

THERMAL BOUNDARY CONDITIONS

A: DRUM_STRUCTURAL STEEL

Steady-State Thermal

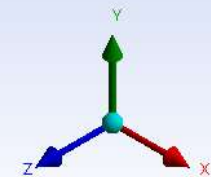
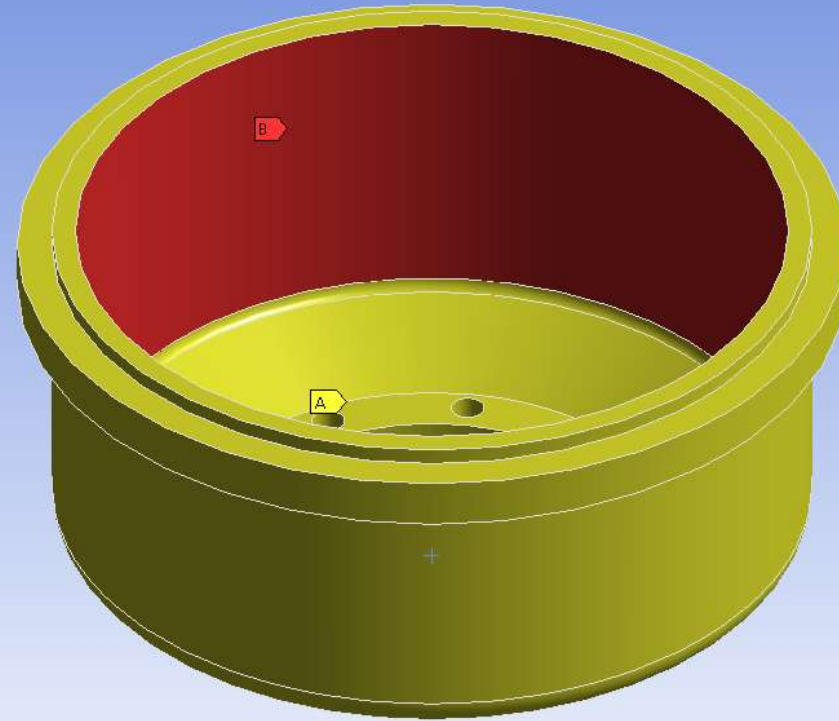
Time: 1. s

18-11-2022 08:52 AM

Ansys
2021 R2

A Convection: 22. °C, 5.e-006 W/mm².°C

B Temperature: 90. °C



G: PAD_FRAME_STRUCTURAL STEEL

Steady-State Thermal

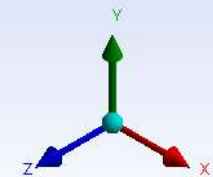
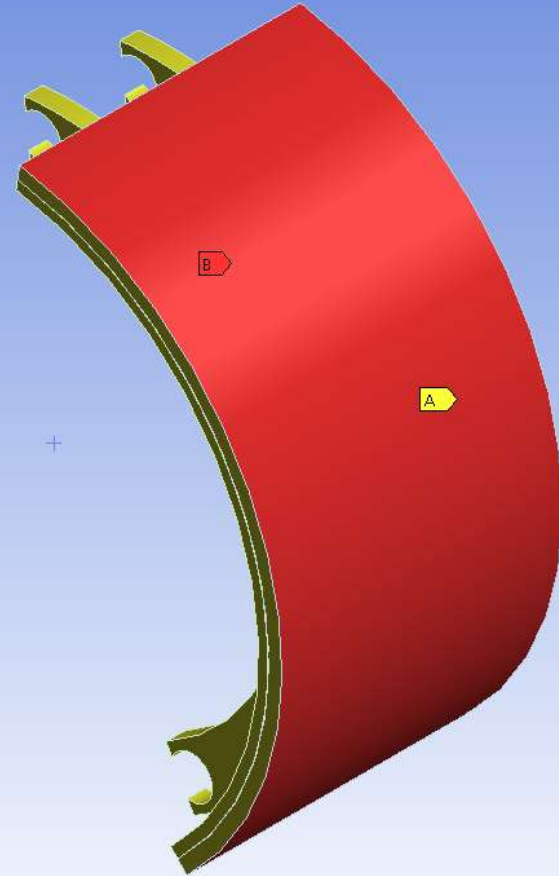
Time: 1. s

18-11-2022 08:53 AM

A Convection: 22. °C, 5.e-006 W/mm².°C

B Temperature: 90. °C

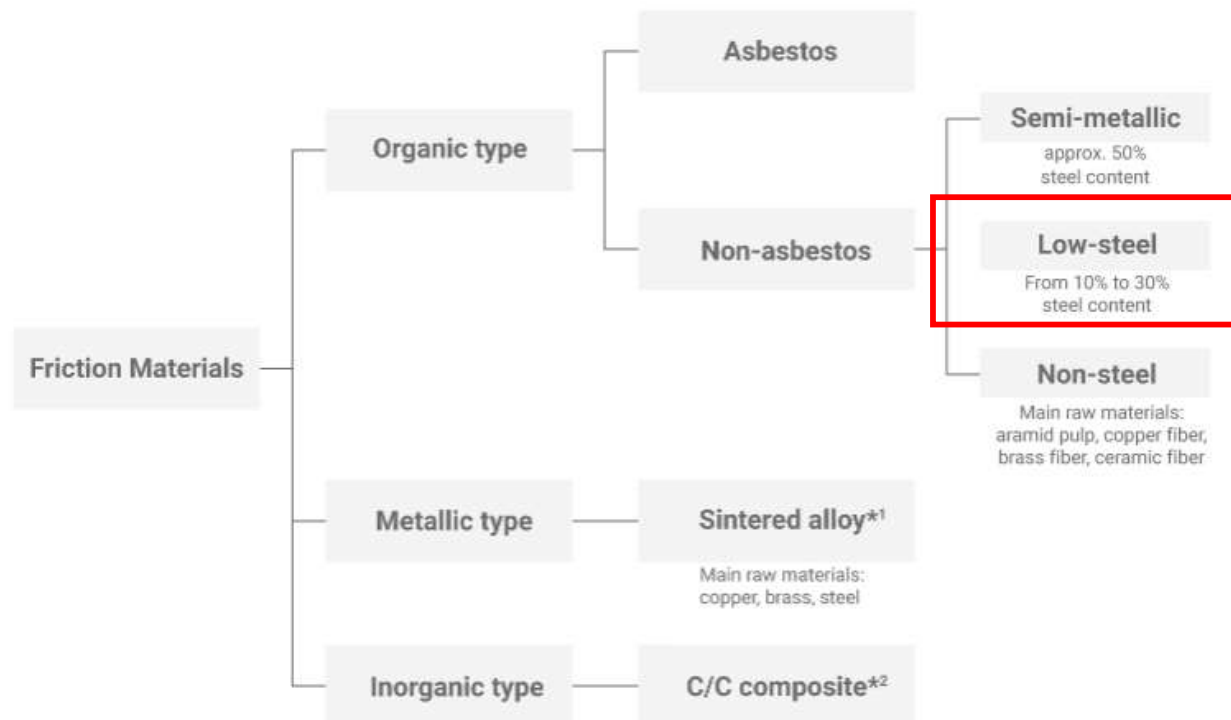
Ansys
2021 R2



Brake pad material – LOW STEEL

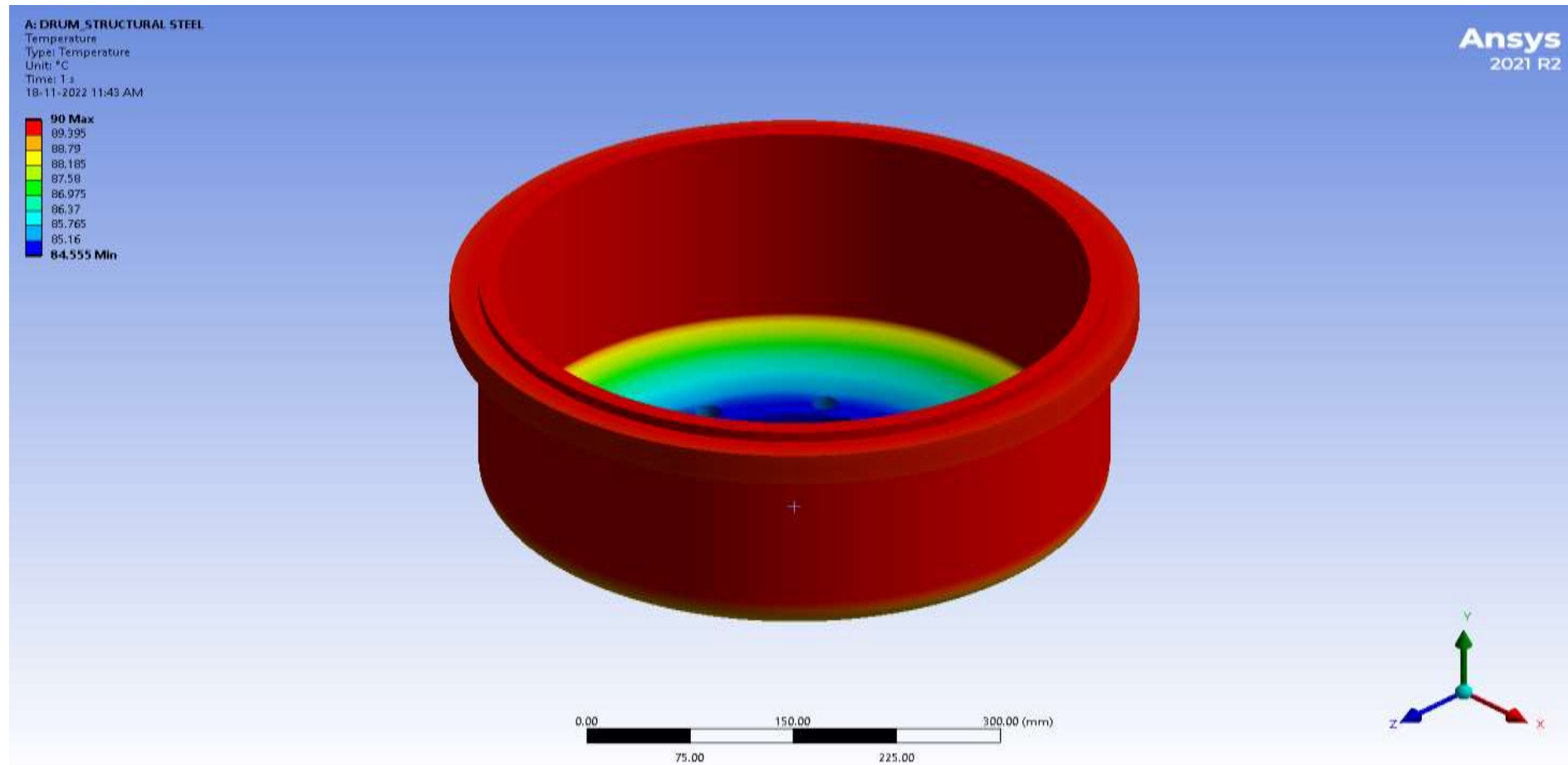
https://www.akebono-brake.com/english/product_technology/product/automotive/friction_material/

