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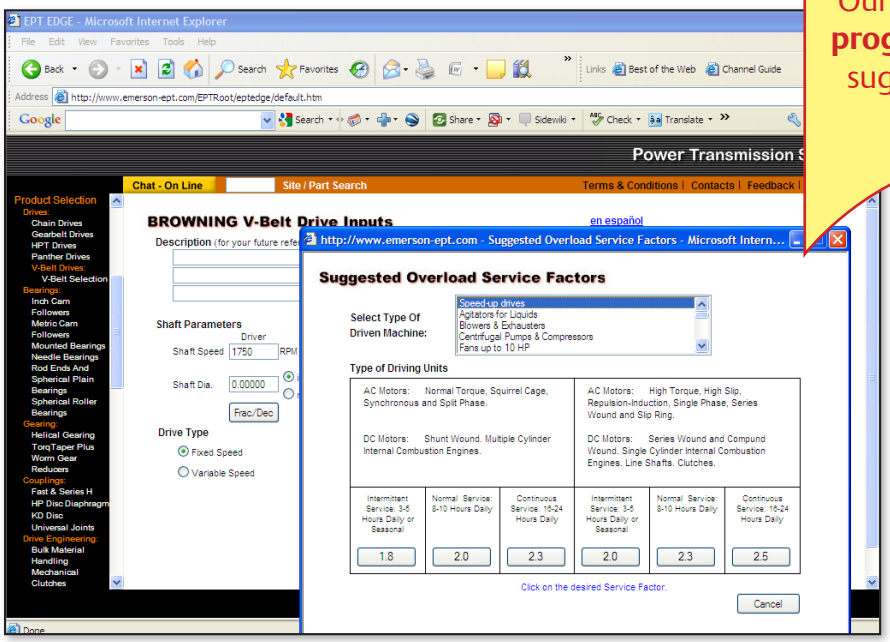
*What Are **Speed-Up Drives** And What **Design Considerations** Do They Require?*

Most V-belt drives have a “drive” speed that is faster than the “driven” speed. Speed-up drives are those drives where the motor speed is slower than that of the driven speed. For example, the “driving” (motor) speed is running at 1750 RPM and the “driven” is running at 2150 RPM. The increased speed is accomplished by using a smaller sheave on the “driven” side of the drive. There are several considerations required for a speed-up drive application.

Adequate Service Factor Design

Because of the acceleration curve during start-up, speed-up drives must have an adequate service factor design to transmit horsepower and minimize belt slip. V-belt slippage during start-up can cause belt glazing and ultimately hardening of the belt. This hardening will more rapidly promote fatigue and premature belt failure. Normal drive service factor suggestions begin at 2.0 and can go as high as 2.5 depending on the application.



Our **EDGE product design program** lists service factor suggestions for speed-up drives.

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Sheave Considerations

1. Always ensure the motor sheave is not so large that it creates excessive belt speed. A typical drive should not exceed 6,500 FPM. For desired speeds greater than 6,500 FPM, always contact Browning Application Engineering at 800-626-2093.

2. Always ensure the driven sheave is not too small as it can cause extreme flexing and high fatigue.

3. If an exceptionally wide sheave is used in the design and significant overhung load is present, consideration for outboard bearings on both the motor and driven shafts may be needed to minimize vibration, reduce bearing loads, and maximize drive life.

Energy Responsibility And Fan Speed

The U.S Department Of Energy publishes "The relationship between fan speed and airflow rate is linear; however, the relationship between fan speed and power consumption is cubed. Consequently, increasing the airflow rate of the fan by increasing its speed requires significantly more power and may require a larger motor. The structural integrity of the rotating elements, bearings, shafts, and support structure needs to be evaluated for the higher speeds" (DOE/GO-102003-1294 – Improving Fan System Performance).

Final Note

- For assistance in selecting V-belt drive components visit us at www.RegalPTS.com and use our EPT EDGE® design software for quick and accurate selections.
- For all the latest energy responsibility information, and support tools "Like Us" on Facebook* www.facebook.com/PowerTransmissionSolutions.

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