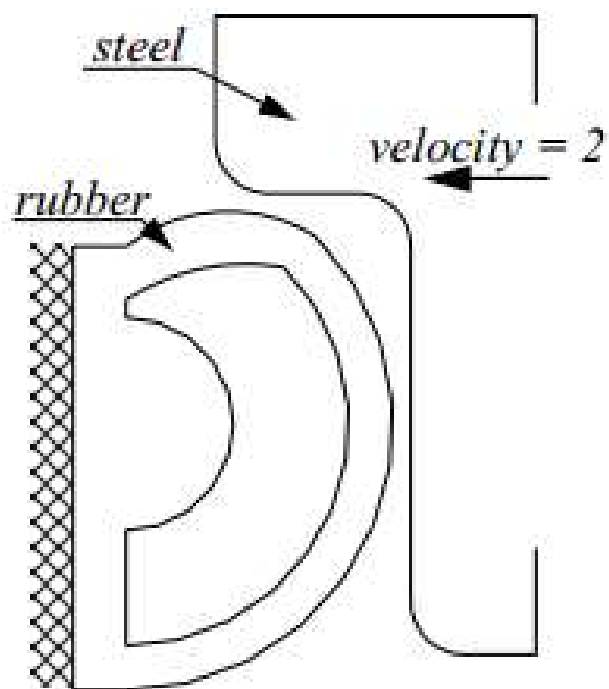


Rubber bumper



0. Analysis planar (PLN)

1. Geometry & Mesh

1.1 Geometry & Mesh: Length: Inch

1.2 File: Import: IGES...: „geo.igs”

1.3 Automesh: Planar

a) Divisions: 35 35

b) Quad Mesh!

- Select rubber curves

- All Selected

c) Ok

2. Boundary Conditions

2.1 New (Structural): Fixed Displacement

a) Displacement X: 0

b) Displacement Y: 0

c) Curves Add

- Select left rubber curve

- All Selected

d) Ok

3. Material Properties

3.1 New: Finite Stiffness Region: Standard *nazwa: Guma*

a) Mass Density: 1

b) Type: Mooney

c) C10: 0.84

d) C01: 0.21

e) Elements Add

- All Existing

f) Ok

4. Geometric Properties

4.1 New (Structural): Planar: Plane Strain

a) Thickness: 3

b) Elements Add

- All Existing

c) Ok

5. Contact

5.1 New: Meshed (Deformable) *nazwa: Odbojnik*

a) Elements Add

- All Existing

b) Ok

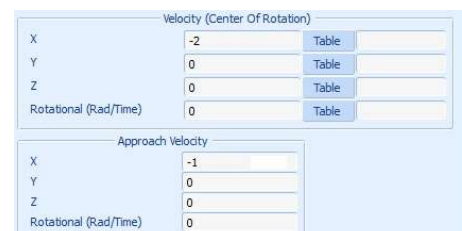
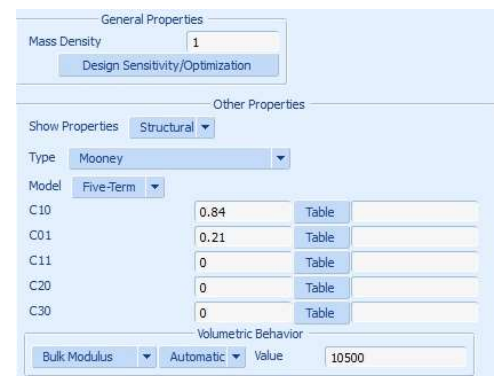
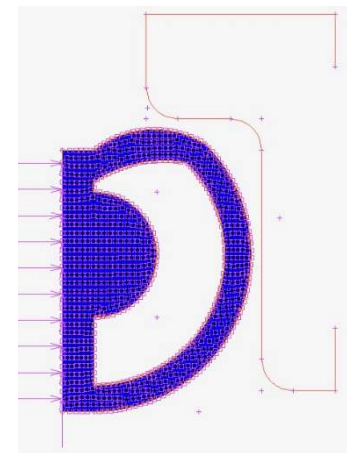
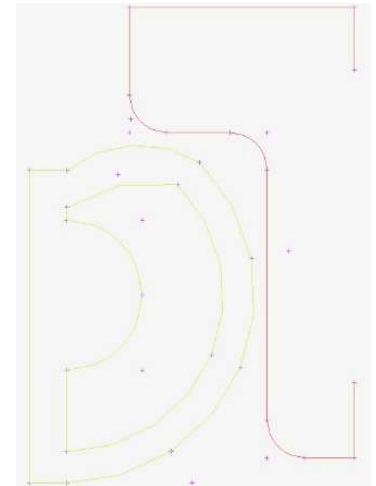
5.2 New: Geometric *nazwa: Burta*

a) Body Control: Velocity

b) Parameters

- Velocity X: -2

- Approach Velocity X: -1



- Ok
- c) 2-D: Curves Add
 - Select steel curves
 - All Selected

d) Ok

5.3 Contact Tables: New *nazwa: kontakt1*

- a) Full Default Contact: Touching
- b) 2: T

- Contact Interaction - Edit
- Friction
 - Friction Coefficient: 0.2
 - Ok

- Ok

- Ok

c) Ok

5.4 Contact Bodies: Identify

If lines points to rubber bumper:

5.5 Tools: Flip Curves

- a) Select curve
- b) All Selected

6. Loadcases

6.1 New: Static *nazwa:jazda*

- a) Contact
 - Contact Table
 - *kontakt1*
 -
- Ok

b) Total Loadcase Time: 4

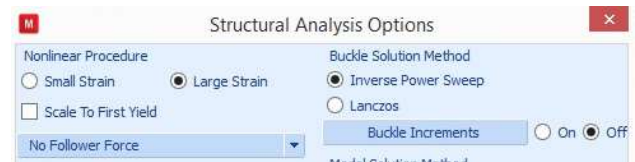
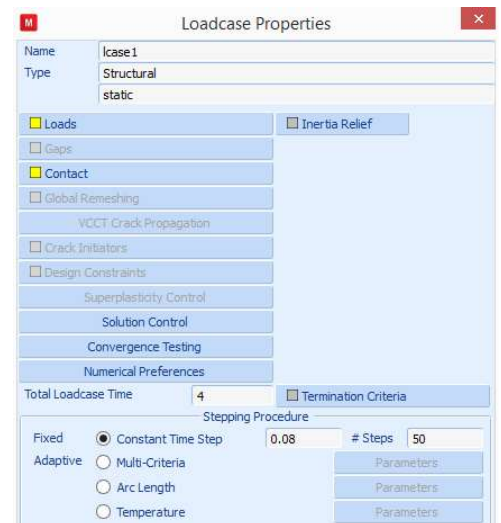
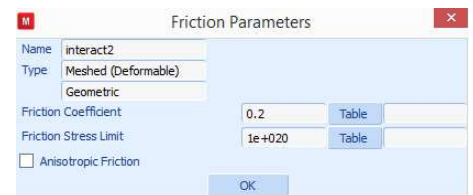
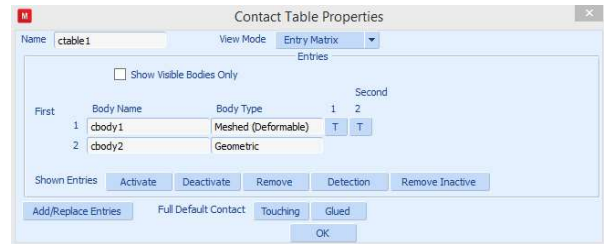
c) # Steps: 50

d) Ok

7. Jobs

7.1 New: Structural

- a) Available: *jazda*
- b) Analysis Options
 - Inverse Power Sweep
 - Ok
- c) Contact Control
 - Type: Arc tangent (Coulomb)
 - Relative Velocity Threshold: 0.05



- Initial Contact
 - Contact Table
 - kontakt1
 - Ok
 - Ok



d) Job Results

- Available Element Tensor: Cauchy Stress
- Available Element Tensor: Total Strain
- Available Element Scalar: Equivalent Cauchy Stress
- Available Element Scalar: Equivalent Elastic Strain
- Ok

