Context and Objectives:
The FSAE Championship regroups teams from technical universities worldwide which design, build and race an open wheeled race car following the « FSAE Reglement ». The TU Graz Racing Team is one of the best teams in the world ranked 6th in 2015. The objective of this project is to build a light weight rim with a parametric width for the car of the season 2016.

Model and Methods:
In order to design the rims, onboard force measurements of a Formula 1 car were scaled down to the weight distribution and weight of our car. The model of 2015 was changed and enhanced following the « European Standard for Rims ». A model using a tire was made on ANSYS to compute the stiffness of the rim and design the layup not to break. The glued zone was modeled in order to select the appropriate one that will withstand the demanding working operations.

Results:
The 2016 rim can be built to be 7” to 8” wide and compare to the 2015 one, which was 6.5” wide, it is up to 20% stiffer although wider. The final theoretical weight is under 1 kilo with a computed value of 975 gram.

Manufacturing:
Aluminum molds were made in order to build the rims, the design was made to match the old mold that will be kept. The « European Standard for Pressure Vessel » was used to design the latter. A home-made autoclave was used to obtain the best mechanical properties of the CFRP provided by our sponsor CarboTech. The ply design was made using CATIA and AutoCAD to add the overlapping.

Conclusion:
The TANKIA 2016 will test the 2016 rims in 7”, 7.5” and 8” and the width making the car faster will be chosen to compete against all the other team in UK, Austria, Germany, Spain and Michigan. The goal of this season being to be at least as good as the last season.