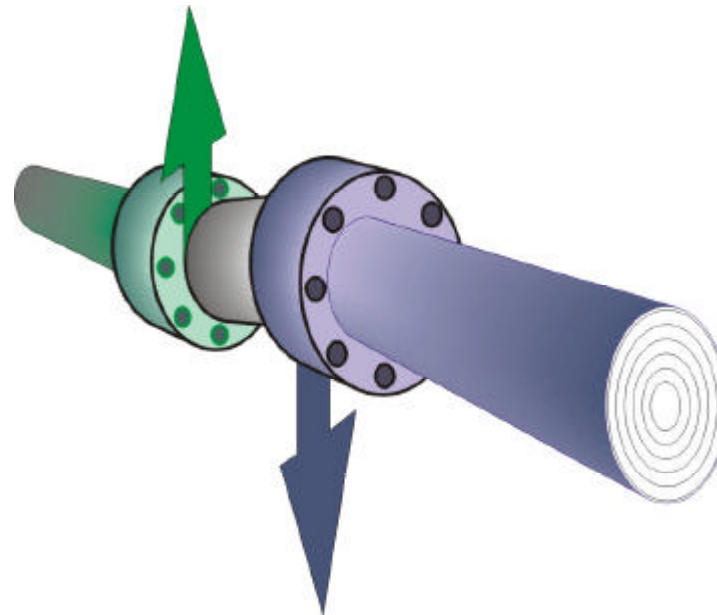


Shaft alignment with  
Fixturlaser Shaft  
systems

# Benefits from Shaft Alignment

When shafts are misaligned forces are  
generated at the coupling



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Fixturlaser *Shaft*<sup>200</sup>

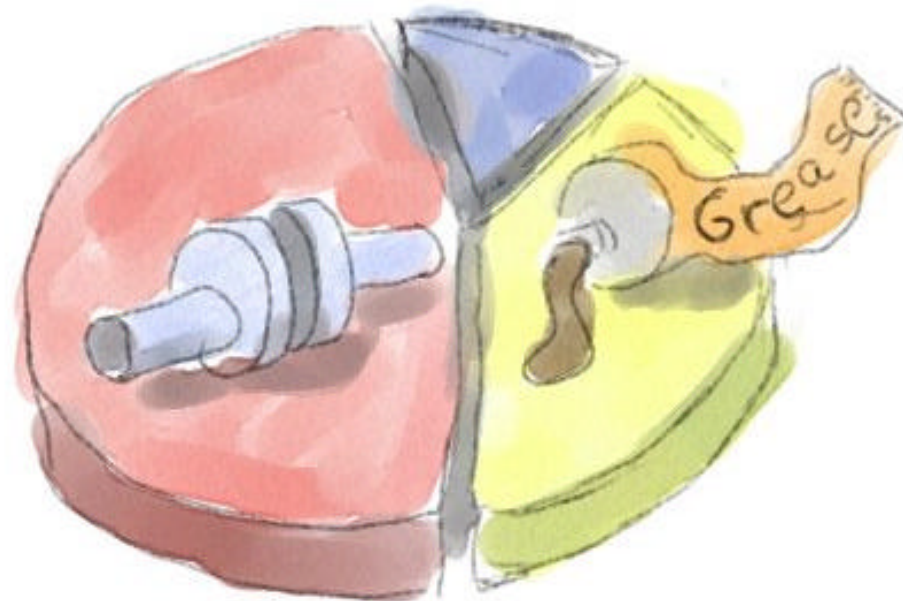
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# Benefits from Shaft Alignment

- Studies over the past ten years indicate that 50% of all machine breakdowns are due to poor alignment.
- Some surveys indicate that up to 90% of all machines run outside their recommended tolerances



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# Benefits from Shaft Alignment

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- ① Vibrations
- ② Energy savings
- ③ Wear of mechanical components
- ④ Production capacity
- ⑤ Product quality

