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## ANALYSIS OF 6:1 GEAR REDUCTION IN ANSYS

### After Analysis we Calculated :

i.Contact Stresss(MPa)

ii.Maximum Deformation(mm)

iii.Factor of Safety

#### ASSUMPTIONS:

Power Transmitted by driver=40KW

Speed of driver=3600 RPM

#### LOAD

For Meshing gear 1 and gear 2 we have,

Input load= Moment on Gear 1 ,i.e **106.10 N-m AntiClockwise**

For Meshing gear 3 and gear 4 we have,

Input load= Moment on Gear 3 ,i.e **212.20 N-m Clockwise**

### Material-EN8 (Based on data collected from google)

Unsaved Project - Workbench

File Edit View Tools Units Extensions Jobs Help

Project A2:Engineering Data

Filter Engineering Data Engineering Data Sources

Toolbox

- Physical Properties
  - Linear Elastic
    - Isotropic Elasticity
    - Orthotropic Elasticity
    - Anisotropic Elasticity
  - Hyperelastic Experimental Data
  - Hyperelastic
  - Chaboche Test Data
  - Plasticity
  - Creep
  - Life
  - Strength
  - Gasket
  - Viscoelastic Test Data
  - Viscoelastic
  - Shape Memory Alloy
  - Geomechanical
  - Damage
  - Cohesive Zone
  - Fracture Criteria
  - Crack Growth Laws
  - Custom Material Models

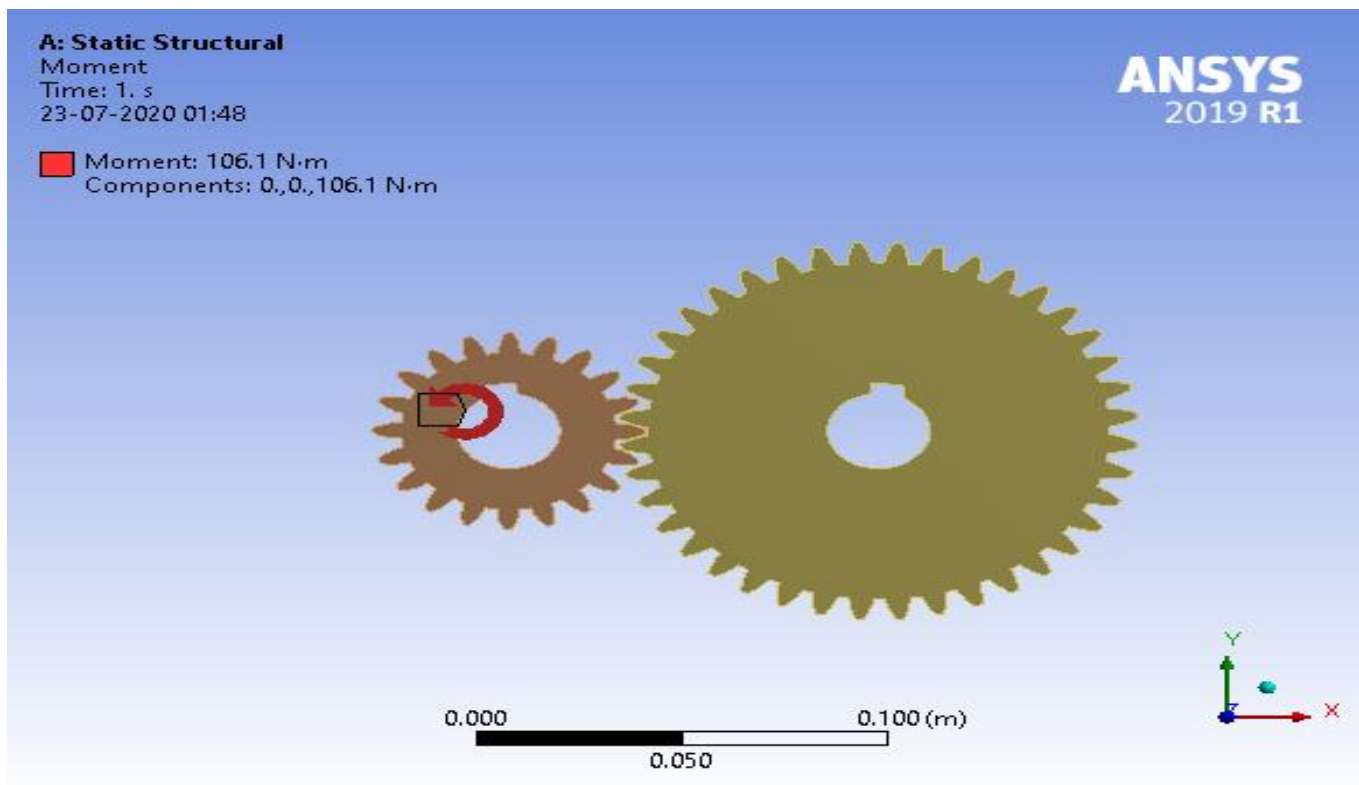
Outline of Schematic A2: Engineering Data

