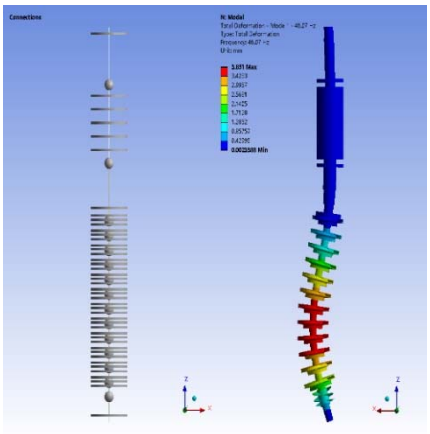
研发中心案例研究分享 R&D CASE STUDY BRIEFING

转子动力学的仿真测试技术 保证泵的运转可靠性 Rotor Dynamics Simulation Test Technology to Ensure the Running Reliability of the Pump

IPT 通过有限元分析和试验技术合理设计转子动力特性，能够在设计阶段识别并避免转子横向振动过大及轴系因扭转共振或冲击造成疲劳断裂的故障风险，保障产品长期安全可靠运行 IPT has the finite element analysis and test technology to design rotor dynamic characteristics reasonably, which can identify and avoid the failure risk of excessive lateral vibration of rotor and fatigue fracture caused by torsional resonance or impact of rotor in the design stage, so as to ensure long-term safe and reliable operation of products.



转子动力学分析考虑流体作用(附加质量与阻尼作用) Rotordynamic Analysis in Consideration of the Effects of Fluid(Added Mass and Damping Effects)

转子动平衡测试 Rotor Dynamic Balancing Test

轴系扭振测试 Rotor Torsional Vibration Test

适用的产品 Applicable products

全部产品 All Products

客户需求 Voice of Customer

- 产品运行安全可靠 Safe and reliable operation of the product
- 低振动、低噪音和长使用寿命 Low vibration, low noise, and long service life
- 振动/噪声问题的快速解决 Quick resolutions of vibration/noise problems

核心技术 Core Technology

- 通过采用有限元分析和试验分析技术准确评估转子支承系统在高速旋转状态下的振动、平衡和稳定性，保障产品安全可靠运行 The vibration, balance and stability of the rotor support system under high speed rotation are evaluated by finite element analysis and test analysis technology to ensure safe and reliable operation of products
- 采用专业的静力学分析技术对转子在静止或低速运行时的应力和变形进行分析，保障转子强度安全可靠 The professional static analysis technology is performed to analyze the stress and deformation of the rotor at stable or low speed, to ensure the safety and reliability of the rotor strength.
- 采用专业的转子动力学分析技术对高速旋转的转子部件进行横向分析及扭转分析，评估临界转速、动态响应、稳定性及疲劳特性等，保障转子系统可靠性 The professional rotor dynamic analysis technology is performed to carry out lateral analysis and torsional analysis of high-speed rotating rotor, evaluate the critical speed, dynamic response, stability and fatigue characteristics, etc., to ensure the reliability of the rotor system.
- 利用动平衡试验台，测量并减少转子不平衡质量，减少不平衡带来的激振力 Measurement and reduction of rotor unbalanced mass by using dynamic balance test equipment for reducing the excitation force generated by the imbalance
- 基于轴系外在形变测量的扭转角测量系统进行轴系扭振测试，以避免轴系发生扭转共振，保证转子可靠性 The Shaft torsional vibration test is carried out based on the torsional angle measurement system of shafting external deformation measurement to avoid torsional resonance of rotor and ensure the reliability of rotor.

客户收益 Customer benefits

- 高速旋转设备长期稳定运行 Long-term stable operation of high-speed rotating equipment
- 专业工程师进行转子振动诊断，节约维护成本 Professional engineers perform rotor vibration diagnosis to save maintenance costs.