

What is RadiantLink?

The RadiantLink system is a modern form of radiant heating that is attached to the existing furnace. The RadiantLink system acts as a heat exchanger and receives warm air from the furnace to heat a glycol-water mixture.

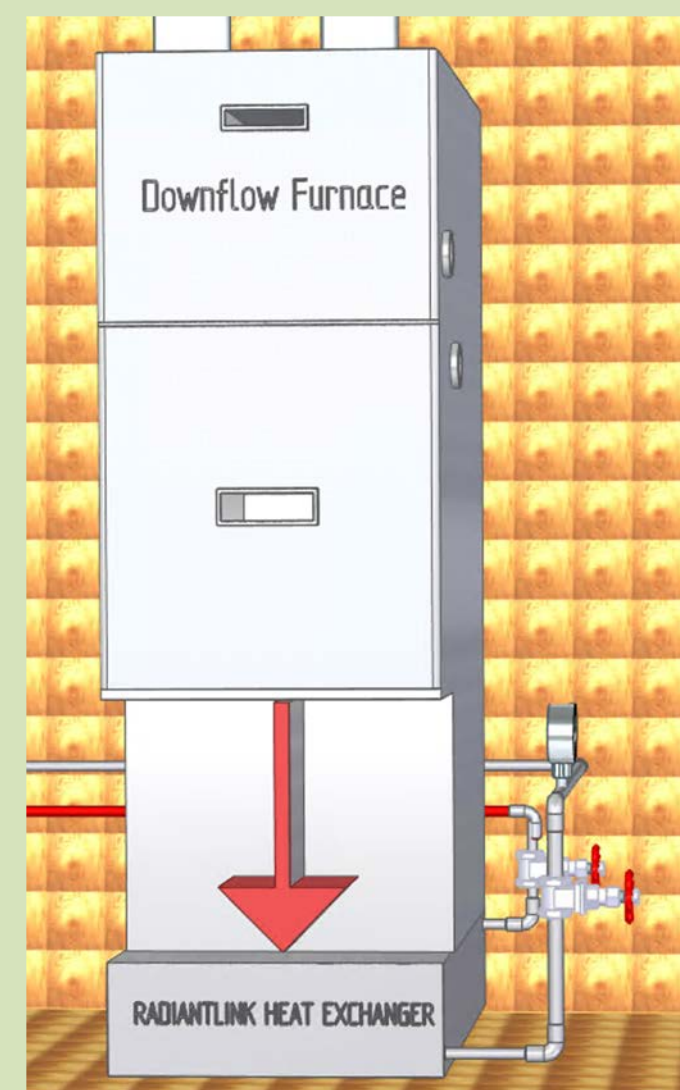


Figure 1: RadiantLink heat exchanger and downflow furnace

Objectives

The objectives of this project include comparing the heat loss between a window with RadiantLink installed versus one without. Next was to demonstrate that the system complies with ASHRAE 55 Standards. Finally, to demonstrate that the system considers six of the United Nations 17 Sustainable Development Goals.