| Types of friction materials



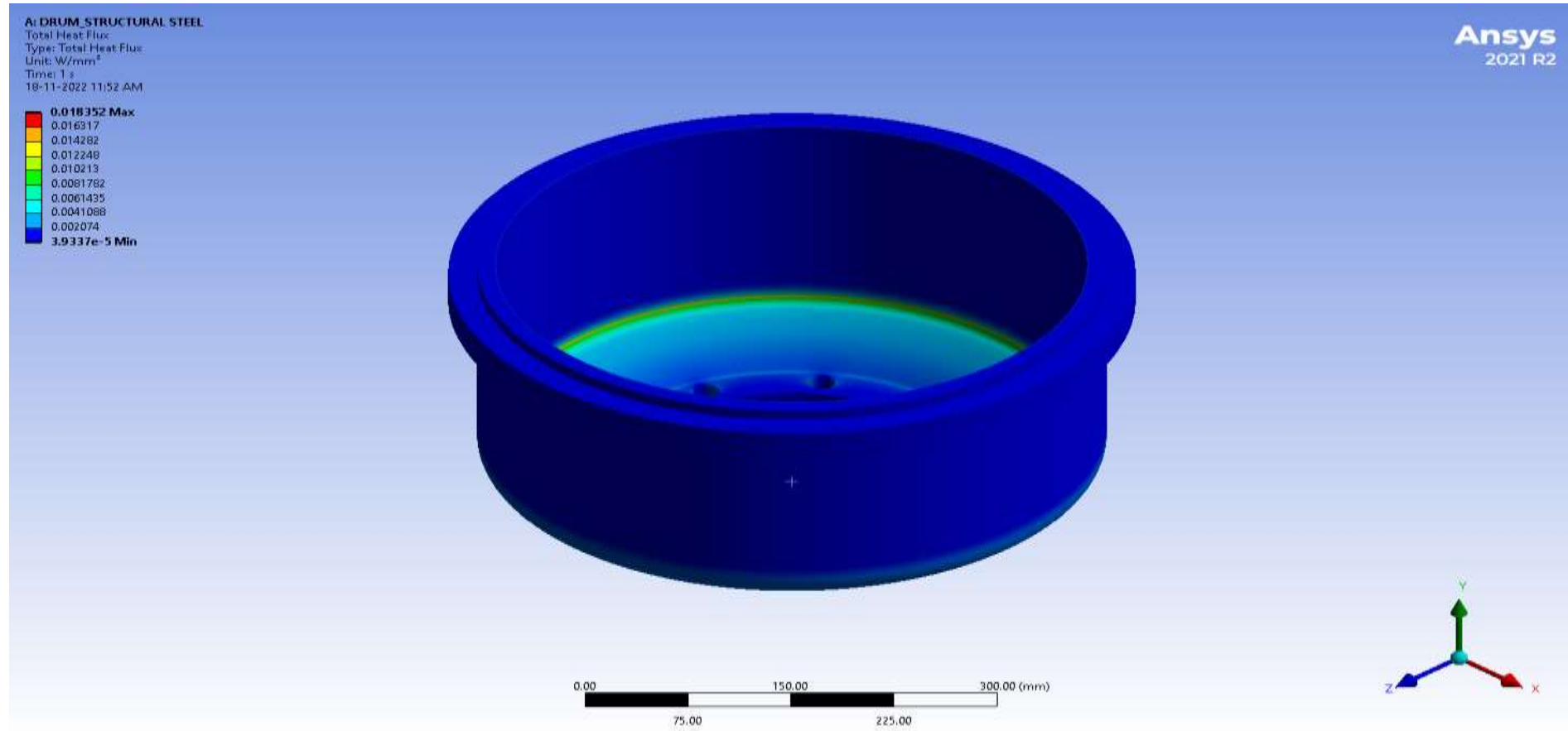
STRUCTURAL STEEL RESULTS

TEMPERATURE



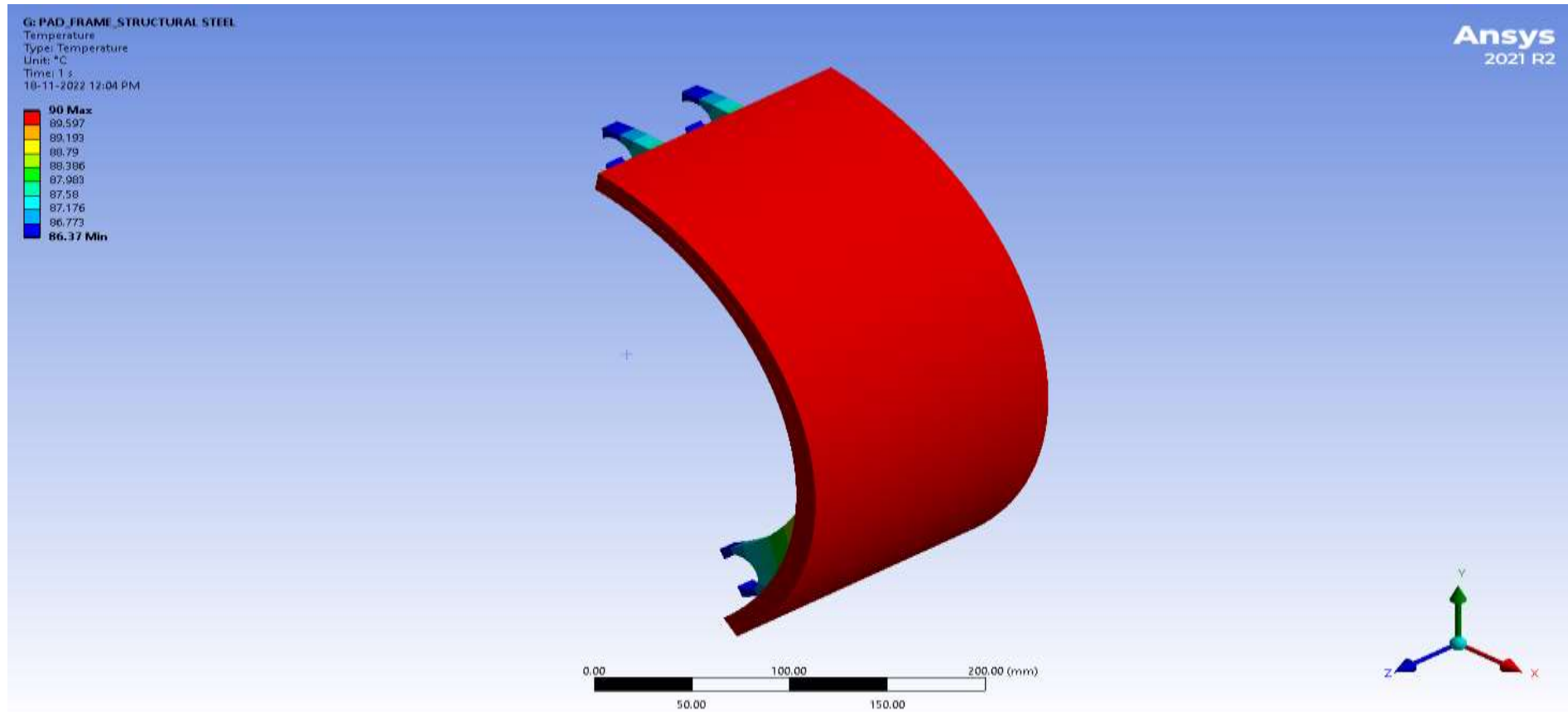
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of Structural Steel is calculated drum which is minimum of about 84.512 °C and maximum of 90 °C

HEAT FLUX



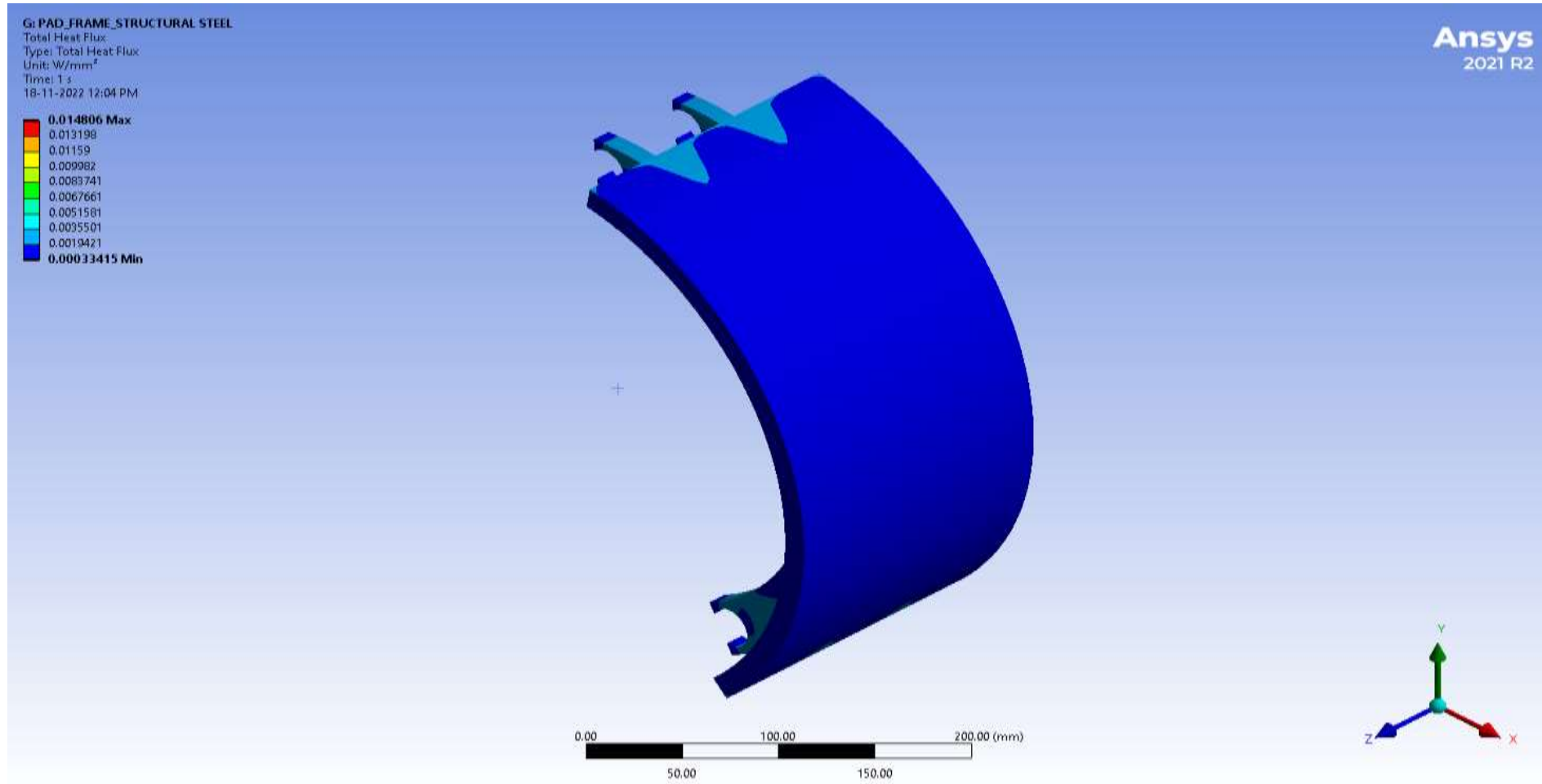
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of Structural Steel is calculated drum which is minimum of about 3.9337×10^{-5} W/mm² and maximum of 0.01835 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and color pattern, for the applied temperature of 90 deg. Temperature distribution of Structural Steel is calculated pad which is minimum of about 86.37 °C and maximum of 90 °C

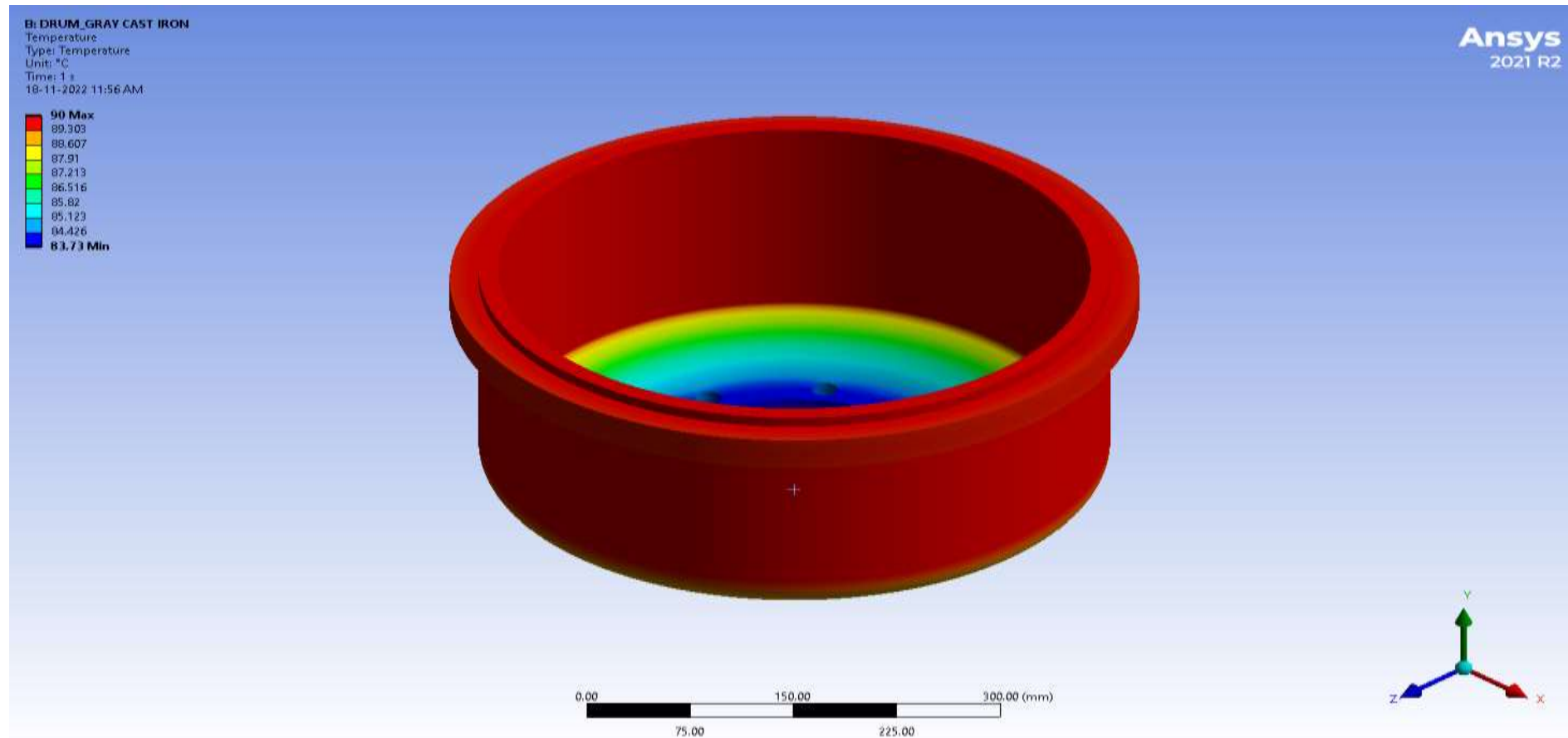
HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Structural Steel is calculated pad which is minimum of about 0.000334 W/mm² and maximum of 0.0148 W/mm² around the pad.