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# 1 Vibrations

## Major Sources of Machinery Vibration



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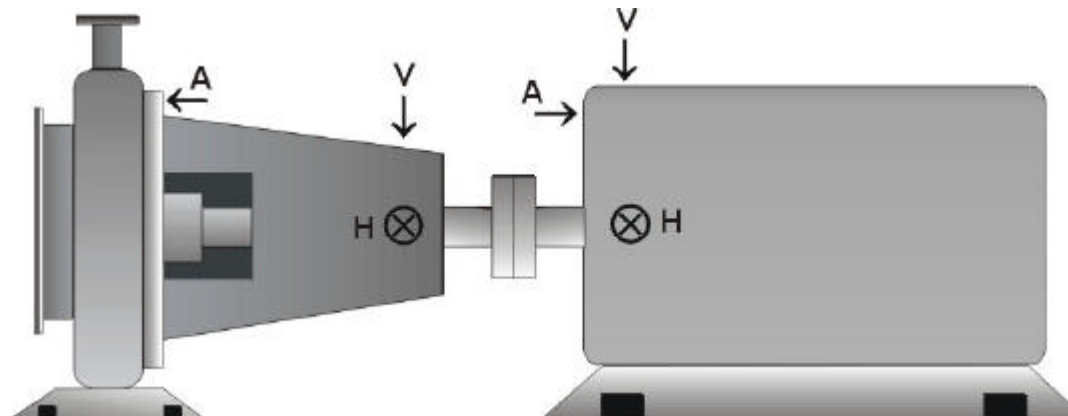
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# 1 Vibrations

When measuring vibrations:

- Horizontal vibrations indicates imbalance (H)
- Vertical vibrations indicate a weak or loose foundation (V)
- Axial vibrations indicate misalignment (A)

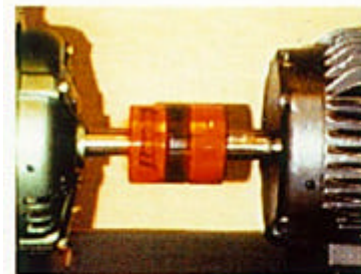




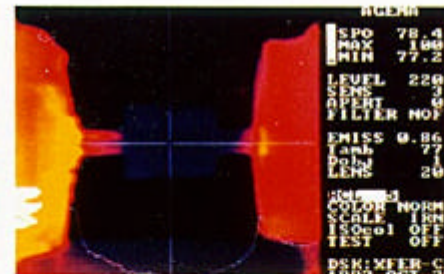
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## ② Energy savings

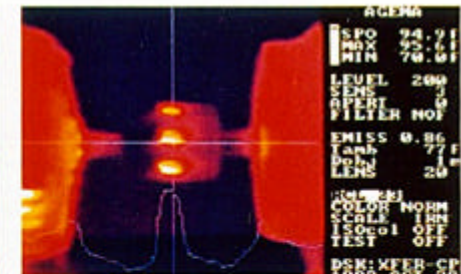
- The correct alignment can reduce energy consumption with anything up to 15%, sometimes more.



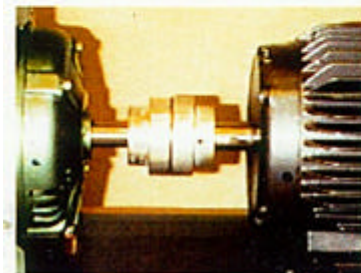
Lovejoy



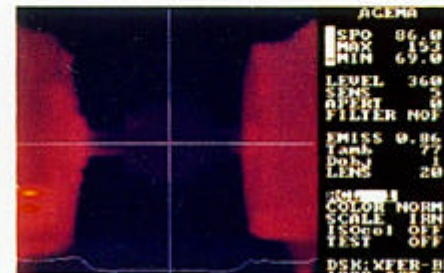
Aligned



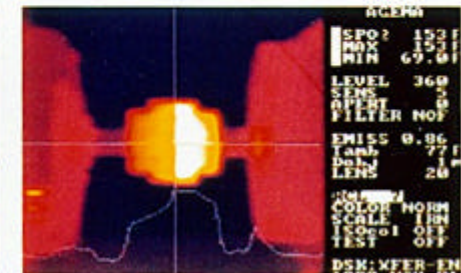
Misaligned



Magnaloy



Aligned



Misaligned

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## ② Energy savings

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To calculate savings

- Measure amperage before and after alignment
- Find the difference
- Get motor data
- Find cost of energy
- Calculate kW savings with formula below:

$$\text{kW} = \frac{(\text{volts} * \text{amps} * \text{pf} * 1,732)}{1000}$$

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## ③ Wear of mechanical components

