Simulation of the NRC Wide-Plate Tests Performed in at Oakridge Nat. Labs. Invited Talk given at Lund Institute of Technology, Lund, Orationem Meam

Ståhle, P.

1989

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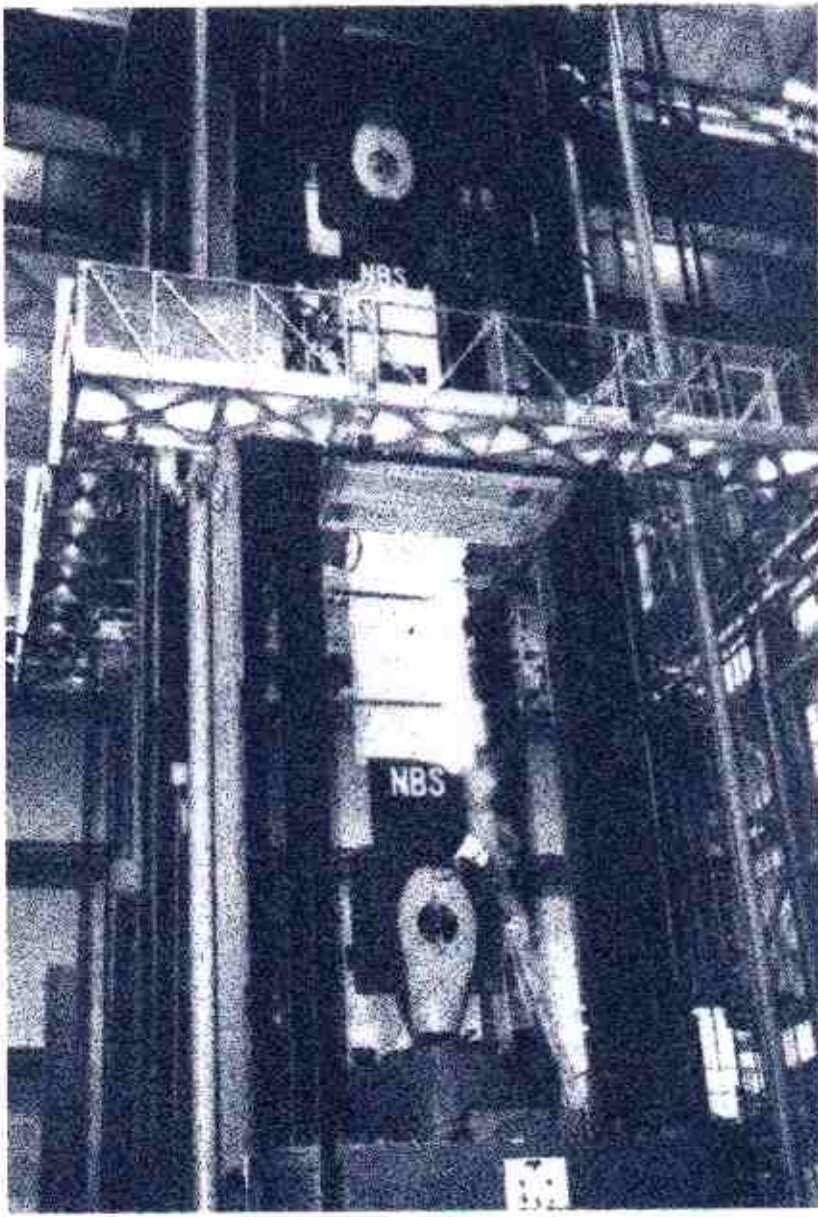
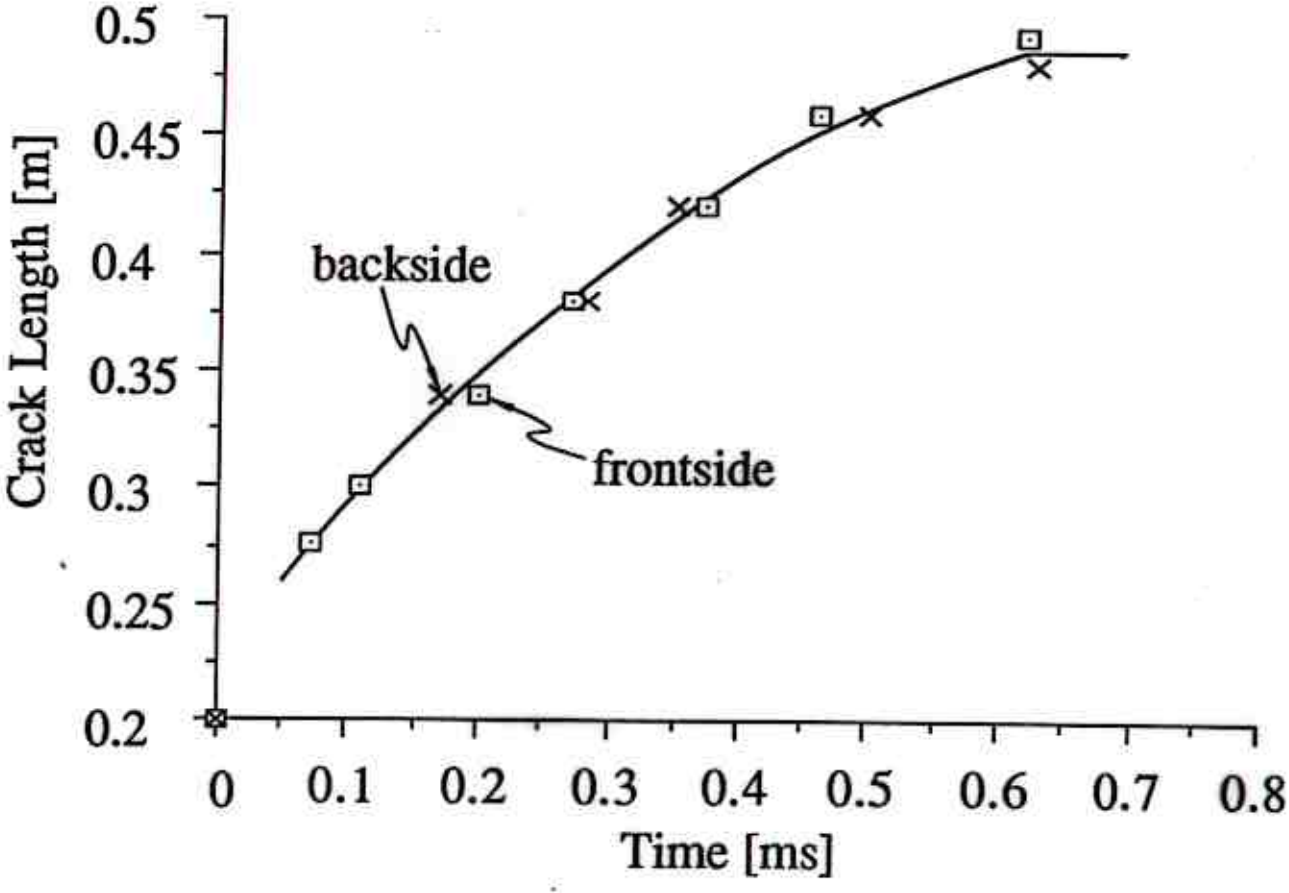
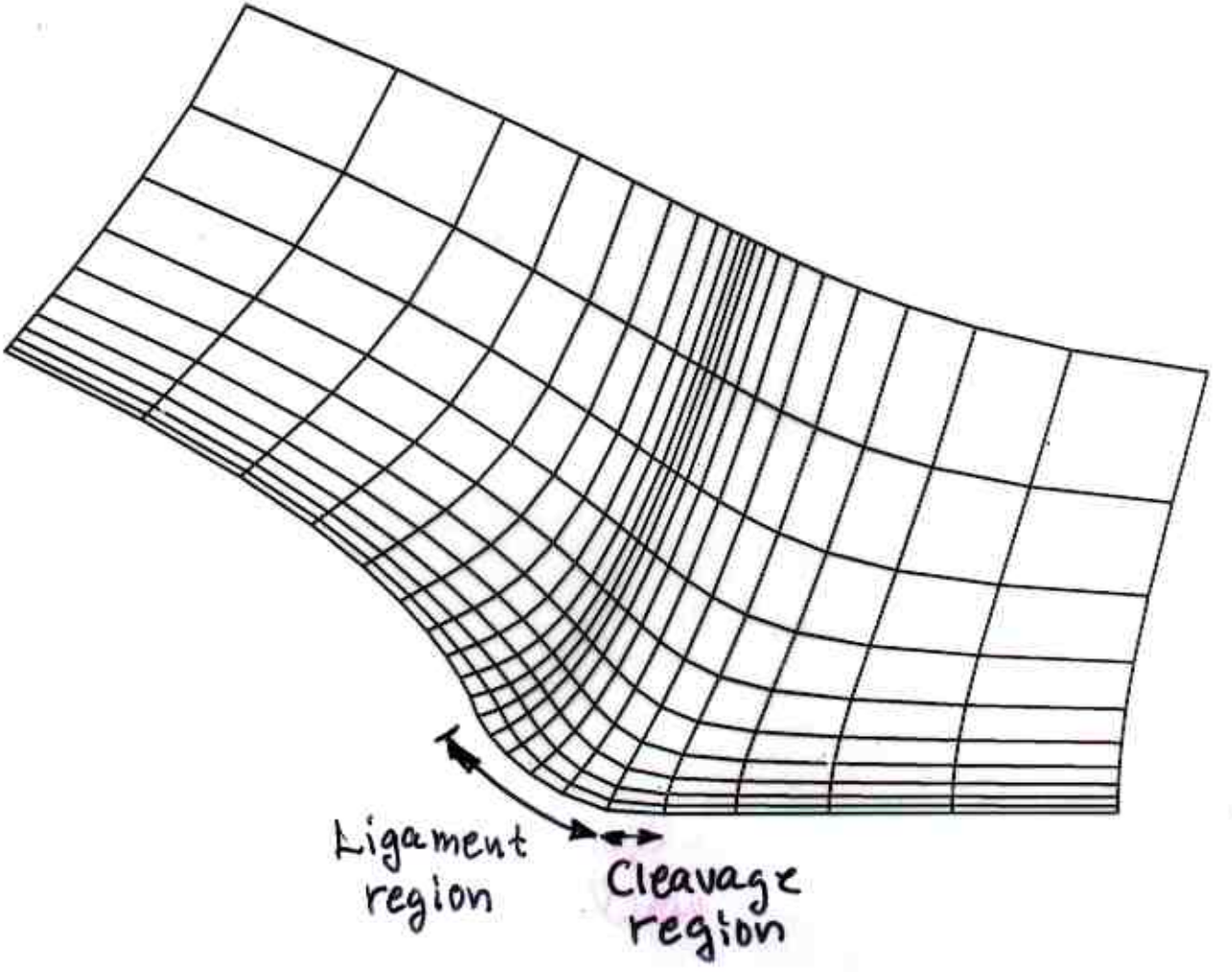
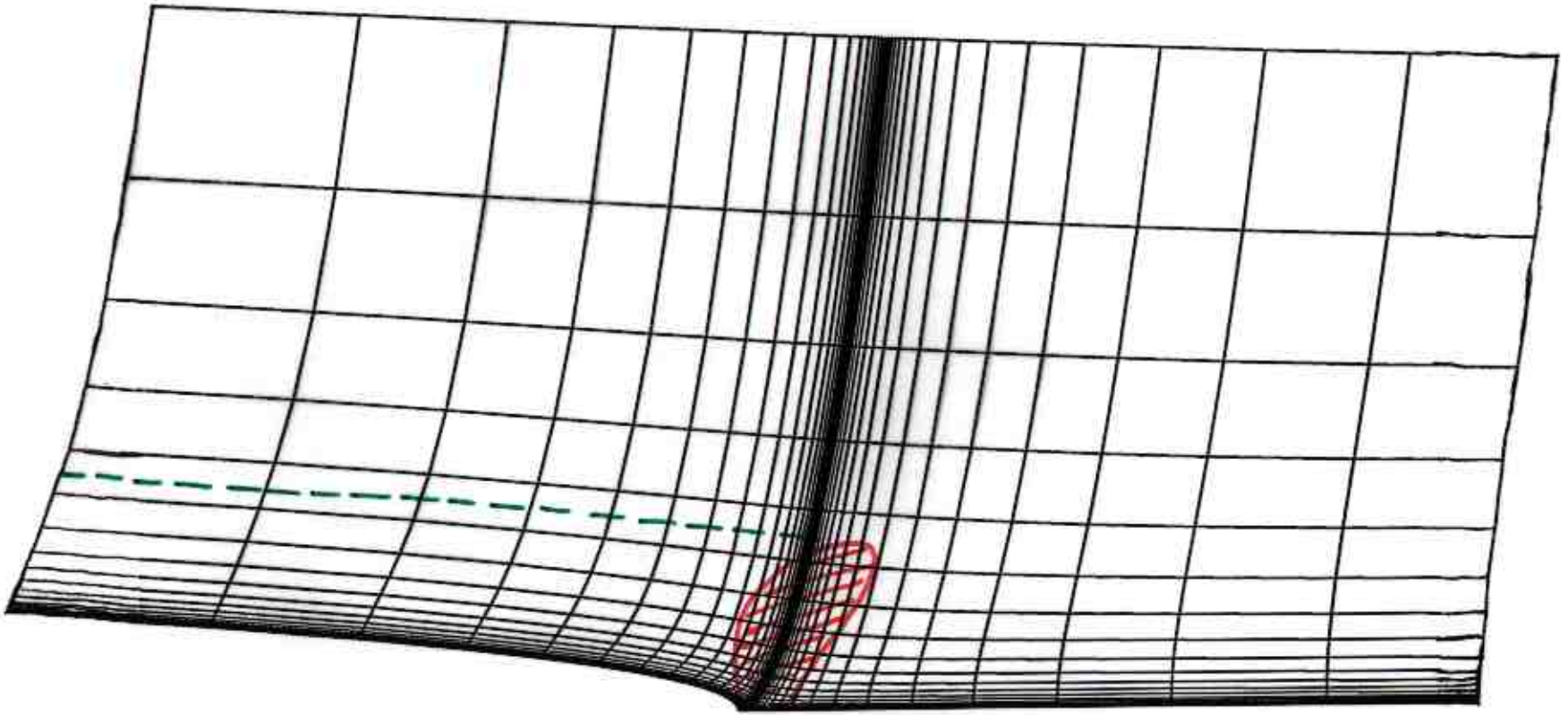
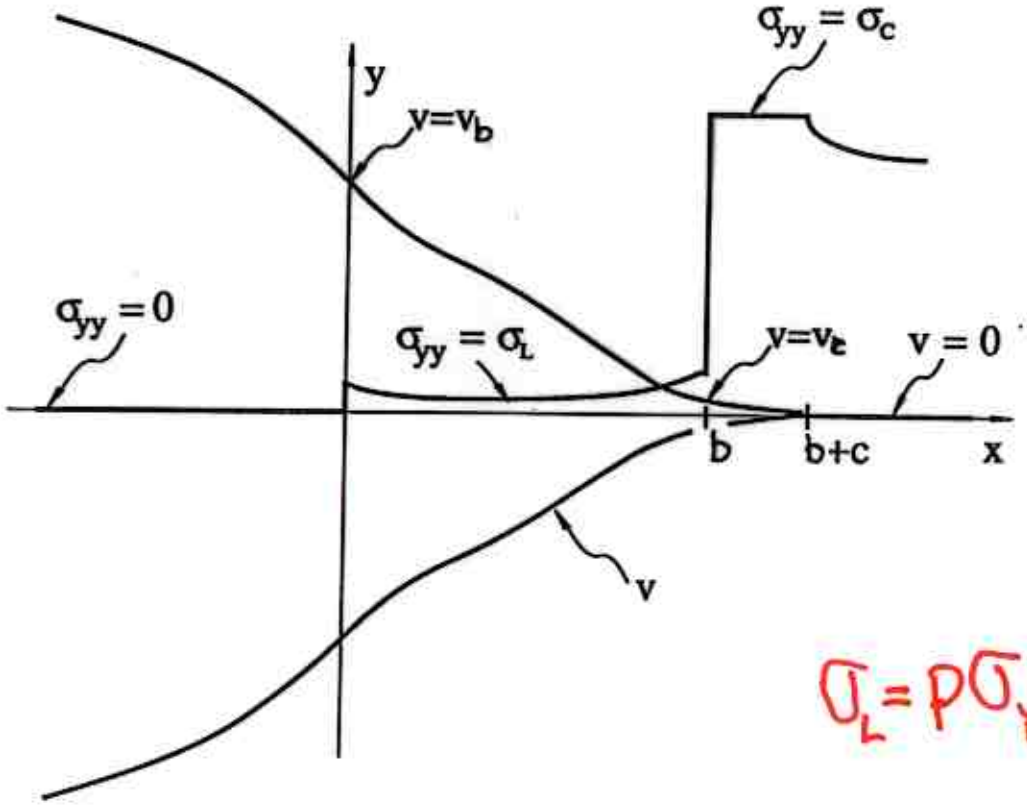


