Case Study of Innovation

FROM HEAT TO STRENGTH

Modernizing Preheat & Welding for Heavy Fabrication

Traditional nichrome-based heating methods slow down production, consume heavy power, and create inconsistent weld temperatures. For high-thickness pipe joints, this results in longer cycle times and higher rework.
SigmaWeld introduced its Induction Preheating System combined with SWAT Automated Welding, creating a complete end-to-end solution that boosts speed, improves uniformity, and reduces operating costs significantly.

MONTHLY IMPACT (INDUCTION HEATING)

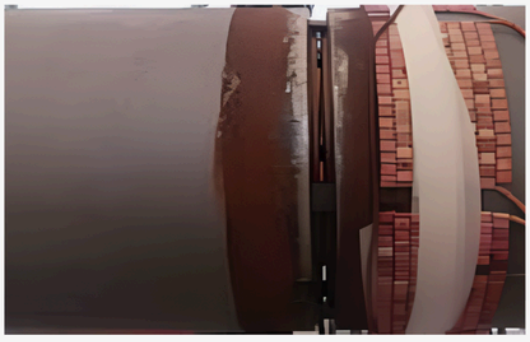
Uniform Heating (±5°C)
Consistent weld-zone temperature for stronger weld strength.

Energy Saved **~93%**
Old: **150 kWh**
New: **9.24 kWh**

Cycle Time: **2.5 hrs → 20 mins**
Dramatic reduction in heating duration.

Challenges with Traditional Heating Methods

Nichrome coil systems rely on indirect heating, leading to heat losses, coil burnout, and poor temperature control. This method demands heavy insulation, produces a hot working environment, and consumes significant power.



HIGH POWER CONSUMPTION

~150 kWh per cycle

Long Heating Time
2.5–3 hours per joint

High Maintenance
Regular coil burnouts and insulation replacement

AFTER: SIGMAWELD SWAT WELDING AUTOMATION

Automated Precision for Critical Weld Joints

Once induction establishes the correct preheat temperature, SigmaWeld's SWAT Automated Welding System takes over. The synergy of stable preheat + machine-controlled welding ensures consistent, repeatable, and defect-free welds.

- ✓ **Stable travel speed**
- ✓ **Controlled oscillation**
- ✓ **Lower rework (<2%)**
- ✓ **Improved bead uniformity**
- ✓ **Safer operator environment**
- ✓ **Faster overall cycle time**

THE COMBINED ADVANTAGE

End-to-End Efficiency

By integrating Induction Preheating + SWAT Automation, fabricators can reduce the overall welding cycle from 4 hours to nearly 1.5 hours, increase output, and maintain consistent weld quality across all joints.

Induction Heating – Performance Summary

Parameter	Old Nichrome	SigmaWeld Induction	Improvement
Time to Reach 200°C	2.5 hours	20 min	**7.5× Faster**
Power Draw	60 kW	28 kW	**↓ 52%**
Energy Used	150 kWh	9.24 kWh	**↓ 93%**
Temp Uniformity	±25°C	±5°C	**5× More Consistent**

⚡ ENERGY SAVING CALCULATION

Old Method:
60 kW × 2.5 hr = 150 kWh

New Method (Induction):
28 kW × 0.33 hr = 9.24 kWh

Energy Saved per Cycle:
150 − 9.24 = 140.76 kWh

💰 COST SAVING (₹10/kWh)

Old Cost: ₹1,500 per cycle

New Cost: ₹92 per cycle

Saving per Weld: ₹1,408

📅 ANNUAL SAVINGS SUMMARY

Saving	Amount
Per Weld	₹1,408
Monthly Saving	₹84,480
Yearly Saving	₹10,13,760
Maintenance	₹50,000

Improve quality, reduce cost, and accelerate your weld cycles — all with one integrated solution.

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#WeldLikePro #InductionHeating #SWATWelding