3.220	2.26	4.524	2.30	5.788	2.34	6.903	2.34	7.758	2.24
500	0.975	2.41	2.012	2.28	3.244	2.26	4.555	2.30	5.829	2.35	6.949	2.35	7.801	2.25
525	1.017	2.43	2.037	2.29	3.268	2.26	4.586	2.30	5.869	2.35	6.994	2.35	7.840	2.25
550	1.059	2.44	2.063	2.29	3.292	2.26	4.617	2.30	5.909	2.35	7.038	2.36	7.877	2.26

n =14	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
250	0.576	1.92	1.835	2.17	3.225	2.32	4.644	2.41	5.993	2.42	7.169	2.39	8.072	2.30
275	0.615	2.03	1.845	2.20	3.234	2.32	4.676	2.40	6.066	2.43	7.301	2.41	8.276	2.32
300	0.655	2.11	1.861	2.22	3.247	2.32	4.704	2.40	6.124	2.44	7.397	2.43	8.414	2.34
325	0.697	2.18	1.880	2.24	3.263	2.32	4.731	2.40	6.172	2.45	7.472	2.44	8.516	2.34
350	0.740	2.24	1.901	2.25	3.280	2.32	4.758	2.40	6.215	2.45	7.533	2.45	8.593	2.35
375	0.783	2.29	1.924	2.27	3.299	2.32	4.783	2.39	6.253	2.45	7.584	2.45	8.652	2.36
400	0.827	2.33	1.948	2.28	3.318	2.32	4.808	2.39	6.288	2.46	7.627	2.46	8.697	2.36
425	0.871	2.37	1.973	2.29	3.338	2.32	4.833	2.39	6.320	2.46	7.665	2.46	8.731	2.36
450	0.916	2.41	1.998	2.31	3.359	2.32	4.857	2.39	6.350	2.46	7.697	2.47	8.756	2.36
475	0.960	2.44	2.025	2.32	3.380	2.32	4.881	2.39	6.378	2.46	7.725	2.47	8.774	2.36
500	1.005	2.47	2.051	2.33	3.402	2.32	4.904	2.39	6.404	2.46	7.749	2.47	8.785	2.36
525	1.050	2.50	2.079	2.34	3.424	2.32	4.928	2.38	6.429	2.46	7.770	2.47	8.790	2.36

n =15	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
200	0.519	1.69	1.865	2.13	3.369	2.39	4.909	2.50	6.364	2.51	7.612	2.45	8.531	2.37
225	0.549	1.86	1.851	2.18	3.368	2.39	4.970	2.50	6.526	2.54	7.907	2.51	8.984	2.42
250	0.587	1.97	1.856	2.21	3.376	2.38	5.011	2.50	6.622	2.55	8.075	2.54	9.233	2.44
275	0.628	2.06	1.869	2.23	3.388	2.38	5.043	2.50	6.692	2.56	8.191	2.55	9.398	2.46
300	0.671	2.14	1.886	2.25	3.402	2.38	5.071	2.50	6.745	2.57	8.275	2.57	9.513	2.47
325	0.715	2.20	1.906	2.27	3.418	2.38	5.096	2.49	6.787	2.57	8.338	2.58	9.595	2.47
350	0.759	2.26	1.929	2.29	3.434	2.38	5.118	2.49	6.821	2.57	8.385	2.58	9.652	2.48
375	0.805	2.32	1.953	2.31	3.452	2.38	5.138	2.48	6.849	2.57	8.421	2.59	9.690	2.48
400	0.851	2.37	1.978	2.32	3.470	2.38	5.157	2.48	6.872	2.57	8.447	2.59	9.712	2.48
425	0.898	2.42	2.005	2.34	3.489	2.38	5.175	2.48	6.891	2.57	8.465	2.59	9.722	2.47
450	0.945	2.47	2.033	2.35	3.508	2.38	5.192	2.47	6.907	2.56	8.476	2.59	9.721	2.47
475	0.992	2.51	2.061	2.36	3.527	2.38	5.207	2.47	6.919	2.56	8.481	2.59	9.710	2.47
500	1.039	2.55	2.091	2.38	3.547	2.37	5.222	2.46	6.929	2.56	8.481	2.58	9.692	2.46

n =16	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
175	0.496	1.64	1.889	2.15	3.502	2.45	5.194	2.58	6.818	2.61	8.232	2.55	9.292	2.47
200	0.523	1.79	1.865	2.18	3.503	2.45	5.277	2.59	7.025	2.64	8.587	2.61	9.803	2.52
225	0.560	1.90	1.864	2.21	3.511	2.44	5.329	2.59	7.147	2.66	8.793	2.65	10.10	2.55
250	0.600	2.00	1.873	2.24	3.521	2.44	5.367	2.59	7.230	2.67	8.931	2.67	10.29	2.57
275	0.643	2.08	1.887	2.26	3.534	2.44	5.397	2.59	7.291	2.68	9.029	2.68	10.43	2.58
300	0.688	2.16	1.906	2.29	3.548	2.44	5.421	2.58	7.335	2.68	9.099	2.69	10.52	2.58
325	0.734	2.23	1.928	2.31	3.562	2.44	5.440	2.58	7.368	2.68	9.149	2.70	10.59	2.58
350	0.781	2.30	1.953	2.33	3.577	2.44	5.457	2.57	7.391	2.68	9.182	2.70	10.63	2.58
375	0.829	2.36	1.979	2.34	3.593	2.43	5.470	2.57	7.407	2.68	9.202	2.70	10.65	2.58
400	0.878	2.43	2.007	2.36	3.610	2.43	5.482	2.56	7.417	2.67	9.211	2.70	10.66	2.58
425	0.927	2.49	2.036	2.38	3.627	2.43	5.491	2.55	7.422	2.67	9.211	2.70	10.65	2.57
450	0.976	2.54	2.066	2.40	3.644	2.43	5.499	2.54	7.422	2.66	9.204	2.69	10.64	2.56

