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Shaft Torque as It Relates to Screw RPM in a High Speed, Energy Input (HSEI) Twin Screw Extruder (TSE)

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Shaft Torque as It Relates to Screw RPM in a High Speed, Energy Input (HSEI) Twin Screw Extruder (TSE)
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In a HSEI TSE segmented screws are assembled on splined shafts. The cross-sectional area of the screw shafts, the shaft design/metallurgy, and the manufacturing method determines the available torque that can be imparted into a process and dictates which motor/gearbox are specified. This formula helps determine the proper gearbox ratio for a HSEI twin screw extruder:

- Torque = 9550 x KW/top RPM of the machine
- Torque = Total torque for both screw shafts, typically denoted in NM (Newton-Meters)
- KW = Motor rating on the HSEI twin screw extruder

For example, if a HSEI twin screw extruder a 60 mm screw diameter has a torque rating of 2800 NM and 200 KW motor when geared at 600 RPM, then a 400 KW motor would be specified at 1200 RPM.

For processes that operated between 0-600 RPM there would be no difference whether a 200 KW (if geared for 600 RPM) or 400 KW drive was utilized, except that the larger motor/drive costs more.

Therefore, if the process does not benefit from higher screw speeds the higher RPM/KW configuration should probably not be specified.

- Charlie Martin, Leistritz

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