Table 90 The file, **WALLTHICK.STAGS** (or eqellipse.STAGS) for the **optimized unstiffened equivalent ellipsoidal shell with the thick apex (Segment 1 in Fig. 2) of uniform thickness, t = 0.47183** inch, optimized with imperfection amplitude, **Wimp = 0.1 inch.**
This file is "called" by the "user-written" SUBROUTINE WALL for generation of the STAGS model with meridionally varying wall thickness. This file is also "called" by "user-written" SUBROUTINE USRFAB.(See Table 40). SUBROUTINE WALL is listed as Table a21 (wall.elastic.src) or as Table a22 (wall.plastic.src) or as Table a32 (wall.soccerball.plastic.src). SUBROUTINE USRFAB is listed as Table a35 (usrfab.plastic.src) or as Table a36 (usrfab.soccerball.plastic.src). The file, "**eqellipse.STAGS**" is generated automatically in SUBROUTINE STRUCT whenever the GENOPT processor, OPTIMIZE, is executed in the "ITYPE = 2" mode, that is, for the analysis of a "fixed" design with the user-selected specific case name, "eqellipse". Before the user runs STAGS, the file, **eqellipse.STAGS**, must be placed in the proper directory with the proper name: **WALLTHICK.STAGS.** Example, if the user is currently "in" the directory where STAGS is to be run:
cp /user/progs/genoptcase/**eqellipse.STAGS WALLTHICK.STAGS**
Compare with Table 79, for which t(apex) = 0.4 inch.

```
==================================================================
     Number of shell segments (units)=  12

 Isogrid spacing,modulus,nu,density=
              3.000000E+00  1.600000E+07  2.500000E-01  1.605492E-01

              Nodal points in Segment  1 =  13

                Angle (X-coordinate)=
  0.000000E+00  8.156468E-02  2.993615E-01  5.914913E-01  8.873521E-01
  1.183329E+00  1.479094E+00  1.774868E+00  2.070654E+00  2.366536E+00
  2.658591E+00  2.876780E+00  2.958103E+00

 Meridional arc length (X-coordinate)=
  0.000000E+00  7.027998E-02  2.587581E-01  5.111271E-01  7.666907E-01
  1.022254E+00  1.277818E+00  1.533381E+00  1.788945E+00  2.044508E+00
  2.296877E+00  2.485355E+00  2.555635E+00

                Shell skin thickness=
  4.718300E-01  4.718300E-01  4.718300E-01  4.718300E-01  4.718300E-01
  4.718300E-01  4.718300E-01  4.718300E-01  4.718300E-01  4.718300E-01
  4.718300E-01  4.718300E-01  4.718300E-01

       Stringer (or isogrid)  height=
  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
  1.000000E-06  1.000000E-06  1.000000E-06
```

Stringer (or isogrid) thickness=

1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 2 = 13

Angle (X-coordinate)=

2.957441E+00 3.060174E+00 3.335835E+00 3.704859E+00 4.078567E+00
4.452235E+00 4.825966E+00 5.199648E+00 5.573376E+00 5.947057E+00
6.316089E+00 6.591689E+00 6.694480E+00

Meridional arc length (X-coordinate)=

2.555635E+00 2.641534E+00 2.871897E+00 3.180351E+00 3.492708E+00
3.805066E+00 4.117423E+00 4.429781E+00 4.742138E+00 5.054496E+00
5.362949E+00 5.593312E+00 5.679211E+00

Shell skin thickness=

4.718300E-01 4.686015E-01 4.599432E-01 4.483500E-01 4.366100E-01
4.248700E-01 4.131300E-01 4.013900E-01 3.896500E-01 3.779100E-01
3.663168E-01 3.576585E-01 3.544300E-01

Stringer (or isogrid) height=

1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=

1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 3 = 13

Angle (X-coordinate)=

6.677820E+00 6.787783E+00 7.082718E+00 7.477612E+00 7.877512E+00
8.277422E+00 8.677313E+00 9.077207E+00 9.477120E+00 9.877010E+00
1.027192E+01 1.056684E+01 1.067682E+01

Meridional arc length (X-coordinate)=

5.679211E+00 5.765109E+00 5.995471E+00 6.303923E+00 6.616279E+00
6.928634E+00 7.240990E+00 7.553346E+00 7.865702E+00 8.178058E+00
8.486509E+00 8.716871E+00 8.802770E+00