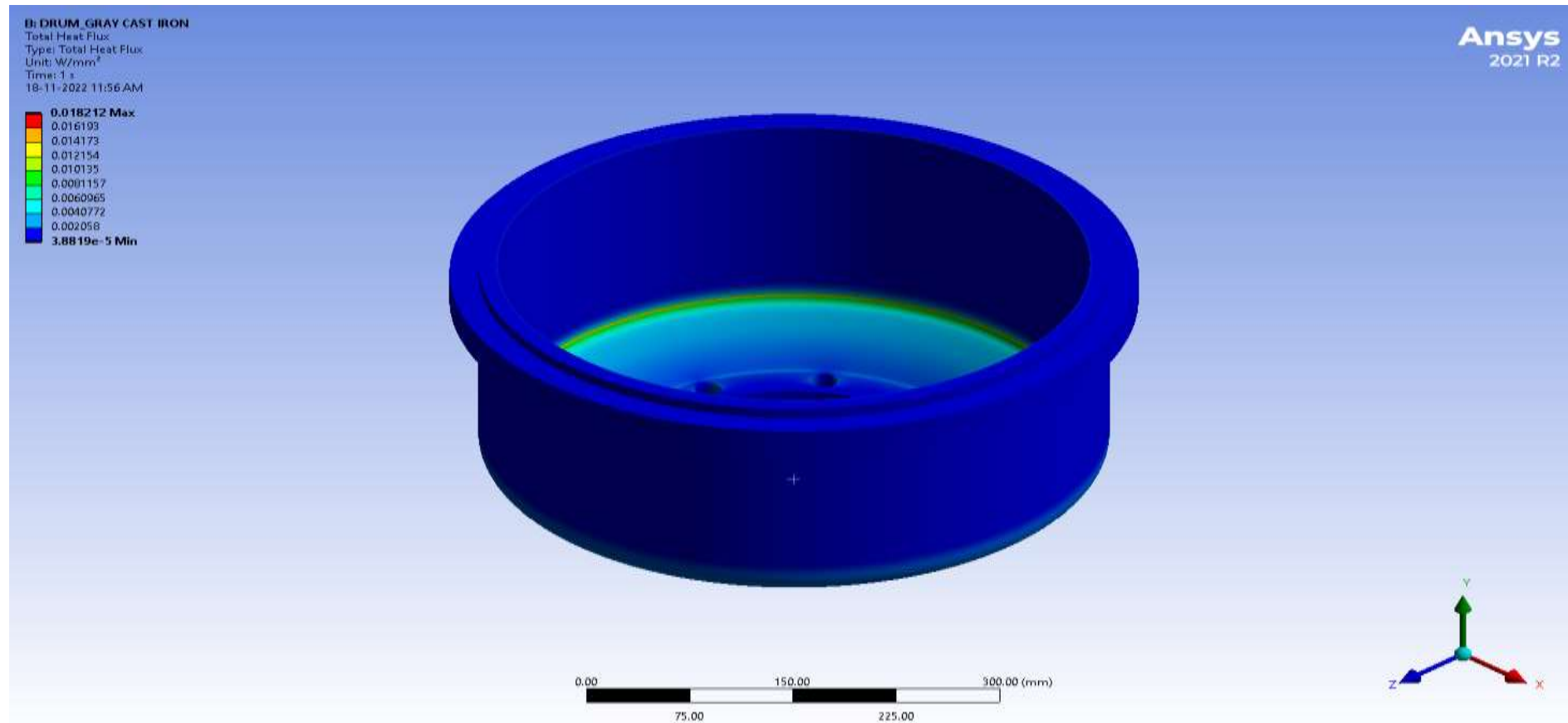
GRAY CAST IRON RESULTS

TEMPERATURE



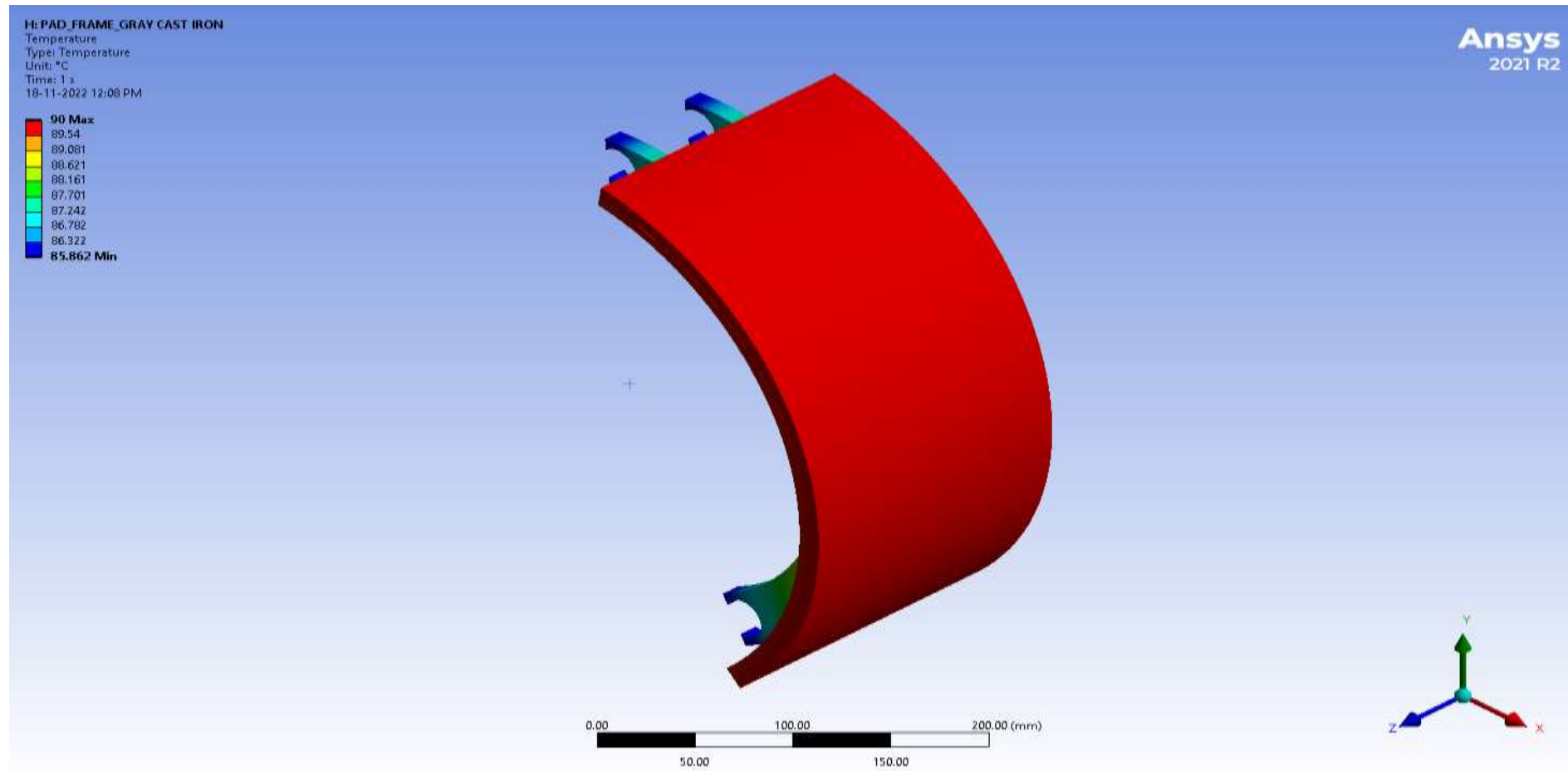
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of Gray Cast Iron is calculated drum which is minimum of about 83.73 °C and maximum of 90 °C

HEAT FLUX



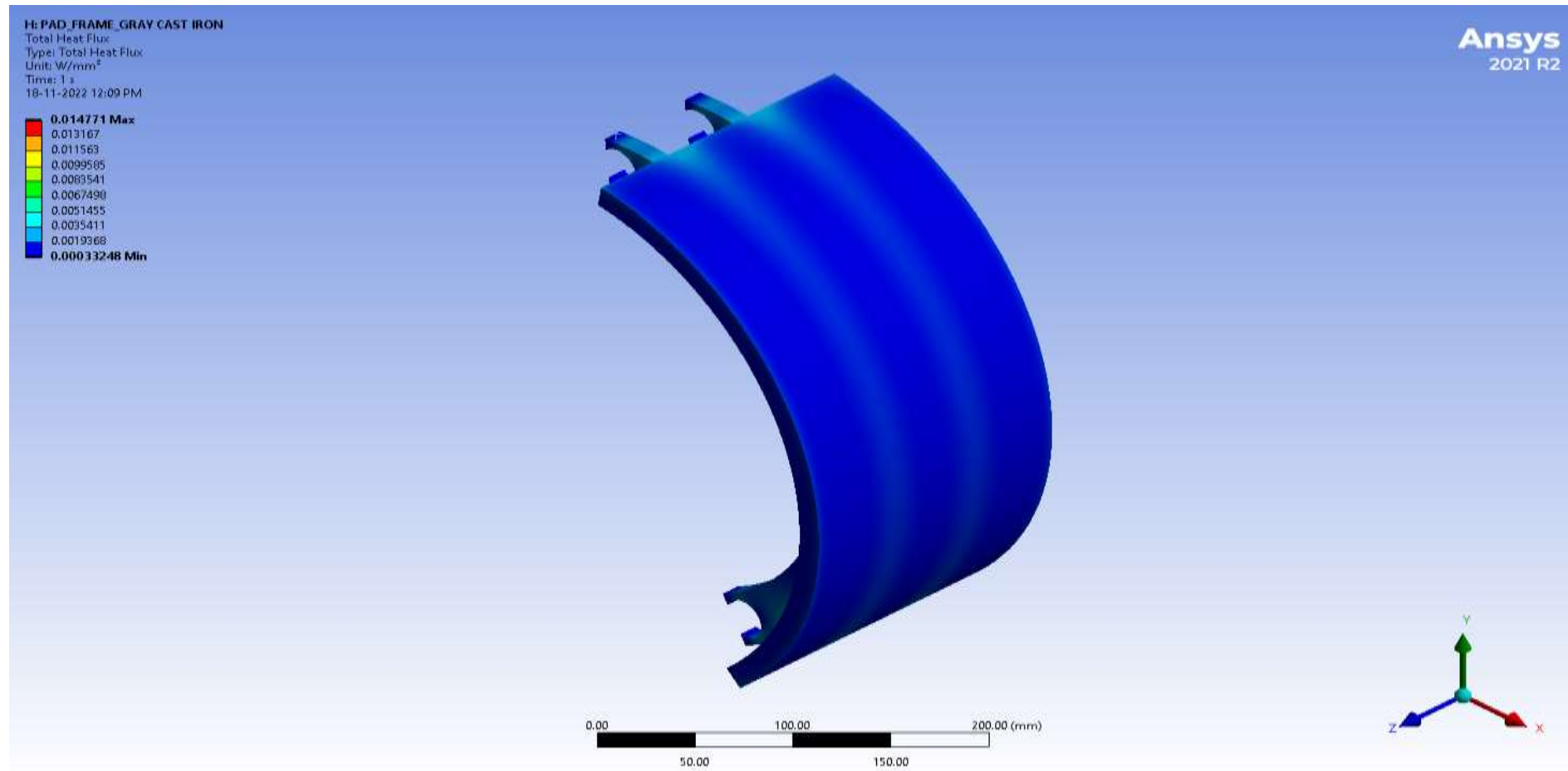
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of Gray Cast Iron is calculated drum which is minimum of about 3.88×10^{-5} W/mm² and maximum of 0.0182 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of Gray Cast Iron is calculated pad which is minimum of about 85.86 °C and maximum of 90 °C