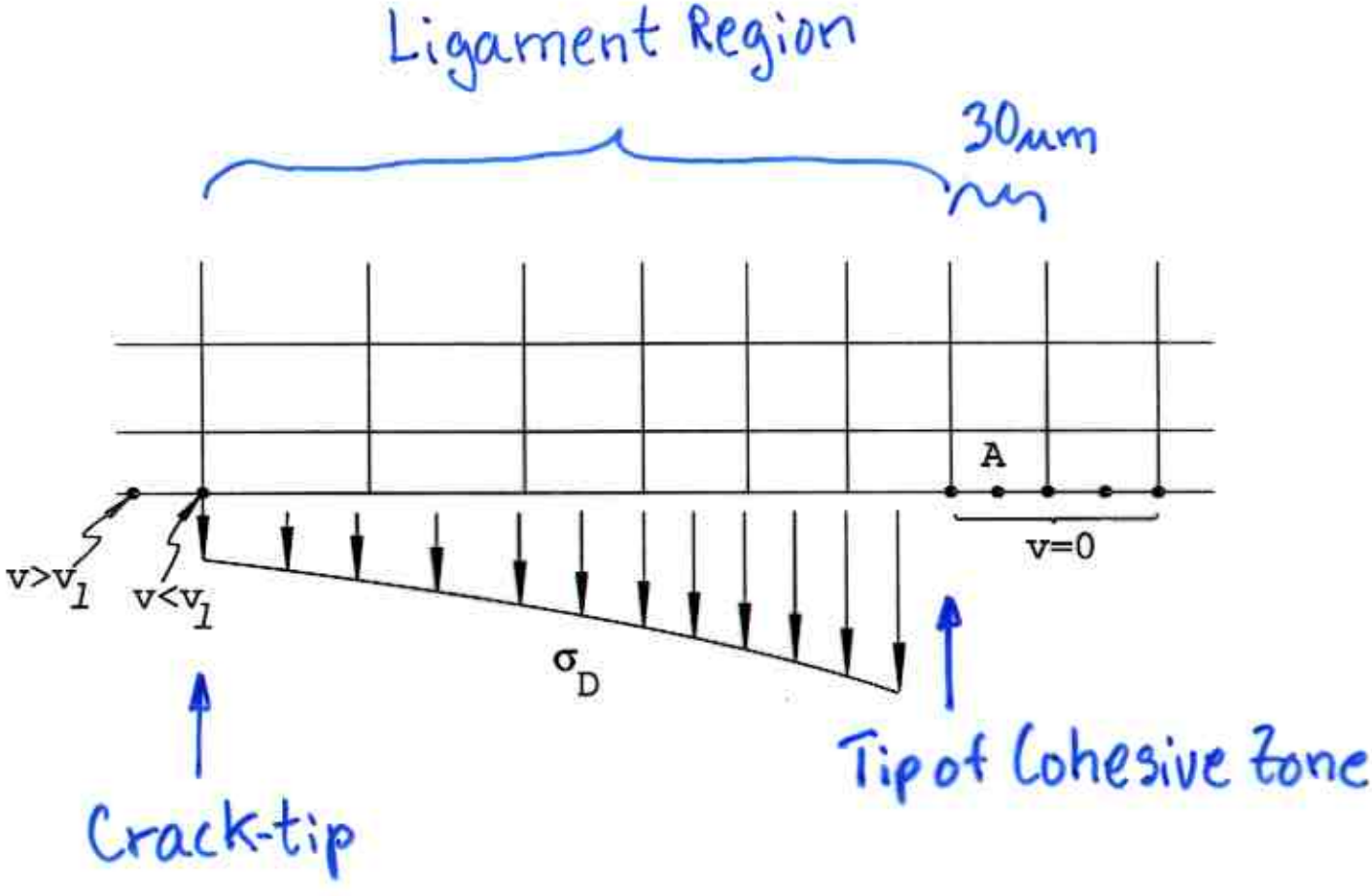

0.5
0.45
0.4
0.35
0.3
0.25
0.2
Crack Length [m]
backside
frontside
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Time [ms]