	A	B	C	D	E
1	Contents of Engineering Data			Source	Description
2	Material				
3	EN8			C:\Users\Ashis srivastava\Docume	
4	Structural Steel			General_Materials.xml	Fatigue Data at zero mean stress comes from 1998 ASME BPV Code, Section 8, Div 2, Table 5-110.1
*	Click here to add a new material				

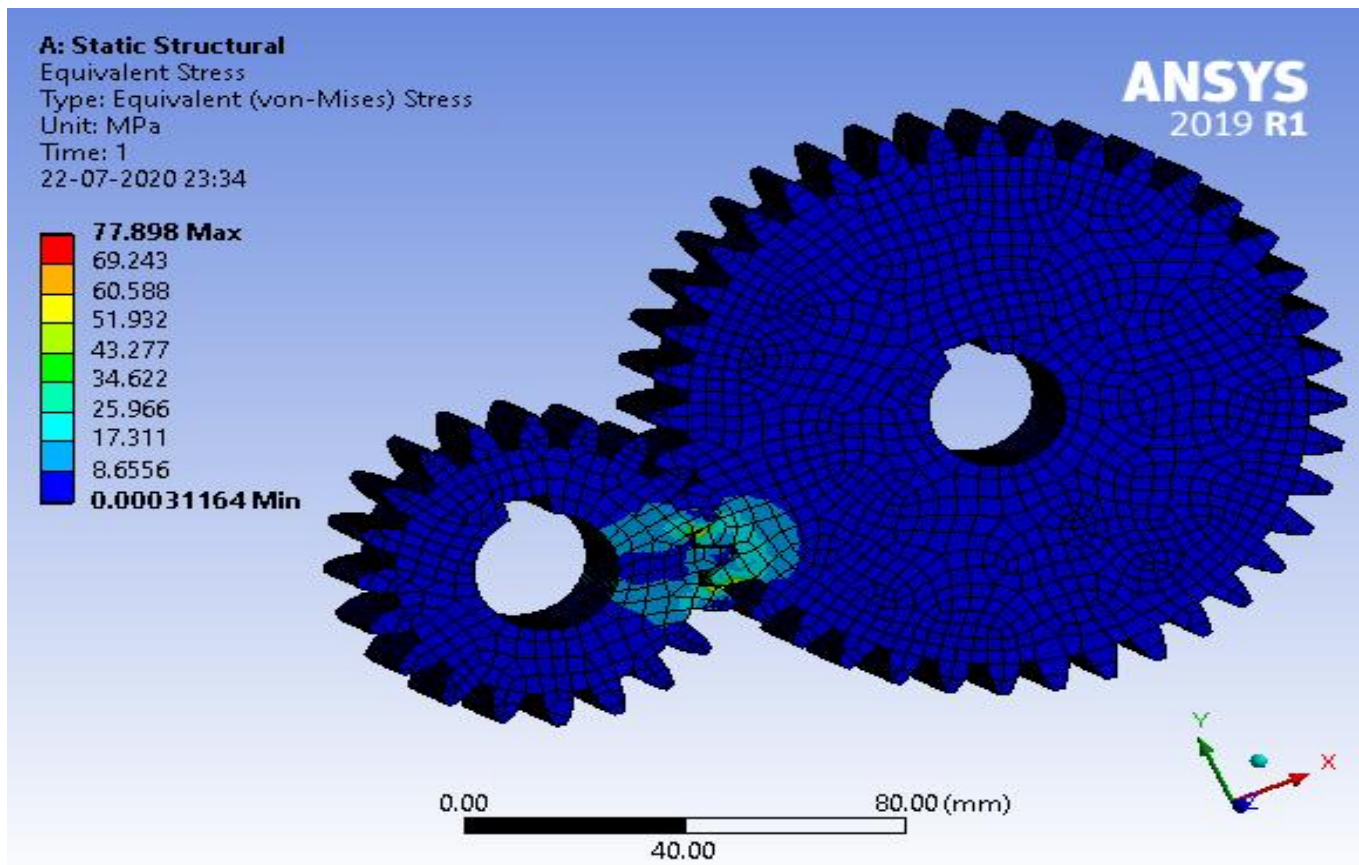
Properties of Outline Row 3: EN8

	A	B	C	D	E
1	Property	Value	Unit		
2	Material Field Variables	Table			
3	Density	7800	kg m^-3		
4	Isotropic Elasticity				
