Table A–15
Charts of Theoretical Stress-Concentration Factors $K_t^*$.

Figure A–15–1
Bar in tension or simple compression with a transverse hole, $\sigma_0 = F/A$, where $A = (w - d)t$ and $t$ is the thickness.

Figure A–15–2
Rectangular bar with a transverse hole in bending, $\sigma_0 = Mc/I$, where $I = (w - d)h^3/12$.

Figure A–15–3
Notched rectangular bar in tension or simple compression, $\sigma_0 = F/A$, where $A = dt$ and $t$ is the thickness.
Table A-15
Charts of Theoretical Stress-Concentration Factors $K_t^*$ (Continued)

**Figure A-15–4**
Notched rectangular bar in bending. $\sigma_0 = Mc/I$, where $c = d/2$, $I = td^3/12$, and $t$ is the thickness.

**Figure A-15–5**
Rectangular filleted bar in tension or simple compression. $\sigma_0 = F/A$, where $A = dt$ and $r$ is the thickness.

**Figure A-15–6**
Rectangular filleted bar in bending. $\sigma_0 = Mc/I$, where $c = d/2$, $I = td^3/12$, and $t$ is the thickness.

Table A–15
Charts of Theoretical Stress-Concentration Factors $K_t^*$ (Continued)

Figure A–15–7
Round shaft with shoulder fillet in tension. $\sigma_0 = F/A$, where $A = \pi d^2/4$.

Figure A–15–8
Round shaft with shoulder fillet in torsion. $\tau_0 = Tc/J$, where $c = d/2$ and $J = \pi d^4/32$.

Figure A–15–9
Round shaft with shoulder fillet in bending. $\sigma_0 = Mc/I$, where $c = d/2$ and $I = \pi d^4/64$. 
**Table A-15**

Charts of Theoretical Stress-Concentration Factors $K_t^*$ (Continued)

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**Figure A-15–10**
Round shaft in torsion with transverse hole.

**Figure A-15–11**
Round shaft in bending with a transverse hole. $\sigma_0 = M/[(\pi D^3/32) − (dD^2/6)]$, approximately.

**Figure A-15–12**
Plate loaded in tension by a pin through a hole. $\sigma_0 = F/A$, where $A = (w − d)t$. When clearance exists, increase $K_t$ 35 to 50 percent. (M. M. Frocht and H. N. Hill, “Stress-Concentration Factors around a Central Circular Hole in a Plate Loaded through a Pin in Hole,” J. Appl. Mechanics, vol. 7, no. 1, March 1940, p. A-5.)

### Table A–15
Charts of Theoretical Stress-Concentration Factors $K^*_t$ (Continued)

#### Figure A–15–13
Grooved round bar in tension. 
$\sigma_0 = F/A$, where $A = \pi d^2/4$.

![Figure A–15–13](image)

#### Figure A–15–14
Grooved round bar in bending. 
$\sigma_0 = Mc/l$, where $c = d/2$ and $I = \pi d^4/64$.

![Figure A–15–14](image)

#### Figure A–15–15
Grooved round bar in torsion. 
$\tau_0 = Tc/J$, where $c = d/2$ and $J = \pi d^4/32$.

![Figure A–15–15](image)

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Table A-15
Charts of Theoretical Stress-Concentration Factors $K_t^*(Continued)$

Figure A-15-16
Round shaft with flat-bottom groove in bending and/or tension.

$\sigma_0 = \frac{4F}{\pi d^2} + \frac{32M}{\pi d^3}$

Table A–15
Charts of Theoretical Stress-Concentration Factors $K_t^0$ (Continued)

Figure A–15–17
Round shaft with flat-bottom groove in torsion.

\[ \tau_0 = \frac{16T}{\pi d^3} \]