n =17	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	

E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
150	0.476	1.58	1.917	2.16	3.628	2.50	5.444	2.66	7.201	2.69	8.736	2.63	9.884	2.55
175	0.498	1.72	1.879	2.19	3.630	2.50	5.557	2.67	7.467	2.73	9.167	2.70	10.46	2.60
200	0.532	1.83	1.869	2.22	3.637	2.50	5.625	2.68	7.623	2.76	9.422	2.74	10.81	2.63
225	0.572	1.93	1.872	2.24	3.646	2.50	5.671	2.68	7.728	2.77	9.594	2.77	11.05	2.65
250	0.614	2.02	1.884	2.27	3.657	2.50	5.706	2.68	7.801	2.78	9.716	2.79	11.22	2.66
275	0.659	2.11	1.901	2.29	3.669	2.49	5.731	2.67	7.853	2.79	9.803	2.80	11.35	2.67
300	0.706	2.19	1.922	2.32	3.682	2.49	5.750	2.66	7.889	2.79	9.864	2.81	11.44	2.67
325	0.754	2.27	1.946	2.34	3.695	2.49	5.763	2.66	7.913	2.78	9.906	2.81	11.50	2.67
350	0.804	2.34	1.973	2.36	3.709	2.48	5.773	2.65	7.926	2.78	9.930	2.81	11.55	2.67
375	0.854	2.42	2.002	2.38	3.723	2.48	5.779	2.64	7.931	2.77	9.941	2.81	11.57	2.67
400	0.905	2.49	2.033	2.41	3.737	2.48	5.782	2.63	7.929	2.76	9.941	2.81	11.58	2.66
425	0.956	2.56	2.065	2.43	3.752	2.48	5.782	2.62	7.920	2.76	9.931	2.80	11.58	2.66

n =18	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
125	0.464	1.53	1.963	2.17	3.741	2.54	5.625	2.71	7.441	2.74	9.016	2.67	10.18	2.58
150	0.476	1.64	1.898	2.19	3.744	2.55	5.789	2.74	7.806	2.80	9.571	2.76	10.86	2.64
175	0.505	1.74	1.874	2.21	3.751	2.55	5.883	2.75	8.017	2.84	9.900	2.81	11.28	2.68
200	0.541	1.84	1.869	2.24	3.760	2.55	5.946	2.76	8.158	2.86	10.13	2.84	11.58	2.70
225	0.582	1.94	1.874	2.26	3.770	2.54	5.990	2.75	8.258	2.87	10.29	2.87	11.82	2.72
250	0.627	2.03	1.888	2.29	3.781	2.54	6.022	2.75	8.328	2.88	10.42	2.88	12.00	2.73
275	0.673	2.12	1.907	2.31	3.792	2.54	6.044	2.74	8.378	2.88	10.51	2.89	12.15	2.74
300	0.722	2.21	1.930	2.34	3.803	2.54	6.058	2.74	8.410	2.88	10.58	2.90	12.27	2.75
325	0.772	2.30	1.957	2.37	3.815	2.53	6.066	2.73	8.430	2.88	10.62	2.91	12.37	2.75
350	0.823	2.39	1.987	2.39	3.828	2.53	6.070	2.72	8.437	2.87	10.66	2.91	12.45	2.75
375	0.876	2.47	2.020	2.42	3.840	2.53	6.069	2.70	8.436	2.86	10.67	2.91	12.51	2.75
400	0.929	2.56	2.054	2.44	3.853	2.52	6.064	2.69	8.426	2.85	10.68	2.91	12.56	2.75

n =19	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
125	0.463	1.56	1.941	2.19	3.840	2.58	5.913	2.78	7.918	2.82	9.608	2.76	10.74	2.62
150	0.480	1.64	1.888	2.20	3.848	2.58	6.063	2.80	8.237	2.88	10.07	2.82	11.28	2.66
175	0.509	1.72	1.865	2.22	3.857	2.58	6.161	2.81	8.451	2.91	10.40	2.87	11.69	2.69
200	0.546	1.81	1.860	2.24	3.868	2.58	6.229	2.82	8.604	2.93	10.65	2.90	12.03	2.71
225	0.587	1.90	1.865	2.27	3.878	2.58	6.278	2.82	8.717	2.95	10.85	2.93	12.33	2.74
250	0.632	2.00	1.880	2.29	3.889	2.58	6.312	2.82	8.801	2.96	11.01	2.95	12.59	2.76
275	0.680	2.10	1.900	2.32	3.899	2.58	6.335	2.81	8.862	2.96	11.14	2.97	12.82	2.78
300	0.730	2.20	1.926	2.35	3.911	2.57	6.349	2.80	8.905	2.96	11.24	2.99	13.03	2.80
325	0.781	2.30	1.956	2.38	3.922	2.57	6.355	2.79	8.933	2.96	11.33	3.00	13.23	2.82
350	0.834	2.40	1.990	2.41	3.933	2.57	6.356	2.78	8.948	2.96	11.40	3.01	13.41	2.83
375	0.889	2.51	2.026	2.44	3.944	2.56	6.351	2.77	8.953	2.95	11.46	3.02	13.57	2.85
400	0.944	2.61	2.066	2.47	3.956	2.56	6.341	2.76	8.948	2.95	11.50	3.02	13.73	2.87