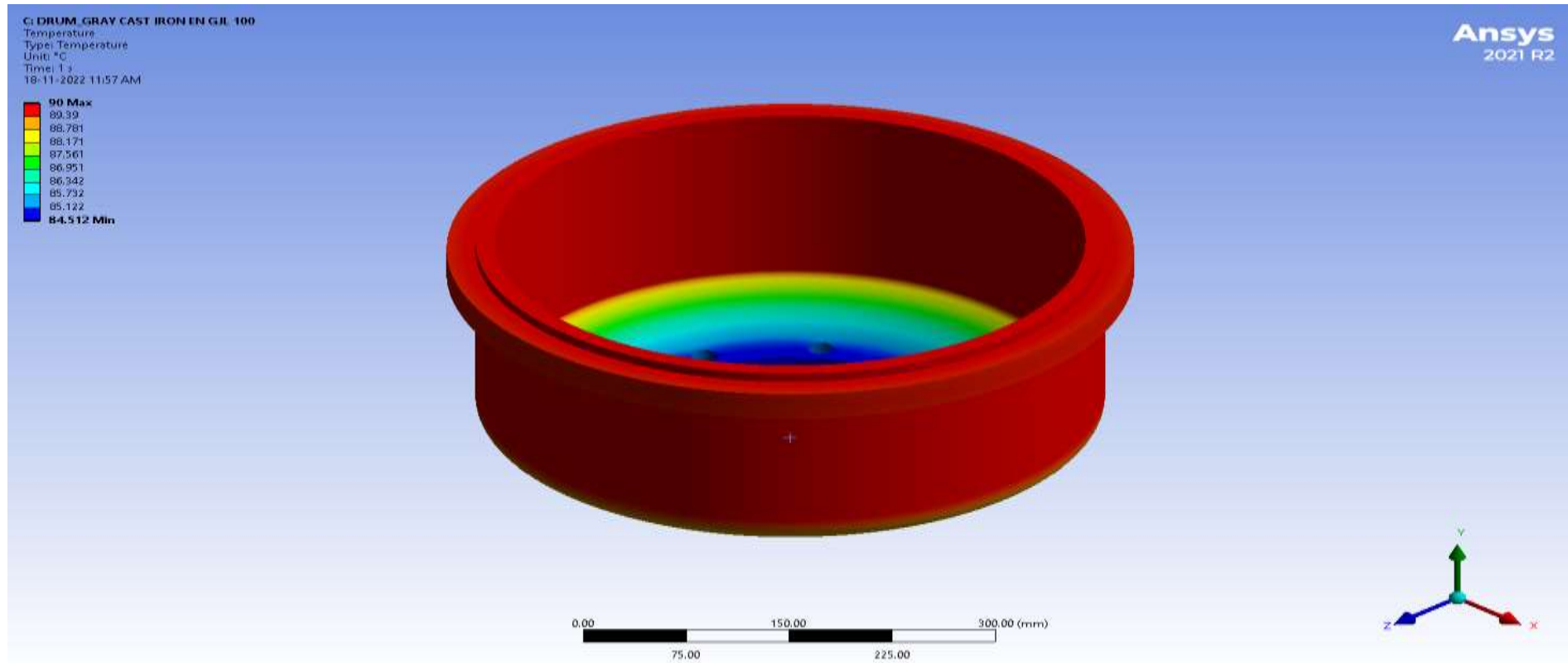
HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Gray Cast Iron is calculated pad which is minimum of about 0.00033 W/mm² and maximum of 0.0147 W/mm² around the pad. c

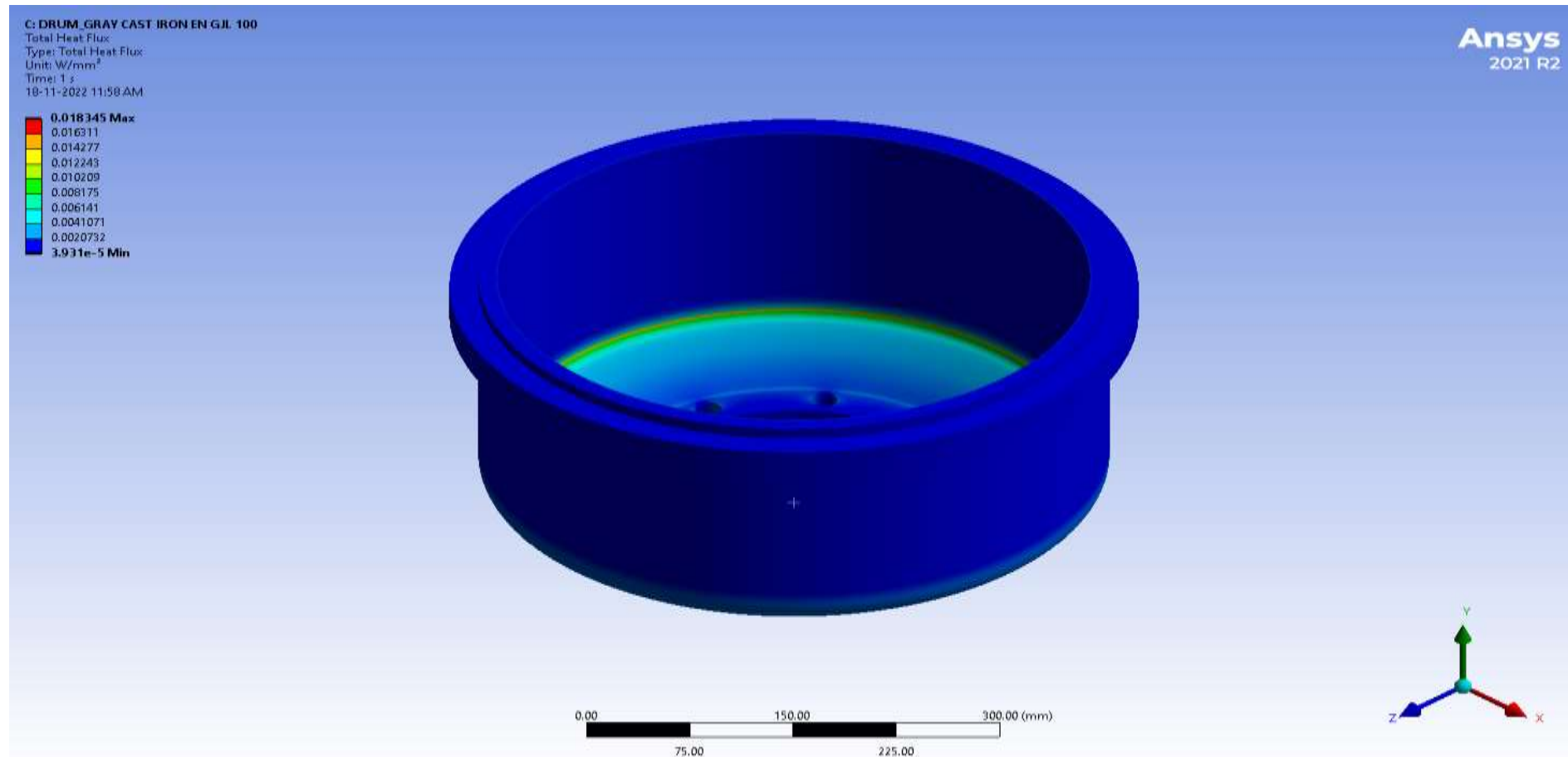
GRAY CAST IRON EN GJL 100 RESULTS

TEMPERATURE



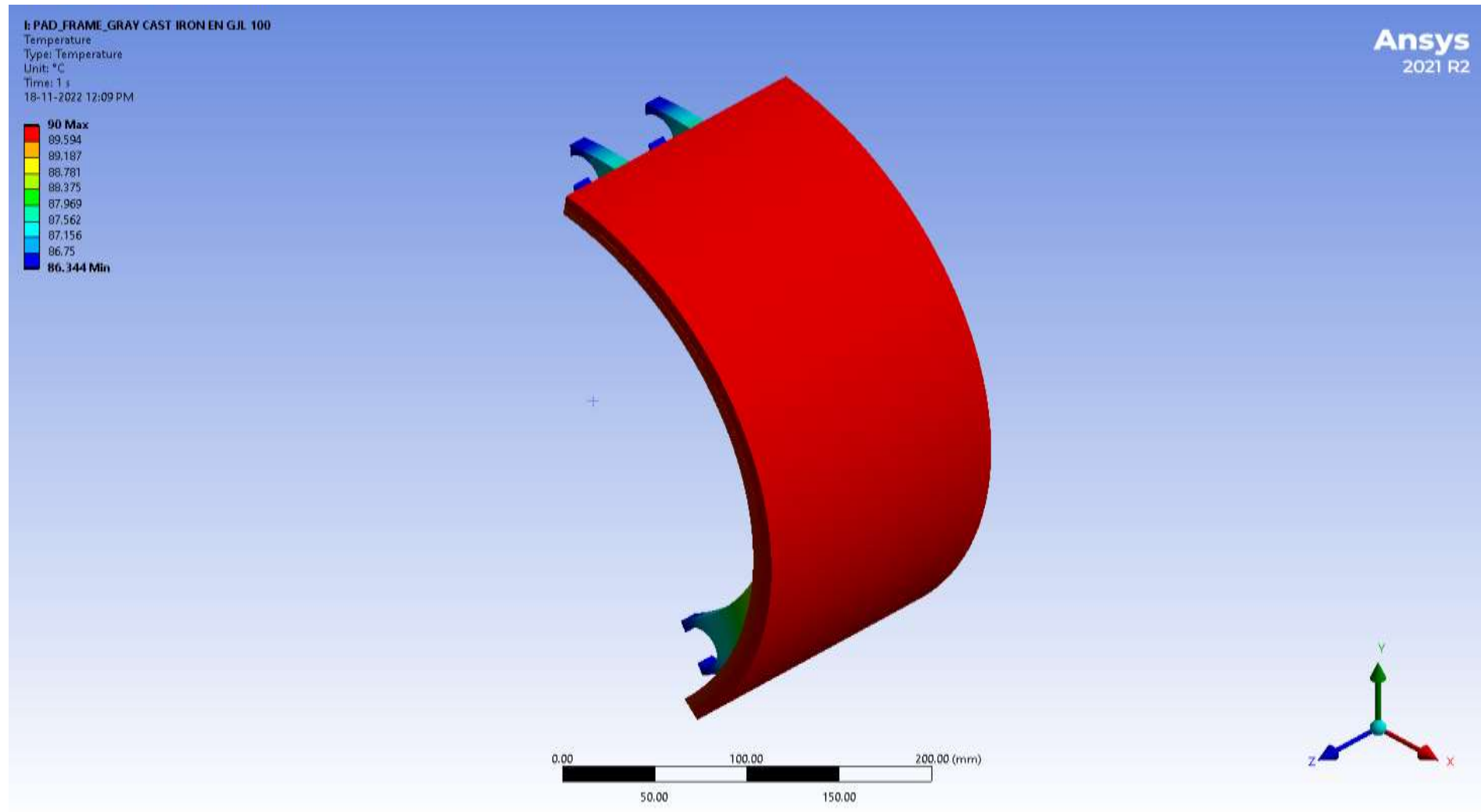
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of GRAY CAST IRON EN GJL 100 is calculated drum which is minimum of about 84.512 °C and maximum of 90 °C

