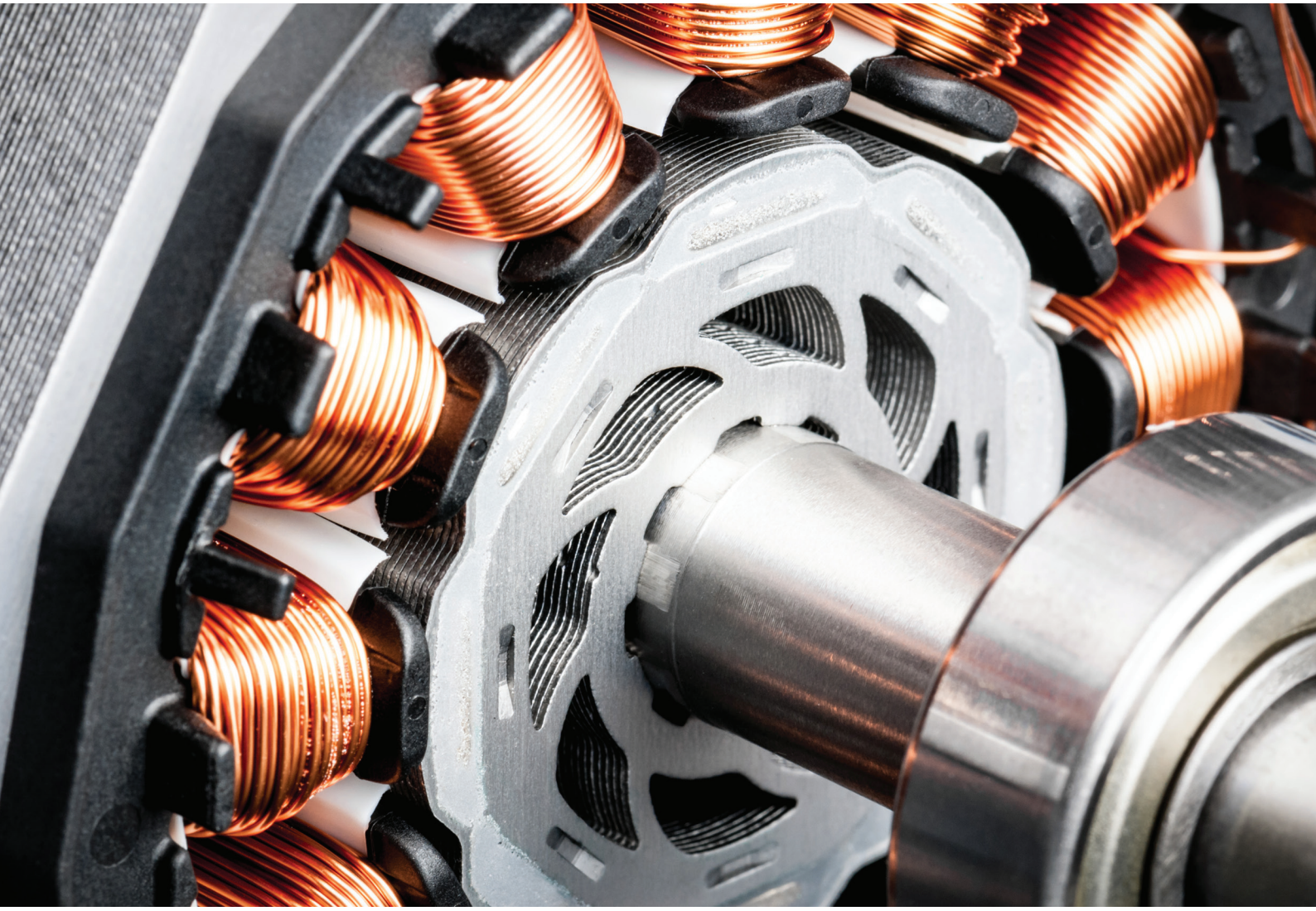
DASSAULT SYSTEMES

CATIA

3DEXPERIENCE®

SYSTEMS BRUSHLESS DC DRIVES LIBRARY

Enables effective development of drive systems containing brushless DC drives



MODELING AND SIMULATION OF BRUSHLESS DC MOTOR AND CONTROLLERS

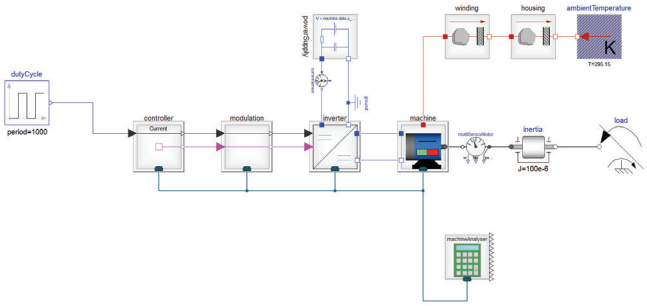
Brushless DC motors are increasingly used, replacing brushed DC motors in many industries and applications. They offer higher efficiency, reliability, longer life and better torque to weight ratio. Controllers are more complex to develop but offer a higher flexibility.

APPLICATION

- The Brushless DC motor library enables engineers to develop and quickly assess the performance of a complete electric drive, including the motor, the power electronics and the control software for speed and torque control. Models enable the validation of energy consumption for complete cycles and to estimate overload capabilities based on thermal models. The library offers models with a varying level of complexity, from DC-equivalent machine for fast computation and overall system simulation, up to detailed models to study, for example, voltage and current ripple effects.
- Moreover, standard brushless DC motor characteristics from supplier datasheets can be easily transferred to the library in order to assess the performance of existing motors in the system.

BENEFITS

- Covers a wide range of scenarios due to the different levels of complexity available
- Simple coupling with other technical domains (mechanical, thermal) with the high flexibility of ModelicaParameters and models can be added by the user extending and specializing the functionality of the library (similar to the EPTL)



KEY FEATURES

- Speed/torque controller design of electrified powertrains
- Power Loss estimation of electric machine and thermal analysis
- Study the voltage and current ripple effect
- Compute the system energy consumption

PACKAGING

Examples –

Ready-to-use simulations to demonstrate the libraries capabilities, including a how to apply the library guide.

Common –

Auxiliary blocks and models across all detail levels such as specific interfaces and machine energy analyzers

Controller –

Different level of complexity for BLDC controllers, including six-step variants.

Modulation –

Various levels of complexity for the modulation method, such as averaged and full PWM models.

Inverter –

Averaged and full switching inverters for fast and detailed simulations.

Machines –

Multiple machines, versions such as standard DC machine for quick simulations, sinusoidal and trapezoidal air-gap field machines.

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