n =20	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
100	0.521	1.62	2.149	2.23	3.881	2.57	5.591	2.70	7.150	2.68	8.431	2.59	9.307	2.49
125	0.485	1.55	1.974	2.19	3.898	2.58	5.961	2.77	7.865	2.80	9.313	2.69	10.01	2.49
150	0.488	1.57	1.894	2.18	3.913	2.59	6.170	2.81	8.286	2.86	9.886	2.76	10.59	2.52
175	0.509	1.62	1.853	2.19	3.927	2.60	6.312	2.84	8.586	2.91	10.33	2.82	11.13	2.55
200	0.539	1.69	1.836	2.21	3.941	2.60	6.414	2.85	8.815	2.95	10.70	2.87	11.63	2.60
225	0.576	1.77	1.834	2.23	3.954	2.60	6.491	2.86	8.995	2.98	11.02	2.91	12.12	2.64
250	0.618	1.87	1.843	2.25	3.967	2.60	6.548	2.87	9.140	3.00	11.30	2.96	12.59	2.69
275	0.664	1.97	1.861	2.28	3.980	2.60	6.589	2.87	9.258	3.02	11.56	3.00	13.05	2.74
300	0.712	2.08	1.887	2.32	3.993	2.60	6.618	2.87	9.353	3.03	11.78	3.03	13.50	2.80
325	0.764	2.19	1.918	2.35	4.005	2.60	6.638	2.86	9.430	3.05	11.99	3.07	13.95	2.85
350	0.817	2.31	1.955	2.39	4.018	2.60	6.648	2.86	9.491	3.06	12.19	3.11	14.39	2.91
375	0.872	2.43	1.996	2.43	4.030	2.60	6.652	2.85	9.539	3.06	12.37	3.14	14.82	2.97
400	0.929	2.56	2.041	2.47	4.042	2.60	6.649	2.84	9.575	3.07	12.54	3.17	15.25	3.03

K.3.3 Lookup Tables for a and k defined with respect to Q-stresses

n = 5	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
450	0.593	1.84	0.890	1.45	0.971	1.23	0.915	1.14	0.803	1.12	0.714	1.13	0.728	1.13
475	0.636	1.87	0.910	1.46	0.976	1.24	0.911	1.14	0.795	1.13	0.704	1.14	0.717	1.14
500	0.667	1.86	0.926	1.46	0.981	1.24	0.911	1.15	0.791	1.13	0.698	1.15	0.711	1.15
525	0.693	1.84	0.940	1.46	0.987	1.24	0.911	1.15	0.788	1.14	0.695	1.15	0.707	1.15
550	0.716	1.82	0.953	1.45	0.993	1.25	0.913	1.16	0.787	1.14	0.692	1.16	0.705	1.16
575	0.737	1.79	0.965	1.44	0.999	1.25	0.914	1.16	0.786	1.15	0.691	1.16	0.703	1.17
600	0.756	1.75	0.977	1.43	1.005	1.25	0.916	1.17	0.786	1.15	0.690	1.17	0.702	1.18
625	0.775	1.72	0.988	1.42	1.011	1.25	0.919	1.17	0.787	1.16	0.689	1.17	0.702	1.19
650	0.792	1.68	0.999	1.41	1.017	1.25	0.922	1.18	0.787	1.16	0.689	1.17	0.702	1.19
675	0.809	1.63	1.010	1.40	1.023	1.26	0.924	1.18	0.788	1.16	0.689	1.18	0.702	1.20
700	0.825	1.59	1.020	1.39	1.029	1.26	0.927	1.19	0.789	1.17	0.689	1.18	0.703	1.21
725	0.841	1.55	1.031	1.37	1.036	1.26	0.931	1.20	0.790	1.17	0.690	1.18	0.704	1.22
750	0.856	1.50	1.041	1.36	1.042	1.26	0.934	1.20	0.792	1.18	0.691	1.19	0.705	1.23

