Recommended Pulley Specification

(This Specification generally adheres to Precision’s standard practices for high reliability pulley design. Some features, which add cost, are included to provide better value with improved pulley performance. The topics discussed in this specification should be defined and considered in all competitive pulley comparison.)

**General Requirements (All Load Levels):**

- All pulleys shall be designed for 100,000 hours life using running and momentary belt loads at the given belt speed.
- Pulleys for North American use shall have exposed surfaces covered with lead free high solids enamel. Pulleys for use outside of North America shall have exposed surfaces covered with high solids epoxy at least 5 mils thick and suitable for ocean freight. Exposed shaft surfaces shall be coated with cosmoline.
- All welds shall be AWS qualified and performed by welders with current AWS qualifications for the process being performed.
- Locking elements shall be sized to transmit the required torque and bending moment per manufacturer’s recommendations. Not more than one locking element shall be used on each end of pulley. Keyless locking assemblies are recommended for drive pulleys with hollow shaft right angle reducers or rigid low speed couplings. For all other applications, refer to graph on the right for locking element type recommendation.
- Shaft size shall be calculated per CEMA publication “Belt Conveyors for Bulk Materials, Fifth Edition” with a design factor of safety of 1.5 and a free shaft deflection limit of 0.0015 in/in.
- All bearings shall be self-aligning spherical roller type, adapter mounted to the shaft, and sized for 60,000 B10 life. All housings shall be horizontally split and manufactured from gray cast iron.
- Use of crown face or flat face pulleys shall be per CEMA publication “Belt Conveyors for Bulk Materials, Fifth Edition”, page 219. High Modulus or steel cable belts must have machined flat face pulleys.
- Lagging shall be 60 +/-5 durometer SBR rubber and hot vulcanized to the pulley. Other compounds are available, upon request, for chemical environments, MSHA flame ratings, or static conductive conditions.

**Load Level Requirements:**

Each load classification requires a different level of construction specifications. Load classifications are determined by comparing the running belt tension, in PIW, with the graph below. PIW is calculated by dividing each pulley’s running belt tension, in pounds, by the belt width, in inches.
Classification Level I (<=750 PIW)

Note: Do not use if a level III pulley is on the conveyor using this pulley.

- Welded plate pulley construction shall be used. Internal (center) discs are recommended.
- Pulley and lagging dimensional tolerances per CEMA B105.1-1990. If a level II pulley exists on this pulley’s conveyor, the lagging shall be machined to 0.030 inch TIR (total indicator run out).
- Lagging is recommended if pulley is driven or in contact with dirty side of belt. Lagging for drives shall be ½ inch thick and grooved. All other pulleys with lagging shall be 3/8 inch thick without grooving.

Classification Level II (>750 PIW and <=2500 PIW)

- Welded plate, Profile Disc, and Turbine “T” designs may be used. As can be seen on the graph to the right, an increase in loads causes a more fatigue proof construction recommendation. Where multiple constructions are recommended, lower line on the graph is usually best value.
- Internal (center) discs are recommended with welded plate and Profile Disc designs. No internal discs are recommended for Turbine “T” designs.
- Thermal stress relief is recommended.
- Pulleys shall be static balanced per ISO 1940/1 with a G40 acceptance.
- Pulley dimensional tolerances per CEMA B105.1-1990. In addition, Turbine “T” and profile disc pulleys shall have rim (shell) outside diameter machined within 0.030” TIR (total indicator run out). All pulley lagging shall be machined to 0.030” TIR.
- Lagging is recommended on all pulleys. Lagging for drives shall be ½ inch thick and grooved. All other pulleys with lagging shall be 3/8 inch thick without grooving.

Classification Level III (>2500 PIW)

- Turbine “T” designs must be used. Type “A” welds are full penetration with surfaces ground smooth. Type “B” welds are full penetration with a weld backing machined into the joint (integral). The recommendations on the graph to the right provide the most value in this class. Type “A” welds should be used only where recommended due to cost, delivery, and manufacturing considerations.
- Internal (center) discs are not allowed.
- Thermal stress relief is required.
- Pulleys shall be static balanced per ISO 1940/1 with a G40 acceptance.
- Line bore of hubs prior to final machining is required.
- End Disc and Rim material shall be ultrasound inspected.
- Weld ultrasound and magnetic particle inspections are required.
- Pulley dimensional tolerances per CEMA B105.1-1990. In addition, all pulleys shall have rim (shell) outside diameter machined within 0.030” TIR (total indicator run out). All pulley lagging shall be machined to 0.030” TIR.
- Lagging is recommended on all pulleys. Lagging for drives shall be ¾ inch thick and grooved. All other pulleys with lagging shall be ½ inch thick without grooving.