Shell skin thickness=

3.544300E-01 3.542086E-01 3.536150E-01 3.528200E-01 3.520150E-01
3.512100E-01 3.504050E-01 3.496000E-01 3.487950E-01 3.479900E-01

```
 3.471951E-01  3.466014E-01  3.463800E-01

       Stringer (or isogrid)  height=
 1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
 1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
 1.000000E-06  1.000000E-06  1.000000E-06

    Stringer (or isogrid)  thickness=
 1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05
 1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05
 1.000000E-05  1.000000E-05  1.000000E-05

              Nodal points in Segment  4 =  13

                Angle (X-coordinate)=
 1.065673E+01  1.077948E+01  1.110865E+01  1.154942E+01  1.199575E+01
 1.244210E+01  1.288845E+01  1.333478E+01  1.378113E+01  1.422747E+01
 1.466823E+01  1.499742E+01  1.512016E+01

Meridional arc length (X-coordinate)=
 8.802770E+00  8.888667E+00  9.119027E+00  9.427476E+00  9.739830E+00
 1.005218E+01  1.036454E+01  1.067689E+01  1.098924E+01  1.130160E+01
 1.161005E+01  1.184041E+01  1.192630E+01

                Shell skin thickness=
 3.463800E-01  3.460239E-01  3.450688E-01  3.437900E-01  3.424950E-01
 3.412000E-01  3.399050E-01  3.386100E-01  3.373150E-01  3.360200E-01
 3.347412E-01  3.337861E-01  3.334300E-01

       Stringer (or isogrid)  height=
 1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
 1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06  1.000000E-06
 1.000000E-06  1.000000E-06  1.000000E-06

    Stringer (or isogrid)  thickness=
 1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05
 1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05  1.000000E-05
 1.000000E-05  1.000000E-05  1.000000E-05

              Nodal points in Segment  5 =  13

                Angle (X-coordinate)=
 1.508829E+01  1.523219E+01  1.561814E+01  1.613492E+01  1.665823E+01
 1.718155E+01  1.770487E+01  1.822818E+01  1.875149E+01  1.927481E+01
 1.979159E+01  2.017753E+01  2.032144E+01

Meridional arc length (X-coordinate)=
 1.192630E+01  1.201220E+01  1.224257E+01  1.255102E+01  1.286338E+01
```

1.317574E+01 1.348810E+01 1.380046E+01 1.411282E+01 1.442518E+01
1.473364E+01 1.496400E+01 1.504990E+01

Shell skin thickness=
3.334300E-01 3.324342E-01 3.297637E-01 3.261880E-01 3.225670E-01
3.189460E-01 3.153250E-01 3.117040E-01 3.080830E-01 3.044620E-01
3.008862E-01 2.982157E-01 2.972200E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 6 = 13

Angle (X-coordinate)=
2.026536E+01 2.044455E+01 2.092512E+01 2.156858E+01 2.222019E+01
2.287180E+01 2.352341E+01 2.417502E+01 2.482663E+01 2.547823E+01
2.612170E+01 2.660226E+01 2.678145E+01

Meridional arc length (X-coordinate)=
1.504990E+01 1.513580E+01 1.536616E+01 1.567462E+01 1.598697E+01
1.629933E+01 1.661169E+01 1.692405E+01 1.723640E+01 1.754876E+01
1.785721E+01 1.808758E+01 1.817347E+01

Shell skin thickness=
2.972200E-01 2.962644E-01 2.937016E-01 2.902700E-01 2.867950E-01
2.833200E-01 2.798450E-01 2.763700E-01 2.728950E-01 2.694200E-01
2.659884E-01 2.634256E-01 2.624700E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 7 = 13

Angle (X-coordinate)=

2.679548E+01 2.696524E+01 2.742050E+01 2.803009E+01 2.864739E+01
2.926470E+01 2.988201E+01 3.049931E+01 3.111662E+01 3.173392E+01
3.234351E+01 3.279877E+01 3.296853E+01

Meridional arc length (X-coordinate)=
1.817347E+01 1.823699E+01 1.840732E+01 1.863539E+01 1.886634E+01
1.909730E+01 1.932825E+01 1.955921E+01 1.979016E+01 2.002112E+01
2.024919E+01 2.041952E+01 2.048303E+01

Shell skin thickness=
2.624700E-01 2.623229E-01 2.619283E-01 2.614000E-01 2.608650E-01
2.603300E-01 2.597950E-01 2.592600E-01 2.587250E-01 2.581900E-01
2.576617E-01 2.572671E-01 2.571200E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 8 = 13

Angle (X-coordinate)=
3.294721E+01 3.313707E+01 3.364623E+01 3.432798E+01 3.501837E+01
3.570876E+01 3.639914E+01 3.708953E+01 3.777991E+01 3.847030E+01
3.915207E+01 3.966122E+01 3.985107E+01

Meridional arc length (X-coordinate)=
2.048303E+01 2.053856E+01 2.068748E+01 2.088689E+01 2.108882E+01
2.129074E+01 2.149267E+01 2.169460E+01 2.189653E+01 2.209846E+01
2.229786E+01 2.244678E+01 2.250231E+01

