



# Stiff Shaft

## 2-pole



- ▲ Ranges from 2000 to 9000 HP and typical speeds to 3600 RPM.
- ▲ In “stiff shaft” induction motors, the first lateral critical of the entire motor (including effects of actual stiffness/softness of job bearing, bearing brackets, frame and as installed on the foundation) must be at least 15% above 2-pole synchronous speed.
- ▲ Custom engineered and manufactured to handle your high load and starting torque requirements.
- ▲ Custom designed to match your existing equipment ratings and foundation requirements.
- ▲ Used in variable speed applications using variable frequency power sources.
- ▲ Meets rigorous vibration requirements of API standards to provide dependable operation.
- ▲ Tilting pad journal bearings are used to provide the highest possible stability under all operating conditions.
- ▲ Duraguard VPI insulation is fully Class F rated and uses a two-part epoxy-mica system which resists chemicals and moisture, and provides long motor life.
- ▲ Enclosures available in traditional open and enclosed NEMA and IEC designations.
- ▲ Rotors are dynamically balanced at rated speed to achieve lowest levels of residual unbalance.
- ▲ Copper cage bar and end ring construction withstands heat cycling and provides low loss.
- ▲ Motor designs have been proven by extensive dynamometer and field experience testing, and are extremely stable under all load and thermal conditions.
- ▲ Stiff shaft rotors are built to minimize vibration at all operating speeds.
- ▲ Copper rotor bars are brazed into individual milled pockets into the end rings on all motors.
- ▲ Each rotor joint is ultrasonic-tested to ensure cage integrity.
- ▲ EM experience... providing reliable solutions for over 100 years.

### ELECTRIC MACHINERY COMPANY

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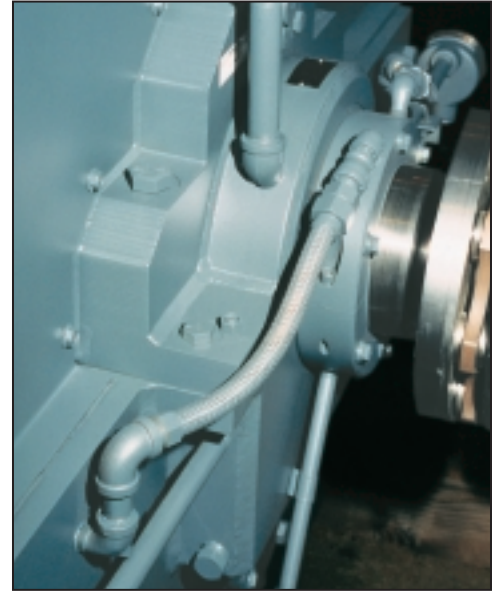
INDUCTION MOTORS

# Stiff Shaft

Electric Machinery builds a true stiff shaft induction motor. These motors deliver the reliability and high quality construction required in petroleum, utility and other applications. Every machine incorporates EM expertise to meet customer requirements with durable design and reliable performance.

## ADVANTAGES OVER FLEXIBLE SHAFT INDUCTION MOTORS

- Stiff shaft machines improve reliability by eliminating magnification of unbalance in the operating range. The stiff shaft machine can handle greater amounts of unbalance due to the fact that the response peaks are above operating speed.
- The stiff shaft induction rotor has a shorter length and larger diameter to provide operation below the first lateral critical speed.
- EM's stiff shaft rotor has 5-8 times stiffer construction than a flexible shaft rotor. This extremely rugged construction provides high dependability.
- Stator frame is much heavier than standard motor frames.
- EM stiff shaft induction motors used in variable speed applications from zero to maximum operating speed will not pass through the first critical speed.
- Critical speed problems encountered in typical designs are avoided.

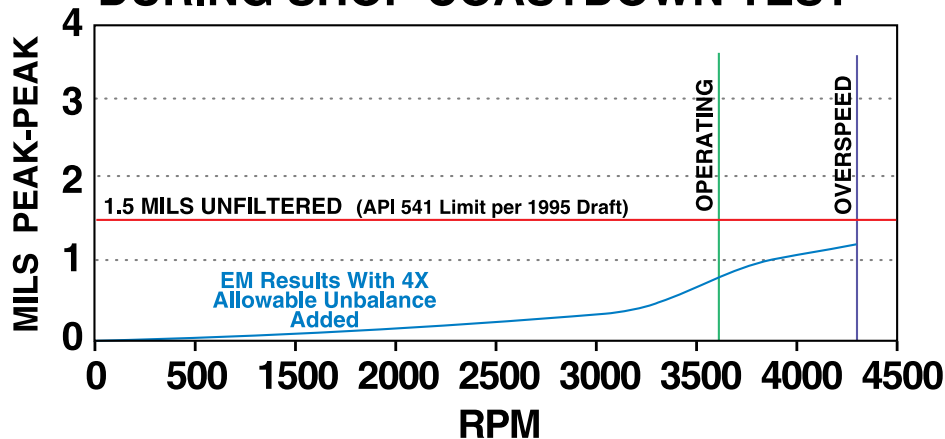


Robust bearing bracket with all welded construction.



Placement of rotor bars in milled end ring pockets enhance reliability.

## TYPICAL SHAFT VIBRATION DURING SHOP COASTDOWN TEST



1300-PRD-401

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