

Time Dependence

AFGROW European Workshop

ZHAW

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3.5.4 Time Dependence

Time dependent crack growth rate data MUST be entered as a function of stress intensity and/or crack length (as indicated in Figure 184 below). Users may enter data as a function of both parameters. If this is done, the effect of time will be determined for both parameters.

Time Dependent Crack Growth Rate Data

AFGROW accepts time dependent data in a tabular format. These data may be functions of Crack Length and/or Stress Intensity.

Material Name:

Select Parameter and Application Ratio

Stress Intensity

Crack Length

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Users may select one or more parameters to be used to determine crack growth as a function of time. If both parameters are selected, each one will be applied with equal weight.

Stress Intensity

Number of sets:

Set	da/dt	K
1	1.00e-009	2.606
2	3.00e-009	2.636
3	1.00e-008	2.673
4	2.00e-008	2.685
5	4.00e-008	2.729
6	6.00e-008	2.792
7	1.00e-007	2.954
8	2.00e-007	3.207

Threshold Value:

OK Cancel Save Read Help

3.2.4.2.2 Time Dependent Spectrum Format

The time dependent spectrum format allows BOTH the cyclic and time dependent aspects of crack growth to be considered. If this format is used, user-defined time dependent crack growth rate data (see Section 3.5.5) will be used to determine the time dependent portion of the total crack growth life.

The first file for the time dependent spectrum is called a spectrum information file (named [filename].st3) with the format shown below:

[Title]

[sub-spectrum label] (i.e. Flight, Block , Hour, etc.)

[type of spectrum] (Either BLOCKED or CYCLEXCYCLE)

[number of files to follow]

The spectrum data files (**ASCII text**) are named [filename01.std], [filename02.std], ..., etc. These files are constructed as follows:

[Sub-spectrum Number] [number of levels] [seconds in sub-spectrum] [loading type]

[max] [min] [cycles]

.....

Loading Type:

1 – Random Cyclic Sequence (assumed to be sinusoidal)

2 – Ramp Up (may only have one level describing the ramp up)

3 – Ramp Down (may only have one level describing the ramp down)