ตัวอย่างอินพุตไฟล์สำหรับคำนวณค่าสัมประสิทธิ์พลังงานความเครียดเมื่อรับแรงดึง

*HEADING

 Single element model to test fit of hyperelastic test data

 Tension Polynomial N=2

*RESTART,WRITE,FREQUENCY=100

*NODE,   NSET=ALL

1,0.,0.,0.

2,1.,0.,0.

3,1.,1.,0.

4,0.,1.,0.

5,0.,0.,1.

6,1.,0.,1.

7,1.,1.,1.

8,0.,1.,1.

*NSET,   NSET=FACE1

1,2,3,4

*NSET,   NSET=FACE2

5,6,7,8

*NSET,   NSET=FACE3

1,2,5,6

*NSET,   NSET=FACE4

2,3,6,7

*NSET,   NSET=FACE5

3,4,7,8

*NSET,   NSET=FACE6

4,1,8,5

*EQUATION

2

FACE2,1,1, 2,1,-1

```
*ELEMENT,    TYPE=C3D8RH,        ELSET=ONE
1,1,2,3,4,5,6,7,8
*SOLID SECTION,ELSET=ONE,        MATERIAL=TREL
*MATERIAL,NAME=TREL
*HYPERELASTIC,POLYNOMIAL,N=2,TEST DATA INPUT
*UNIAXIAL TEST DATA
0.0000,      0.0000
0.2581,      0.0500
0.4498,      0.1000
0.5955,      0.1500
0.7114,      0.2000
0.8102,      0.2500
0.9012,      0.3000
0.9914,      0.3500
1.0854,      0.4000
1.1865,      0.4500
1.2970,      0.5000
1.4185,      0.5500
1.5530,      0.6000
1.7029,      0.6500
1.8718,      0.7000
2.0649,      0.7500
2.2898,      0.8000
2.5567,      0.8500
2.8791,      0.9000
**
*STEP,NLGEOM,INC=50000
Step 1:Uniaxial Tension
*STATIC,DIRECT
.02,1.8
```

```
*BOUNDARY,OP=NEW

FACE1,3

FACE3,2

FACE6,1

FACE4,1,1,1.8

*ENERGY PRINT

*EL PRINT,FREQUENCY=500

S

E

*NODE PRINT,FREQUENCY=500

U,RF

*NODE FILE,FREQUENCY=1

U,RF

*END STEP

*STEP,NLGEOM,INC=20

Step 2: Unload

*STATIC,DIRECT

.1,1.8

*BOUNDARY,OP=MOD

FACE4,1

*END STEP
```

ตัวอย่างอินพุตไฟล์สำหรับคำนวณค่าสัมประสิทธิ์พลังงานความเครียดเมื่อรับแรงกด

*HEADING

 Single element model to test fit of hyperelastic test data

 Compression Polynomial N=2

*RESTART,WRITE,FREQUENCY=100

*NODE,   NSET=ALL

1,0.,0.,0.

2,1.,0.,0.

3,1.,1.,0.

4,0.,1.,0.

5,0.,0.,1.

6,1.,0.,1.

7,1.,1.,1.

8,0.,1.,1.

*NSET,   NSET=FACE1

1,2,3,4

*NSET,   NSET=FACE2

5,6,7,8

*NSET,   NSET=FACE3

1,2,5,6

*NSET,   NSET=FACE4

2,3,6,7

*NSET,   NSET=FACE5

3,4,7,8

*NSET,   NSET=FACE6

4,1,8,5

*EQUATION

2

FACE2,1,1, 2,1,-1

```
*ELEMENT,    TYPE=C3D8RH,         ELSET=ONE
1,1,2,3,4,5,6,7,8
*SOLID SECTION,ELSET=ONE,         MATERIAL=TREL
*MATERIAL,NAME=TREL
*HYPERELASTIC,POLYNOMIAL,N=2,TEST DATA INPUT
*UNIAXIAL TEST DATA
0.0000,          0.0000
-0.1251,         -0.0250
-0.2430,         -0.0500
-0.3561,         -0.0750
-0.4668,         -0.1000
-0.5774,         -0.1250
-0.6902,         -0.1500
-0.8076,         -0.1750
-0.9319,         -0.2000
-1.0654,         -0.2250
-1.2106,         -0.2500
-1.3697,         -0.2750
-1.5450,         -0.3000
-1.7390,         -0.3250
-1.9540,         -0.3500
-2.1922,         -0.3750
-2.4561,         -0.4000
-2.7480,         -0.4250
-3.0702,         -0.4500
-3.4251,         -0.4750
**
*STEP,NLGEOM,INC=50000
Step 1:Uniaxial Compression
*STATIC,DIRECT
```