Shell skin thickness=
2.571200E-01 2.565032E-01 2.548489E-01 2.526340E-01 2.503910E-01
2.481480E-01 2.459050E-01 2.436620E-01 2.414190E-01 2.391760E-01
2.369610E-01 2.353068E-01 2.346900E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05

1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 9 = 13

Angle (X-coordinate)=
3.977901E+01 4.002785E+01 4.069519E+01 4.158876E+01 4.249363E+01
4.339851E+01 4.430339E+01 4.520827E+01 4.611314E+01 4.701801E+01
4.791158E+01 4.857893E+01 4.882777E+01

Meridional arc length (X-coordinate)=
2.250231E+01 2.255784E+01 2.270677E+01 2.290617E+01 2.310810E+01
2.331003E+01 2.351196E+01 2.371389E+01 2.391582E+01 2.411775E+01
2.431715E+01 2.446608E+01 2.452161E+01

Shell skin thickness=
2.346900E-01 2.340512E-01 2.323380E-01 2.300440E-01 2.277210E-01
2.253980E-01 2.230750E-01 2.207520E-01 2.184290E-01 2.161060E-01
2.138120E-01 2.120988E-01 2.114600E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 10 = 13

Angle (X-coordinate)=
4.874254E+01 4.907703E+01 4.997408E+01 5.117522E+01 5.239155E+01
5.360789E+01 5.482423E+01 5.604056E+01 5.725691E+01 5.847325E+01
5.967438E+01 6.057143E+01 6.090592E+01

Meridional arc length (X-coordinate)=
2.452161E+01 2.457714E+01 2.472606E+01 2.492546E+01 2.512739E+01
2.532931E+01 2.553124E+01 2.573317E+01 2.593509E+01 2.613702E+01
2.633642E+01 2.648534E+01 2.654087E+01

Shell skin thickness=
2.114600E-01 2.115092E-01 2.116412E-01 2.118180E-01 2.119970E-01
2.121760E-01 2.123550E-01 2.125340E-01 2.127130E-01 2.128920E-01
2.130688E-01 2.132008E-01 2.132500E-01

Stringer (or isogrid) height=

1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 11 = 13

Angle (X-coordinate)=
6.095361E+01 6.134404E+01 6.239109E+01 6.379308E+01 6.521282E+01
6.663256E+01 6.805230E+01 6.947204E+01 7.089178E+01 7.231151E+01
7.371350E+01 7.476056E+01 7.515099E+01

Meridional arc length (X-coordinate)=
2.654087E+01 2.659085E+01 2.672488E+01 2.690434E+01 2.708607E+01
2.726781E+01 2.744954E+01 2.763127E+01 2.781301E+01 2.799474E+01
2.817420E+01 2.830823E+01 2.835821E+01

Shell skin thickness=
2.132500E-01 2.114589E-01 2.066556E-01 2.002240E-01 1.937110E-01
1.871980E-01 1.806850E-01 1.741720E-01 1.676590E-01 1.611461E-01
1.547144E-01 1.499111E-01 1.481200E-01

Stringer (or isogrid) height=
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06 1.000000E-06
1.000000E-06 1.000000E-06 1.000000E-06

Stringer (or isogrid) thickness=
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05 1.000000E-05
1.000000E-05 1.000000E-05 1.000000E-05

Nodal points in Segment 12 = 13

Angle (X-coordinate)=
7.531520E+01 7.571658E+01 7.679298E+01 7.823426E+01 7.969379E+01
8.115332E+01 8.261285E+01 8.407239E+01 8.553191E+01 8.699145E+01
8.843273E+01 8.950913E+01 8.991051E+01

Meridional arc length (X-coordinate)=
2.835821E+01 2.840263E+01 2.852177E+01 2.868129E+01 2.884283E+01
2.900438E+01 2.916592E+01 2.932747E+01 2.948901E+01 2.965055E+01
2.981007E+01 2.992921E+01 2.997364E+01

Shell skin thickness=

1.481200E-01	1.504974E-01	1.568731E-01	1.654100E-01	1.740550E-01
1.827001E-01	1.913451E-01	1.999900E-01	2.086350E-01	2.172800E-01
2.258169E-01	2.321926E-01	2.345700E-01		

Stringer (or isogrid) height=

1.000000E-06	1.000000E-06	1.000000E-06	1.000000E-06	1.000000E-06
1.000000E-06	1.000000E-06	1.000000E-06	1.000000E-06	1.000000E-06
1.000000E-06	1.000000E-06	1.000000E-06		

Stringer (or isogrid) thickness=

1.000000E-05	1.000000E-05	1.000000E-05	1.000000E-05	1.000000E-05
1.000000E-05	1.000000E-05	1.000000E-05	1.000000E-05	1.000000E-05
1.000000E-05	1.000000E-05	1.000000E-05		

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