n = 6	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
425	0.564	1.82	0.961	1.51	1.138	1.31	1.166	1.20	1.115	1.15	1.056	1.14	1.059	1.16
450	0.606	1.86	0.990	1.53	1.152	1.32	1.169	1.21	1.115	1.17	1.068	1.17	1.103	1.18
475	0.638	1.88	1.013	1.53	1.163	1.32	1.169	1.22	1.108	1.18	1.062	1.19	1.110	1.19
500	0.665	1.87	1.032	1.53	1.172	1.33	1.167	1.23	1.099	1.19	1.049	1.19	1.101	1.20
525	0.689	1.86	1.050	1.53	1.180	1.33	1.165	1.23	1.087	1.20	1.032	1.20	1.082	1.20
550	0.711	1.84	1.066	1.53	1.188	1.34	1.162	1.24	1.074	1.20	1.011	1.20	1.056	1.20
575	0.732	1.82	1.081	1.52	1.194	1.34	1.159	1.24	1.061	1.21	0.987	1.20	1.025	1.20
600	0.751	1.79	1.095	1.52	1.201	1.34	1.155	1.25	1.046	1.21	0.962	1.20	0.991	1.20
625	0.770	1.76	1.109	1.51	1.207	1.35	1.151	1.25	1.031	1.21	0.936	1.19	0.953	1.20
650	0.788	1.72	1.122	1.50	1.212	1.35	1.147	1.25	1.016	1.21	0.908	1.19	0.912	1.20
675	0.805	1.69	1.135	1.49	1.218	1.35	1.143	1.26	1.000	1.20	0.879	1.18	0.869	1.19
700	0.821	1.65	1.147	1.48	1.223	1.36	1.138	1.26	0.983	1.20	0.849	1.18	0.824	1.19

n = 7	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
425	0.555	1.90	1.082	1.61	1.371	1.42	1.491	1.31	1.509	1.25	1.495	1.22	1.517	1.21
450	0.588	1.93	1.108	1.63	1.387	1.43	1.497	1.32	1.509	1.26	1.495	1.24	1.526	1.22
475	0.617	1.94	1.131	1.63	1.401	1.44	1.501	1.32	1.505	1.27	1.487	1.24	1.520	1.22
500	0.644	1.94	1.152	1.64	1.413	1.44	1.504	1.33	1.499	1.27	1.474	1.24	1.505	1.22
525	0.669	1.93	1.172	1.64	1.425	1.45	1.506	1.34	1.492	1.27	1.458	1.24	1.483	1.22
550	0.692	1.91	1.191	1.64	1.437	1.45	1.509	1.34	1.484	1.28	1.441	1.24	1.458	1.22
575	0.715	1.89	1.210	1.64	1.448	1.46	1.510	1.34	1.475	1.28	1.421	1.24	1.429	1.22
600	0.737	1.86	1.228	1.63	1.459	1.46	1.512	1.35	1.465	1.28	1.401	1.24	1.398	1.22
625	0.759	1.84	1.246	1.63	1.470	1.47	1.513	1.35	1.455	1.28	1.379	1.23	1.364	1.22
650	0.780	1.81	1.263	1.62	1.480	1.47	1.514	1.36	1.445	1.28	1.356	1.23	1.329	1.21
675	0.801	1.77	1.280	1.62	1.490	1.48	1.514	1.36	1.434	1.27	1.333	1.22	1.292	1.21
700	0.821	1.74	1.297	1.61	1.500	1.48	1.515	1.37	1.423	1.27	1.308	1.22	1.253	1.21

n = 8	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
400	0.489	1.89	1.131	1.67	1.548	1.53	1.794	1.44	1.920	1.38	1.981	1.33	2.029	1.27
425	0.520	1.96	1.152	1.70	1.563	1.54	1.804	1.44	1.922	1.38	1.968	1.33	1.991	1.26
450	0.549	1.99	1.173	1.72	1.580	1.55	1.818	1.44	1.932	1.37	1.971	1.32	1.981	1.26
475	0.577	2.00	1.195	1.73	1.599	1.55	1.834	1.44	1.946	1.38	1.982	1.33	1.985	1.27
500	0.604	2.00	1.216	1.74	1.617	1.56	1.851	1.45	1.963	1.38	1.997	1.33	1.997	1.27
525	0.631	1.99	1.238	1.74	1.636	1.57	1.870	1.45	1.981	1.38	2.015	1.33	2.015	1.28
550	0.657	1.97	1.259	1.74	1.655	1.57	1.888	1.46	2.001	1.39	2.036	1.34	2.037	1.29
575	0.684	1.95	1.281	1.74	1.675	1.58	1.908	1.47	2.022	1.39	2.059	1.34	2.062	1.30
600	0.710	1.93	1.303	1.73	1.695	1.58	1.928	1.48	2.043	1.40	2.083	1.35	2.090	1.30
625	0.736	1.90	1.324	1.73	1.715	1.59	1.948	1.48	2.065	1.41	2.109	1.35	2.119	1.31
650	0.761	1.87	1.346	1.72	1.735	1.60	1.968	1.49	2.088	1.41	2.135	1.36	2.151	1.32
675	0.787	1.84	1.368	1.72	1.755	1.60	1.989	1.50	2.111	1.42	2.163	1.36	2.185	1.34