.02,1.8

*BOUNDARY,OP=NEW

FACE1,3

FACE3,2

FACE6,1

FACE4,1,1,1.8

*ENERGY PRINT

*EL PRINT,FREQUENCY=500

S

E

*NODE PRINT,FREQUENCY=500

U,RF

*NODE FILE,FREQUENCY=1

U,RF

*END STEP

*STEP,NLGEOM,INC=20

Step 2: Unload

*STATIC,DIRECT

.1,1.8

*BOUNDARY,OP=MOD

FACE4,1

*END STEP

ตัวอย่างอินพุตไฟล์สำหรับชิ้นงานยางทดสอบแรงดึง

*HEADING

Model Rubber Tension Test Polynomial N=2

Unit SI mm, MPa

PERFECT BONDING

*NODE

1,0.,0.,0.

801,6.,0.,0.

4001,0.,3.,0.

4801,6.,3.,0.

49,0.,0.,40.

849,6.,0.,40.

4049,0.,3.,40.

4849,6.,3.,40.

**

*NGEN,   NSET=F1

1,801,100

*NGEN,   NSET=B1

4001,4801,100

*NFILL,   NSET=BASE1

F1,B1,4,1000

*NGEN,   NSET=F2

49,849,100

*NGEN,   NSET=B2

4049,4849,100

*NFILL,   NSET=BASE2

F2,B2,4,1000

*NFILL,   NSET=ALL

BASE1,BASE2,48,1

```
**
**
*ELEMENT,          TYPE=C3D20,          ELSET=STEEL1
1,1,201,2201,2001,3,203,2203,2003,101,1201,
2101,1001,103,1203,2103,1003,2,202,2202,2002
*ELGEN,          ELSET=STEEL1
1,4,200,100,2,2000,1000
*ELEMENT,          TYPE=C3D20RH,          ELSET=RUBBER
2,3,203,2203,2003,5,205,2205,2005,103,1203,
2103,1003,105,1205,2105,1005,4,204,2204,2004
*ELGEN,          ELSET=RUBBER
2,4,200,100,2,2000,1000,22,2,1
*ELEMENT,          TYPE=C3D20,          ELSET=STEEL2
24,47,247,2247,2047,49,249,2249,2049,147,1247,
2147,1047,149,1249,2149,1049,48,248,2248,2048
*ELGEN,          ELSET=STEEL2
24,4,200,100,2,2000,1000
**
*SOLID SECTION,     ELSET=STEEL1          ,MATERIAL=STEEL
*SOLID SECTION,     ELSET=STEEL2,          MATERIAL=STEEL
*SOLID SECTION,     ELSET=RUBBER,          MATERIAL=RUBBER
*MATERIAL,          NAME=RUBBER
*HYPERELASTIC,N=2
-2.042,3.088,1.414,-3.878,3.678
*MATERIAL,          NAME=STEEL
*ELASTIC
200E3,0.3
*STEP,NLGEOM
*STATIC
*BOUNDARY
```

```
BASE1, ENCASTRE
*DLOAD
STEEL2,P2,-2.0
*RESTART, WRITE
*NODE PRINT
U
RF
*EL PRINT
S
*END STEP
```

ตัวอย่างอินพุตไฟล์สำหรับชิ้นงานยางขนาดความกว้าง 30 mm หนา 10 mm เชื่อมต่อด้วยกาวแห้ง เร็ว รับแรงกด 1 MPa

*HEADING

Design element

Unit SI mm, MPa

Rectangular Bonded Disk, h=10 mm, D=30 mm, Instant Glue

*NODE

1,0.,0.,0.

