

# T H E X T E K *Difference*

## **Xtek Steel/Safe™ Brake Wheels**

*For overhead crane and process motor applications*

Xtek *Steel/Safe* Brake Wheels provide excellent wear resistance, but more importantly, they are superior in their ability to prevent catastrophic failure. Xtek *Steel/Safe* Brake Wheels are manufactured from steel forgings, which provide a denser and more defect free base material compared to cast iron brake wheels.

Typical service conditions subject the brake wheel surface to high levels of frictional heat, with rapid dissipation of this heat into the rim and web areas. The most common mode of failure is stress cracking on the wear surface. From a safety standpoint, it is critical that these cracks do not propagate through the rim and into the web area. To minimize the possibility of crack formation, the material in the rim must have the superior toughness of steel.

### **TOUGHNESS**

The toughness of an Xtek *Steel/Safe* Brake Wheel is inherently superior to that of a cast iron brake wheel. Toughness is the ability of a metal to absorb energy and deform plastically before fracturing.

While a ductile iron brake wheel meets the requirements of ASTM A536 specification, experience dictates that this is not the best or safest brake wheel that should be considered. Specifically, the impact toughness of ductile iron is relatively low, with Charpy V-notch impact energy values of 2-3 foot-pounds. In comparison, an Xtek *Steel/Safe* Brake Wheel has Charpy V-notch impact energy values in excess of 100 foot-pounds.

As a result of this significant difference in impact toughness, the forged steel brake wheel will resist the tendency for crack propagation. This will result in safer operating conditions, as it virtually eliminates the chance of a catastrophic failure.

The Xtek *Steel/Safe* Brake Wheel combines the toughness of AISI alloy forged steel with excellent wear resistant properties, providing our customers with a brake wheel that is both safe and exceptional in service.

### **FORGED PROPERTIES**

The successful performance of a brake wheel is directly related to the material quality and hardening. Fatigue properties are adversely affected by material defects such as porosity, slag, inclusions, and a non-uniform microstructure. These are common defects found in castings and can lead to crack initiation and propagation. Xtek's *Steel/Safe* Brake Wheels are manufactured exclusively from forgings. These forgings employ vacuum degassed steels, which are clean, porosity-free, and have a more uniform microstructure than cast iron wheels.

### **XTEK HEAT-TREATING**

Xtek has developed a series of heat-treating processes that refine the microstructure and improve the forging's mechanical strength in the rim, web and hub areas. Based on the needs of a specific application, we will select the heat-treating process that will provide the optimal combination of wear resistance and impact toughness.



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