5	Derive from	Young's Modulus and Poisson...			
6	Young's Modulus	1.9E+05	MPa		
7	Poisson's Ratio	0.3			
8	Bulk Modulus	1.5833E+11	Pa		
9	Shear Modulus	7.3077E+10	Pa		
10	Tensile Yield Strength	4.65E+08	Pa		
11	Tensile Ultimate Strength	7.5E+08	Pa		

## Analysis for Gear 1 and Gear 2



**Fig: Moment on Gear 1 (106.10N-m-AntiClockwise)**



**FIG: Contact Stresses**

**A: Static Structural**

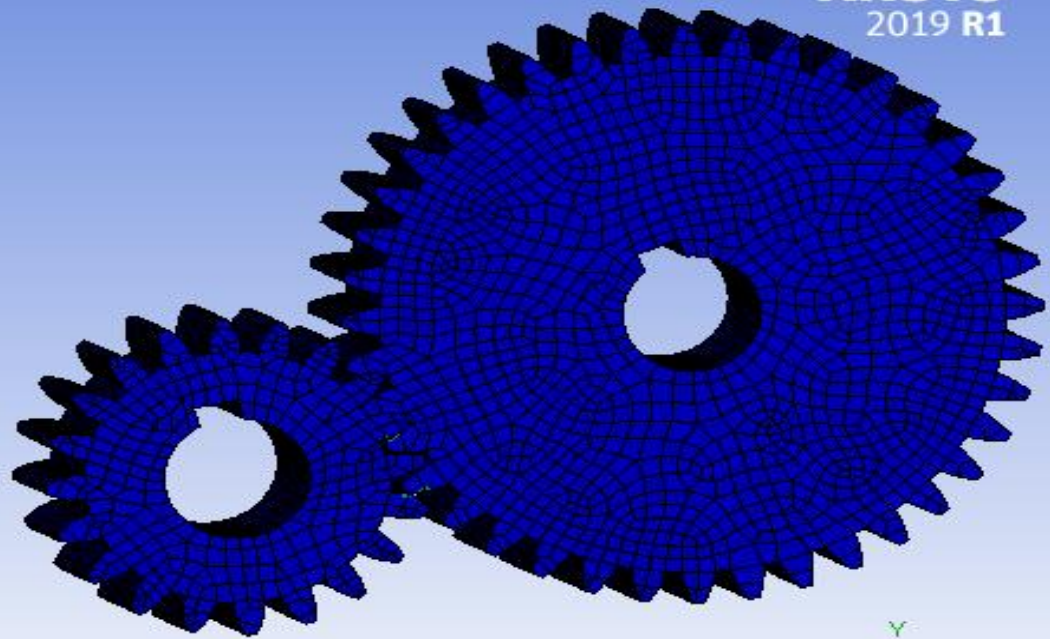
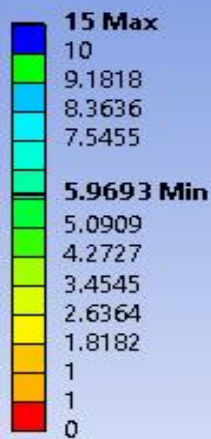
Safety Factor