n = 9	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
400	0.474	1.92	1.137	1.73	1.630	1.60	1.978	1.53	2.211	1.48	2.354	1.42	2.437	1.35
425	0.499	1.96	1.157	1.75	1.648	1.61	1.996	1.53	2.225	1.47	2.361	1.42	2.426	1.35
450	0.526	1.98	1.178	1.76	1.668	1.62	2.018	1.53	2.249	1.48	2.384	1.42	2.443	1.35
475	0.552	1.99	1.199	1.77	1.690	1.63	2.043	1.54	2.279	1.48	2.417	1.43	2.476	1.36
500	0.579	1.99	1.221	1.77	1.712	1.63	2.071	1.55	2.313	1.49	2.457	1.44	2.520	1.37
525	0.606	1.98	1.243	1.78	1.736	1.64	2.099	1.56	2.350	1.50	2.502	1.45	2.572	1.38
550	0.633	1.97	1.265	1.78	1.759	1.65	2.129	1.56	2.389	1.51	2.551	1.46	2.631	1.40
575	0.660	1.95	1.287	1.78	1.783	1.66	2.160	1.57	2.429	1.52	2.603	1.47	2.694	1.41
600	0.688	1.93	1.310	1.77	1.808	1.66	2.191	1.58	2.471	1.53	2.658	1.48	2.761	1.43
625	0.715	1.91	1.332	1.77	1.832	1.67	2.223	1.60	2.515	1.54	2.715	1.50	2.832	1.45
650	0.743	1.89	1.355	1.77	1.857	1.68	2.256	1.61	2.559	1.55	2.773	1.51	2.906	1.47
675	0.770	1.86	1.378	1.76	1.882	1.68	2.289	1.62	2.604	1.57	2.834	1.52	2.983	1.49

n =10	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
350	0.421	1.75	1.088	1.69	1.638	1.64	2.083	1.60	2.432	1.55	2.695	1.51	2.881	1.45
375	0.441	1.85	1.107	1.73	1.654	1.65	2.091	1.59	2.427	1.55	2.671	1.50	2.831	1.44
400	0.464	1.90	1.127	1.75	1.674	1.66	2.111	1.60	2.447	1.56	2.687	1.51	2.840	1.44
425	0.488	1.93	1.148	1.76	1.696	1.66	2.137	1.61	2.477	1.57	2.720	1.52	2.873	1.45
450	0.514	1.94	1.170	1.77	1.719	1.67	2.166	1.61	2.513	1.58	2.763	1.53	2.921	1.46
475	0.539	1.95	1.191	1.78	1.743	1.68	2.197	1.62	2.553	1.59	2.813	1.54	2.979	1.47
500	0.566	1.95	1.212	1.79	1.767	1.69	2.229	1.63	2.596	1.60	2.868	1.56	3.044	1.49
525	0.592	1.95	1.234	1.79	1.792	1.70	2.262	1.64	2.642	1.61	2.927	1.57	3.114	1.50
550	0.619	1.95	1.256	1.79	1.817	1.70	2.297	1.65	2.689	1.62	2.989	1.59	3.189	1.52
575	0.646	1.94	1.278	1.80	1.842	1.71	2.332	1.66	2.738	1.63	3.053	1.60	3.267	1.54
600	0.673	1.93	1.299	1.80	1.868	1.72	2.368	1.68	2.789	1.65	3.119	1.62	3.349	1.56
625	0.701	1.92	1.321	1.80	1.894	1.73	2.404	1.69	2.840	1.66	3.188	1.63	3.434	1.58
650	0.728	1.90	1.343	1.80	1.920	1.73	2.441	1.70	2.893	1.68	3.258	1.65	3.520	1.60

n =11	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
325	0.396	1.68	1.053	1.68	1.644	1.67	2.160	1.65	2.595	1.61	2.940	1.57	3.188	1.52
350	0.414	1.77	1.075	1.72	1.664	1.68	2.176	1.65	2.605	1.62	2.946	1.58	3.195	1.52
375	0.435	1.83	1.096	1.74	1.686	1.69	2.200	1.66	2.632	1.64	2.978	1.60	3.232	1.53
400	0.458	1.86	1.117	1.76	1.709	1.70	2.228	1.67	2.666	1.65	3.020	1.61	3.282	1.54
425	0.482	1.89	1.138	1.77	1.733	1.71	2.258	1.68	2.706	1.66	3.069	1.63	3.340	1.55
450	0.506	1.91	1.159	1.78	1.757	1.72	2.289	1.69	2.748	1.68	3.123	1.64	3.404	1.57
475	0.531	1.92	1.180	1.79	1.781	1.72	2.322	1.70	2.793	1.69	3.180	1.66	3.472	1.58
500	0.557	1.93	1.200	1.80	1.805	1.73	2.356	1.71	2.839	1.70	3.240	1.67	3.544	1.60
525	0.582	1.94	1.221	1.80	1.829	1.74	2.391	1.72	2.887	1.71	3.302	1.69	3.618	1.62
550	0.608	1.94	1.242	1.81	1.854	1.75	2.426	1.73	2.937	1.73	3.366	1.71	3.694	1.64
575	0.635	1.94	1.262	1.81	1.879	1.76	2.461	1.74	2.987	1.74	3.432	1.72	3.773	1.66
600	0.661	1.94	1.283	1.82	1.904	1.77	2.498	1.76	3.038	1.75	3.499	1.74	3.852	1.67

