

EPC Industry

CASE STUDY

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Key Facts

Sector EPC Industry

Category Investigation on Bevel Helical Gear Box

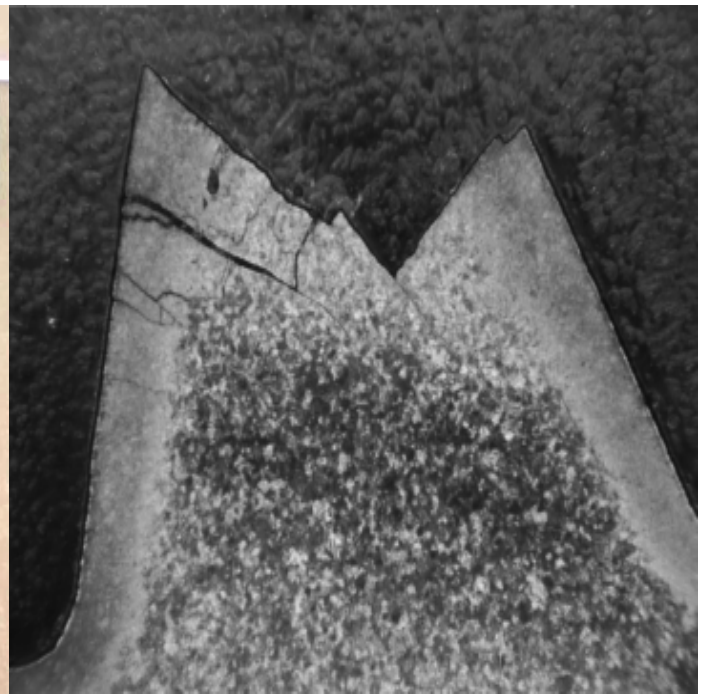
Problem

- Bevel wheel and intermediate helical shaft of gear box was failed prematurely during its service.
- 11 gear boxes out of 22 were damaged which were replaced, after working for 100-500 hours similar failure occurred.



Diagnosis

- The principle reason for the premature failure of the bevel gear wheel and pinion shaft is the uneven case depth obtained during case carburizing treatment.
- The failure has been assisted further hardenability, poor hot working practice and faulty oil hardening and tempering heat treatment



Solution/Recommendations

- Case carburizing treatment should achieve uniform case depth as per design stipulation. It should ensure freedom from any grain boundary carbides.
 - Hardening and tempering done should achieve tempered martensite into the case. Core microstructure should be bainite and tempered martensite, free from traces of ferrite to ensure higher toughness.
 - The selection of the material is based on the hardenability consideration and not merely on the chemical composition.
 - Material stock should not be from induction melting con-cast route, it should be at least EAF + LRF route. Vacuum degassed material is highly preferable.
 - The hot working should be done in such a way that the prior as cast structure is completely destroyed with proper reduction ratio. Upset forging requires to be carried out to prevent cutting of flow lines at the teeth edges.
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Contact Us

If you are interested to learn more about TCR Advanced,
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