Type: Safety Factor

Time: 1

22-07-2020 23:36

**ANSYS**  
2019 R1



0.00 80.00 (mm)  
40.00

**FIG: Factor of Safety**

**A: Static Structural**

Total Deformation

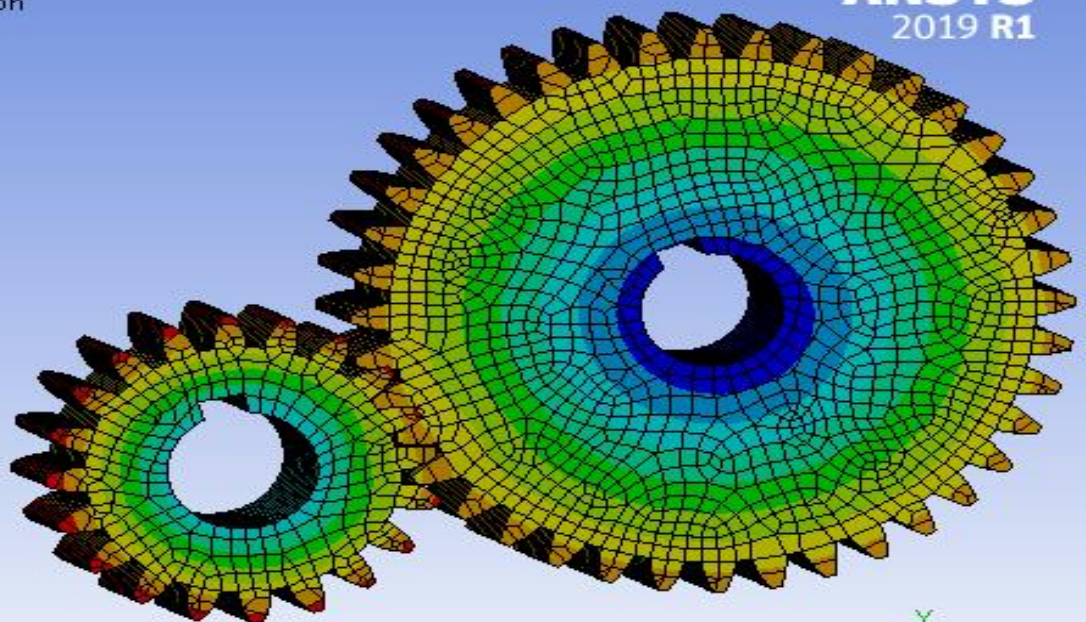
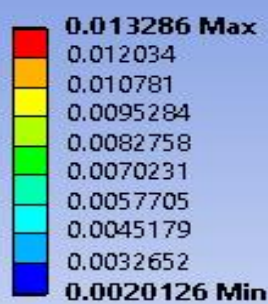
Type: Total Deformation

