**APPENDIX 2**

Wiebols-Cook criterion:

|  | (A.2.1) |
| --- | --- |

where *J*1 and *J*2 are stress invariants:

|  | (A.2.2) |
| --- | --- |

and parameters A, B, C and D are functions of *σ33* and *UCS*:

|  | (A.2.3) |
| --- | --- |