



REDUCING FRICTION, BENDING RESISTANCE & SLIPPAGE

Focus on Fan Belts

SIMPLE AND INEXPENSIVE WAY TO CUT VENTILATION ENERGY USE

Cogged V-belts and synchronous-drive fan belts represent low-investment ways to reduce the inefficiencies of ventilation fans caused by belt slippage and bending resistance. After GPG's Rocky Mountain Region put the two belts to the test and found both energy savings and a positive return on investment, R8 recommended that O&M contractors replace standard V-belts at end-of-life with these new belts. Tyler Cooper, R8's Supervisory Energy Project Manager, reports that there has been more deployment of the synchronous-drive belts because they reduce O&M time by up to 75%—one synchronous-drive belt can replace four V-belts. Cogged belts have not seen as much uptake. Cogged belts are a like-for-like replacement, and they do not save maintenance time, though they do realize energy savings of up to 11%. "Energy savings are required from O&M contractors," says Tyler, "though this can be hard to enforce. The extra ~\$40 in cost for the cogged V-belts can be a deterrent for some O&M contractors." Tyler recommends working closely with contracting officers to make it standard operating procedure to use both cogged and synchronous-drive belts as end-of-life replacements. **GPG recommends replacing all standard V-belts on variable-speed fans with synchronous drive belts. On constant-volume fans, cogged V-belts are recommended.**

Synchronous and cogged V-belts improve efficiency, save energy and offer a lower life-cycle cost compared to standard V-belts.

"It's always hard to get people to do something different. We've found the best way to make change is to build personal relationships."

– Tyler Cooper, Supervisory Energy Project Manager, GSA Rocky Mountain Region (R-8)

Synchronous and Cogged Fan Belts

- 2%–20% energy savings from synchronous-drive belts on VFD fans; 2% at 60 Hz, 20% at 15 Hz
- 1%–10% energy savings from cogged-belts on CV fans; 1% at 60 Hz, 10% at 15 Hz
- Synchronous belts are not recommended on CV fans because high-torque starts and increased speeds create operational risks
- 75% lower O&M costs for synchronous belts; cogged O&M equivalent to standard V-belts
- No significant change was noted in the sound levels generated by the operation of either belt
- < 4 year payback for initial installation of synchronous belts; repeat installations have immediate payback
- < 1 year payback for cogged V-belts

RESOURCES

Learn More About Fan Belts

[GPG Findings 012 & Report by the National Renewable Energy Laboratory »](#)

[Webinar Recording, 08.10.17 »](#)

[Webinar Presentation Slides »](#)

For more information about GSA's Proving Ground program and the technologies it evaluates: contact Michael Hobson michael.hobson@gsa.gov or go to www.gsa.gov/gpg



Emerging Building Technologies' two programs, GSA Proving Ground (GPG) and Pilot to Portfolio (P2P), enable GSA to make sound investment decisions in next-generation building technologies based on their real-world performance. www.gsa.gov/gpg