11,15.,0.,0.

511,15.,15.,0.

501,0.,15.,0.

12,20.,0.,0.

512,20.,15.,0.

551,0.,20.,0.

561,15.,20.,0.

562,20.,20.,0.

1001,0.,0.,5.

1011,15.,0.,5.

1511,15.,15.,5.

1501,0.,15.,5.

1012,20.,0.,5.

1512,20.,15.,5.

1551,0.,20.,5.

1561,15.,20.,5.

1562,20.,20.,5.

2001,0.,0.,5.

2011,15.,0.,5.

2511,15.,15.,5.

2501,0.,15.,5.

```
12001,0.,0.,15.
12011,15.,0.,15.
12511,15.,15.,15.
12501,0.,15.,15.
13001,0.,0.,15.
13011,15.,0.,15.
13511,15.,15.,15.
13501,0.,15.,15.
13012,20.,0.,15.
13512,20.,15.,15.
13551,0.,20.,15.
13561,15.,20.,15.
13562,20.,20.,15.
14001,0.,0.,20.
14011,15.,0.,20.
14511,15.,15.,20.
14501,0.,15.,20.
14012,20.,0.,20.
14512,20.,15.,20.
14551,0.,20.,20.
14561,15.,20.,20.
14562,20.,20.,20.
**
*NGEN,              NSET=LEFT1
1,501,50
*NGEN,              NSET=RIGHT1
11,511,50
*NFILL,             NSET=BASE1
LEFT1,RIGHT1,10,1
*NGEN,              NSET=BASE1
```

```
12,512,50
*NGEN,              NSET=BASE1
551,561,1
*NGEN,              NSET=LEFT2
1001,1501,50
*NGEN,              NSET=RIGHT2
1011,1511,50
*NFILL,             NSET=BASE2
LEFT2,RIGHT2,10,1
*NGEN,              NSET=BASE2
1012,1512,50
*NGEN,              NSET=BASE2
1551,1561,1
*NGEN,              NSET=LEFT3
2001,2501,50
*NGEN,              NSET=RIGHT3
2011,2511,50
*NFILL,             NSET=BASE3
LEFT3,RIGHT3,10,1
*NGEN,              NSET=LEFT4
12001,12501,50
*NGEN,              NSET=RIGHT4
12011,12511,50
*NFILL,             NSET=BASE4
LEFT4,RIGHT4,10,1
*NFILL,             NSET=STEEL
BASE3,BASE4,10,1000
*NGEN,              NSET=LEFT5
13001,13501,50
*NGEN,              NSET=RIGHT5
```