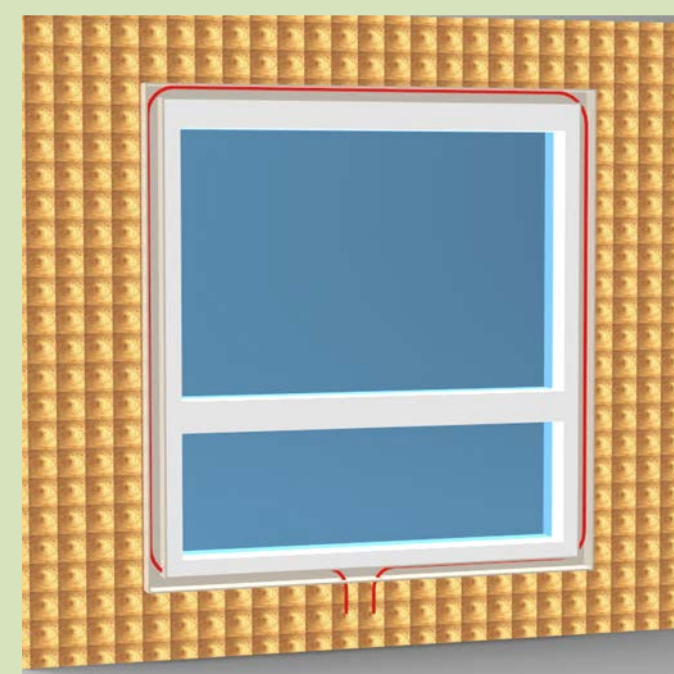


Figure 2: Window with PEX pipe

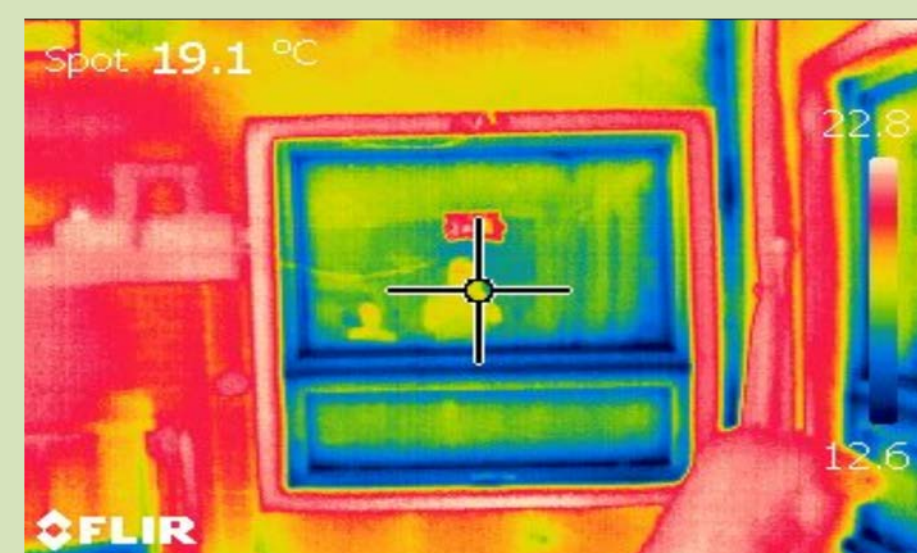


Figure 3: Thermal picture of window with RadiantLink System

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Build Back Better

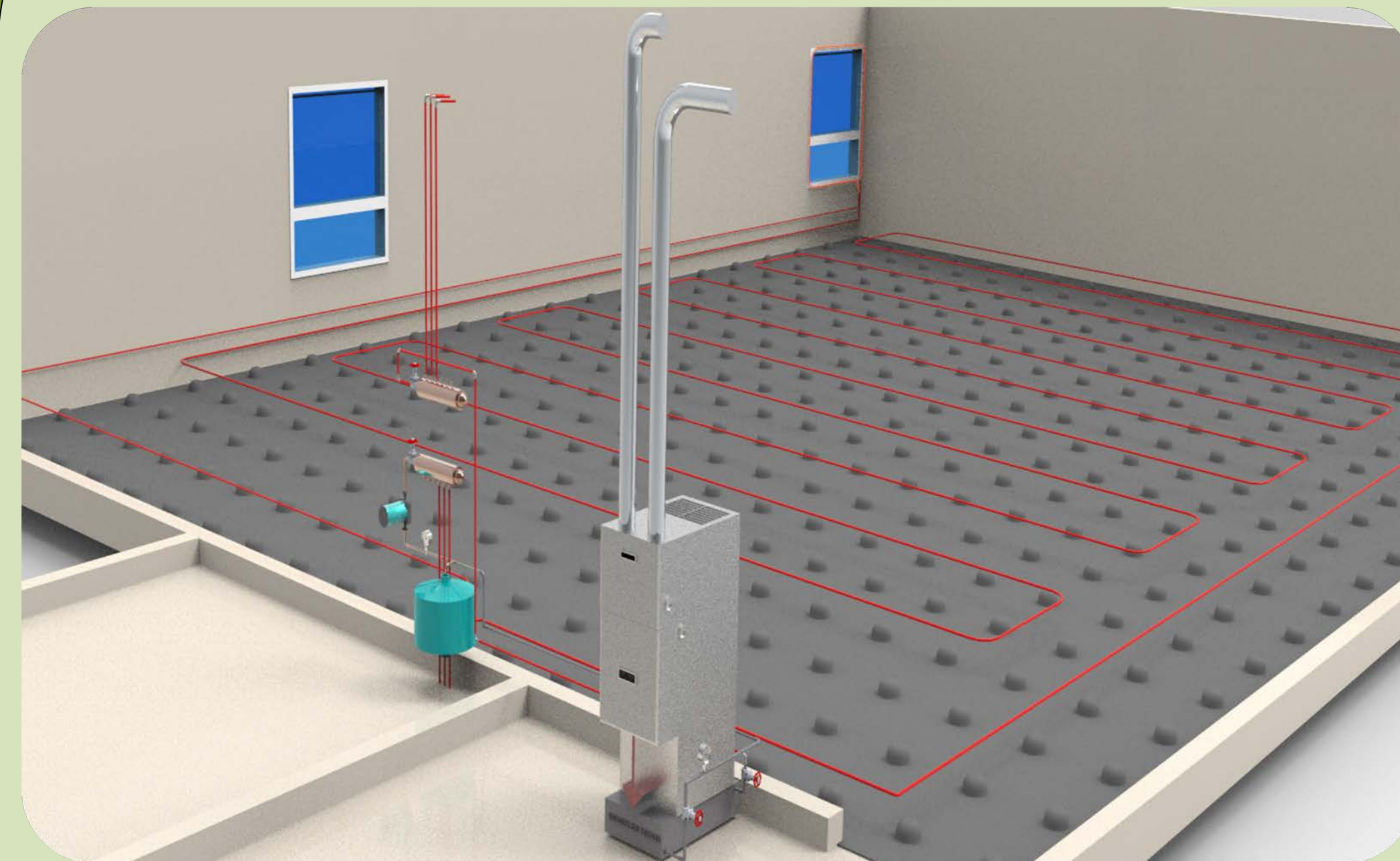


Figure 4: System Layout of the cottage in Katepwa Lake Sk.
As compared to the use of more insulation and costly windows by most home builders to achieve thermal comfort to the occupants of a home, the system builds back better by using thermal mass to retain heating and cooling transferred by PEX pipes imbedded in the floor, walls and around window frames. This not only comes at an affordable price, it also reduces the carbon footprint of the home in a bid to achieve net zero.



United Nations 17 Goals of Sustainable Development

- ❖ Goal #3: Good health and well being.
- ❖ Goal #7: Affordable and clean energy.
- ❖ Goal #8: Decent work and economic growth.
- ❖ Goal #9: Industry, innovation and infrastructure.
- ❖ Goal #12: Responsible consumption and production.
- ❖ Goal #17: Partnership for the goals.

Conclusion

The system proved to increase the overall temperature of the window. Furthermore, the active window showed higher heat loss than the inactive window. Next, the system complies with ASHRAE 55 standards in terms of providing thermal comfort to its users. Homebuilders now have the option to use RadiantLink, water heater or boiler as a source of energy. Lastly the system showed room for improvement and the team was able to optimize the existing system by reducing the heat loss of the active window to the environment.