HEAT FLUX



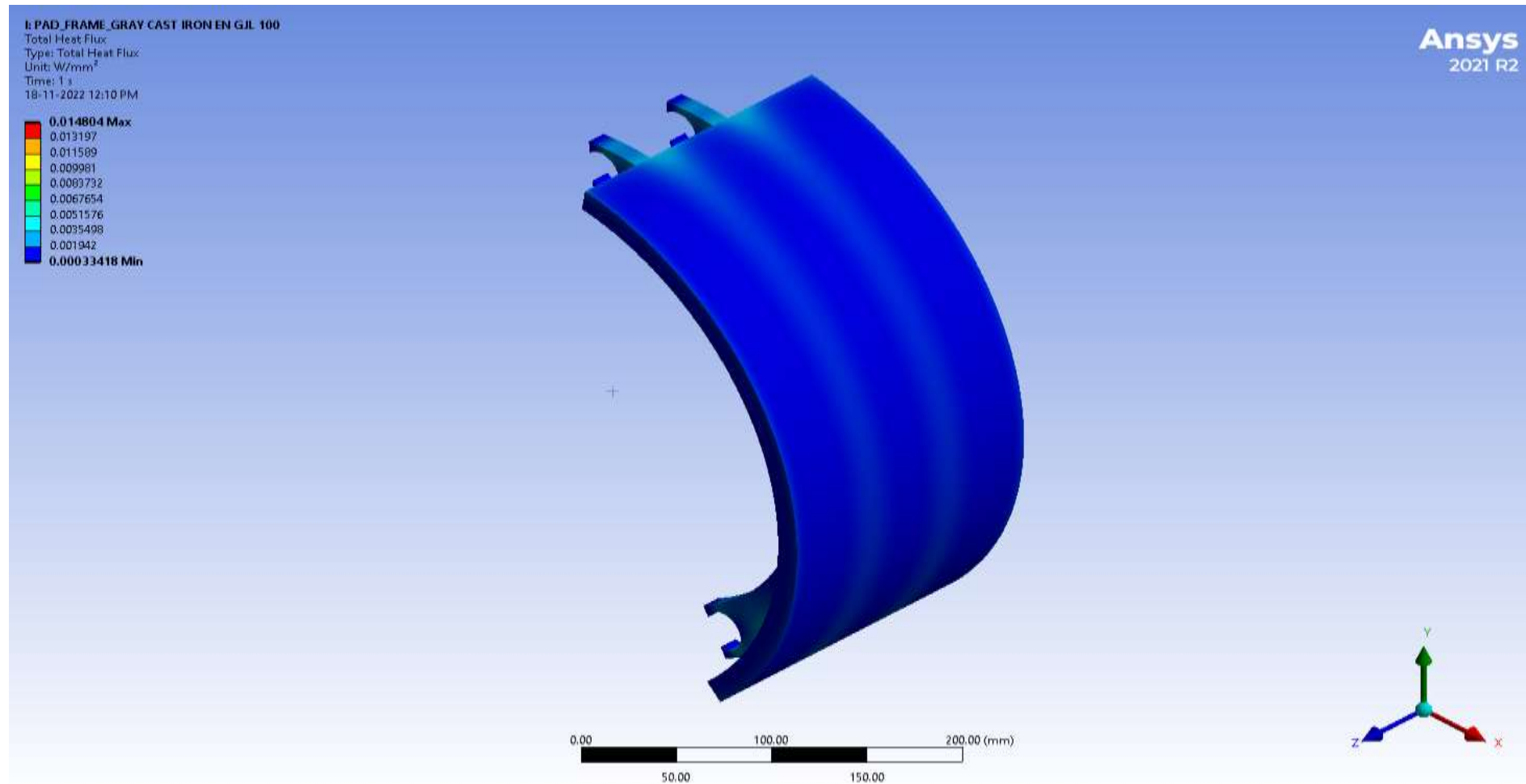
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of GRAY CAST IRON EN GJL 100 is calculated drum which is minimum of about 3.931×10^{-5} W/mm² and maximum of 0.01834 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of GRAY CAST IRON EN GJL 100 is calculated pad which is minimum of about 86.34°C and maximum of 90 °C

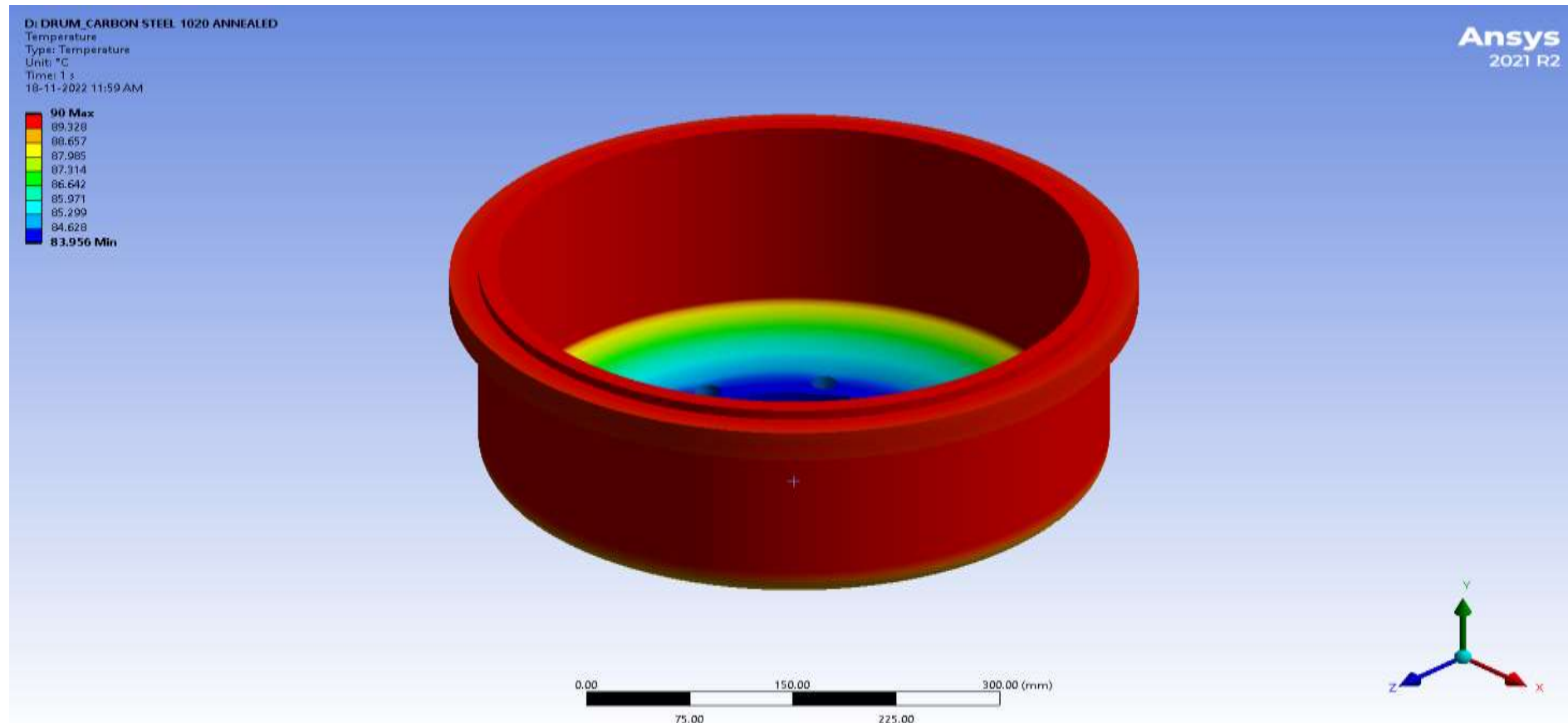
HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Gray Cast Iron is calculated pad which is minimum of about 0.000334 W/mm² and maximum of 0.0148 W/mm² around the pad.

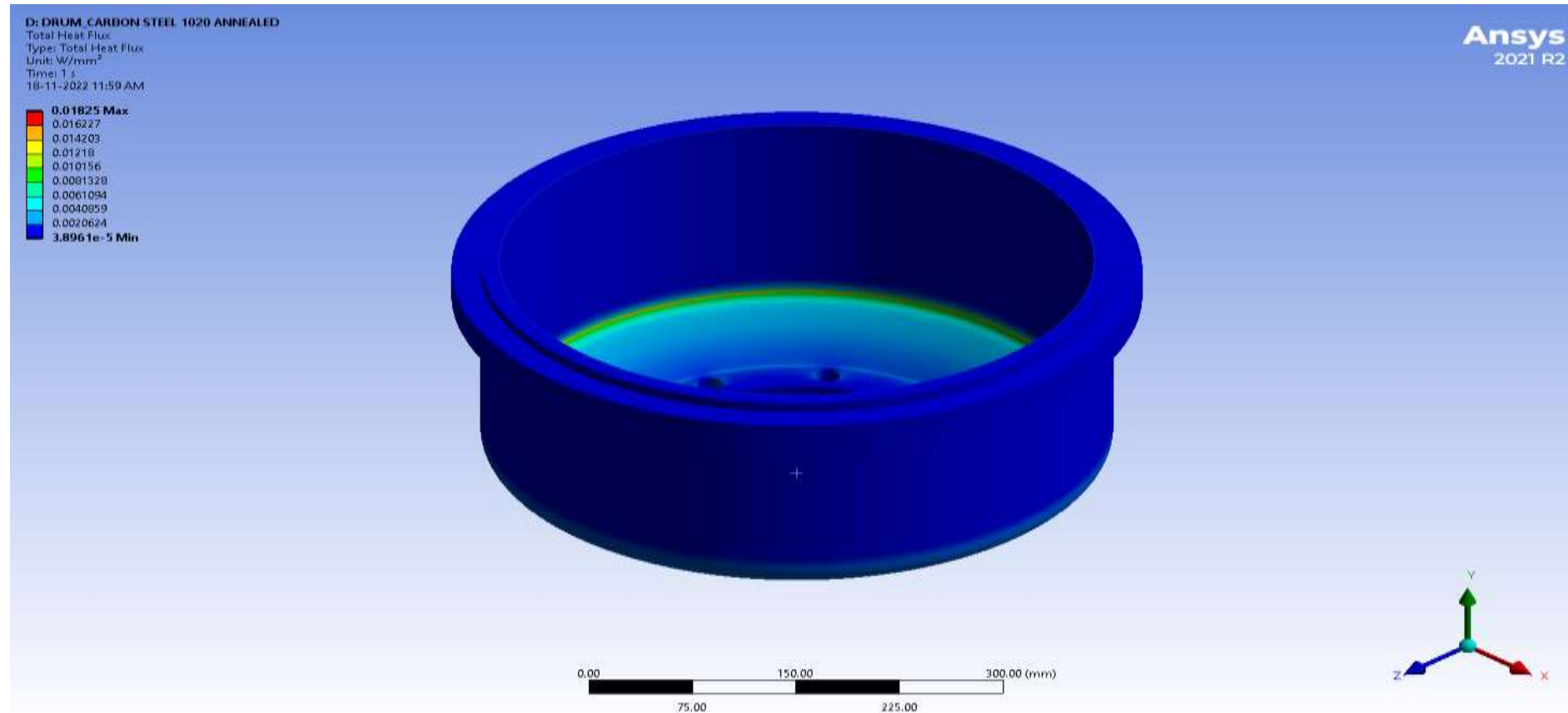
CARBON STEEL 1020 ANNEALED RESULTS

TEMPERATURE



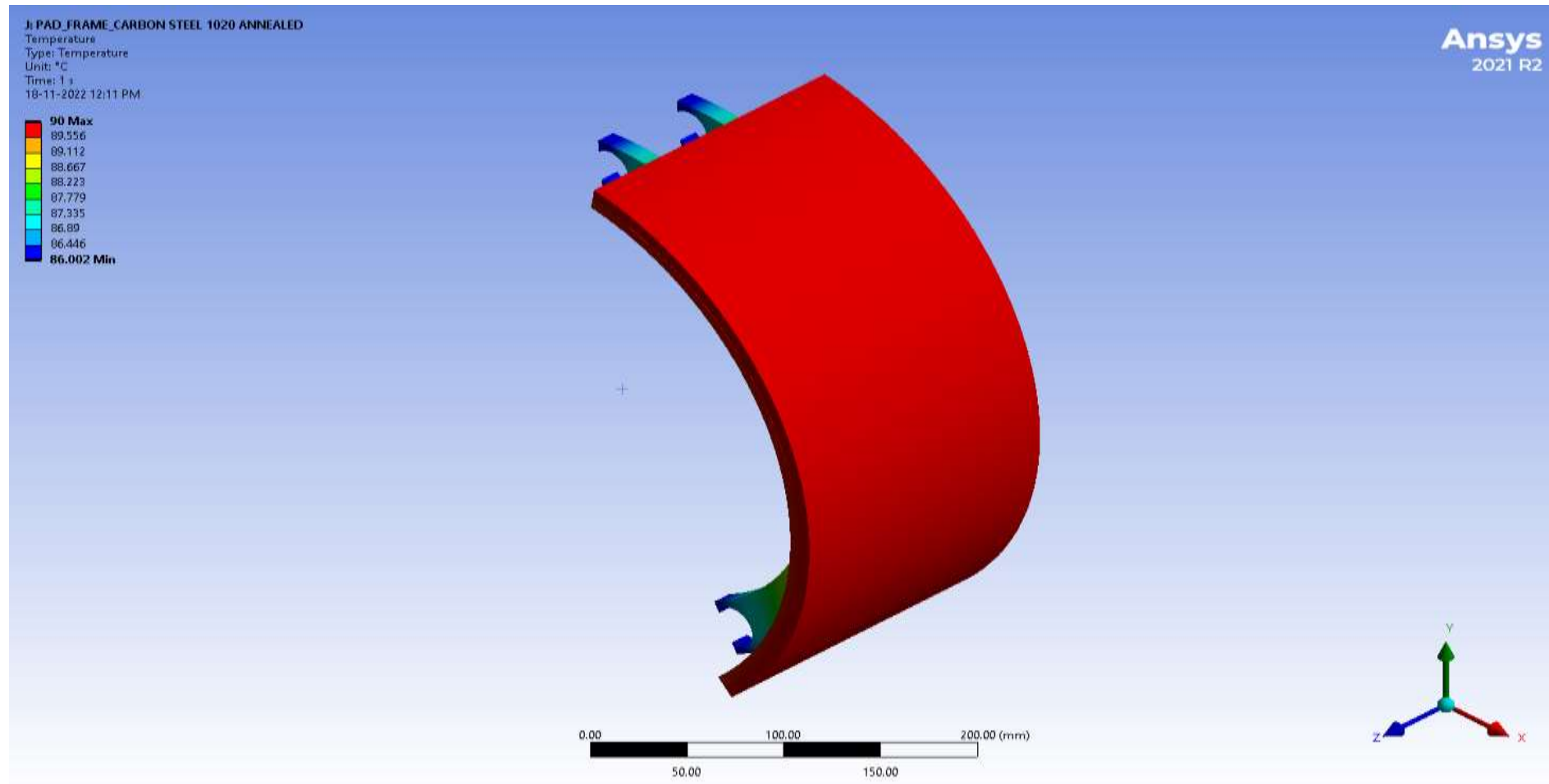
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of Carbon Steel 1020 Annealed is calculated drum which is minimum of about 83.956 °C and maximum of 90 °C