Unit: mm

Time: 1

22-07-2020 23:36

**ANSYS**  
2019 R1

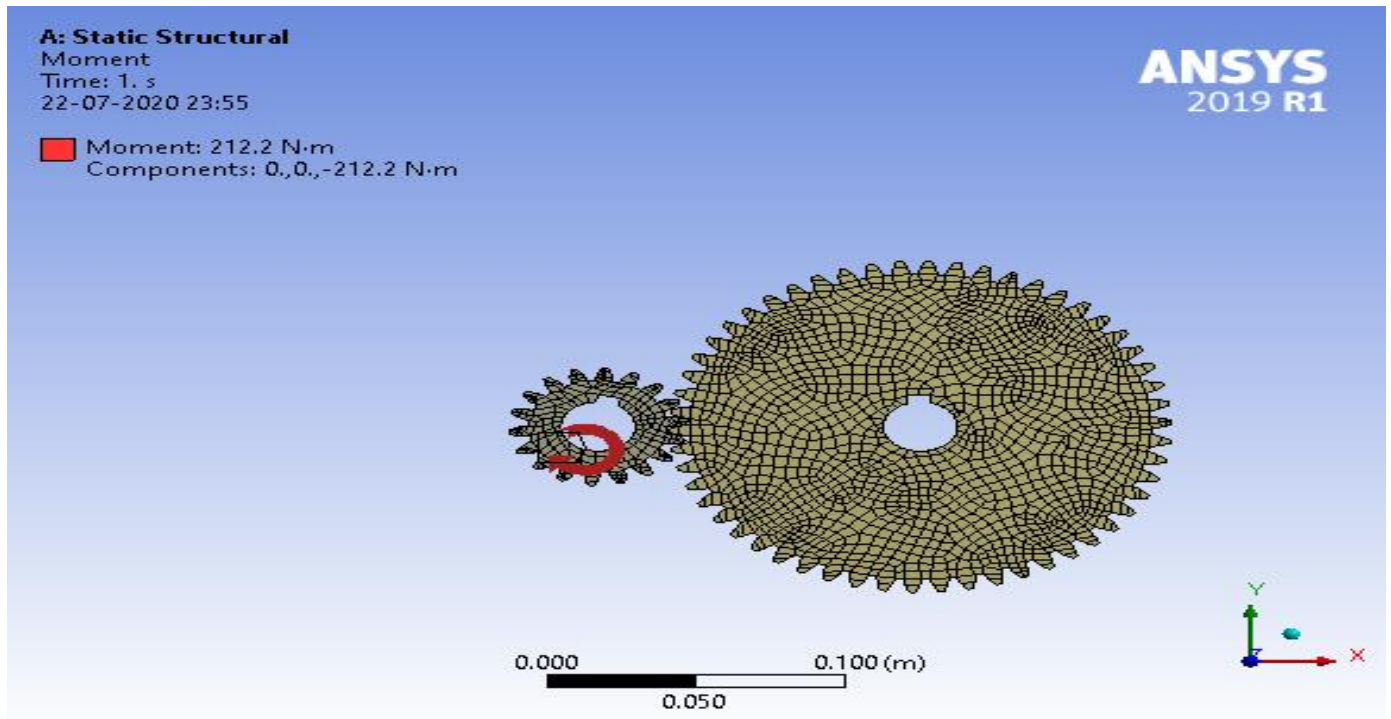


0.00 80.00 (mm)  
40.00

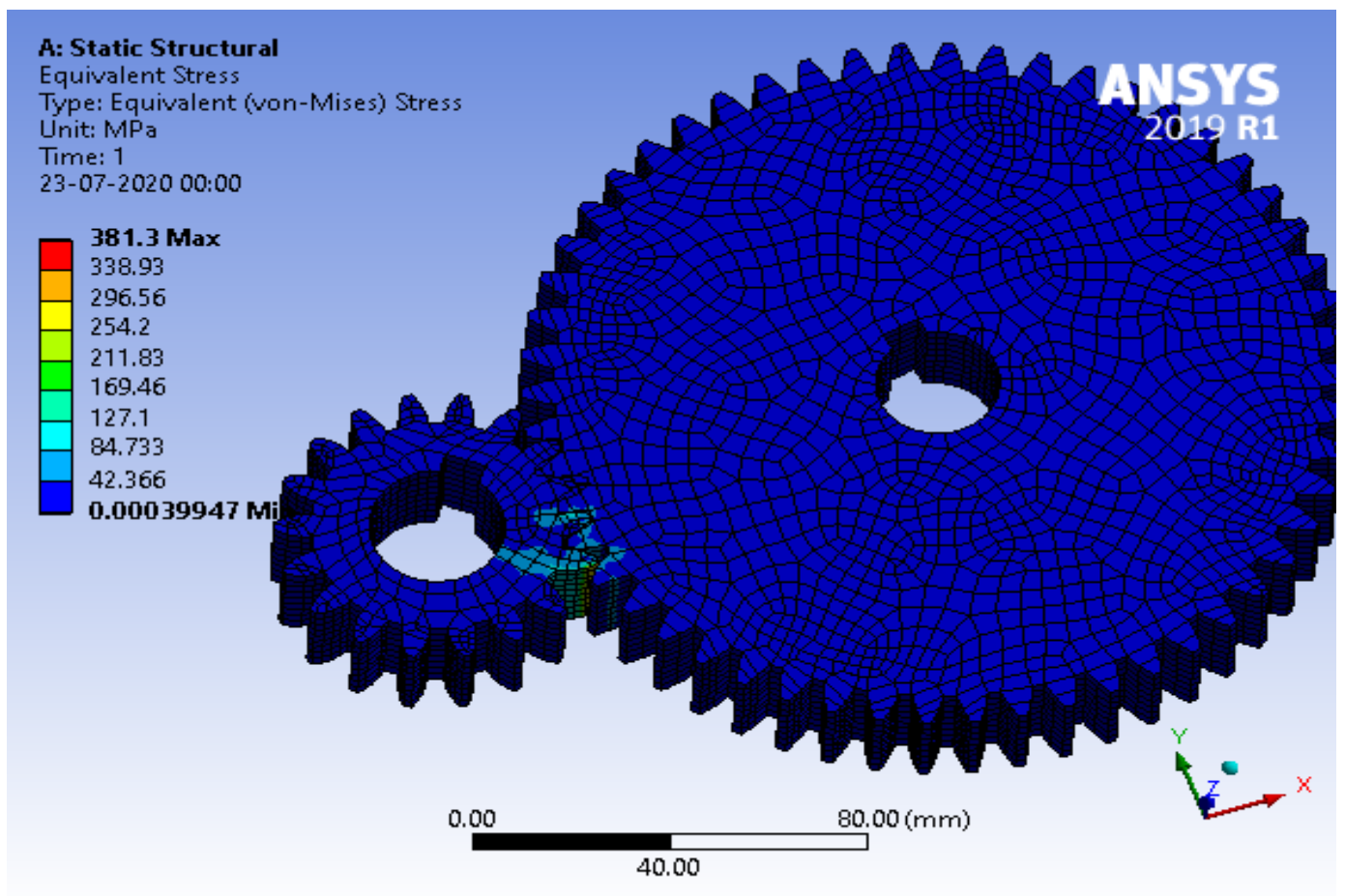
**FIG: Deformation**



