

# Future of Lightweighting Winner



## AAM

### Quantum Program

Quantum is a unique integration of proven materials and technologies to radically reduce subsystem mass, increase transmitted power efficiency, while maintaining current cost levels of traditional carryover products.

Quantum uses lightweight materials, hollow shafts, and efficient structural shapes to achieve a 35% reduction in mass in a light duty pickup rear axle assembly (25 kg reduction). The system employs ball bearing subsystems that are made integral with the gear components they support. This provides a greater mounting accuracy and stiffness that increases the power density (torque per gear size) and allows the first ever “completely net build” assembly in this product space. Net build is one of the key factors that offsets the cost of the lightweight materials used in the gear housings.

The custom engineered and integral bearing subsystems use a clearance fit internal design (no preload) which reduces parasitic losses (improved efficiency). This improves NVH robustness of the system by increasing internal damping and eliminating a wear dependent element of system NVH performance.

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