Performance Evaluation

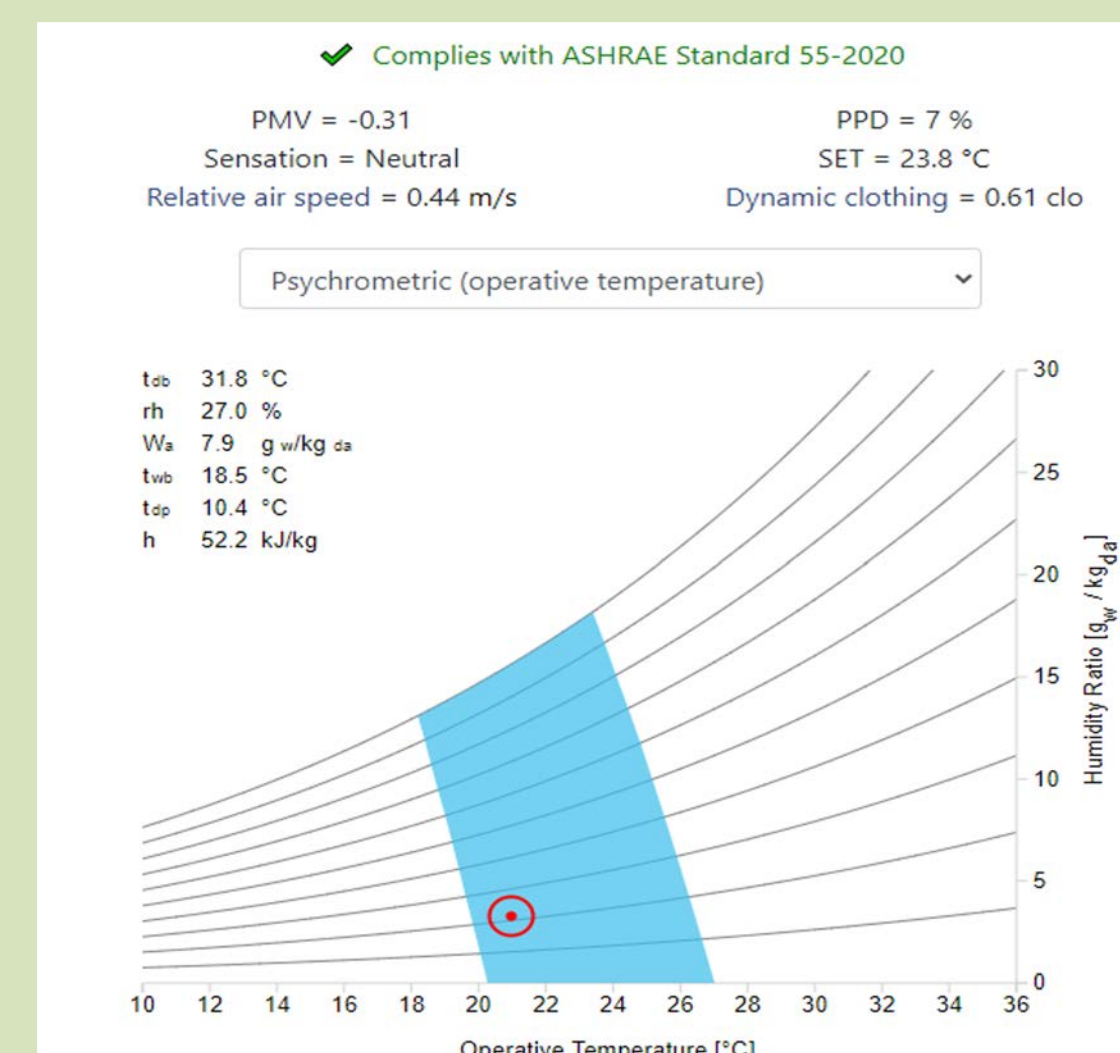


Figure 1 shows RadiantLink Compliance with ASHRAE Standard 55 throughout the winter months.