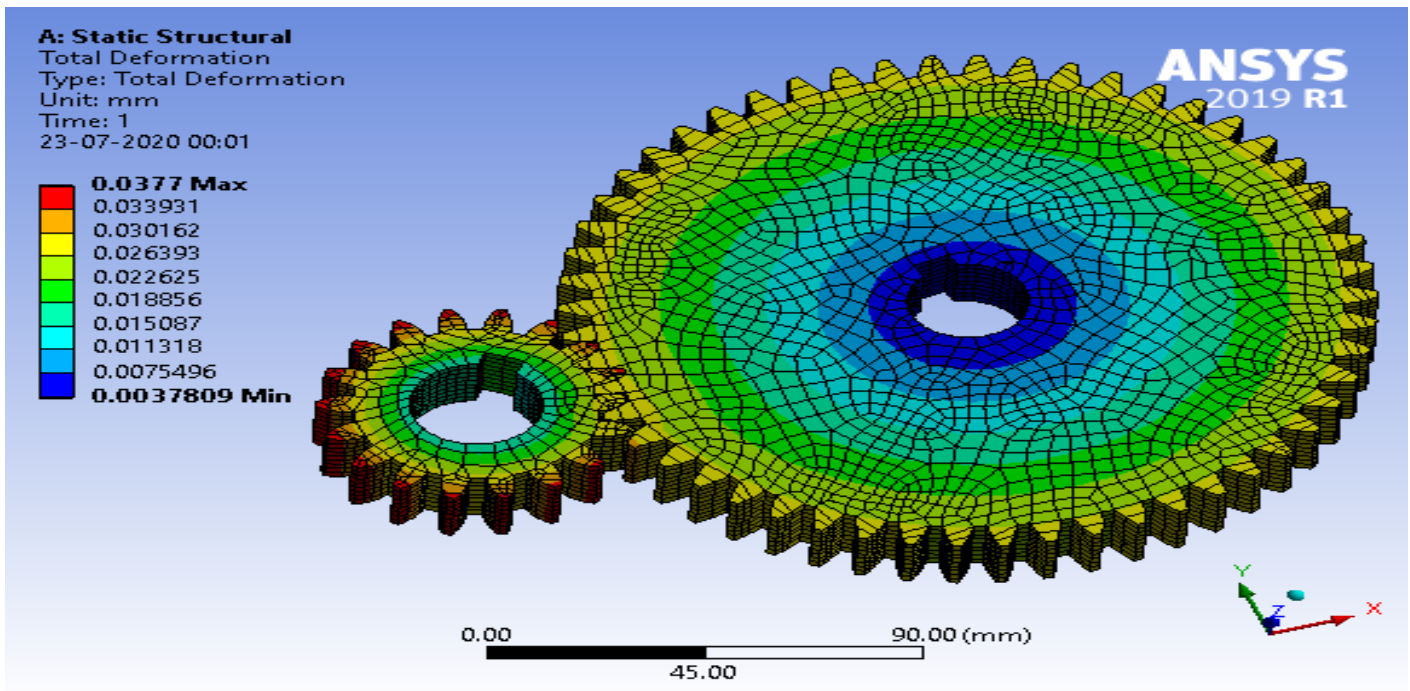
## Analysis for Gear 3 and Gear 4



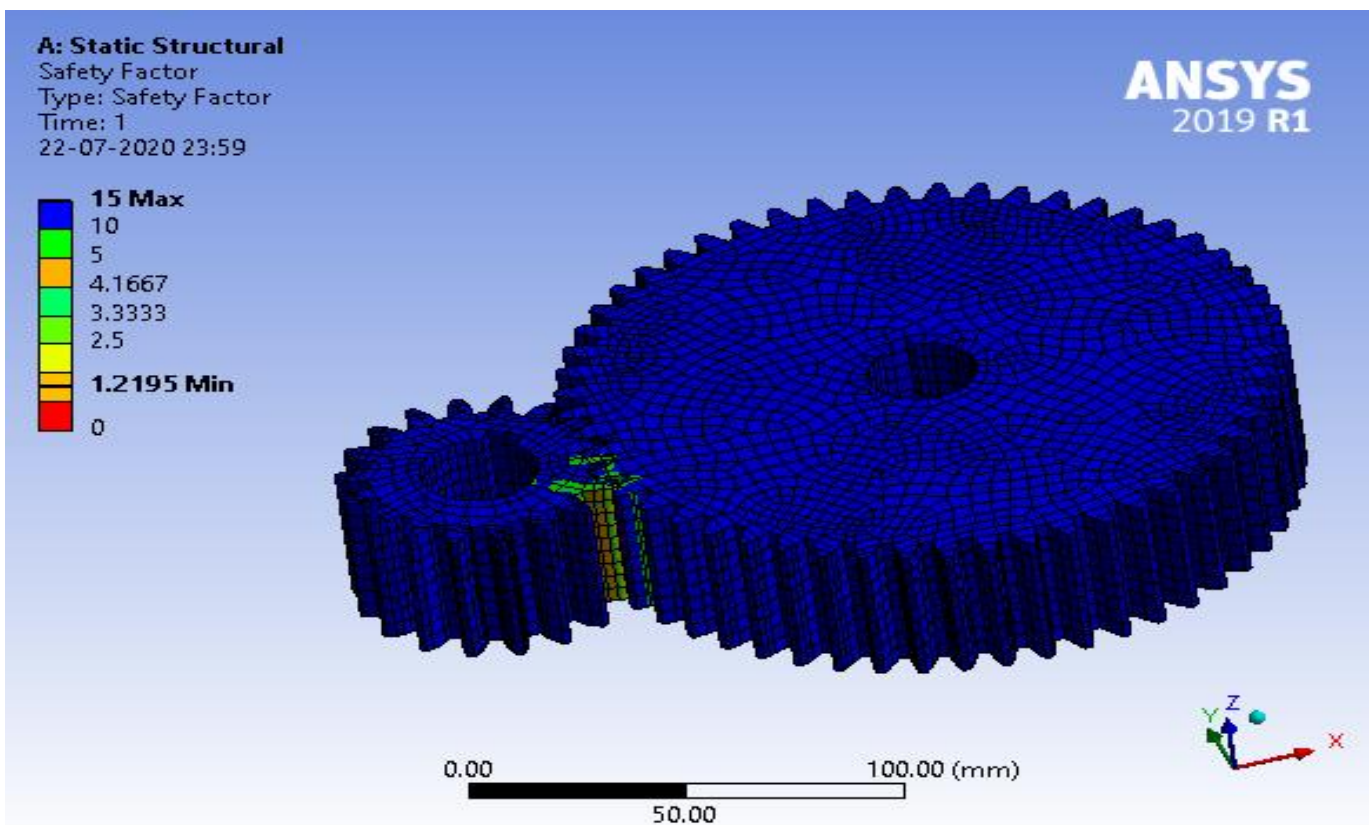
**Fig: Moment on Gear 3 (212.2N-m-Clockwise)**



**FIG: Contact Stresses**



**FIG: Deformation**



**FIG: Factor of Safety**

## CONCLUSION:

The Design is well under the permissible limits and will not fail when working on this assumed data. So This is the required 6:1 Compound Gear Train.