n =12	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
300	0.373	1.61	1.022	1.68	1.644	1.70	2.220	1.70	2.731	1.67	3.159	1.63	3.484	1.59
325	0.390	1.70	1.045	1.71	1.668	1.71	2.244	1.71	2.759	1.69	3.197	1.66	3.544	1.60
350	0.410	1.76	1.067	1.73	1.692	1.72	2.272	1.72	2.794	1.71	3.243	1.68	3.606	1.62
375	0.431	1.80	1.087	1.75	1.715	1.73	2.302	1.73	2.832	1.73	3.293	1.70	3.670	1.63
400	0.454	1.84	1.107	1.76	1.739	1.74	2.332	1.74	2.872	1.74	3.345	1.72	3.734	1.65
425	0.477	1.86	1.127	1.78	1.762	1.75	2.363	1.75	2.914	1.76	3.399	1.74	3.799	1.66
450	0.500	1.89	1.147	1.79	1.785	1.76	2.395	1.76	2.957	1.77	3.454	1.75	3.865	1.68
475	0.524	1.91	1.166	1.80	1.808	1.77	2.427	1.77	3.001	1.79	3.510	1.77	3.930	1.69
500	0.549	1.92	1.186	1.81	1.831	1.77	2.459	1.78	3.046	1.80	3.567	1.79	3.997	1.71
525	0.573	1.94	1.205	1.82	1.854	1.78	2.492	1.79	3.091	1.81	3.624	1.80	4.063	1.73
550	0.598	1.95	1.224	1.83	1.876	1.79	2.525	1.80	3.137	1.82	3.683	1.82	4.129	1.74
575	0.623	1.96	1.243	1.84	1.899	1.80	2.558	1.81	3.184	1.84	3.741	1.83	4.196	1.76

n =13	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
275	0.352	1.53	0.996	1.66	1.643	1.73	2.270	1.75	2.851	1.74	3.362	1.71	3.780	1.67
300	0.368	1.62	1.018	1.69	1.670	1.74	2.302	1.76	2.895	1.76	3.428	1.74	3.880	1.69
325	0.387	1.69	1.039	1.71	1.694	1.75	2.333	1.78	2.937	1.79	3.486	1.77	3.962	1.70
350	0.407	1.74	1.059	1.73	1.717	1.76	2.364	1.79	2.978	1.80	3.542	1.79	4.034	1.72
375	0.428	1.78	1.078	1.75	1.740	1.77	2.393	1.80	3.019	1.82	3.594	1.81	4.100	1.73
400	0.449	1.82	1.096	1.77	1.761	1.77	2.423	1.81	3.058	1.84	3.646	1.83	4.162	1.75
425	0.471	1.85	1.114	1.78	1.783	1.78	2.452	1.82	3.098	1.85	3.695	1.84	4.221	1.76
450	0.494	1.88	1.132	1.80	1.804	1.79	2.481	1.83	3.137	1.86	3.744	1.86	4.277	1.78
475	0.516	1.91	1.150	1.81	1.825	1.80	2.510	1.84	3.176	1.87	3.793	1.87	4.330	1.79
500	0.539	1.94	1.168	1.83	1.845	1.81	2.538	1.85	3.214	1.89	3.840	1.89	4.382	1.81
525	0.563	1.96	1.185	1.84	1.866	1.82	2.567	1.86	3.253	1.90	3.887	1.90	4.432	1.82
550	0.586	1.98	1.203	1.85	1.886	1.83	2.595	1.87	3.291	1.91	3.933	1.91	4.481	1.83

n =14	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
250	0.333	1.46	0.975	1.65	1.643	1.75	2.311	1.81	2.955	1.81	3.549	1.78	4.068	1.74
275	0.348	1.55	0.995	1.67	1.670	1.76	2.351	1.82	3.015	1.84	3.638	1.82	4.197	1.76
300	0.365	1.62	1.013	1.70	1.694	1.77	2.385	1.83	3.064	1.86	3.707	1.85	4.293	1.78
325	0.384	1.68	1.031	1.72	1.716	1.78	2.416	1.84	3.107	1.88	3.766	1.87	4.370	1.80
350	0.403	1.73	1.048	1.74	1.737	1.79	2.445	1.85	3.147	1.89	3.818	1.89	4.435	1.81
375	0.423	1.78	1.065	1.76	1.757	1.80	2.472	1.86	3.183	1.91	3.865	1.91	4.491	1.83
400	0.444	1.82	1.082	1.78	1.776	1.81	2.498	1.87	3.218	1.92	3.908	1.92	4.540	1.84
425	0.464	1.86	1.099	1.80	1.795	1.82	2.523	1.88	3.251	1.93	3.948	1.94	4.584	1.85
450	0.485	1.90	1.115	1.82	1.814	1.83	2.547	1.89	3.282	1.94	3.985	1.95	4.623	1.87
475	0.507	1.94	1.131	1.84	1.831	1.84	2.570	1.90	3.312	1.95	4.020	1.96	4.658	1.88
500	0.528	1.97	1.147	1.85	1.849	1.85	2.593	1.90	3.341	1.96	4.053	1.98	4.690	1.89
525	0.550	2.00	1.163	1.87	1.866	1.86	2.616	1.91	3.369	1.97	4.084	1.99	4.719	1.90