13011,13511,50

*NFILL,   NSET=BASE5

LEFT5,RIGHT5,10,1

*NGEN,   NSET=BASE5

13012,13512,50

*NGEN,   NSET=BASE5

13551,13561,1

*NGEN,   NSET=LEFT6

14001,14501,50

*NGEN,   NSET=RIGHT6

14011,14511,50

*NFILL,   NSET=BASE6

LEFT6,RIGHT6,10,1

*NGEN,   NSET=BASE6

14012,14512,50

*NGEN,   NSET=BASE6

14551,14561,1

*NSET,   NSET=B12,   GENERATE

1001,14001,1000

*NSET,   NSET=B2,   GENERATE

1002,14002,1000

1003,14003,1000

1004,14004,1000

1005,14005,1000

1006,14006,1000

1007,14007,1000

1008,14008,1000

1009,14009,1000

1010,14010,1000

1011,14011,1000

```
*NSET,              NSET=B1,      GENERATE
1051,14051,1000
1101,14101,1000
1151,14151,1000
1201,14201,1000
1251,14251,1000
1301,14301,1000
1351,14351,1000
1401,14401,1000
1451,14451,1000
1501,14501,1000
**
*ELEMENT,          TYPE=C3D8,        ELSET=STEEL1
1, 1,2,52,51,1001,1002,1052,1051
*ELGEN,            ELSET=STEEL1
1,11,1,1,11,50,20
*ELEMENT,          TYPE=C3D8RH,      ELSET=RUBBER
1001,2001,2002,2052,2051,3001,3002,3052,3051
*ELGEN,            ELSET=RUBBER
1001,10,1,1,10,50,20,10,1000,1000
*ELEMENT,          TYPE=C3D8,        ELSET=STEEL2
12001,13001,13002,13052,13051,14001,14002,14052,14051
*ELGEN,            ELSET=STEEL2
12001,11,1,1,11,50,20
**ELEMENT
*ELSET,            ELSET=RU1,        GENERATE
1001,1010,1
1021,1030,1
1041,1050,1
1061,1070,1
```

1081,1090,1

1101,1110,1

1121,1130,1

1141,1150,1

1161,1170,1

1181,1190,1

*ELSET,   ELSET=RU2,   GENERATE

10001,10010,1

10021,10030,1

10041,10050,1

10061,10070,1

10081,10090,1

10101,10110,1

10121,10130,1

10141,10150,1

10161,10170,1

10181,10190,1

*ELSET,   ELSET=TOP,   GENERATE

12001,12181,20

12002,12182,20

12003,12183,20

12004,12184,20

12005,12185,20

12006,12186,20

12007,12187,20

12008,12188,20

12009,12189,20

12010,12190,20

*ELSET,   ELSET=RB4,   GENERATE

1010,1190,20

```
*ELSET,              ELSET=RB5,          GENERATE
1181,1190,1
*ELSET,              ELSET=RT4,          GENERATE
10010,10190,20
*ELSET,              ELSET=RT5,          GENERATE
10181,10190,1
*ELEMENT,            TYPE=SPRING2,       ELSET=CX
40001,1001,2001
45001,12001,13001
*ELGEN,              ELSET=CX
40001,2,10,10,2,500,500
45001,2,10,10,2,500,500
*SPRING,             ELSET=CX
1,1
14.63
*ELEMENT,            TYPE=SPRING2,       ELSET=CY
20001,1001,2001
25001,12001,13001
*ELGEN,              ELSET=CY
20001,2,10,10,2,500,500
25001,2,10,10,2,500,500
*SPRING,             ELSET=CY
2,2
14.63
*ELEMENT,            TYPE=SPRING2,       ELSET=CZ
30001,1001,2001
35001,12001,13001
*ELGEN,              ELSET=CZ
30001,2,10,10,2,500,500
35001,2,10,10,2,500,500
```

```
*SPRING,              ELSET=CZ
3,3
32.63
*ELEMENT,            TYPE=SPRING2        ,ELSET=SX
40002,1002,2002
40051,1051,2051
45002,12002,13002
45051,12051,13051
*ELGEN,              ELSET=SX
40002,9,1,1,2,500,500
40051,2,10,10,9,50,50
45002,9,1,1,2,500,500
45051,2,10,10,9,50,50
*SPRING,             ELSET=SX
1,1
29.25
*ELEMENT,            TYPE=SPRING2,       ELSET=SY
20002,1002,2002
20051,1051,2051
25002,12002,13002
25051,12051,13051
*ELGEN,              ELSET=SY
20002,9,1,1,2,500,500
20051,2,10,10,9,50,50
25002,9,1,1,2,500,500
25051,2,10,10,9,50,50
*SPRING,             ELSET=SY
2,2
29.25
*ELEMENT,            TYPE=SPRING2,       ELSET=SZ
```

```
30002,1002,2002
30051,1051,2051
35002,12002,13002
35051,12051,13051
*ELGEN,                 ELSET=SZ
30002,9,1,1,2,500,500
30051,2,10,10,9,50,50
35002,9,1,1,2,500,500
35051,2,10,10,9,50,50
*SPRING,                ELSET=SZ
3,3
65.25
*ELEMENT,               TYPE=SPRING2,      ELSET=MX
40052,1052,2052
45052,12052,13052
*ELGEN,ELSET=MX
40052,9,1,1,9,50,50
45052,9,1,1,9,50,50
*SPRING,ELSET=MX
1,1
58.50
**
*ELEMENT,               TYPE=SPRING2,      ELSET=MY
20052,1052,2052
25052,12052,13052
*ELGEN,                 ELSET=MY
20052,9,1,1,9,50,50
25052,9,1,1,9,50,50
*SPRING,                ELSET=MY
2,2
```

