

EVAPCO ENGINEERING FLASH



FAN DRIVE SYSTEMS

Belt drive, gear drive and direct drive systems are the three basic fan drive systems used in evaporative cooling equipment. The purpose of this e-flash is to objectively outline the utility of these systems, and also discuss relative cost and maintenance. The longevity and reliability of these drive systems almost entirely depends on the care and attention they receive during their life.

Belt Drive

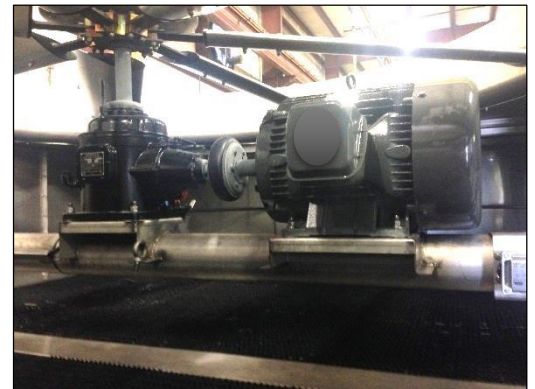


Figure 1: Belt Drive System

From an initial cost perspective, belt drive systems are the most economical, and can be reliably operated with motors up to and including 75 HP. Higher horsepower applications are typically supplied with a gear or direct drive system. Belt tension checks and fan shaft bearing lubrication are the only routine drive maintenance procedures that are required. Quarterly sheave alignment checks are also recommended. Given the low cost of belts, it is not uncommon for spare belts to be stored at a jobsite, since they are considered “wear” items. The use of variable frequency drives provide soft start capabilities, allow for excellent capacity control, and greatly extend belt life!

Gear Drive

Gear drive systems are ideal for applications involving 75 HP motors and greater, and tend to have a higher initial cost due to their complex componentry. Historically, they have been a symbol of reliability and robust application due to being one of the earliest means of power transmission. Weekly oil level and quality checks, and quarterly shaft alignment checks (for externally mounted motors) are recommended by most gear drive manufacturers. Daily checks for unusual vibrations or noises are also recommended. While a poorly maintained gearbox could result in a complicated and costly repair, a gearbox operated and maintained properly per the manufacturer’s recommendations, can last the life of the evaporative cooling equipment.



**Figure 2: Gear Drive System
(Internally mounted motor shown)**

Direct Drive



Figure 3: Direct Drive System

In years past, direct drive systems have mostly been applied to smaller HP motors. Recent introductions utilize permanent magnet technology, which allows the motor to transmit power without requiring any gear reductions. The initial cost of these systems is almost always greater than gear drive systems, and they need their own dedicated drive controller. Given that these systems are considered alternatives to gear driven systems, it can be assumed that their ideal applications involve motors of 75 HP and higher. Direct drive systems have less components than traditional gear drive systems, and therefore require lesser maintenance. Much like in the case of gear drive systems, the longevity and reliability of a direct drive system is related directly to the quality of maintenance it's received during its lifetime.

In today's evaporative cooling market, engineers and owners have options that provide ease of maintenance, longevity and efficiency. Consumers have options which allow for a solution best suited for their needs.

For more information on drive systems, please contact your local EVAPCO Sales Representative!

Thank you,

Mihir Kalyani

Marketing Engineer
HVAC/Cooling Towers

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