

LAMPIRAN 1. INPUT FILE

*Heading

Extrusion two Billet with Dies 16 mm

** Job name: Job-16mm Model name: Model-1

*Preprint, echo=NO, model=NO, history=NO, contact=NO

**

** PARTS

**

*Part, name=Billet1

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429, 452, 453, 472, 471
430, 453, 454, 473, 472
431, 454, 455, 474, 473
432, 455, 456, 475, 474
*Nset, nset=_PickedSet2, internal, generate
    1, 475, 1
*Elset, elset=_PickedSet2, internal, generate
    1, 432, 1
** Region: (Billet-section:Picked)
*Elset, elset=_PickedSet2, internal, generate
    1, 432, 1
** Section: Billet-section
*Solid Section, elset=_PickedSet2, material=Aluminium
1.,
*End Part
**
*Part, name=Dies
*Node
    1, 0.00949999969, -0.00650000013, 0.
*Nset, nset=Dies-RefPt_, internal
1,
*End Part
**
*Part, name=Punch
*Node
    1, 0., 0.02999999993, 0.
*Nset, nset=Punch-RefPt_, internal
1,
*End Part
**
**
** ASSEMBLY
**
*Assembly, name=Assembly
**

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*Instance, name=Billet1-1, part=Billet1
*End Instance
**
*Instance, name=Billet2-1, part=Billet2
      0.,      -0.005,      0.
*End Instance
**
*Instance, name=Dies-1, part=Dies
      0.,      0.005,      0.
*Surface, type=SEGMENTS, name=Dies
START,      0.008,      -0.02
LINE,      0.008,      -0.0065
CIRCL,      0.0095,      -0.005,      0.0095,      -0.0065
LINE,      0.013,      -0.005
LINE,      0.013,      0.015
*Rigid Body, ref node=Dies-RefPt_, analytical surface=Dies
*End Instance
**
*Instance, name=Punch-1, part=Punch
      0.,      -0.01,      0.
*Surface, type=SEGMENTS, name=Punch
START,      0.013,      0.05
LINE,      0.013,      0.03
LINE,      0.,      0.03
*Rigid Body, ref node=Punch-RefPt_, analytical surface=Punch
*End Instance
**
*Nset, nset=RP-Punch, instance=Punch-1
1,
*Nset, nset=RP-Dies, instance=Dies-1
1,
*Nset, nset=Axis1, instance=Billet1-1, generate
1, 19, 1
*Elset, elset=Axis1, instance=Billet1-1, generate
1, 18, 1
*Nset, nset=Axis2, instance=Billet2-1, generate
1, 19, 1
*Elset, elset=Axis2, instance=Billet2-1, generate
1, 18, 1
*Nset, nset=All1, instance=Billet1-1, generate
1, 475, 1
*Elset, elset=All1, instance=Billet1-1, generate
1, 432, 1
*Nset, nset=All2, instance=Billet2-1, generate
1, 475, 1
*Elset, elset=All2, instance=Billet2-1, generate
1, 432, 1
*Nset, nset=_PickedSet23, internal, instance=Billet1-1, generate
1, 475, 1
*Nset, nset=_PickedSet23, internal, instance=Billet2-1, generate
1, 475, 1
*Elset, elset=_PickedSet23, internal, instance=Billet1-1, generate

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    1, 432, 1
*Elset, elset=_PickedSet23, internal, instance=Billet2-1, generate
    1, 432, 1
*Elset, elset=_Atas_S4, internal, instance=Billet2-1, generate
    1, 415, 18
*Surface, type=ELEMENT, name=Atas
_Atas_S4, S4
*Elset, elset=_Kanan_S3, internal, instance=Billet2-1, generate
    415, 432, 1
*Surface, type=ELEMENT, name=Kanan
_Kanan_S3, S3
*Elset, elset=_Kanan-bawah_S2, internal, instance=Billet1-1,
generate
    18, 432, 18
*Elset, elset=_Kanan-bawah_S3, internal, instance=Billet1-1,
generate
    415, 432, 1
*Surface, type=ELEMENT, name=Kanan-bawah
_Kanan-bawah_S2, S2
_Kanan-bawah_S3, S3
*Elset, elset=_Inter1_S4, internal, instance=Billet1-1, generate
    1, 415, 18
*Surface, type=ELEMENT, name=Inter1
_Inter1_S4, S4
*Elset, elset=_Inter2_S2, internal, instance=Billet2-1, generate
    18, 432, 18
*Surface, type=ELEMENT, name=Inter2
_Inter2_S2, S2
*End Assembly
**
** MATERIALS
**
*Material, name=Aluminium
*Density
2700.,
*Elastic
6.9e+10, 0.33
*Plastic
    6e+07, 0.
    9e+07, 0.125
    1.13e+08, 0.25
    1.24e+08, 0.375
    1.33e+08, 0.5
    1.65e+08, 1.
    1.66e+08, 2.
**
** INTERACTION PROPERTIES
**
*Surface Interaction, name=fric
*Friction
0.15,
*Surface Interaction, name="no fric"

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*Friction
0.,
**
** BOUNDARY CONDITIONS
**
** Name: Axis1 Type: Symmetry/Antisymmetry/Encastre
*Boundary
Axis1, XSYMM
** Name: Axis2 Type: Symmetry/Antisymmetry/Encastre
*Boundary
Axis2, XSYMM
** Name: Dies-fix Type: Symmetry/Antisymmetry/Encastre
*Boundary
RP-Dies, XSYMM
** Name: Punch-fix Type: Symmetry/Antisymmetry/Encastre
*Boundary
RP-Punch, XSYMM
** -----
**
** STEP: Step-1
**
*Step, name=Step-1
*Dynamic, Explicit
, 0.005
*Bulk Viscosity
0.06, 1.2
**
** BOUNDARY CONDITIONS
**
** Name: Dies Type: Velocity/Angular velocity
*Boundary, type=VELOCITY
RP-Dies, 2, 2
** Name: Punch-velocity Type: Velocity/Angular velocity
*Boundary, type=VELOCITY
RP-Punch, 2, 2, -1.6
*Adaptive Mesh Controls, name=Ada-1, smoothing objective=GRADED
1., 0., 0.
*Adaptive Mesh, elset=_PickedSet23, controls=Ada-1, initial mesh
sweeps=16, op=NEW
**
** INTERACTIONS
**
** Interaction: Dies-kanan
*Contact Pair, interaction="no fric", mechanical
constraint=KINEMATIC, cpset=Dies-kanan
Dies-1.Dies, Kanan
** Interaction: Dies-kanan bawah
*Contact Pair, interaction="no fric", mechanical
constraint=KINEMATIC, cpset=Dies-kanan bawah
Dies-1.Dies, Kanan-bawah
** Interaction: Punch-atas

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*Contact Pair, interaction="no fric", mechanical constraint=PENALTY,
cpset=Punch-atas
Punch-1.Punch, Atas
** Interaction: inter
*Contact Pair, interaction=fric, mechanical constraint=PENALTY,
cpset=inter
Inter1, Inter2
**
** OUTPUT REQUESTS
**
*Restart, write, number interval=1, time marks=NO
**
** FIELD OUTPUT: F-Output-1
**
*Output, field, variable=PRESELECT
**
** HISTORY OUTPUT: H-Output-1
**
*Output, history
*Node Output, nset=RP-Punch
RF2, U2
*End Step
```