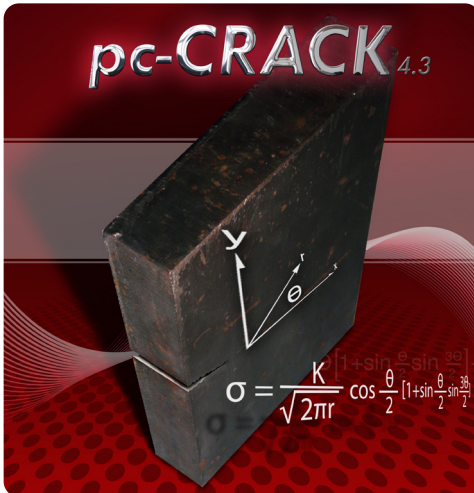


pc-CRACK FRACTURE MECHANICS SOFTWARE

Analyze Predict Flaw Behavior and Crack Growth Rates



Structural Integrity Associates, Inc.® pc-CRACK™ software has been an industry leader in fracture mechanics software. The Microsoft® Windows® based software analyzes and predicts flaw behavior, including calculation of crack growth rates and critical crack sizes for pressure vessels, piping, turbines, and structures, with immediate display of analysis results. pc-CRACK applications include ASME Code Section XI flaw evaluations as well as weld overlay design.

WHY pc-CRACK

pc-CRACK expands the capability of your engineering staff by providing an easy-to-use tool that allows users to rapidly perform sophisticated fracture mechanics analyses. With pc-CRACK, you can easily formulate decisions (and generate support documentation) regarding the effects of structural flaws in a wide variety of materials and components. A demo version of the software is available for free.

SOFTWARE FEATURES

- LEFM and EPFM Solutions
- Graphical User Interface Based Workflow
- Stress Intensity Factor Calculations
- Crack Growth Calculations
- J-a Tables and Crack Instability Determination
- Built-in Materials Library
- Single Edge and Double Edge Cracks
 - Standard Specimens
 - Plates
 - Hollow Cylinders
 - Solid Cylinders
 - Holes
 - Nozzles
 - Welds
 - Compound Crack in Hollow Cylinders
 - User Defined (1-DOF & 2-DOF)

System of Units		Start Mode	
<input checked="" type="radio"/> US Customary (ksi, in., °F, hrs) <input type="radio"/> SI (MPa, m, °C, hrs)		<input checked="" type="radio"/> Wizard <input type="radio"/> Free Form	
Analysis Type			
LEFM <input type="radio"/> Stress Intensity Factors <input type="radio"/> Critical Crack Size <input type="radio"/> Crack Growth		Codes and Standards <input checked="" type="radio"/> Allowable Crack Size - ASME Section XI IWB-3640/50 (1998) <input type="radio"/> Allowable Crack Size - ASME Section XI IWB-3640 (2004) <input type="radio"/> Weld Overlay Sizing (1998) <input type="radio"/> Weld Overlay Sizing (2004)	
EPFM <input type="radio"/> J-a Tables <input type="radio"/> Instability			

Analysis Options

CODES AND STANDARDS

- ASME Codes and Standards Qualifications
 - Allowable Crack Size Calculation
 - Weld Overlay Sizing Design
- Nuclear Quality Assurance



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1-877-474-7693

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San Jose, CA 95138

Crack Parameters (US Customary Units)

Crack Categories

Hollow Cylinders

305: Semi-Elliptical Longitudinal Crack in Cylinder on the Inside Surface (API 579)

Crack Dimensions

Crack Depth, a

Half Crack Length, c

Component Dimensions/Other Inputs

Wall Thickness, t

Inside Radius, R_i

Maximum a/t

For SIF Tabulation

a Print Increment

Maximum c/a

c/a Print Increment

☒ Variable Aspect Ratio

Available Crack Models

Pipe & Crack Dimensions

Orientation

☒ Circumferential

☐ Axial

Material

☐ Stainless Steel

☒ Carbon Steel

Seamless/Welded Wrought CS Pipe and Pipe Fitting, $YS \leq 40 \text{ ksi}$ (Categ

Pipe & Crack Dimensions

Nominal Pipe Size Crack Depth

Pipe OD Crack Length

Wall Thickness

Crack and Pipe Dimension Inputs

Load Cases (SI Units)

CaseID	Input Type	C0	C1	C2	C3
1	Coeffs. from Stress				
*					

Coefs. from Stress Table

Stress Table

Stress Intensity Factors (1D)

Load Input Options

Stress Input (SI Units)

Case ID: 1

X	Stress
1	0
2	12
3	38
4	30
5	32
6	33
7	41
* 8	

Degree of Polynomial

C0 = 6.2820 C2 = -92.4567

C1 = 88.9053 C3 = 29.6893

Corr. Coeff. = 0.8396

Use

☒ Coefficients ☐ Tabular Data

Stress Table Input and Curve Fit Capability

Materials Library

Library Selection

☐ Local (Read/Write)

☒ Global (Read only)

E:\PCCCRACK42\Matlibs\MatLib-MF.bin

4. Alloy 600: Description goes here

5. Material 5: Type 316 (CF8M): CG for SEQ Hot Leg

6. Material 6: Type 316 (CF8M): CG for SEG Cold/Crossover

7. Material 7: Type 316 (CF8M): CG for SEQ Hot Leg 304

8. Alloy 82/182: DMW for Hatch Recirc Inlet Nozzle WOL

9. Stainless Steel: SS for Hatch Recirc Inlet Nozzle WOL

10. Alloy 182: DMW for CCNP SRV

11. Diablo Canyon Stainless Steel: CG for Piping

12. Carbon Steel: ONS Hot Leg

13. Diablo Canyon Stainless Steel 2: ASME Austenitic Ste

System of Units

☒ US Customary (ksi, in, °F, hrs)

☐ SI (MPa, m, °C, hrs)

Tensile

Paris/Walker

SCC

PWSCC

ΔK -da/dn

KIC

Kmax-da/dt

J-R Curve

J-T Curve

Material Name

Description

Young's Modulus

Poisson's Ratio

Yield Strength

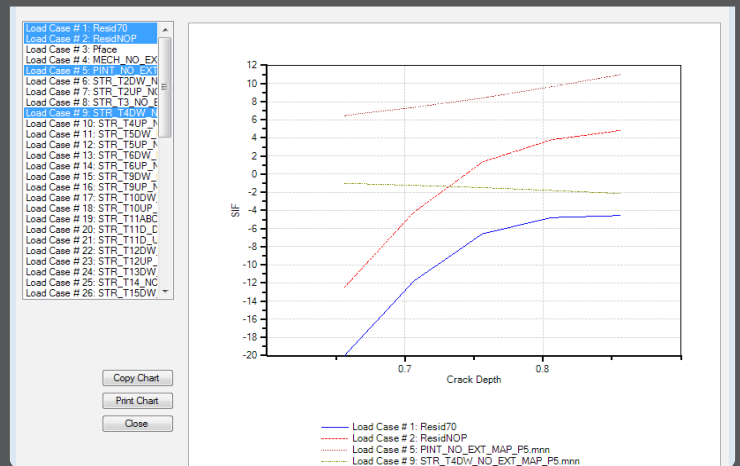
Flow Stress

Ramberg-Osgood $e0$

Ramberg-Osgood Alpha

Ramberg-Osgood n

User Customizable Materials Library



Stress Intensity Factor Results