



● STEAM

Steam Boiler Scale Removal Case Study Minnesota, USA

HydroFLOW® helped gradually reduce existing boiler scale deposits, improve heat transfer efficiency and support reduced maintenance requirements on a 60 HP steam boiler.

8%

Heat Transfer Improvement

24°F

Stack Temperature Reduction

5.8 mo

Cash Flow Breakeven

216%

ROI

⇒ BEFORE & AFTER

● BEFORE

- Heavy scale coated boiler tubes
- Scale accumulation continued despite chemicals
- Acid cleaning was being considered

● AFTER

- ✓ Scale became brittle and began breaking away
- ✓ Stack temperature reduced steadily
- ✓ Scale debris purged through blow-down



BEFORE

Heavy scale on boiler tubes



AFTER

Brittle scale breaking away



OVERVIEW

A commercial trucking company in Rosemount, Minnesota operated a 60 HP low pressure natural gas steam boiler used during its truck wash process. Despite softened well water and boiler treatment chemicals, excessive scale accumulation persisted inside the steam boiler. The maintenance team evaluated Hydropath technology to help gradually reduce existing scale deposits, improve boiler efficiency and avoid the need for acid cleaning.



CHALLENGE

Persistent scale buildup reduced boiler efficiency despite water softening and chemical treatment.

- Scale persisted despite softening and chemicals
- Heavy scale coated internal boiler tubes
- Acid cleaning was being considered
- Heat transfer efficiency was reduced by scale



SOLUTION

One *HydroFLOW® i45* unit was installed on the feed water line entering the 60 HP steam boiler while existing water treatment remained active.

UNIT INSTALLED

1x *HydroFLOW® i45*

APPLICATION

Low pressure steam boiler

WATER SOURCE

Softened well water above 200 ppm hardness

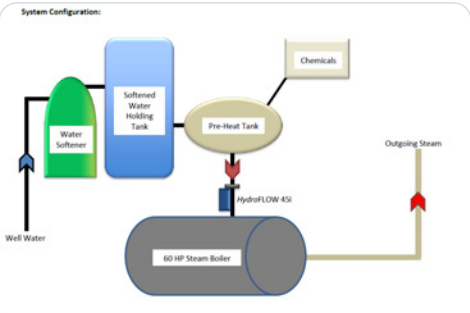
EVALUATION PERIOD

August 2013 to January 2014



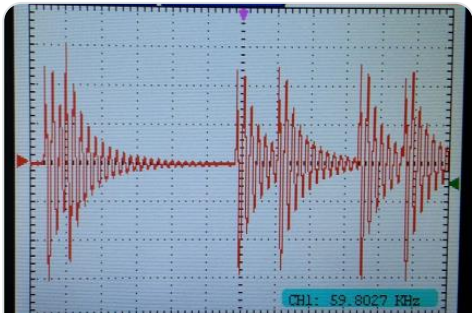
INSTALLATION

HydroFLOW® i45 installation



SYSTEM

Boiler feed water layout



SIGNAL

Signal verification reading



RESULTS

🌡 24°F Temperature Drop

Stack temperature reduced from 296°F to 272°F during the evaluation period

⚡ 8% Efficiency Increase

Reduced stack temperature indicated improved heat transfer efficiency

🛡 Scale Deposits Reduced

Existing scale deposits loosened gradually during the monitored cleaning process.