### Bearings

- Increasing the load will result in exponential bearing life reduction
- Doubling the load will reduce the bearing life to one eighth of its design life.
- Expected bearing lifetime is calculated according to:

$$L_{10} = \left[ \frac{\text{Bearing constant}}{\text{Bearing load}} \right]^3$$



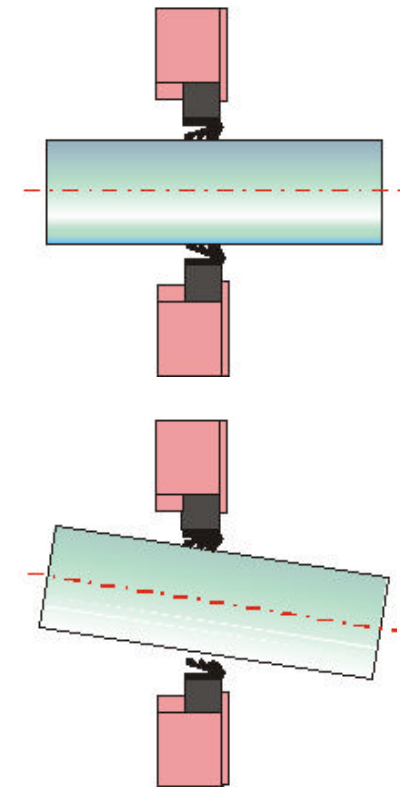


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## ③ Wear of mechanical components

### Seals

- Poor alignment can cause a 50%-70% reduction of calculated life time.
- Lubrication problems are often caused by leakage in the seals



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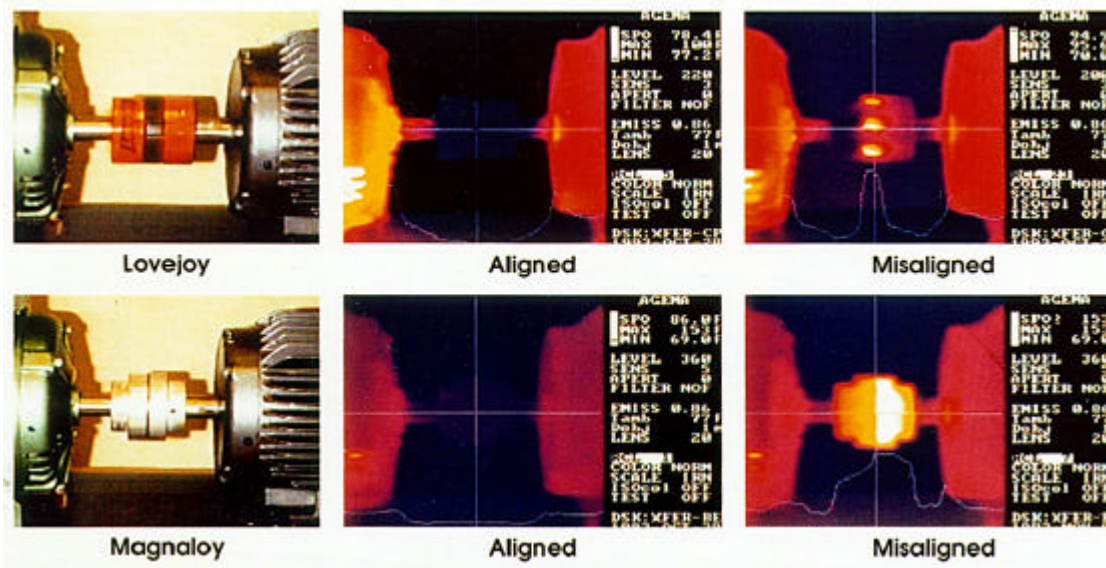
## Shaft alignment with Fixturlaser Shaft systems

# ③ Wear of mechanical components

## Couplings

### Indications of misalignment:

- Coupling is getting hot
- Stacks of rubber or plastic under the coupling or coupling guard
- Excessive wear of teeth in gear type coupling



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## ④ Production capacity

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- Today a modern production process is depended on high runability.
- Production stop, 5-25 thousand USD/hour
- Exceeds by far the cost for the replacement of components.

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## ⑤ Product quality

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- **Decreased vibration levels, reduced loads on mechanical components will have a positive impact on the product itself.**
- **Alignment of drives: Paper, Steel, Plastic film**

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