HEAT FLUX



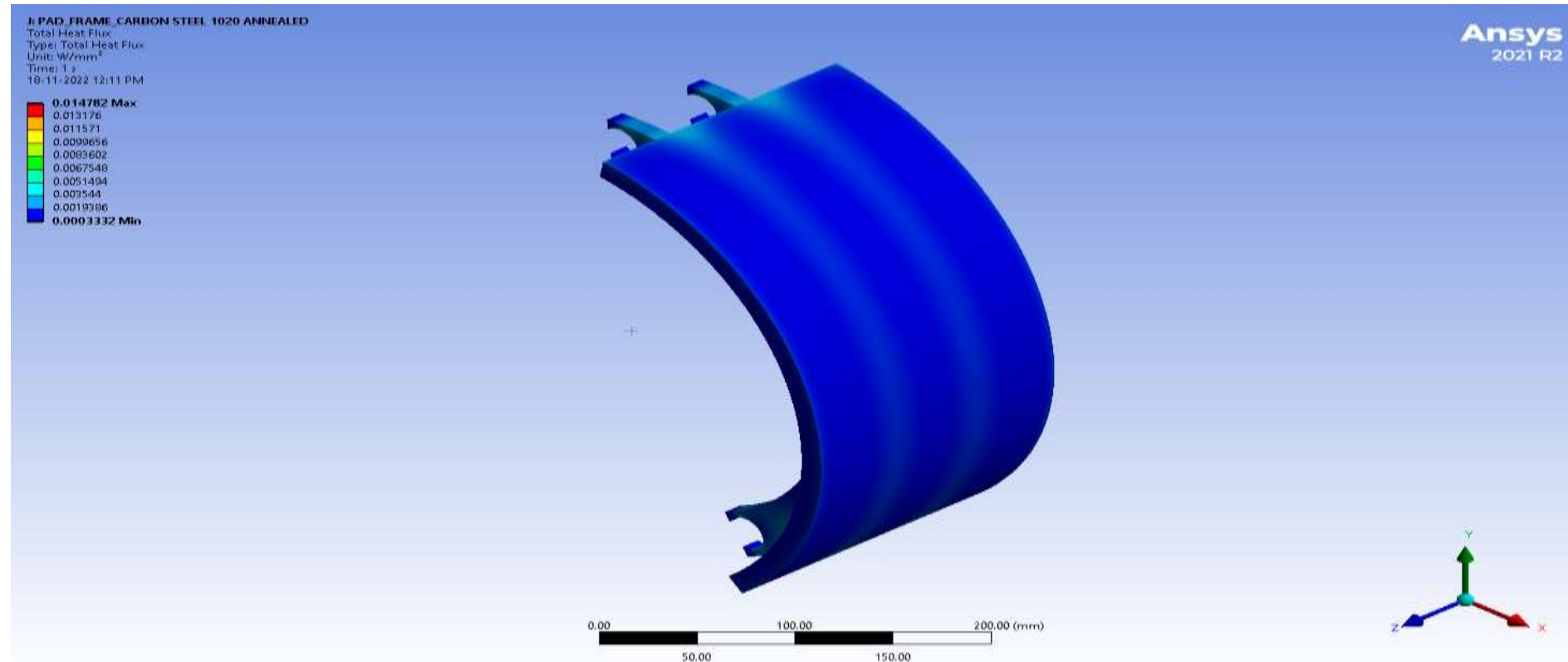
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of Carbon Steel 1020 Annealed is calculated drum which is minimum of about 3.896×10^{-5} W/mm² and maximum of 0.01825 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of Carbon Steel 1020 Annealed is calculated drum which is minimum of about 86 °C and maximum of 90 °C

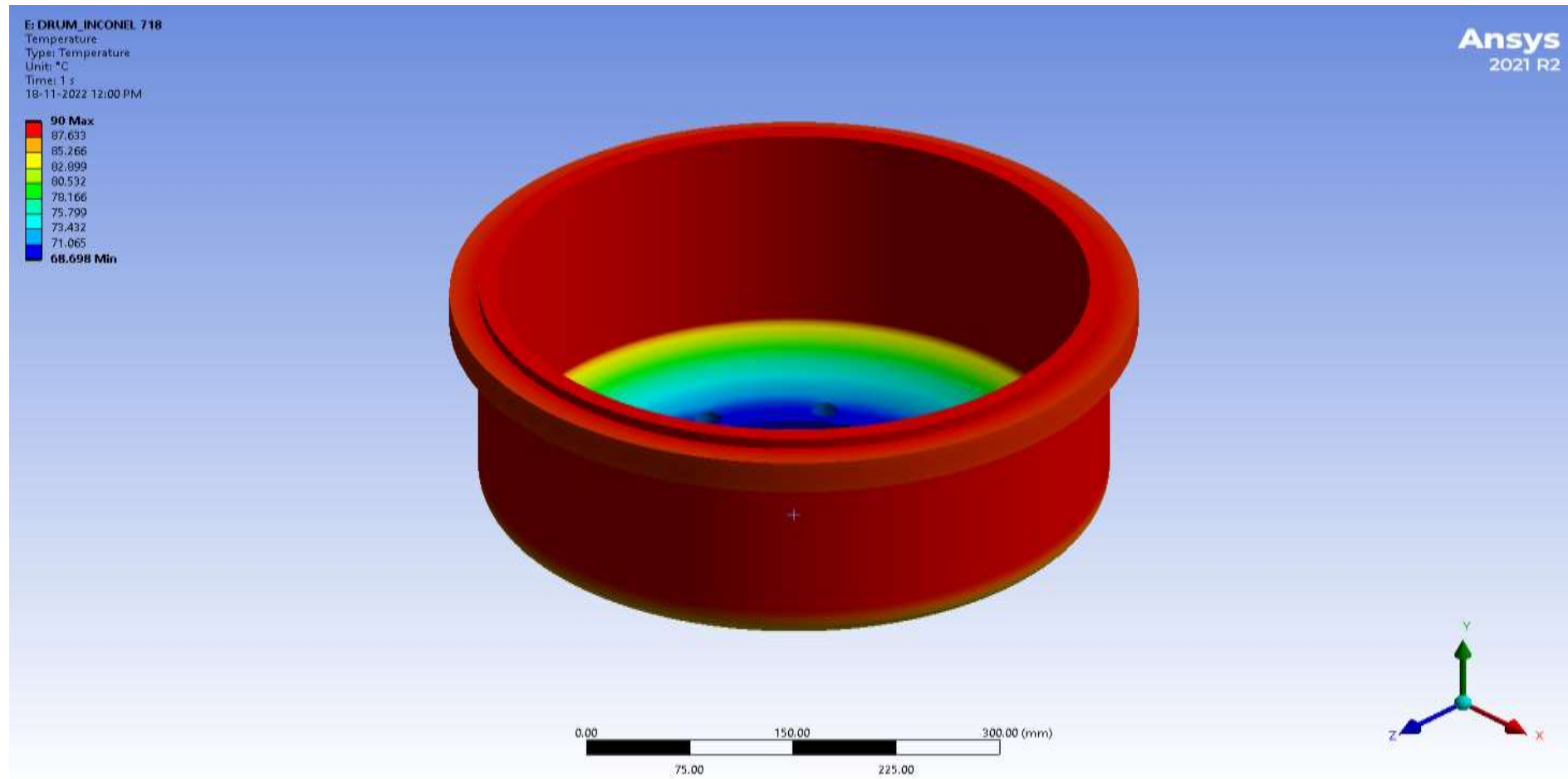
HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Carbon Steel 1020 Annealed is calculated pad which is minimum of about 0.000333 W/mm² and maximum of 0.01478 W/mm² around the pad.