Ligament region
Cleavage region





$$\sigma_L = p\sigma_Y \left[1 + \left(\frac{4\sqrt{3}\mu\dot{v}}{l_{gr}\dot{\varepsilon}_0\sigma_Y}\right)^{\frac{1}{n}}\right]$$



$$\sigma_D = P\sigma_0 \left\{ 1 + \left[\frac{4\sqrt{3}\,M\dot{v}}{l_{gr}\dot{\gamma}_0\sigma_0} \right]^{\frac{1}{n}} \right\}$$

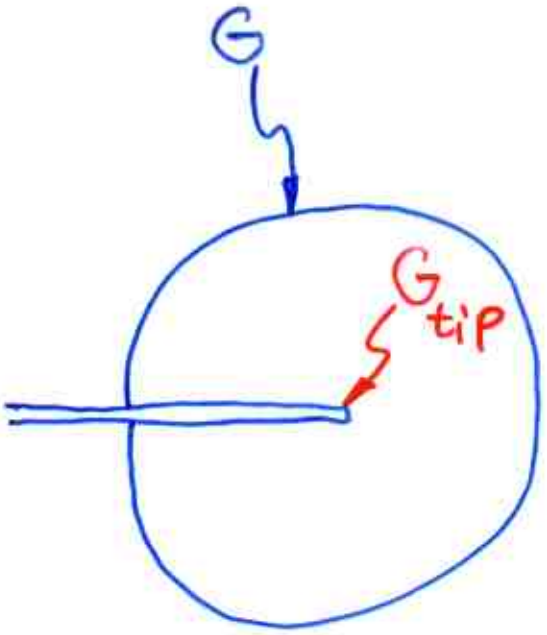
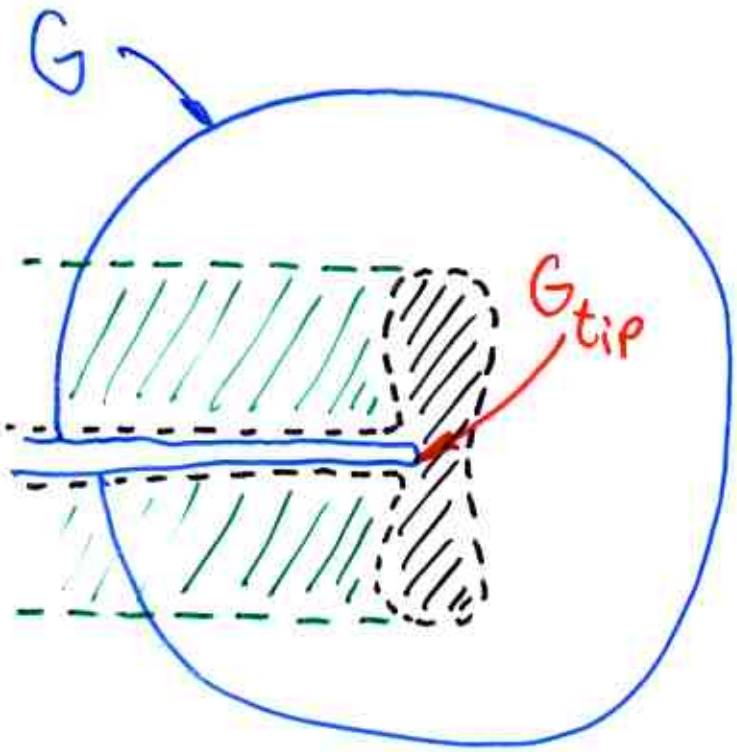
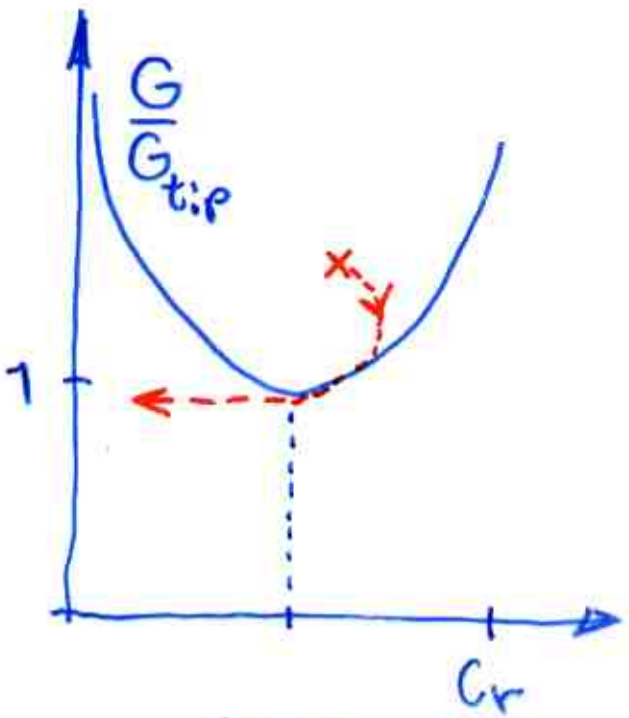