n =15	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
200	0.306	1.28	0.942	1.59	1.605	1.77	2.272	1.85	2.921	1.86	3.532	1.82	4.081	1.76
225	0.316	1.39	0.958	1.63	1.642	1.78	2.343	1.86	3.041	1.89	3.713	1.87	4.336	1.81
250	0.330	1.48	0.974	1.65	1.669	1.79	2.391	1.87	3.117	1.91	3.823	1.90	4.486	1.83
275	0.346	1.55	0.990	1.68	1.692	1.79	2.428	1.88	3.173	1.93	3.903	1.92	4.591	1.85
300	0.363	1.62	1.005	1.71	1.713	1.80	2.460	1.89	3.219	1.94	3.965	1.94	4.671	1.87
325	0.380	1.68	1.020	1.73	1.732	1.81	2.487	1.90	3.258	1.96	4.016	1.96	4.733	1.88
350	0.398	1.73	1.035	1.75	1.750	1.82	2.512	1.90	3.291	1.97	4.058	1.98	4.782	1.90
375	0.417	1.79	1.051	1.78	1.767	1.83	2.534	1.91	3.320	1.98	4.093	1.99	4.821	1.91
400	0.436	1.84	1.066	1.80	1.783	1.84	2.554	1.92	3.346	1.99	4.123	2.01	4.853	1.92
425	0.455	1.89	1.081	1.82	1.799	1.85	2.573	1.93	3.368	2.00	4.148	2.02	4.877	1.93
450	0.475	1.94	1.096	1.84	1.814	1.86	2.591	1.94	3.389	2.01	4.170	2.03	4.896	1.94
475	0.495	1.98	1.111	1.87	1.828	1.87	2.607	1.95	3.407	2.02	4.188	2.04	4.910	1.95
500	0.515	2.03	1.126	1.89	1.843	1.88	2.623	1.95	3.424	2.03	4.203	2.06	4.920	1.96

n =16	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
175	0.291	1.22	0.941	1.57	1.604	1.80	2.275	1.93	2.949	1.96	3.621	1.92	4.284	1.82
200	0.300	1.32	0.947	1.60	1.640	1.80	2.364	1.92	3.104	1.97	3.843	1.95	4.567	1.86
225	0.313	1.41	0.957	1.63	1.667	1.81	2.421	1.92	3.198	1.98	3.976	1.97	4.733	1.89
250	0.327	1.48	0.968	1.66	1.688	1.81	2.462	1.93	3.264	1.99	4.068	1.99	4.847	1.91
275	0.342	1.55	0.980	1.69	1.707	1.82	2.495	1.93	3.314	2.00	4.135	2.01	4.929	1.93
300	0.358	1.62	0.993	1.72	1.724	1.83	2.522	1.94	3.353	2.01	4.186	2.02	4.989	1.94
325	0.375	1.69	1.006	1.74	1.740	1.84	2.544	1.95	3.383	2.02	4.224	2.04	5.033	1.96
350	0.392	1.75	1.020	1.77	1.755	1.85	2.562	1.95	3.407	2.03	4.252	2.05	5.064	1.97
375	0.409	1.81	1.033	1.80	1.769	1.86	2.578	1.96	3.425	2.04	4.273	2.07	5.085	1.98
400	0.427	1.87	1.047	1.82	1.782	1.87	2.591	1.97	3.439	2.06	4.287	2.08	5.097	1.99
425	0.445	1.93	1.062	1.85	1.794	1.88	2.603	1.98	3.449	2.07	4.295	2.09	5.102	2.00
450	0.463	1.99	1.076	1.87	1.806	1.89	2.612	1.98	3.456	2.08	4.299	2.11	5.101	2.00

n =17	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
150	0.280	1.17	0.952	1.54	1.603	1.82	2.255	2.01	2.928	2.08	3.643	2.04	4.423	1.86
175	0.287	1.25	0.944	1.58	1.638	1.82	2.368	1.98	3.130	2.06	3.920	2.03	4.736	1.90
200	0.298	1.33	0.944	1.61	1.663	1.83	2.437	1.98	3.250	2.05	4.083	2.04	4.920	1.93
225	0.311	1.41	0.949	1.64	1.683	1.83	2.486	1.97	3.331	2.05	4.192	2.05	5.044	1.95
250	0.324	1.49	0.957	1.67	1.700	1.84	2.522	1.97	3.389	2.05	4.269	2.06	5.131	1.97
275	0.339	1.56	0.967	1.70	1.715	1.85	2.549	1.97	3.430	2.06	4.324	2.07	5.193	1.99
300	0.353	1.63	0.977	1.73	1.729	1.86	2.569	1.98	3.460	2.06	4.362	2.08	5.236	2.00
325	0.369	1.70	0.989	1.76	1.742	1.87	2.585	1.98	3.480	2.07	4.386	2.10	5.264	2.02
350	0.384	1.77	1.002	1.79	1.753	1.88	2.596	1.99	3.492	2.09	4.400	2.11	5.280	2.03
375	0.400	1.84	1.016	1.82	1.764	1.89	2.605	2.00	3.498	2.10	4.405	2.13	5.286	2.04
400	0.416	1.91	1.030	1.85	1.774	1.90	2.610	2.01	3.499	2.11	4.403	2.15	5.283	2.05
425	0.433	1.98	1.044	1.87	1.783	1.91	2.612	2.02	3.495	2.13	4.394	2.16	5.274	2.06