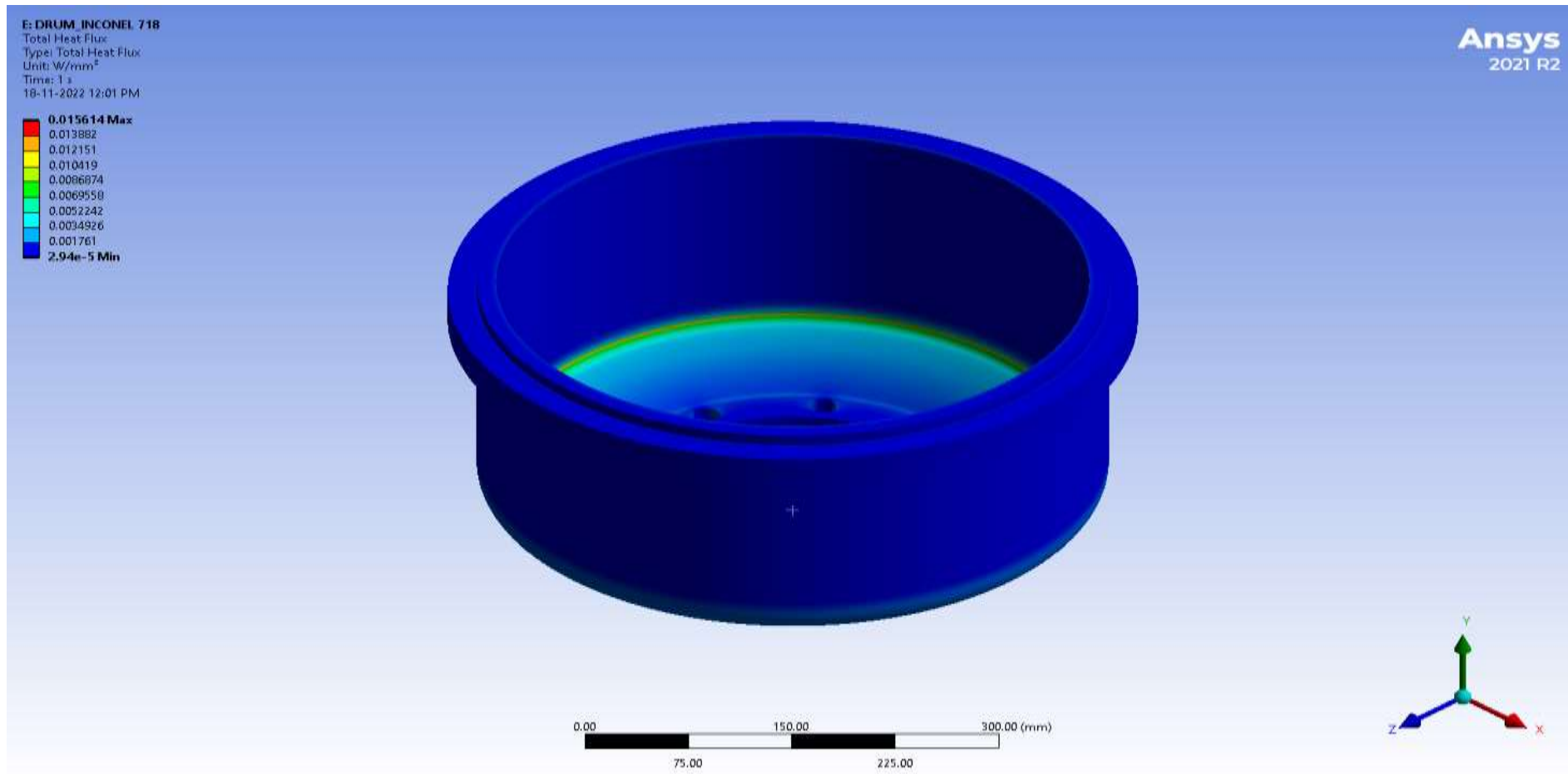
INCONEL 718 RESULTS

TEMPERATURE



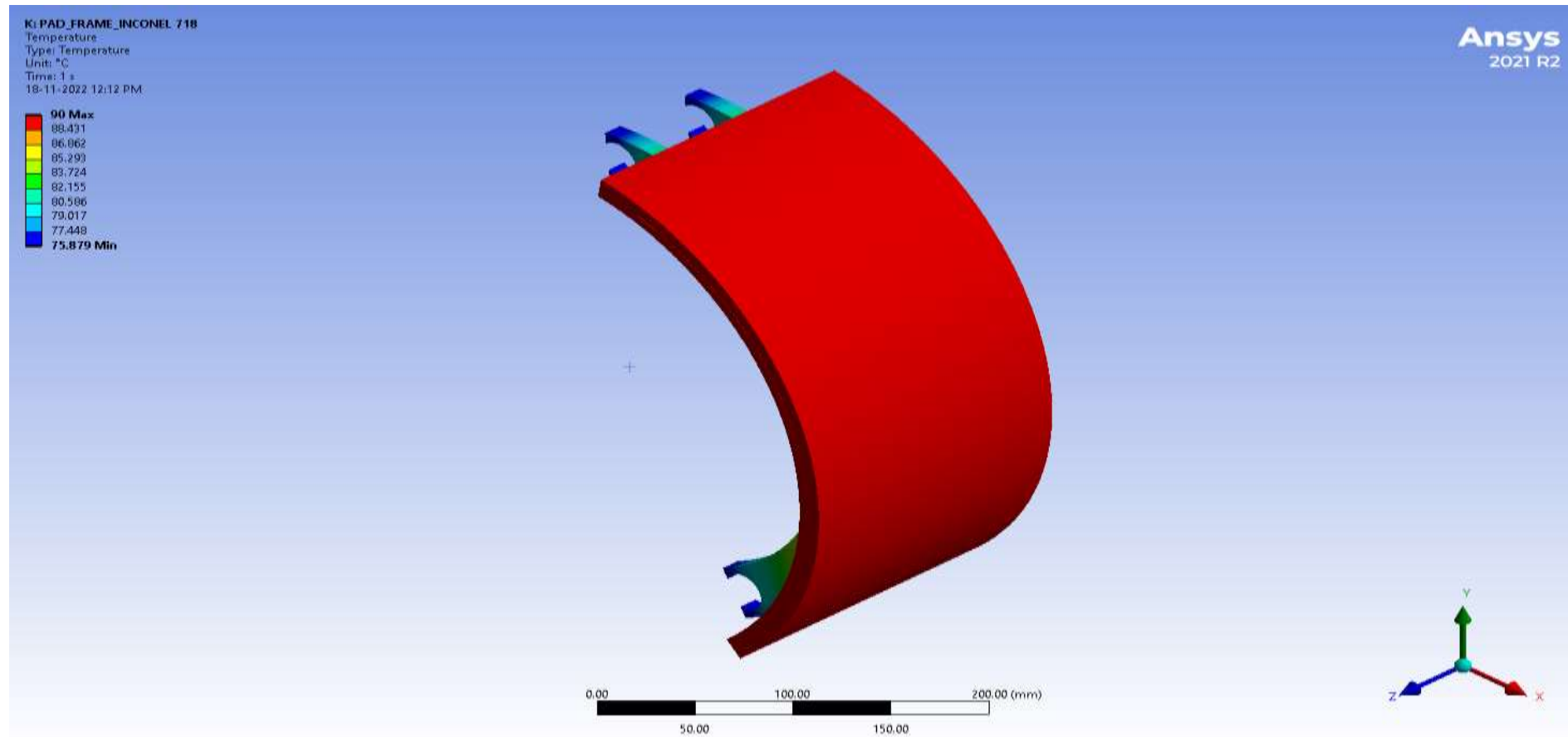
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of INCONEL 718 is calculated drum which is minimum of about 68.7 °C and maximum of 90 °C

HEAT FLUX



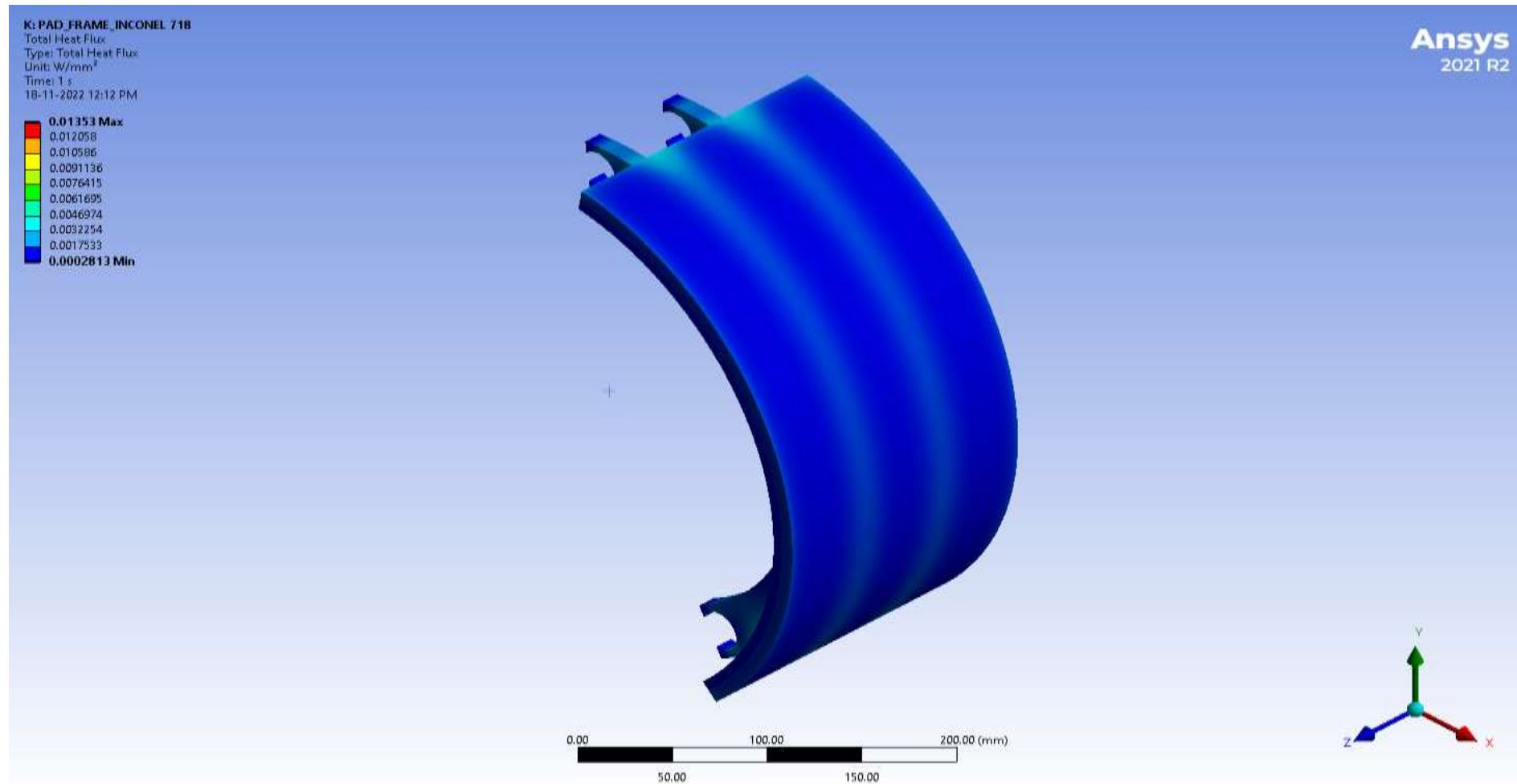
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of INCONEL 718 is calculated drum which is minimum of about 2.94×10^{-5} W/mm² and maximum of 0.0156 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of INCONEL 718 is calculated drum which is minimum of about 78.9°C and maximum of 90 °C

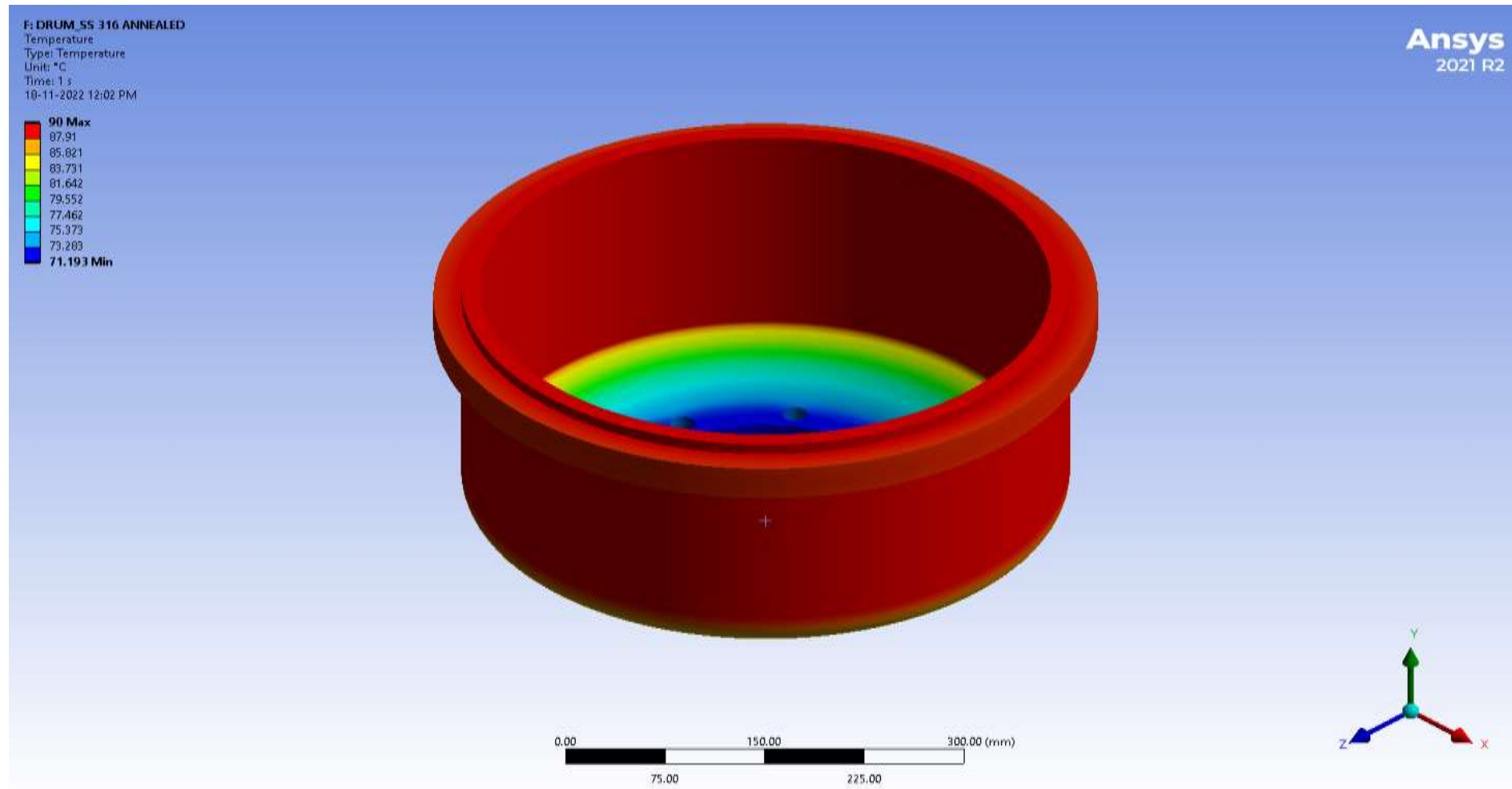
HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Gray Cast Iron is calculated pad which is minimum of about 0.00028 W/mm² and maximum of 0.0135 W/mm² around the pad.