Bild 56

Freund & Hutchinson 1985, n = 1

$$\dot{\varepsilon}^{pl} = \dot{\gamma}_0 (\sigma - \sigma_0)^n$$





$0.54 C_r$

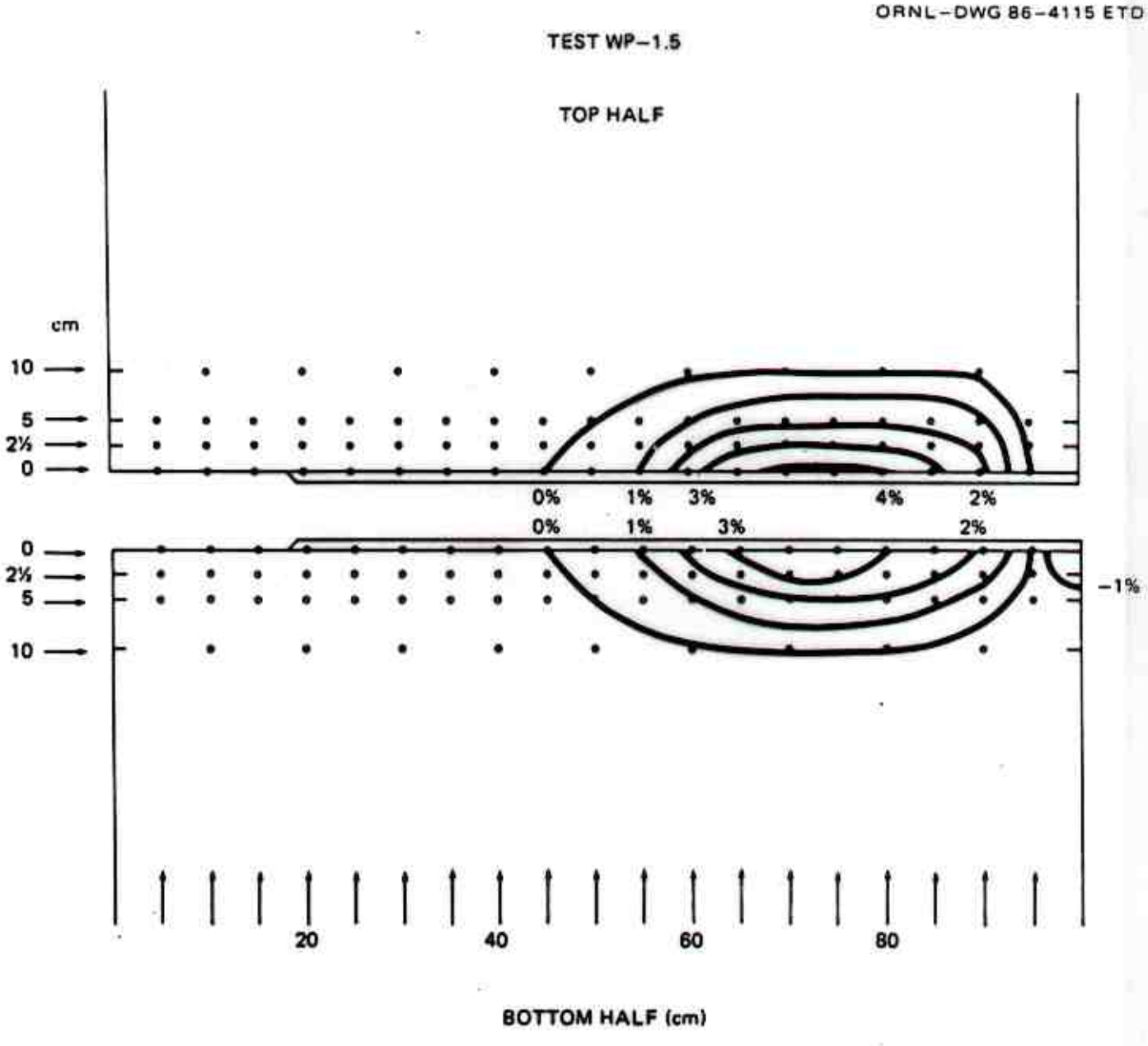
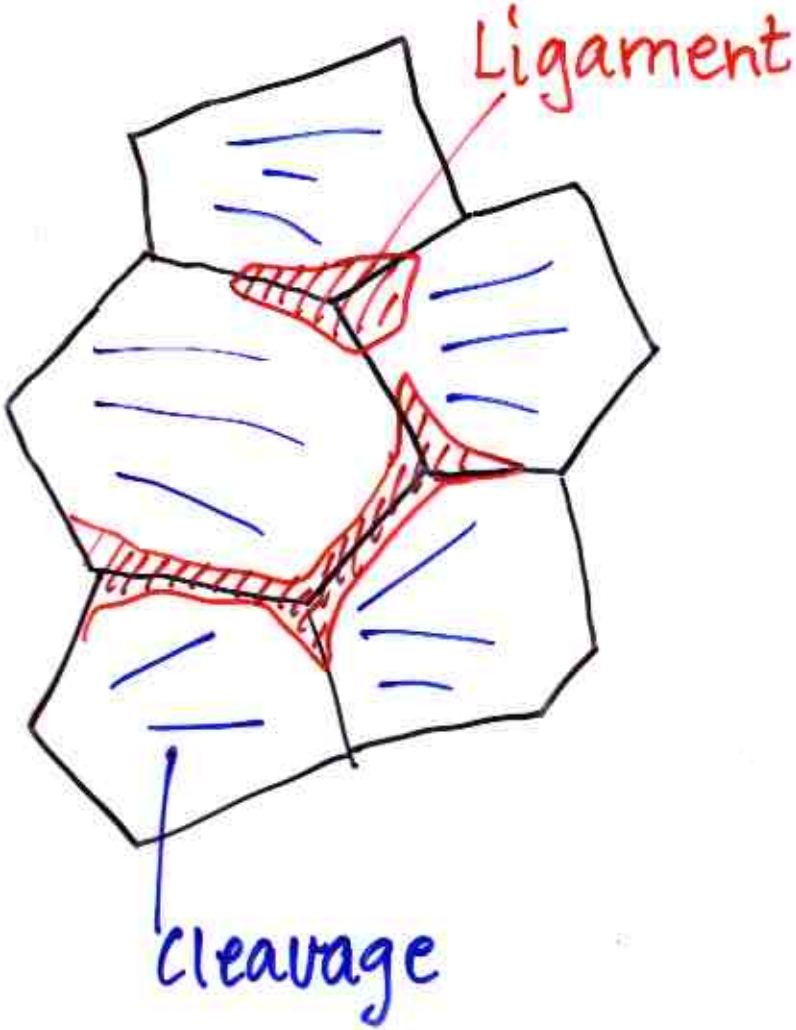
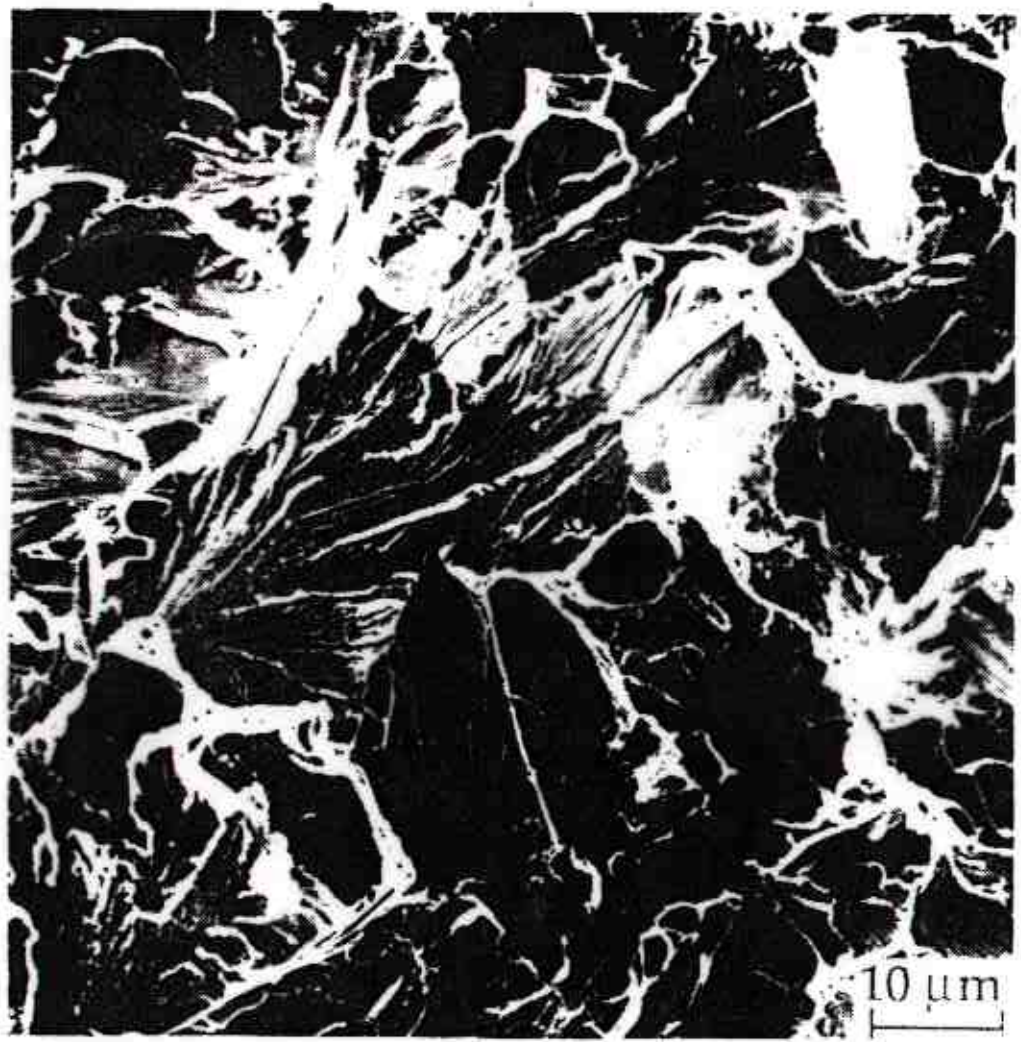
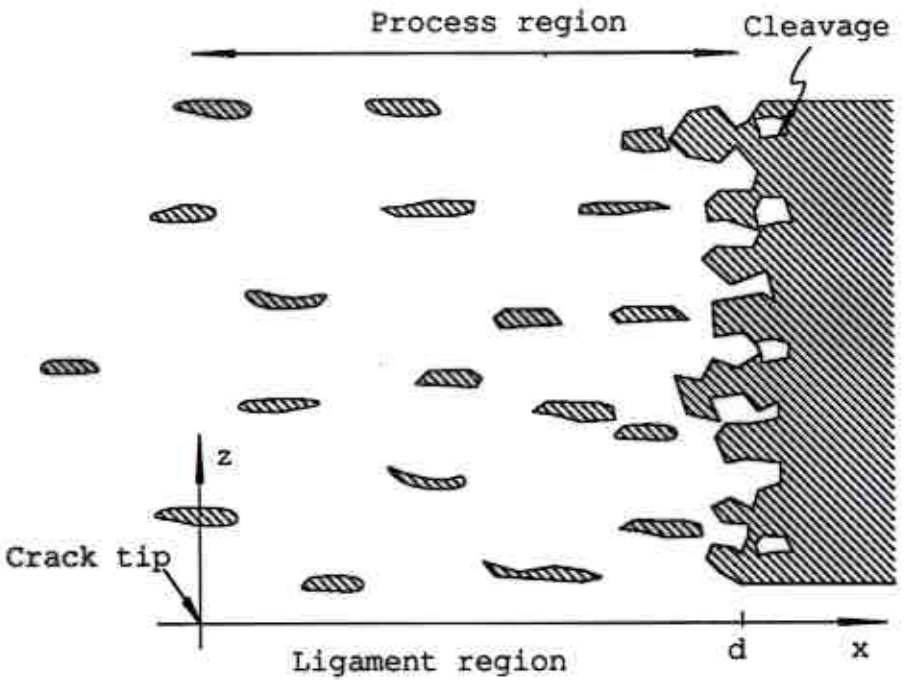


