

# Melt Shop

## Process Engineering Studies

Many aspects of the melt shop operation require detailed analysis in order to truly understand the root cause of problems, and thus the correct design solutions. Quad has developed a range of special engineering services to meet the equipment design and failure requirements of a modern maintenance program. Rather than just replacing broken parts, computerized analysis can result in the re-engineering of components to prevent future machine failures. Process analysis may indicate process changes to improve production and reliability, thus eliminating the root cause of problems.

### Process Engineering Studies are customized to meet specific goals:

- *Stress and failure analysis of all machine components using FEA tools*
- *Thermal analysis of ducts, off-gas temperature modeling*
- *Modern process control algorithms for off-gas control systems and baghouses*
- *Modeling and optimization of scrap handling, alloy addition and dedusting systems for EAF and LMF*
- *Defect analysis and equipment troubleshooting*
- *Development of engineering & special purpose software*



# Melt Shop Process Engineering Studies

## Some process engineering studies include:

- Engineering, design and supply of ladle transfer cars with unique combination of long-range travel and precision stops:
  - Optimization of structural components using FEA tools to provide the most reliable and cost effective design
  - Innovative concept for drive arrangement
  - Automatic hook-up of stirring gas
- Upgrade of tundish cars, caster decks and caster run-out tables
- Hydraulic tilting system retrofit for EAF to fit in existing envelope:
  - Design of mechanical components
  - Hydraulic system arrangement
  - Civil engineering
- Engineering and design of complete off-gas control systems:
  - Use of modern gas temperature control algorithms
  - Roof-mounted pressure sensors and gas quenching (spray) towers
  - Use of modern pulse-jet baghouse systems
  - Custom engineering of space saving arrangement for exhaust fans
- Supplementary off-gas control systems:
  - Snorkels for ladle metallurgy stations
  - Ladle stirring station with exhaust
- Engineering and design of water-cooled components:
  - Length estimation of water-cooled sections of exhaust ducts
  - Sizing and pressure balancing of water-cooling circuits
  - Nozzle selection for quenching towers

