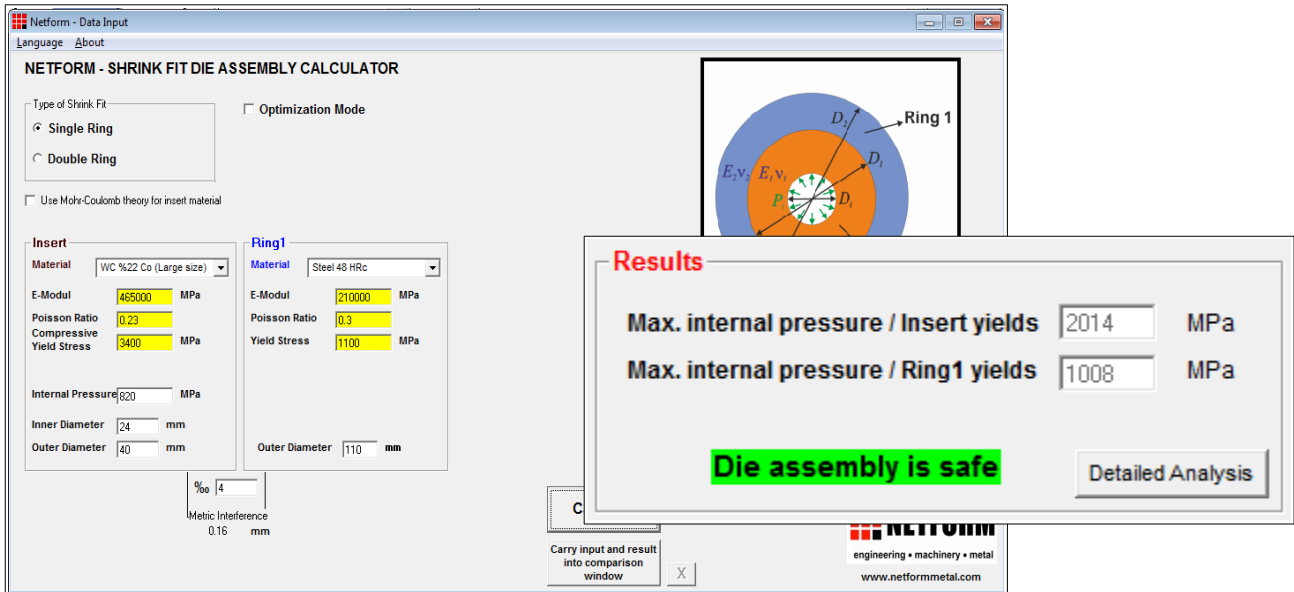


NetTool – Prestressed Die Analysis Software

1. Software capabilities

- Analysis of single and double stress ring
- Safe / non safe decision according to process and material parameters
- Considering process pressure, material data, die geometry and interference, calculation of the following for all assembly members:
 - Radial
 - Tangential
 - Effective stress curves
- Interference optimization for single stress ring
- Tungsten Carbide (WC) material properties depending on Cobalt (%Co) content
- Steel material properties depending on hardness
- Mohr-Coulomb yield theory (optional) for die-insert materials
- Calculation and optimization in seconds

2. Screenshots



The screenshot shows the software interface with the following data:

Parameter	Value	Unit
Material (Insert)	WC %22 Co (Large size)	
E-Modul	465000	MPa
Poisson Ratio	0.23	
Compressive Yield Stress	3400	MPa
Internal Pressure	620	MPa
Inner Diameter	24	mm
Outer Diameter	40	mm
Metric Interference	0.16	mm
Material (Ring1)	Steel 48 HRc	
E-Modul	210000	MPa
Poisson Ratio	0.3	
Yield Stress	1100	MPa
Outer Diameter	110	mm

