



EDWIN L. HEIM COMPANY

P.O. BOX 2247, HARRISBURG, PA 17105-2247

## Laser Alignment



It is no secret, precise shaft alignment will pay for itself. It reduces bearing and seal damage, minimizes energy loss, and reduces production downtime. To neglect it would be like failing to perform regular oil changes on your car. You could get by without it in the beginning, but it could cost you a lot of money down the road.

Not only is precise shaft alignment essential, but doing it in the least amount of time is also desirable. Machinery downtime will cost your facility money, especially if that piece of machinery is in the critical path of operation. In some situations, downtime could cost your company hundreds of thousands of dollars per hour.

The Heim Companies Laser Alignment offers the potential for much greater accuracy than dial indicators, with the added convenience of good time savings. It works by attaching a laser emitter to one shaft and a position detecting sensor/receiver to the other shaft. Both the laser and receiver are separately mounted to the shafts by means of a rigid bracketing system. Both shafts can remain coupled together. Measurement occurs by rotating the shafts in a continuous sweep as little as a quarter turn (or less), or by rotating the shafts to any desired positions, or to specific clock positions. Laser systems let Heim accommodate much longer spans than dial indicators with great ease (which is necessary for cooling tower fans) and will even let you turn the shafts independently when uncoupled.

Shaft misalignment occurs when the centerlines of rotation of two or more machinery shafts are not in line with each other. In more technical terms, shaft misalignment is the deviation of relative shaft position from a collinear axis of rotation measured at the points of power transmission when equipment is running at normal operating conditions. When rotating equipment is started, the shafts will begin to move to another position. The most common cause of this movement is due to

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temperature changes that occur in the machinery casings and therefore this movement is commonly referred to as hot and cold alignment. These temperature changes are caused by friction in the bearings or by thermal changes that occur in the process liquids and gases. Movement of machinery may also be caused by process reaction movements in attached piping or counter-reactions due to the rotation of the rotor. Laser-alignment complements our machinery vibration analysis and balancing services.

### **What is the objective of accurate alignment?**

Simply stated, the objective of shaft alignment is to increase the operating lifespan of rotating machinery. To achieve this goal, machinery components that are most likely to fail must operate within their design limits. Since the components that are most likely to fail are the bearings, seals, coupling, and shafts, accurately aligned machinery will achieve the following results:

- Reduce excessive axial and radial forces on the bearings to insure longer bearing life and rotor stability under dynamic operating conditions.
- Minimize the amount of shaft bending from the point of power transmission in the coupling to the coupling end bearing.
- Minimize the amount of wear in the coupling components.
- Reduce mechanical seal failure.
- Maintain proper internal rotor clearances.
- Eliminate the possibility of shaft failure from cyclic fatigue.
- Lower vibration levels in machine casings, bearing houses, and rotors.

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