**APPENDIX 2**

Wiebols-Cook criterion:

| $$\sqrt{J\_{2}}=A+BJ\_{1}+CJ\_{1}^{2}$$ | (A.2.1) |
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where *J*1 and *J*2 are stress invariants:

| $$J\_{1}=\frac{σ\_{11}+σ\_{22}+σ\_{33}}{3}$$$$\sqrt{J\_{2}}=\sqrt{\frac{\left(σ\_{11}-σ\_{22}\right)^{2}+\left(σ\_{11}-σ\_{33}\right)^{2}+\left(σ\_{22}-σ\_{33}\right)^{2}}{6}}$$ | (A.2.2) |
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and parameters A, B, C and D are functions of *σ33* and *UCS*:

| $$A=\frac{UCS}{\sqrt{3}}-\frac{UCS}{3}B-\frac{UCS^{2}}{9}C$$$$B=\frac{\sqrt{3}\left(N-1\right)}{N+2}-\frac{C}{3}\left(2UCS+\left(N+2\right)σ\_{33}\right)$$$$C=\frac{\sqrt{27}}{2D+\left(N-1\right)σ\_{33}-UCS}\left(\frac{D+\left(N-1\right)σ\_{33}-UCS}{2D+\left(2N+1\right)σ\_{33}-UCS}-\frac{N-1}{N+2}\right)$$$$D=\left(1-0,6μ\right)UCS$$ | (A.2.3) |
| --- | --- |