

# Recent Improvements to the Advanced, Multiple Through Crack Solution

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For

LexTech, Inc.

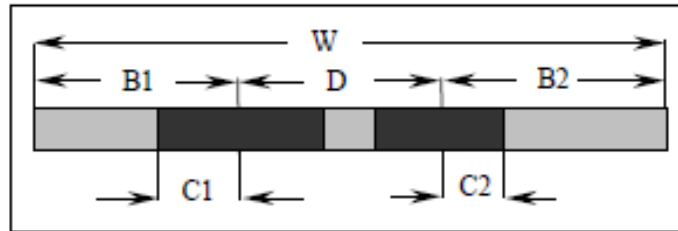
AFGROW Workshop

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# Current Multiple Through Crack Solution

StressCheck and FRANC2D/L FEM Solutions for  $W=40, 24, 20, 16, 8, \& 4$  were completed in 1998

Numerous crack lengths were modeled:  $0.02 < C1/C2 < 50$



## Legend

W – Width of the plate

H – Height of the plate

C1 – Left crack length

C2 – Right crack length

B1 – Offset from the left edge of specimen to the center of left crack

B2 – Offset from the right edge of specimen to the center of right crack

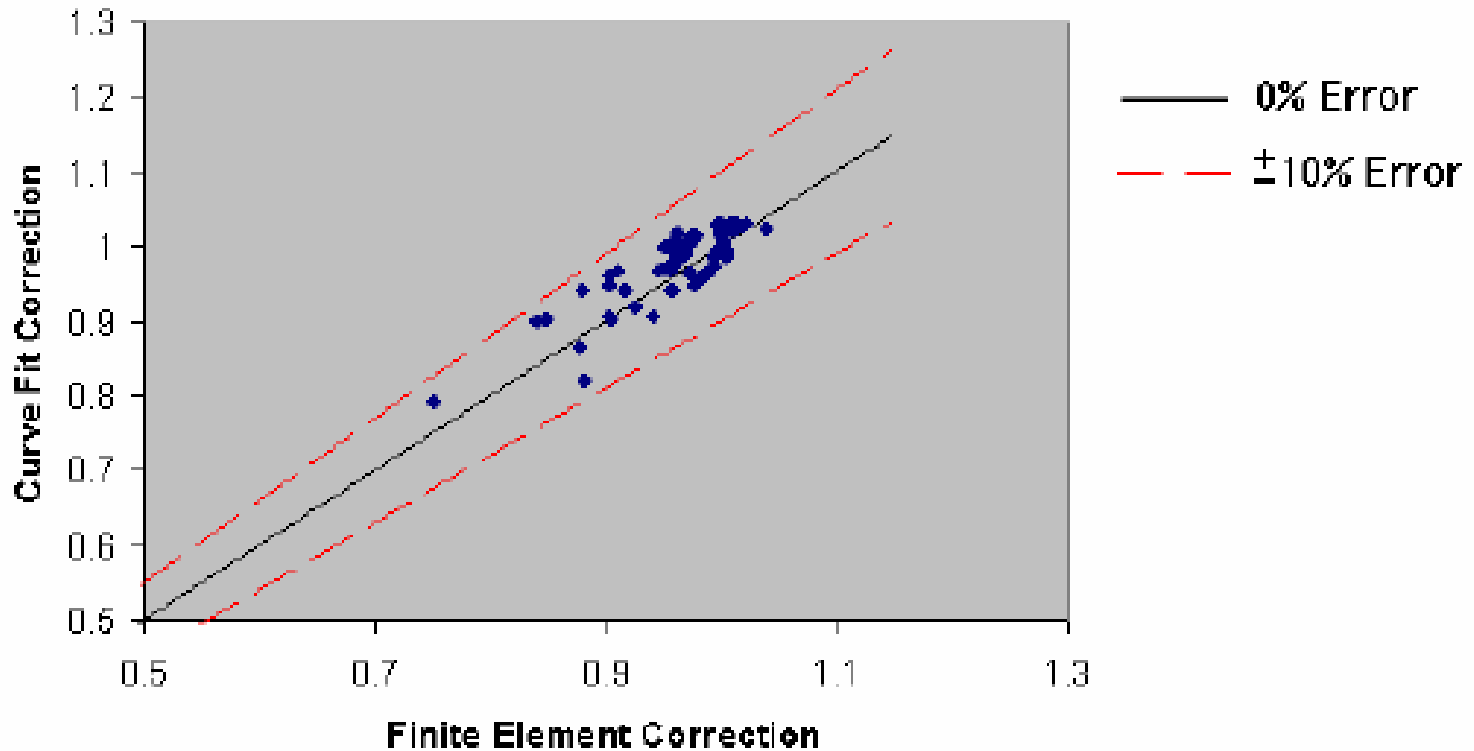
D – Distance between the crack centers

# Solution Parameters

Description	Parameter
Plate width	W
Left crack length	C1
Right crack length	C2
Distance between cracks	D
Crack length ratio	$C1/C2$
Crack length to distance ratio	$(C1+C2)/D$

