



**Product**

## SFM Clutch Coupling & CSK Overrunning Clutches

**Application**

## Eco-marathon Vehicle

**Highlights**

**Warner Electric**  
**SFM VAR 11**  
**Clutch Coupling**

Bearing-mounted, electrically operated power-on clutch

**Stieber**  
**CSK Overrunning**  
**Clutches**

Sprag type overrunning clutch integrated into a 62 Series ball bearing

Thomas More University (TMU), located in Belgium, entered a team of 10 engineering students into the 2018 Shell Eco Marathon. The annual design challenge pits university engineering teams from around the world to design and build highly efficient vehicles. This year, the team competed in the Urban Concept class where the design had to incorporate practical road-legal functionality, including windshield wipers, lights and a horn, along with energy efficiency.

One of the challenges for the student teams is sourcing high quality components while operating within a tight budget. When looking for a suitable clutch to engage and disengage the engine from the drivetrain, the team contacted Warner Electric for help. Upon review of the TMU design proposal, Warner quickly decided to sponsor the team by providing the product free of charge as well as support and advice during the specification and installation.

The project required a lightweight clutch with a small footprint that would integrate with the existing drivetrain and required minimal energy to operate. Additionally, when engaged it would have to transmit torque reliably with zero slip or backlash, as this would impact the vehicle's energy efficiency.

The SFM VAR 11 bearing-mounted clutch coupling from Warner Electric's range of shaft-mounted electro-magnetic clutches was identified as the best fit for the project. Available in seven different sizes, the smallest unit delivers up to 7 Nm torque with a max speed of 8,000 rpm. At 12.5 volts and only 790 grams, the clutch is mounted to the shaft via a keyway design and integrated seamlessly with the car's lightweight design philosophy.

Stieber, another Altra brand, also supported the team by supplying four CSK freewheel bearings for the vehicle's wheel assemblies.

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