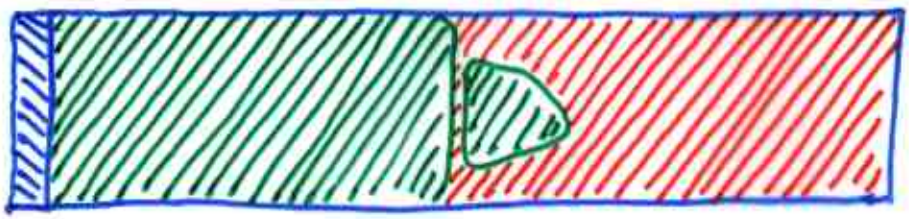
Fig. 6.60. Posttest contour map of plastic reduction in thickness: Test WP-1.5.


Ligament
cleavage

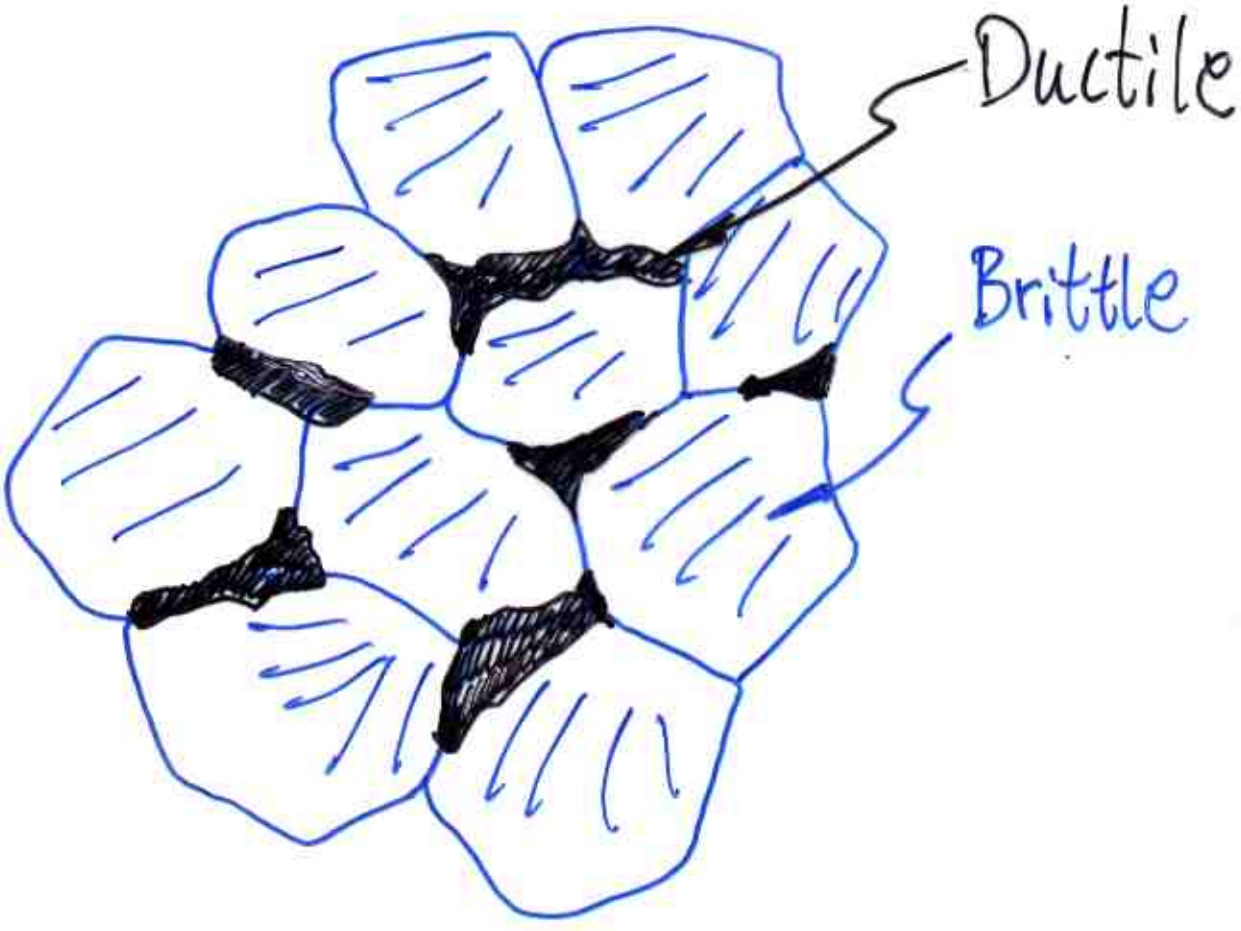

10 μm


Process region
Cleavage
z
Crack tip
Ligament region
d
x

Crack Surface

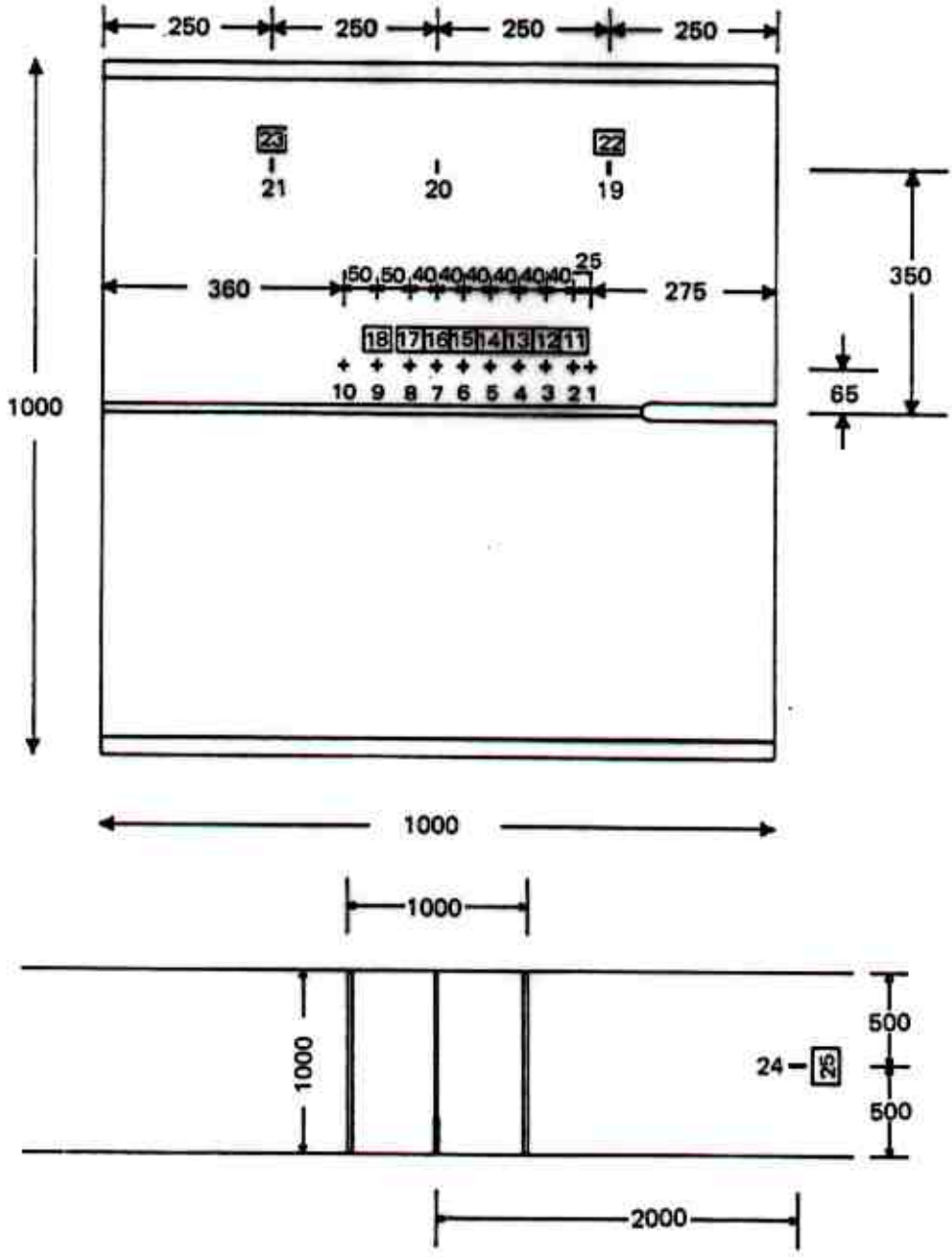


Cleavage Fibrous



D. Alexander & I. Johansson

10-20% Ductile


250
250
250
250
23
22
21
20
19
360
50 50 40 40 40 40 40 40 40
25
275
350
18 17 16 15 14 13 12 11
10 9 8 7 6 5 4 3 2 1
65
1000
1000
1000
1000
500
24
25
500
2000