# Solution Correlation

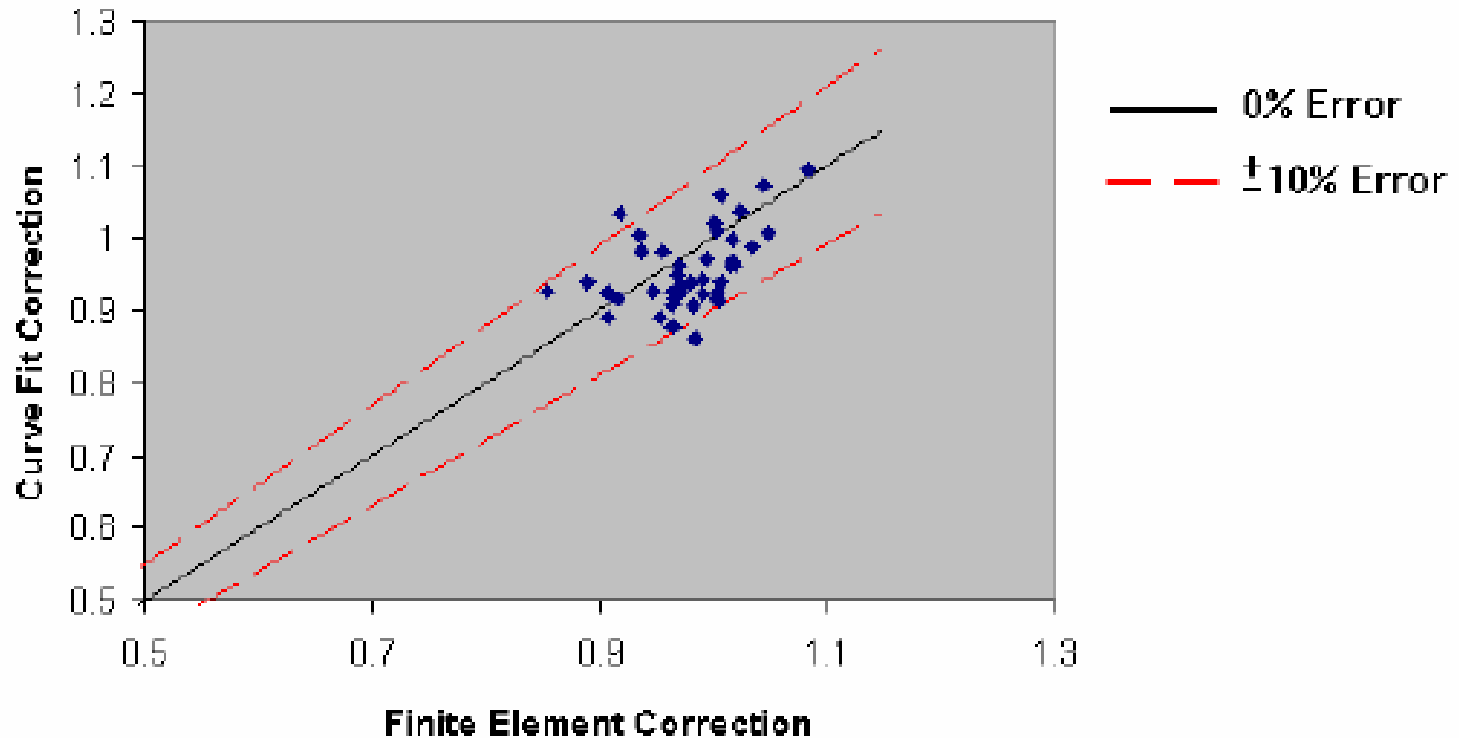
Two Internal Cracks - Left Tip



Outside Crack Tips

# Solution Correlation

Two Internal Cracks - Right Tip



Inside Crack Tips

# Solution Update

Why?

The solution is used as the basis to determine the effect of cracks approaching other cracks

