Quickly Remove Oil from Wire's Surface - Global Project With SJTU

Overview
Kern-Liebers China challenged the Penn State and Shanghai Jiao Tong University Combined Oil Team (PSU/SJTU Oil Team) to design and test a chemical formula that effectively removes oil from the surface of small springs. The oil needs to be removed from the springs surfaces to allow for further heat and surface treatments. Kern-Liebers China expressed that the designed chemical formula needed to be effective, efficient, safe, and cost effective.

Objectives
The objective of the PSU/SJTU Oil Team was to deliver a chemical formula that Kern-Liebers China could incorporate into their current oil removing process. The team’s goal was to design a chemical formula for Kern-Liebers China that is effective, efficient, safe, and cost effective.

Approach
- Kern-Liebers sponsor contacted to determine customer needs
- Research on existing products and patents completed
- Chemical formula concepts designed
- Chemicals and testing supplies ordered
- Lab facilities allocated
- Qualitative chemical testing complete
- Quantitative spectroscopy test complete
- Data analysed to determine most effective chemical formula
- Formula 2 design recommended to Kern-Liebers China

Outcomes
- New hydrocarbon solvent formula, called Formula 2, created to effectively remove oil from springs
- Formula 2 contains 100% biodegradable ingredients making it safe for the environment
- Kern-Liebers China will cut operation costs by 25% by using Formula 2
- Oil removal process times were reduced by 50% as a result of this project
- Formula 2 removed the oil more effectively than the current Kern-Liebers chemical in 8 minutes without the use of the high pressure washing machine
- Formula 2 results in a cleaner spring surface resulting in better quality heat and surface treatments which will improve customer satisfaction