WP–1.6

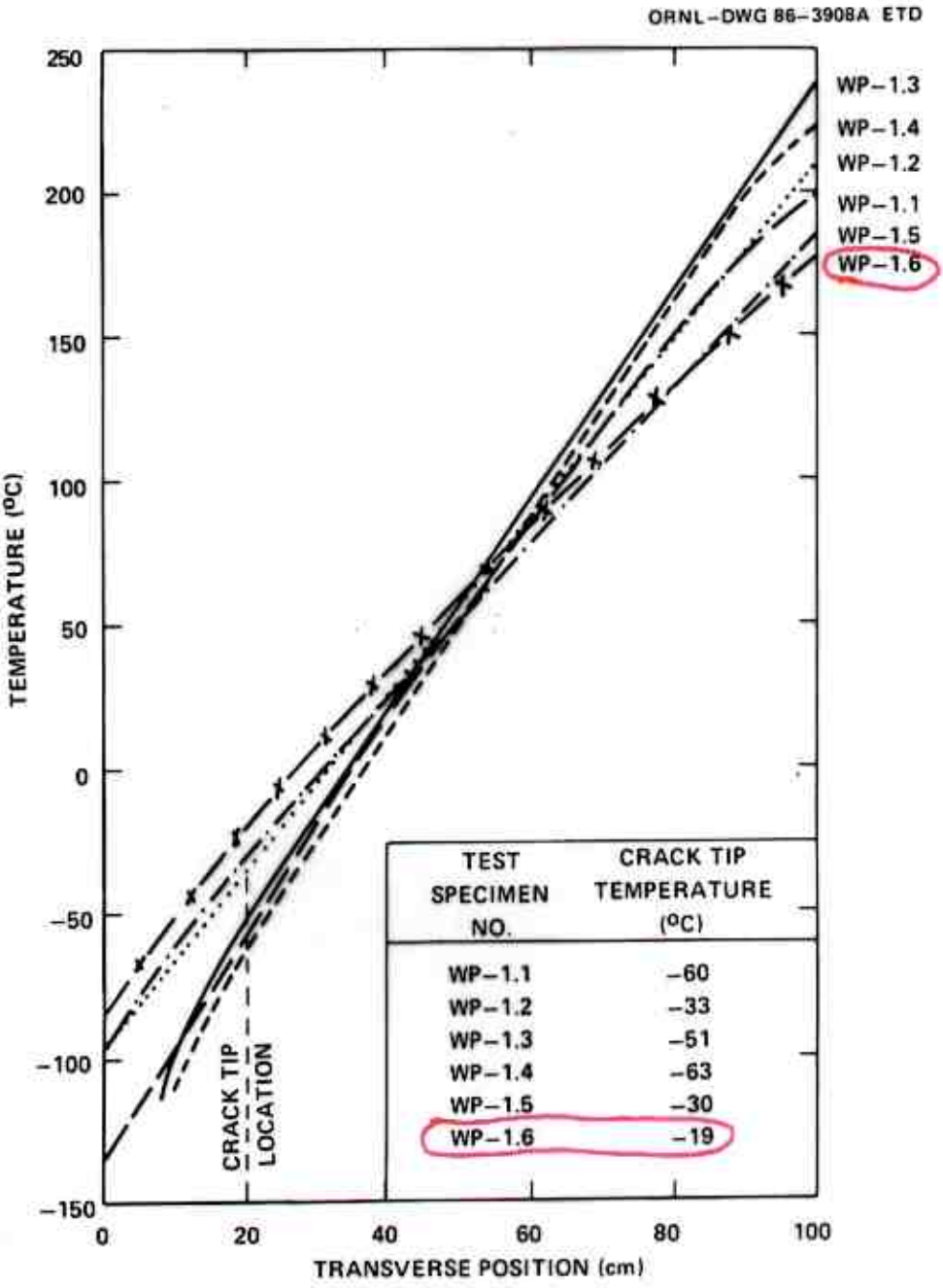
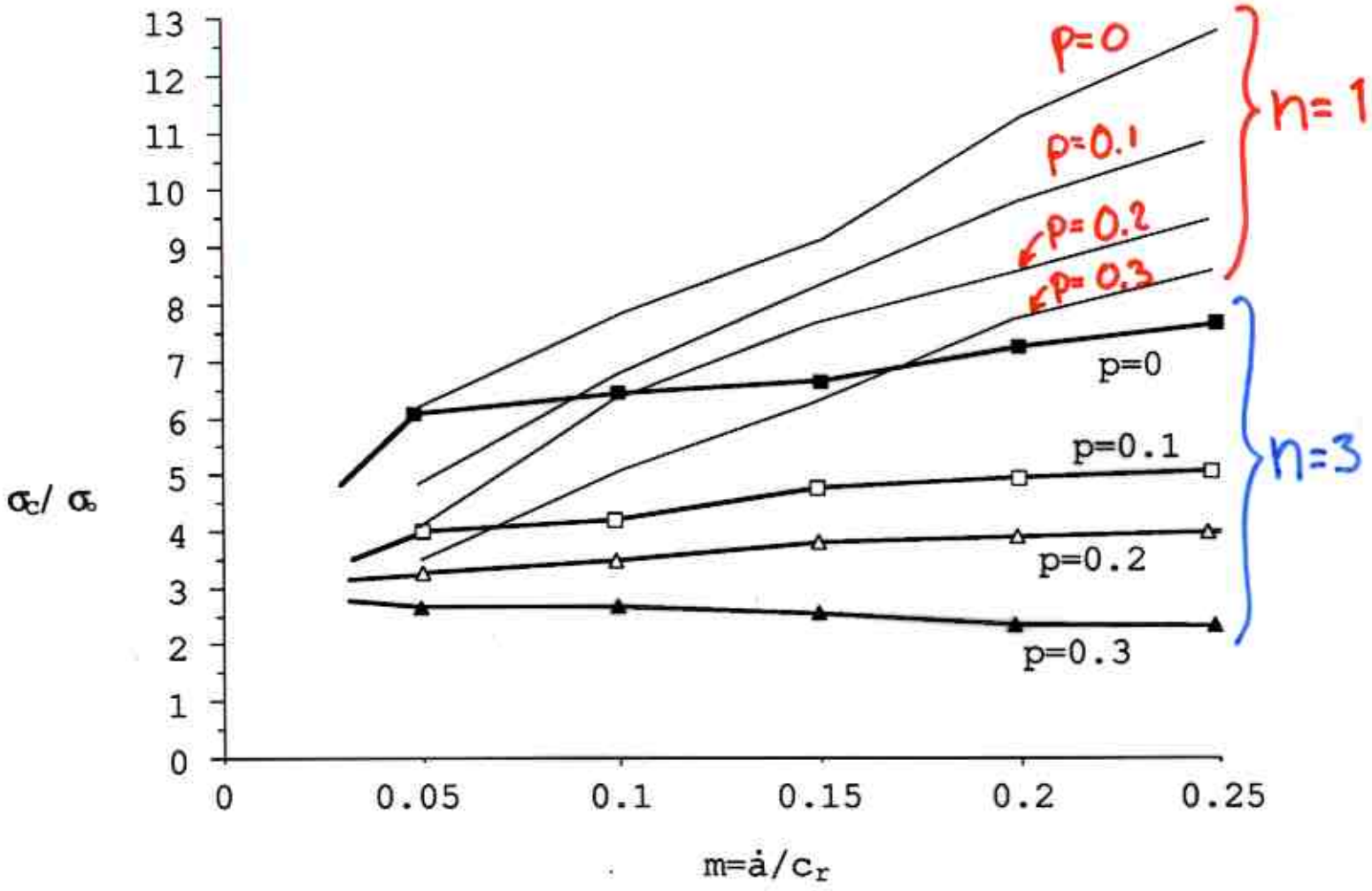


Fig. 6.1. Transverse temperature profiles at approximate time of crack initiation-arrest events: Series WP-1.


13
12
11
10
9
8
7
6
5
4
3
2
1
0
0
0.05
0.1
0.15
0.2
0.25
σc/ σo
m=ȧ/cr
p=0
p=0.1
p=0.2
p=0.3
n=1
p=0
p=0.1
p=0.2
p=0.3
n=3