n =18	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
125	0.273	1.12	0.990	1.50	1.603	1.85	2.185	2.12	2.805	2.24	3.534	2.18	4.445	1.89
150	0.278	1.19	0.955	1.55	1.636	1.84	2.341	2.06	3.091	2.16	3.905	2.12	4.804	1.92
175	0.286	1.26	0.941	1.58	1.659	1.85	2.432	2.03	3.254	2.12	4.116	2.10	5.013	1.95
200	0.297	1.33	0.937	1.62	1.677	1.85	2.493	2.01	3.361	2.10	4.256	2.09	5.154	1.97
225	0.309	1.41	0.938	1.65	1.692	1.85	2.537	2.01	3.435	2.09	4.353	2.09	5.254	1.99
250	0.322	1.48	0.943	1.68	1.706	1.86	2.567	2.00	3.486	2.09	4.420	2.10	5.325	2.01
275	0.335	1.56	0.951	1.71	1.717	1.87	2.589	2.00	3.520	2.09	4.464	2.11	5.376	2.03
300	0.349	1.64	0.961	1.74	1.728	1.88	2.604	2.01	3.541	2.10	4.492	2.12	5.411	2.04
325	0.363	1.72	0.973	1.78	1.738	1.89	2.613	2.02	3.551	2.11	4.506	2.14	5.432	2.06
350	0.377	1.80	0.986	1.81	1.747	1.90	2.617	2.02	3.551	2.13	4.508	2.16	5.442	2.08
375	0.392	1.88	1.001	1.84	1.755	1.91	2.617	2.03	3.545	2.15	4.500	2.19	5.443	2.09
400	0.407	1.96	1.016	1.87	1.763	1.92	2.613	2.05	3.531	2.17	4.484	2.21	5.436	2.11

n =19	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
125	0.276	1.14	1.007	1.50	1.636	1.87	2.241	2.17	2.898	2.33	3.687	2.27	4.684	1.91
150	0.281	1.18	0.963	1.55	1.656	1.87	2.379	2.10	3.152	2.22	3.998	2.18	4.935	1.93
175	0.289	1.24	0.940	1.58	1.671	1.86	2.468	2.06	3.315	2.16	4.200	2.13	5.107	1.95
200	0.299	1.31	0.929	1.62	1.684	1.87	2.529	2.04	3.426	2.12	4.340	2.11	5.234	1.97
225	0.310	1.39	0.925	1.65	1.696	1.87	2.572	2.03	3.503	2.11	4.439	2.10	5.332	1.99
250	0.321	1.46	0.928	1.69	1.707	1.88	2.601	2.02	3.554	2.10	4.508	2.10	5.408	2.02
275	0.334	1.54	0.935	1.72	1.717	1.88	2.620	2.02	3.585	2.11	4.554	2.12	5.467	2.04
300	0.347	1.63	0.945	1.75	1.726	1.89	2.630	2.03	3.601	2.12	4.581	2.14	5.513	2.07
325	0.360	1.71	0.959	1.78	1.734	1.90	2.634	2.03	3.604	2.14	4.593	2.17	5.548	2.09
350	0.374	1.80	0.975	1.81	1.742	1.91	2.631	2.05	3.596	2.16	4.592	2.20	5.573	2.12
375	0.388	1.88	0.993	1.84	1.750	1.92	2.624	2.06	3.579	2.19	4.580	2.24	5.590	2.14
400	0.402	1.97	1.013	1.87	1.758	1.93	2.612	2.08	3.554	2.23	4.558	2.28	5.601	2.17

n =20	m = 5		m = 7.5		m = 10		m = 12.5		m = 15		m = 17.5		m = 20	
E/σ_y	α	k	α	k	α	k	α	k	α	k	α	k	α	k
100	0.304	1.25	1.274	1.41	1.659	1.94	1.795	2.55	2.020	2.94	2.671	2.82	4.084	1.88
125	0.295	1.17	1.101	1.48	1.663	1.90	2.130	2.30	2.647	2.53	3.361	2.42	4.420	1.83
150	0.296	1.17	1.015	1.53	1.670	1.89	2.313	2.18	2.991	2.32	3.753	2.23	4.648	1.83
175	0.302	1.20	0.965	1.57	1.679	1.88	2.434	2.10	3.218	2.19	4.021	2.12	4.831	1.85
200	0.310	1.25	0.936	1.61	1.688	1.88	2.518	2.05	3.377	2.12	4.217	2.06	4.987	1.88
225	0.320	1.31	0.922	1.64	1.698	1.88	2.578	2.02	3.490	2.08	4.363	2.04	5.125	1.91
250	0.331	1.37	0.918	1.67	1.708	1.88	2.619	2.01	3.568	2.06	4.473	2.04	5.251	1.95
275	0.343	1.45	0.923	1.70	1.719	1.89	2.646	2.01	3.620	2.07	4.555	2.06	5.366	1.99
300	0.356	1.53	0.934	1.73	1.730	1.89	2.662	2.01	3.650	2.09	4.614	2.10	5.472	2.04
325	0.369	1.62	0.951	1.75	1.740	1.90	2.668	2.03	3.663	2.12	4.654	2.15	5.572	2.09
350	0.383	1.71	0.972	1.78	1.751	1.91	2.666	2.05	3.660	2.16	4.679	2.21	5.667	2.14
375	0.398	1.80	0.998	1.80	1.763	1.92	2.657	2.08	3.645	2.22	4.690	2.28	5.756	2.19
400	0.413	1.90	1.026	1.83	1.774	1.93	2.642	2.11	3.618	2.28	4.689	2.35	5.841	2.25

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