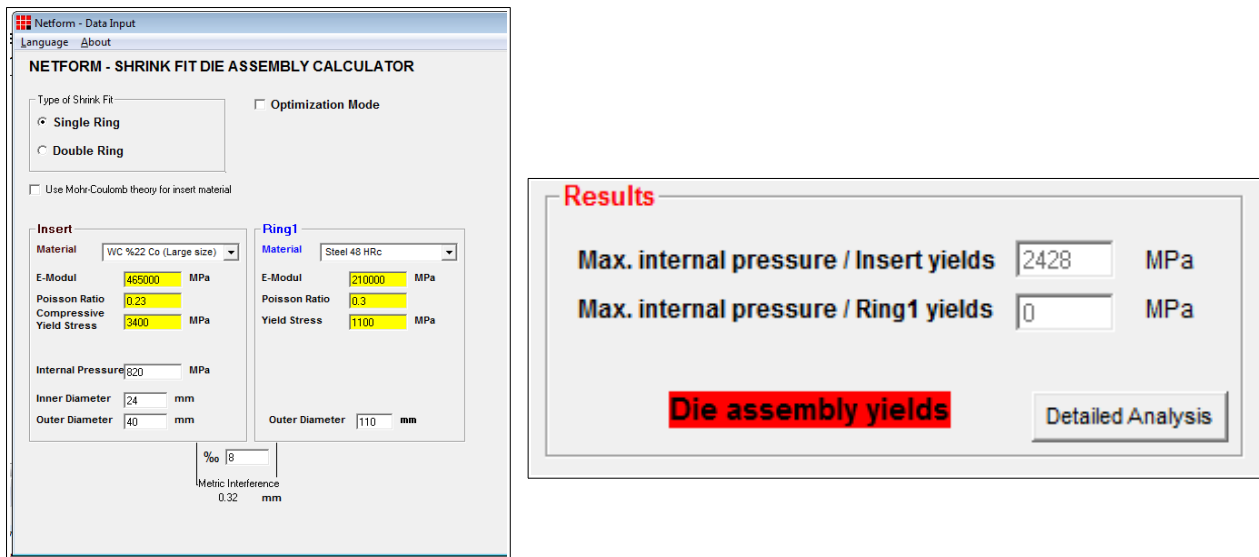
Results:

- Max. internal pressure / Insert yields: 2014 MPa
- Max. internal pressure / Ring1 yields: 1008 MPa

Die assembly is safe

Buttons: Detailed Analysis, Carry input and result into comparison window

Software calculates if the die assembly safe for the given insert/ring diameters, interference and inner process pressure



The screenshot shows the software interface with the following data:

Parameter	Value	Unit
Material (Insert)	WC %22 Co (Large size)	
E-Modul	465000	MPa
Poisson Ratio	0.23	
Compressive Yield Stress	3400	MPa
Internal Pressure	620	MPa
Inner Diameter	24	mm
Outer Diameter	40	mm
Metric Interference	0.32	mm
Material (Ring1)	Steel 48 HRc	
E-Modul	210000	MPa
Poisson Ratio	0.3	
Yield Stress	1100	MPa
Outer Diameter	110	mm

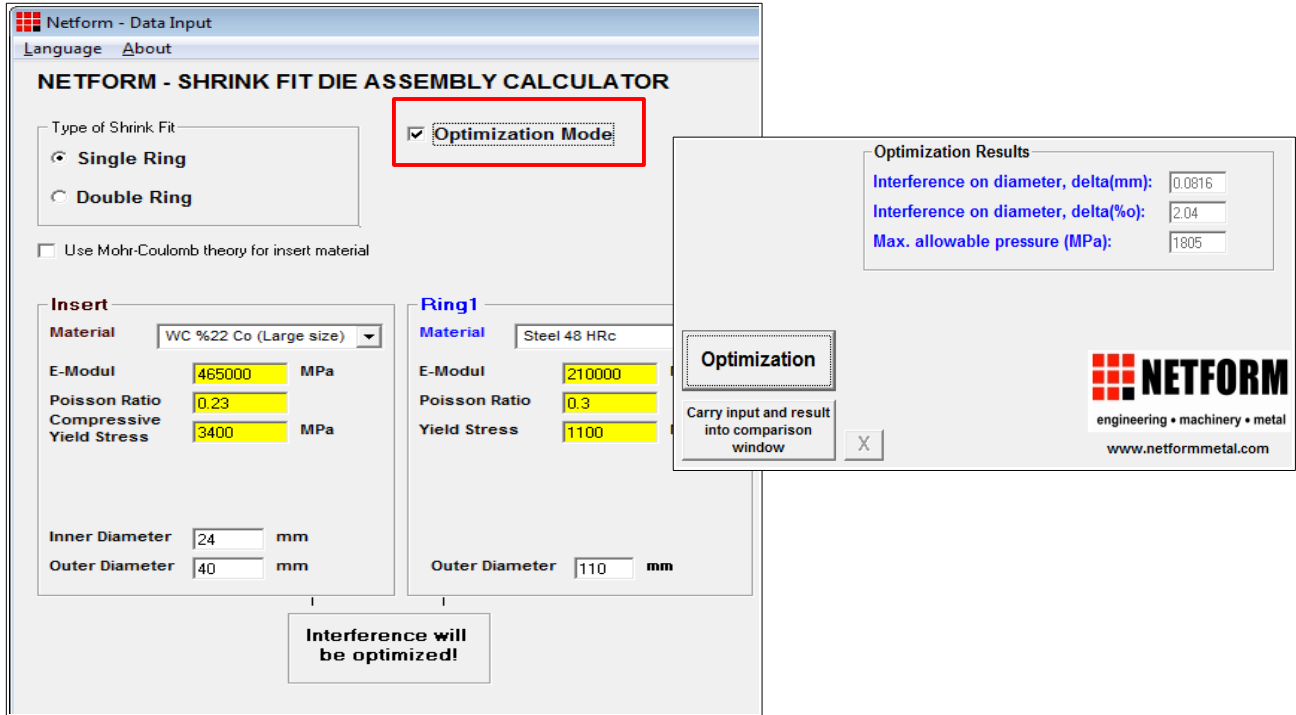
Results:

