```
PCO.hfi - Objectivity Test Input File

**HEADER
PCO.hfi: Test of objectivity of fatigue calculation
History Number Deformation Mode  Coordinate System
   11          ST              1
   12          ST              2
   21          PT              1
   22          PT              3
   31          EB              1
   32          EB              4
This test is passed if, for each of the pairs (11, 12), (21,22),
(31,32):
a) the fatigue life is equal.
b) the hysteresis is equal.

**OUTPUT
LIFE
HYSTERESIS
CRITICAL_PLANE_SEARCH, TYPE=TRI3D, NMESH=10

**MATERIAL

MAT=NR
ELASTICITY_TYPE=NEOHOOKEAN
C10=1.157 !MPA
BULK_MODULUS=1000.0 !MPa
FATIGUE_TYPE=THOMAS
FLAWSIZE=2.3E-6  !M
FLAWCRIT=1E-3  !M
RC=5.2E-6   !(M/CYCLE)
TCRITICAL=10000 !J/m^2
F0=2
TEMPCOEF=0.03 !1/DEGC
TEMPREF=20    ! DEGC
HYSTERESIS_TYPE=POWERLAW
TEMPCOEF_HYS=-0.005 ! 1/degC  Option
TEMPREF_HYS=35 ! (C) reference temperature
RATECOEF_HYS=0.024 ! 1/(1/s)
RATEREF_HYS=1       ! 1/s
EREF=0.150
HYSREF=0.02 ! mJ/mm^3
GAMMA=2.0
FSCALE=2.5
CHI=1.0


**HISTORY

HISTTYPE=6CNE3D

HIST=11,MAT=NR, TEMP=20 DEGC ST
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
0.2000000,-0.0871291,-0.0871291,0.0000000,0.0000000,0.0000000
0.4000000,-0.1548457,-0.1548457,0.0000000,0.0000000,0.0000000
0.6000000,-0.2094306,-0.2094306,0.0000000,0.0000000,0.0000000
0.8000000,-0.2546440,-0.2546440,0.0000000,0.0000000,0.0000000
1.0000000,-0.2928932,-0.2928932,0.0000000,0.0000000,0.0000000

HIST=12,MAT=NR, TEMP=20 DEGC ST
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
0.0610875,0.0180231,-0.0533687,-0.2496822,-0.1191633,0.1414756
0.1315667,0.0483494,-0.0896076,-0.4824837,-0.2302701,0.2733863
0.2083990,0.0869985,-0.1142586,-0.7038660,-0.3359270,0.3988266
0.2897652,0.1315869,-0.1306401,-0.9170991,-0.4376946,0.5196493
0.3745006,0.1805892,-0.1408762,-1.1242762,-0.5365719,0.6370406

HIST=21,MAT=NR, TEMP=20 DEGC PT
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
0.2000000,0.0000000,-0.1666667,0.0000000,0.0000000,0.0000000
0.4000000,0.0000000,-0.2857143,0.0000000,0.0000000,0.0000000
0.6000000,0.0000000,-0.3750000,0.0000000,0.0000000,0.0000000
0.8000000,0.0000000,-0.4444444,0.0000000,0.0000000,0.0000000
1.0000000,0.0000000,-0.5000000,0.0000000,0.0000000,0.0000000

HIST=22,MAT=NR, TEMP=20 DEGC PT
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
-0.1157701,0.0432681,0.1058354,0.0943858,0.2396758,-0.1274773
-0.1981533,0.0941778,0.2182612,0.1568260,0.4651582,-0.2252875
-0.2596697,0.1498635,0.3348061,0.1993001,0.6817699,-0.3045556
-0.3072749,0.2087333,0.4540971,0.2284635,0.8924677,-0.3714624
-0.3451422,0.2698319,0.5753103,0.2483094,1.0990258,-0.4297163

HIST=31,MAT=NR, TEMP=20 DEGC EB
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
0.2000000,0.2000000,-0.3055556,0.0000000,0.0000000,0.0000000
0.4000000,0.4000000,-0.4897959,0.0000000,0.0000000,0.0000000
0.6000000,0.6000000,-0.6093750,0.0000000,0.0000000,0.0000000
0.8000000,0.8000000,-0.6913580,0.0000000,0.0000000,0.0000000
1.0000000,1.0000000,-0.7500000,0.0000000,0.0000000,0.0000000

HIST=32,MAT=NR, TEMP=20 DEGC EB
0.0000000,0.0000000,0.0000000,0.0000000,0.0000000,0.0000000
-0.2374984,0.1777522,0.1541906,0.1973156,-0.0638485,0.2831363
-0.3700129,0.3608431,0.3193738,0.3472825,-0.1123756,0.4983300
-0.4465707,0.5467796,0.4904161,0.4720125,-0.1527364,0.6773102
-0.4905936,0.7343705,0.6648651,0.5820689,-0.1883491,0.8352348
-0.5144175,0.9229885,0.8414290,0.6830155,-0.2210139,0.9800872
```

```
PCO.hfo - objectivity test output file

Endurica VERSION 2.50
**HEADER
PCO.hfi: Test of objectivity of fatigue
calculation
History Number Deformation Mode
Coordinate System
   11          ST              1
   12          ST              2
   21          PT              1
   22          PT              3
   31          EB              1
   32          EB              4
This test is passed if, for each of the
pairs (11, 12), (21,22), (31,32):
a) the fatigue life is equal.
b) the hysteresis is equal.

** LIFE AND ORIENTATION PER HISTORY **
HISTORY#   LIFE
        11    0.73327E+15
        12    0.73359E+15
        21    0.75869E+15
        22    0.75863E+15
        31    0.62520E+15
        32    0.62365E+15
** HYSTERESIS **
HISTORY#   HYSTERESIS PER BLOCK
        11    0.23800E+00
        12    0.23802E+00
        21    0.28846E+00
        22    0.28846E+00
        31    0.47418E+00
        32    0.47412E+00
```