🕒 5.8 mo Payback

Estimated cash flow payback was achieved in under six months

💰 Long-Term Cost Savings

Projected ownership savings exceeded \$482,000 during the analysis period

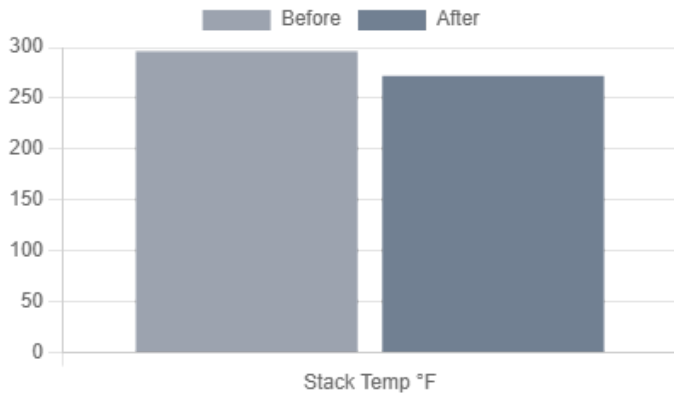
🌊 Blowdown Purged Scale

Increased blow-down helped purge loosened scale deposits



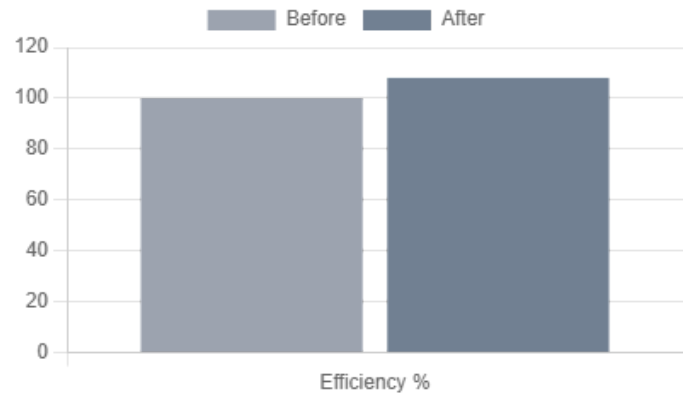
GRAPHS

Stack Temperature Reduction



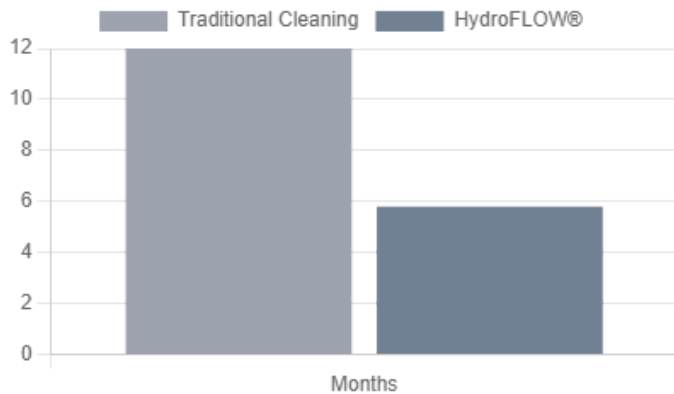
Boiler stack temperature reduced during the six month evaluation period.

Heat Transfer Efficiency



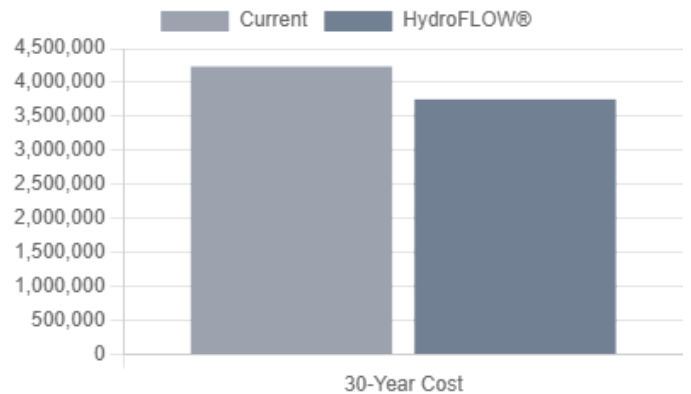
Reduced stack temperature indicated improved heat transfer efficiency.

Cash Flow Payback



Estimated cash flow payback was achieved in under six months.

Projected 30-Year Ownership Cost



ROI analysis projected lower ownership cost with HydroFLOW®.

KEY TAKEAWAY

Summary

HydroPath treatment helped gradually reduce existing scale deposits inside a 60 HP low pressure steam boiler at a commercial trucking facility in Minnesota. During the six month evaluation period, stack temperature reduced from 296°F to 272°F, indicating an 8% improvement in heat transfer efficiency. Existing scale deposits became brittle and began breaking away while projected long-term savings exceeded \$482,000 and the need for acid cleaning was avoided.

8%

EFFICIENCY IMPROVEMENT

24°F

STACK TEMP REDUCTION

\$482k

LONG-TERM SAVINGS



ADDITIONAL PHOTO EVIDENCE



BEFORE

Heavy scale before treatment



AFTER

Scale becoming brittle



INSPECTION

Scale debris after blow-down

RELATED CASE STUDY

Steam Boiler Scale Control Case Study

Krautergersheim, France

HydroFLOW® i45 and C45 units were installed at the Rieffel Sauerkraut Factory to treat severe boiler scale in hard water conditions. The installation reduced maintenance, removed softener dependence and improved operating efficiency.

100% Salt Reduction

Water softener use was eliminated after system stabilisation within 3 months.

90% Labour Reduction

Manual intervention for water treatment and maintenance was significantly reduced

Immediate ROI Achieved

Lower CAPEX and 95% lower OPEX delivered rapid return on investment

HYDROPATH

Ready to improve steam boiler efficiency?

Get a free consultation for your steam system application.

✉ sales@hydropath.com

☎ +44 (0)115 986 9966

🌐 hydropath.com

✓ ISO 14001:2015

✓ ISO 9001:2015

✓ GREENPRO

✓ SOLAR IMPULSE