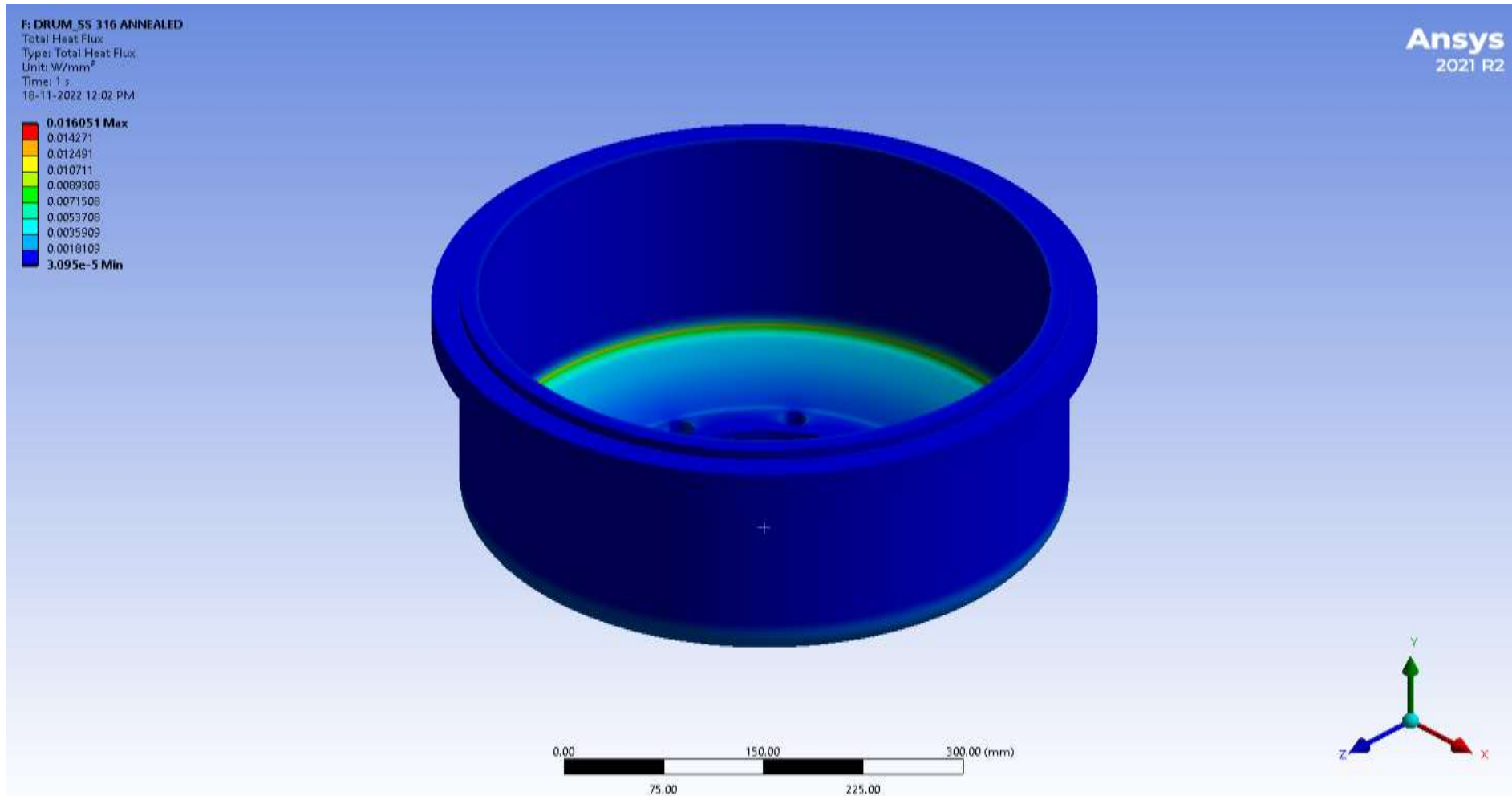
SS 316 ANNEALED RESULTS

TEMPERATURE



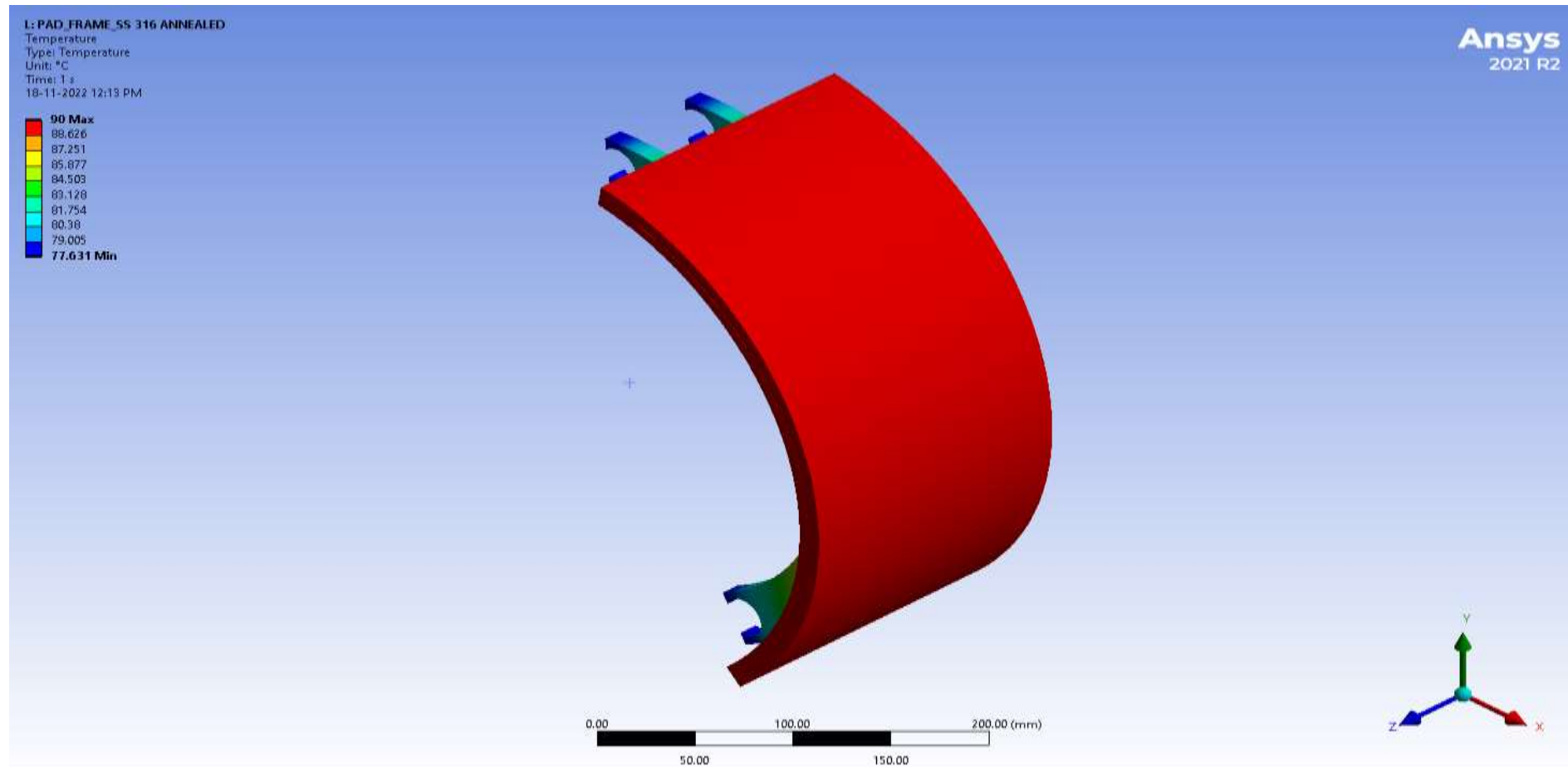
Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of SS 316 ANNEALED is calculated drum which is minimum of about 70.2 °C and maximum of 90 °C

HEAT FLUX



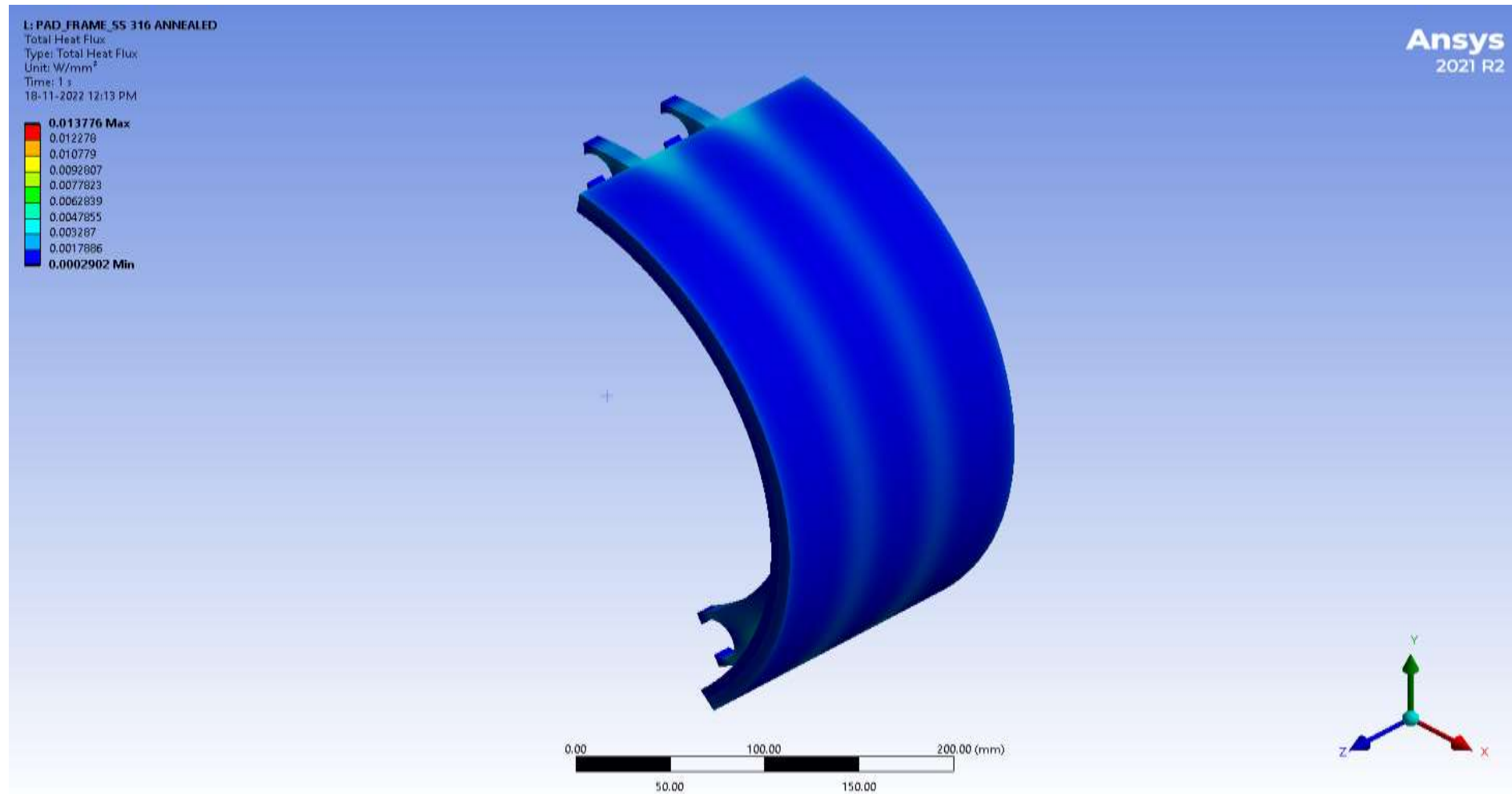
Heat Flux is done for cross-sectional of work piece brake drum. Heat Flux of SS 316 ANNEALED is calculated drum which is minimum of about 3.09×10^{-5} W/mm² and maximum of 0.016 W/mm² around the circumference of the drum.

TEMPERATURE



Temperature distribution values and colour pattern, for the applied temperature of 90 deg. Temperature distribution of SS 316 ANNEALED is calculated drum which is minimum of about 86.34°C and maximum of 90 °C

HEAT FLUX



Heat Flux is done for cross-sectional of work piece brake pad. Heat Flux of Gray Cast Iron is calculated pad which is minimum of about 0.00029W/mm² and maximum of 0.01378 W/mm² around the pad.

BRAKE DRUM		
MATERIAL	TEMPERATURE (CELCIUS)	HEAT FLUX (W/mm2)
STRUCTURAL STEEL	84.55	0.019
GRAY CAST IRON	83.73	0.018
CAST IRON EN GJL 100	84.51	0.018
CARBON STEEL 1020 ANNEALED	83.96	0.018
INCONEL 718	68.69	0.016
SS 316 ANNEALED	71.19	0.016
BRAKE PAD		
MATERIAL	TEMPERATURE (CELCIUS)	HEAT FLUX (W/mm2)
STRUCTURAL STEEL	86.37	0.015
GRAY CAST IRON	85.86	0.015
CAST IRON EN GJL 100	86.34	0.015
CARBON STEEL 1020 ANNEALED	86.002	0.015
INCONEL 718	75.88	0.014
SS 316 ANNEALED	77.63	0.014