Some Users have reported results that are counter-intuitive

# New Solution

StressCheck FEM results have been obtained for additional plate widths

1 & 2 inches

StressCheck FEM results for several previous geometric cases were compared to the original results

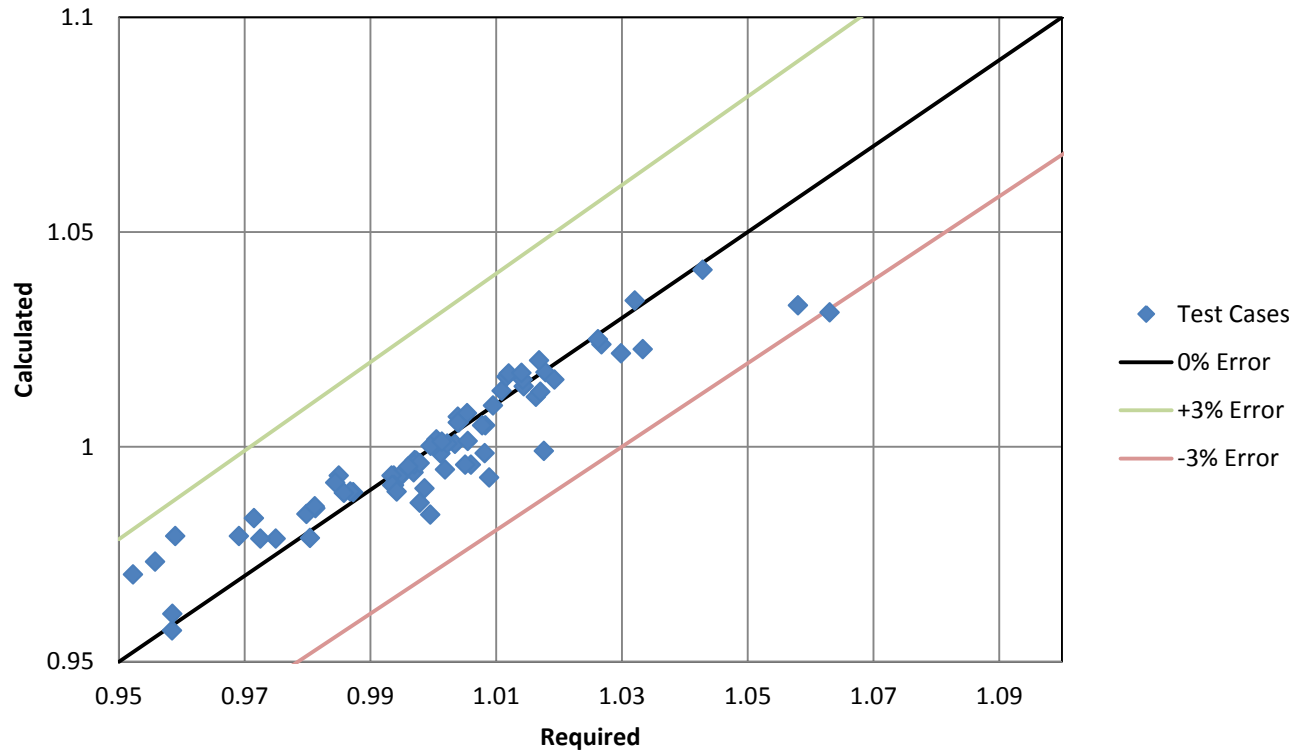
Cases for  $W=4$  and  $8$  were within 1% of the old results