58.50

**

*ELEMENT,   TYPE=SPRING2,   ELSET=MZ

30052,1052,2052

35052,12052,13052

*ELGEN,   ELSET=MZ

30052,9,1,1,9,50,50

35052,9,1,1,9,50,50

*SPRING,   ELSET=MZ

3,3

130.50

*ELSET,   ELSET=T1,   GENERATE

10001,10010,1

10101,10110,1

10181,10190,1

*SOLID SECTION,   ELSET=STEEL1,   MATERIAL=STEEL

*SOLID SECTION,   ELSET=RUBBER,   MATERIAL=RUBBER

*SOLID SECTION,   ELSET=STEEL2,   MATERIAL=STEEL

*MATERIAL,   NAME=RUBBER

*HYPERELASTIC,N=2

2.843,-1.986,2.013,-1.311,0.318

*MATERIAL,   NAME=STEEL

*ELASTIC

200E3,0.3

*SURFACE DEFINITION,   NAME=ST1

STEEL1,S2

*SURFACE DEFINITION,   NAME=RU1

RU1,S1

RB4,S4

RB5,S5

```
*SURFACE DEFINITION,       NAME=ST2
STEEL2,S1
*SURFACE DEFINITION,       NAME=RU2
RU2,S2
RT4,S4
RT5,S5
*CONTACT PAIR, INTERACTION=FRIC,SMALL SLIDING
RU1,ST1
RU2,ST2
*SURFACE INTERACTION,     NAME=FRIC
*FRICTION
0.0
**
*STEP,                 NLGEOM,      INC=20
*STATIC
*BOUNDARY
BASE1, ENCASTRE
B12, 1,2
B1,  1
B2,  2
BASE5,ZASYMM
BASE6,ZASYMM
*DLOAD
TOP,P2,1.0
*RESTART, WRITE
*NODE PRINT,NSET=BASE6
U
*EL PRINT,ELSET=RUBBER
S,MISES,PRESS
*END STEP
```

ตัวอย่างอินพุตไฟล์สำหรับชิ้นงานยางเส้นผ่าศูนย์กลาง 40 mm หนา 10 mm เชื่อมต่อแบบอิสระ (Free Bonding) รับแรงกด 1 MPa

*HEADING

Test element

SI unit mm

Circular Bonded Disk, h=10 mm, D=40 mm, Free Bonding

*NODE,   SYSTEM=C

1,0.,0.,0.

2,1.333,0.,0.

142,20.,0.,0.

152,25.,0.,0.

10,1.333,90.,0.

150,20.,90.,0.

160,25.,90.,0.

501,0.,0.,5.

502,1.333,0.,5.

642,20.,0.,5.

652,25.,0.,5.

510,1.333,90.,5.

650,20.,90.,5.

660,25.,90.,5.

1001,0.,0.,5.

1002,1.333,0.,5.

1142,20.,0.,5.

1010,1.333,90.,5.

1150,20.,90.,5.

7001,0.,0.,15.

7002,1.333,0.,15.

7142,20.,0.,15.

7010,1.333,90.,15.

7150,20.,90.,15.

7501,0.,0.,15.

7502,1.333,0.,15.

7642,20.,0.,15.

7652,25.,0.,15.

7510,1.333,90.,15.

7650,20.,90.,15.

7660,25.,90.,15.

8001,0.,0.,20.

8002,1.333,0.,20.

8142,20.,0.,20.

8152,25.,0.,20.

8010,1.333,90.,20.

8150,20.,90.,20.

8160,25.,90.,20.

*NGEN,LINE=C,   NSET=IN1

2,10,1, ,0,0,0,0,1.

*NGEN,LINE=C,   NSET=OUT1

142,150,1, ,0,0,0,0,1.

*NFILL,   NSET=BASE1

IN1,OUT1,14,10

*NGEN,LINE=C,   NSET=BASE1

152,160,1, ,0,0,0,0,1.