e) Ok

7.2 Element Types

a) Solid

- 80
- All Existing
- Ok

b) Ok

7.3 Jobs: Properties

a) Run

- Submit (1)
- Monitor
- Ok

b) Ok



8. Results

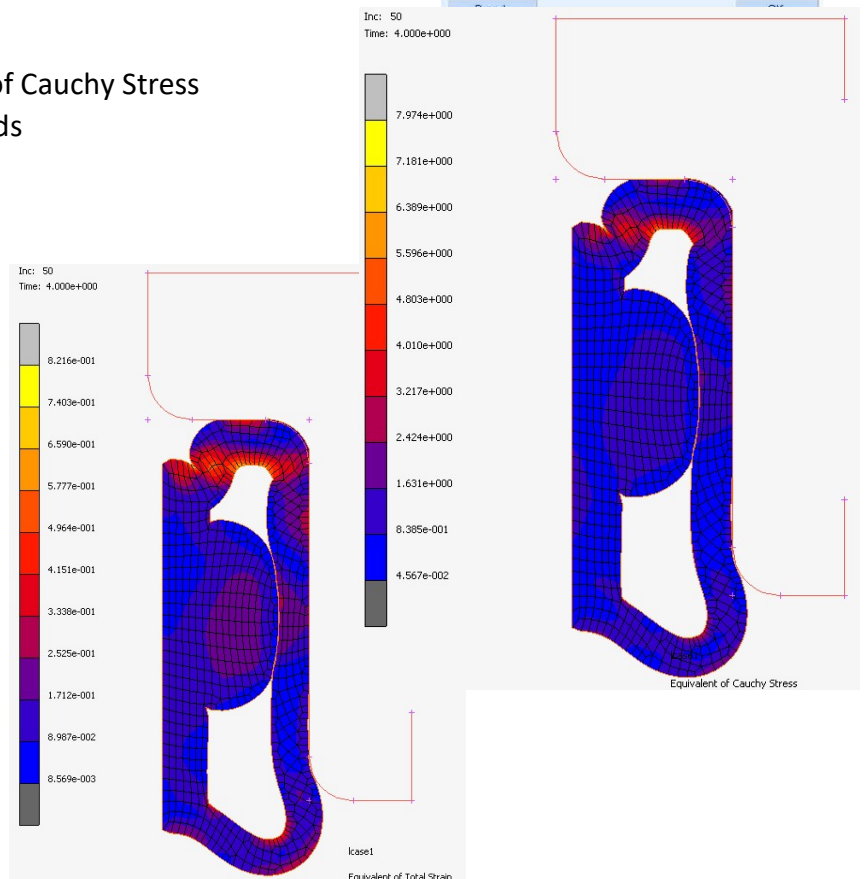
8.1 File: Open Default

8.2 Model Plot

- a) Scalar: Equivalent of Cauchy Stress
- b) Style: Contour Bands
- c) Skip to Inc: 50

d) Scalar: Equivalent of Total Strain

e) Ok



8.3 History Plot

a) All Incs

b) Add Curves

- X-Axis > Data Carrier Type – Contact Body

- Contact Body – cbody2

- Variable - Pos X

- Y-Axis >Data Carrier type – Contact Body

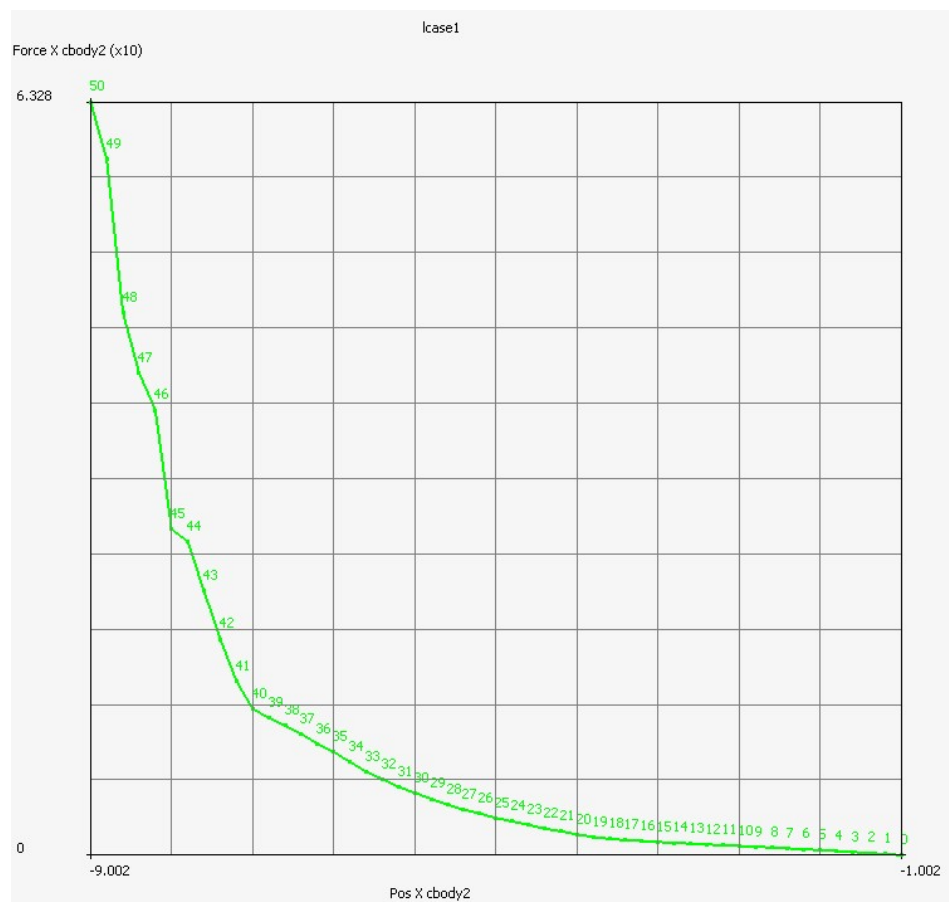
- Contact Body – cbody2

- Variable - Force X

- Add Curve

c) Fit

d) Ok



Powtórzyć analizę z WYŁĄCZENIEM tarcia:

1. Zamknąć plik wyników i wrócić do modelu
2. W drzewie ustawień kliknąć podwójnie w Jobs - „jobs1” (wchodzimy do edycji)
3. W ContactControl **odznaczamy** opcję Friction (zob. 7.1.c)
4. uruchamiamy analizę jak w p. 7.3 (czyli kliknąć podwójnie w Jobs - „jobs1” i RUN)
5. Porównujemy wyniki z punktem 8.