The additional data was used to re-evaluate and update the old curve fit cases

The new fits were performed for:  $1 < W < 8$

# New Correlation

BC11

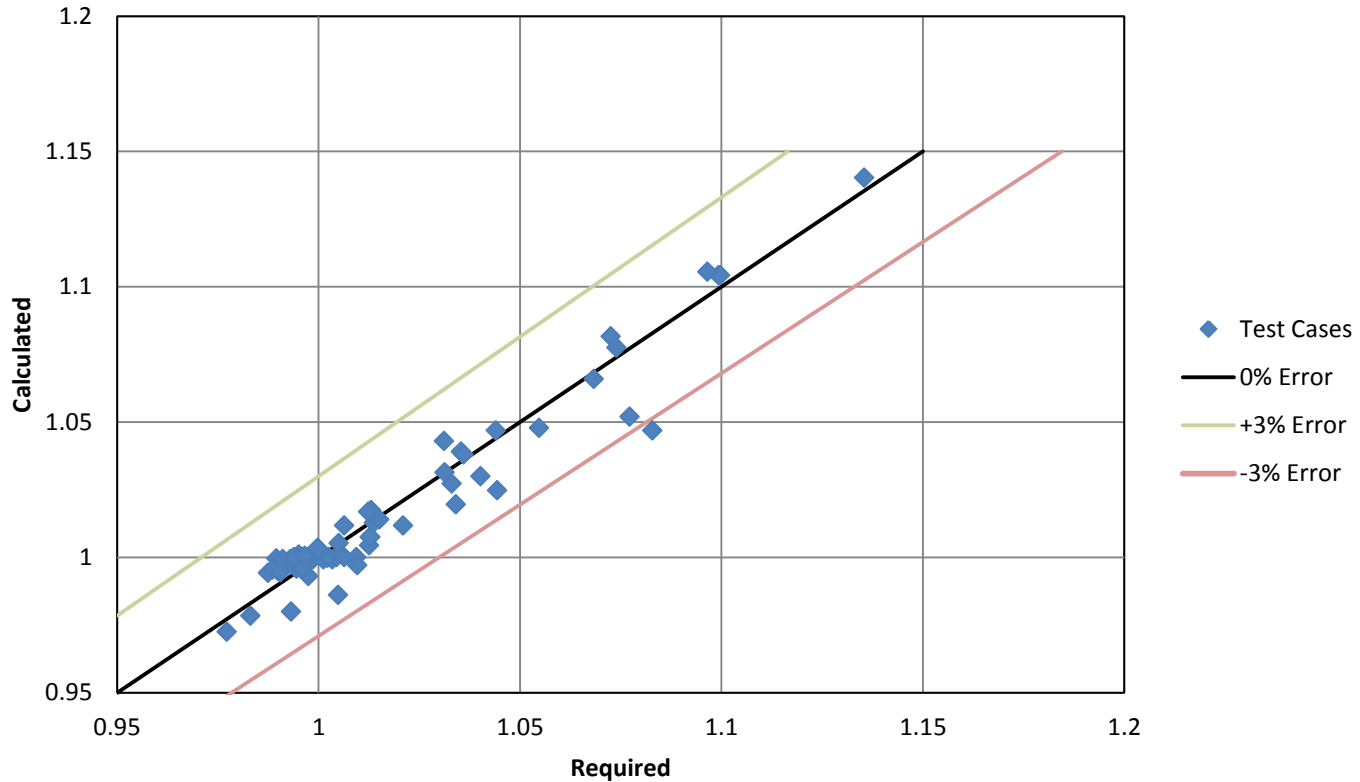


Outside Crack Tips



# New Correlation

BC12



Inside Crack Tips

# What's Next?

- Implement the new fit AFTER the upcoming release
- Test the solution for larger plate width & make any required modifications
- Release the updated solution ASAP