- Max. internal pressure / Insert yields: 2428 MPa
- Max. internal pressure / Ring1 yields: 0 MPa

Die assembly yields

Buttons: Detailed Analysis

If interference or inner pressure causes any of the materials to yield, software gives a warning message of: "plastic deformation"



NETFORM - SHRINK FIT DIE ASSEMBLY CALCULATOR

Type of Shrink Fit: Single Ring Double Ring

Optimization Mode

Use Mohr-Coulomb theory for insert material

Insert
 Material: WC %22 Co (Large size)
 E-Modul: 465000 MPa
 Poisson Ratio: 0.23
 Compressive Yield Stress: 3400 MPa

Ring1
 Material: Steel 48 Hrc
 E-Modul: 210000
 Poisson Ratio: 0.3
 Yield Stress: 1100

Inner Diameter: 24 mm
 Outer Diameter: 40 mm

Outer Diameter: 110 mm

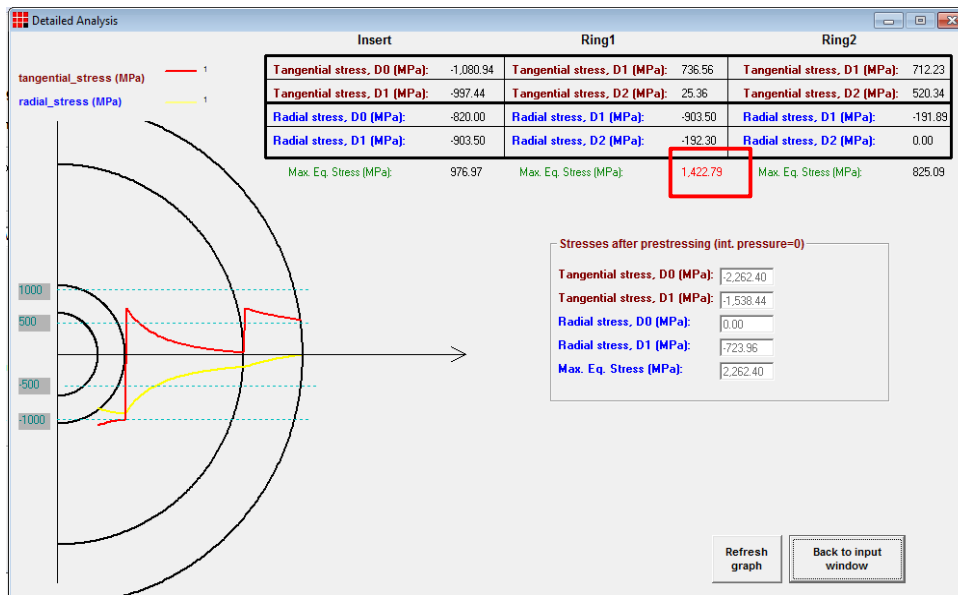
Interference will be optimized!

Optimization Results
 Interference on diameter, delta(mm): 0.0816
 Interference on diameter, delta(%): 2.04
 Max. allowable pressure (MPa): 1805

Optimization
 Carry input and result into comparison window

NETFORM
 engineering • machinery • metal
 www.netformmetal.com

Finding out optimum interference for single ring applications



Stress distribution in die members is shown graphically. One can see in this window which die member exceeds the given limits, as well.