*NGEN,LINE=C,   NSET=IN2

502,510,1, ,0,0,5,0,0,1.

*NGEN,LINE=C,   NSET=OUT2

642,650,1, ,0,0,5,0,0,1.

*NFILL,   NSET=BASE2

IN2,OUT2,14,10

```
*NGEN,LINE=C,              NSET=BASE2
652,660,1, ,0,0,5,0,0,1.
*NGEN,LINE=C,              NSET=IN3
1002,1010,1, ,0,0,5,0,0,1.
*NGEN,LINE=C,              NSET=OUT3
1142,1150,1, ,0,0,5,0,0,1.
*NFILL,                    NSET=BASE3
IN3,OUT3,14,10
*NGEN,LINE=C,              NSET=IN4
7002,7010,1, ,0,0,15,0,0,1.
*NGEN,LINE=C,              NSET=OUT4
7142,7150,1, ,0,0,15,0,0,1.
*NFILL,                    NSET=BASE4
IN4,OUT4,14,10
*NFILL,                    NSET=RUBBER
BASE3,BASE4,12,500
*NGEN
1001,7001,500
*NGEN,LINE=C,              NSET=IN5
7502,7510,1, ,0,0,15,0,0,1.
*NGEN,LINE=C,              NSET=OUT5
7642,7650,1, ,0,0,15,0,0,1.
*NFILL,                    NSET=BASE5
IN5,OUT5,14,10
*NGEN,LINE=C,              NSET=BASE5
7652,7660,1, ,0,0,15,0,0,1.
*NGEN,LINE=C,              NSET=IN6
8002,8010,1, ,0,0,20,0,0,1.
*NGEN,LINE=C,              NSET=OUT6
8142,8150,1, ,0,0,20,0,0,1.
```

*NFILL,   NSET=BASE6

IN6,OUT6,14,10

*NGEN,LINE=C,   NSET=BASE6

8152,8160,1, ,0,0,20,0,0,1.

