FIEA
Capturing Drive Equipment Efficiencies

Three Main Types
Drive Efficiency can be improved on the Three Main Types of Drives:
1. Belts – V and Synchronous
2. Roller Chains
3. Gearboxes
1. Belts

Influences In Belt Power Transmission Efficiencies:
- Maintenance
- Tension
- Design Considerations
- Improvements in Technology

Belts

Maintenance:
Pulleys and Shafts in good condition and Aligned Correctly

Worn pulleys can contribute significantly to drives, with the increase in slip requiring the motor to draw more power to drive the machine at its potential.
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Maintenance
Worn Pulleys

V Belts
Tension:
3 Step procedure with correct equipment and specifications – This can result in increase in efficiencies of up to 20%
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Why is it important to tension?

Driven pulley: Performance = 95%

Why is it important to tension?

Too low a tension will allow too much slip, leading to low energy transmission.
To much tension good energy transmission due to no slip, but destroys bearings.
e.g. at 21% over tension results in a 51% decrease in calculated bearing life.
Belts

Design Considerations
New products allow better opportunities to transmit power efficiently

e.g
Synchronous belts at 98% efficient
Newer flat belts at 98-99% efficient
Technical innovations include the use of the latest materials to give certainty of efficiency and product life.

2. Roller Chain

Standard Roller Chain requires constant maintenance
New special types of Roller Chain offer:
• Maintenance free (Self Lubricating)
• Low Friction Bearing Roller Chain

Up to 80% reduction in drive power requirements in the new types

Source: Engineering Talk UK submitted by Tsubaki UK
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Roller Chain

Roller Chain is also affected by misalignment. Power consumption can increase by 20% as with V belts due to misalignment.

The side effect is also premature drive failure from excessive wear in the driving elements.

Gearboxes

Design types such as the Planetary Gearbox can offer savings over older designs by as much as 38%

Older series such as Worm Gearboxes can be as low as 60% efficient in transmitting power
Summary

Energy Efficiencies can be Affected By

• Maintenance Practices
• Purchasing Decisions
• Design Considerations