(8)

```
!    boral.mac
!    Computes the effective conductivity (including radiation &
!    conduction) for BORAL Sheet pocket
!
!    boral sheet = helium + al clad + core + al clad
!
!    arg1 = material set number
!    arg2 = radiation factor = emissivity*form factor*S-B constant
!    arg3 = thickness of helium gap
!    arg4 = thickness of aluminum cladding for BORAL sheet
!    arg5 = thickness of core material for BORAL sheet
!    arg6 = flag for boral sheet orientation
!          - 1 -  x-direction is parallel to thickness
!          - 2 -  x-direction is parallel to cross-width
!
the=arg3
tal=arg4
tcr=arg5
ttot=2*tal+tcr+2*the
!
!  Aluminum cladding for BORAL Sheet
!  FSAR: 212,392,572,752/100.00,104.51,108.04,109.43 Btu/ft-hr-F
!  (Al 1100) FSAR: 169.9 lbm/ft^3, 0.23 Btu/lbm-F
*set,kxxal
*dim,kxxal,table,5
kxxal(1,0)=   77,   212,   392,   572,   752
kxxal(1,1)=7.705, 8.332, 8.697, 8.991, 9.107
!
!  Core material for BORAL Sheet
!  FSAR: 212,392,572,752/48.09,48.03,47.28,46.35 Btu/ft-hr-F
!  (Boral) FSAR: 154.7 lbm/ft^3, 0.13 Btu/lbm-F
*set,kxxcr
*dim,kxxcr,table,5
kxxcr(1,0)=   77,   212,   392,   572,   752
kxxcr(1,1)=4.166, 4.002, 3.997, 3.935, 3.857
!
!  Helium gap around BORAL Sheet
!  Guyer: 1.24 Btu/lbm-F
!
mptemp
mpdel,kxx,arg1
mpdel,kyy,arg1
mpdel,dens,arg1
mpdel,c,arg1
*do,itab,1,11
  curtem=(itab-1)*100
  mptemp,itab,curtem
  curtma=curtem+460
  kcr=the*arg2*(curtma**2)*(curtma)*4
  kct=kxxx(curtem)+kcr

  tmp1=2*tal/kxxal(curtem)+tcr/kxxcr(curtem)
  tmp2=the/kct
  kxxtot=ttot/(tmp1+tmp2)

  tmp3=2*tal*kxxal(curtem)+tcr*kxxcr(curtem)
  tmp4=the*kxxx(curtem)
  kyytot=(tmp3+tmp4)/ttot

  *if,arg6,eq,1,then
    mpdata,kxx,arg1,itab,kxxtot
    mpdata,kyy,arg1,itab,kyytot
  *elseif,arg6,eq,2,then
    mpdata,kyy,arg1,itab,kxxtot
    mpdata,kxx,arg1,itab,kyytot
  *else
  *endif
```

A/30

```
  dens_hel=(4.00260*p_atm*fti**2/1545.3/(curtem+460))/(fti**3)
  dens_bsp=(169.9/fti**3*(2*tal)+dens_hel*(2*the)+154.7/fti**3*tcr)/ttot
  mpdata,dens,arg1,itab,dens_bsp

*enddo

c_bsp=(0.23*2*tal+1.240*2*the+0.13*tcr)/ttot
mp,c,arg1,c_bsp
```