*NSET,   NSET=B12,   GENERATE

1,8001,500

*NSET,   NSET=B2,   GENERATE

502,8002,500

512,8012,500

522,8022,500

532,8032,500

542,8042,500

552,8052,500

562,8062,500

572,8072,500

582,8082,500

592,8092,500

602,8102,500

612,8112,500

622,8122,500

632,8132,500

642,8142,500

*NSET,   NSET=B1,   GENERATE

510,8010,500

520,8020,500

530,8030,500

540,8040,500

550,8050,500

560,8060,500

570,8070,500

580,8080,500

590,8090,500

600,8100,500

610,8110,500

620,8120,500

630,8130,500

640,8140,500

650,8150,500

*NSET,   NSET=TOT

BASE1,BASE2,BASE5,BASE6,RUBBER,B12

**Create triangular element

*ELEMENT,   TYPE=C3D6H, ELSET=STEEL1

1,1,2,3,501,502,503

2,1,3,4,501,503,504

3,1,4,5,501,504,505

4,1,5,6,501,505,506

5,1,6,7,501,506,507

6,1,7,8,501,507,508

7,1,8,9,501,508,509

8,1,9,10,501,509,510

*ELEMENT,   TYPE=C3D8RH,   ELSET=STEEL1

11,2,12,13,3,502,512,513,503

*ELGEN,   ELSET=STEEL1

11,8,1,1,15,10,10

*ELEMENT,   TYPE=C3D6H,   ELSET=RUBBER

1001,1001,1002,1003,1501,1502,1503

1002,1001,1003,1004,1501,1503,1504

1003,1001,1004,1005,1501,1504,1505

1004,1001,1005,1006,1501,1505,1506

1005,1001,1006,1007,1501,1506,1507

1006,1001,1007,1008,1501,1507,1508

1007,1001,1008,1009,1501,1508,1509

1008,1001,1009,1010,1501,1509,1510

*ELGEN,ELSET=RUBBER

1001,12,500,1000

1002,12,500,1000

1003,12,500,1000

1004,12,500,1000

1005,12,500,1000

1006,12,500,1000

1007,12,500,1000

1008,12,500,1000

*ELEMENT,   TYPE=C3D8RH,   ELSET=RUBBER

1011,1002,1012,1013,1003,1502,1512,1513,1503

*ELGEN,   ELSET=RUBBER

1011,8,1,1,14,10,10,12,500,1000

*ELEMENT,   TYPE=C3D6H,   ELSET=STEEL2

13001,7501,7502,7503,8001,8002,8003

13002,7501,7503,7504,8001,8003,8004

13003,7501,7504,7505,8001,8004,8005

13004,7501,7505,7506,8001,8005,8006

13005,7501,7506,7507,8001,8006,8007

13006,7501,7507,7508,8001,8007,8008

13007,7501,7508,7509,8001,8008,8009

13008,7501,7509,7510,8001,8009,8010

*ELEMENT,   TYPE=C3D8RH,   ELSET=STEEL2

13011,7502,7512,7513,7503,8002,8012,8013,8003

*ELGEN,   ELSET=STEEL2

13011,8,1,1,15,10,10

**ELEMENT

```
*ELSET,        ELSET=RU1,        GENERATE
1001,1141,10
1002,1142,10
1003,1143,10
1004,1144,10
1005,1145,10
1006,1146,10
1007,1147,10
1008,1148,10
*ELSET,            ELSET=RU2,   GENERATE
12001,12141,10
12002,12142,10
12003,12143,10
12004,12144,10
12005,12145,10
12006,12146,10
12007,12147,10
12008,12148,10
*ELSET,            ELSET=TOP,   GENERATE
13001,13141,10
13002,13142,10
13003,13143,10
13004,13144,10
13005,13145,10
13006,13146,10
13007,13147,10
13008,13148,10
*ELSET,            ELSET=RB,    GENERATE
1141,1148,1
2141,2148,1
```

```
*ELSET,              ELSET=RT,    GENERATE
12141,12148,1
12141,12148,1
*ELSET,              ELSET=SIDE,  GENERATE
1001,1141,10
2001,2141,10
3001,3141,10
4001,4141,10
5001,5141,10
6001,6141,10
7001,7141,10
8001,8141,10
9001,9141,10
10001,10141,10
11001,11141,10
12001,12141,10
**
*SOLID SECTION, ELSET=STEEL1,MATERIAL=STEEL,
ORIENTATION=LOCALC
*SOLID SECTION, ELSET=RUBBER,MATERIAL=RUBBER,
ORIENTATION=LOCALC
*SOLID SECTION, ELSET=STEEL2,MATERIAL=STEEL,
ORIENTATION=LOCALC
*ORIENTATION, NAME=LOCALC,SYSTEM=CYLINDRICAL
0.,0.,0.,0.,0.,1.
1,0.
*MATERIAL,              NAME=RUBBER
*HYPERELASTIC,N=2
2.843,-1.986,2.013,-1.311,0.318
*MATERIAL,              NAME=STEEL
```

```
*ELASTIC

200.E4, 0.3

*SURFACE DEFINITION, NAME=ST1

STEEL1,S2

*SURFACE DEFINITION,        NAME=RU1

RU1,S1

RB,S4

*SURFACE DEFINITION,        NAME=ST2

STEEL2,S1

*SURFACE DEFINITION,        NAME=RU2

RU2,S2

RT,S4

*CONTACT PAIR, INTERACTION=FRIC,SMALL SLIDING

RU1,ST1

RU2,ST2

*SURFACE INTERACTION, NAME=FRIC

*FRICTION

0.0

**********Local Cooordinate syatem**********

*TRANSFORM,        NSET=TOT,    TYPE=C

0.,0.,0.,0.,0.,1.

*STEP,NLGEOM

*STATIC

*BOUNDARY

BASE1, ENCASTRE

1, ENCASTRE

B12,1,2

B2,2

B1,2

BASE5,ZASYMM
```

BASE6,ZASYMM

*DLOAD

TOP,P2,1.0

*RESTART, WRITE

*NODE PRINT,NSET=BASE6

U

*EL PRINT,ELSET=SIDE

S,MISES,PRESS

*END STEP