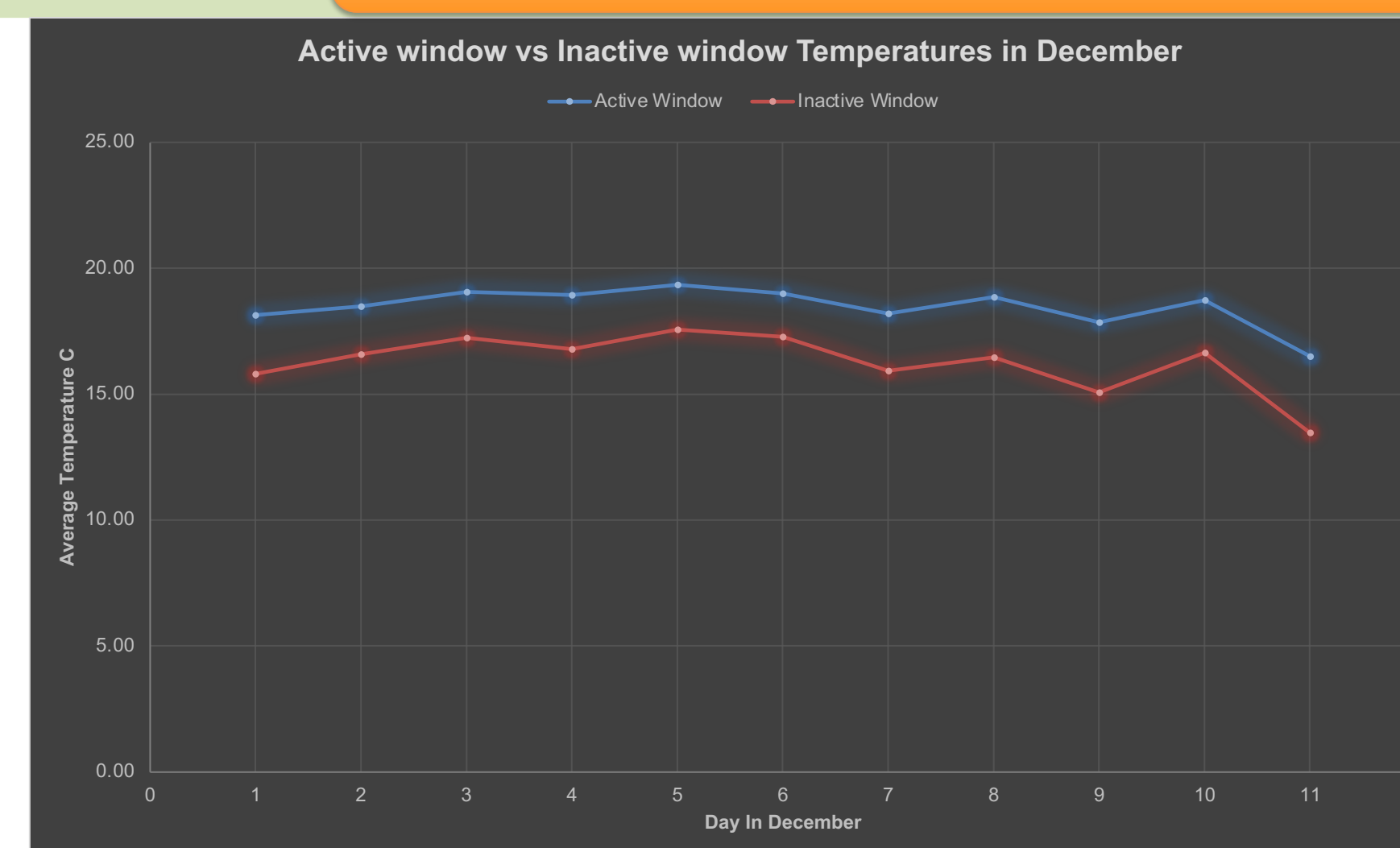


Figure 2 shows the temperature of the glass of a window with RadiantLink and one without in December 2020.

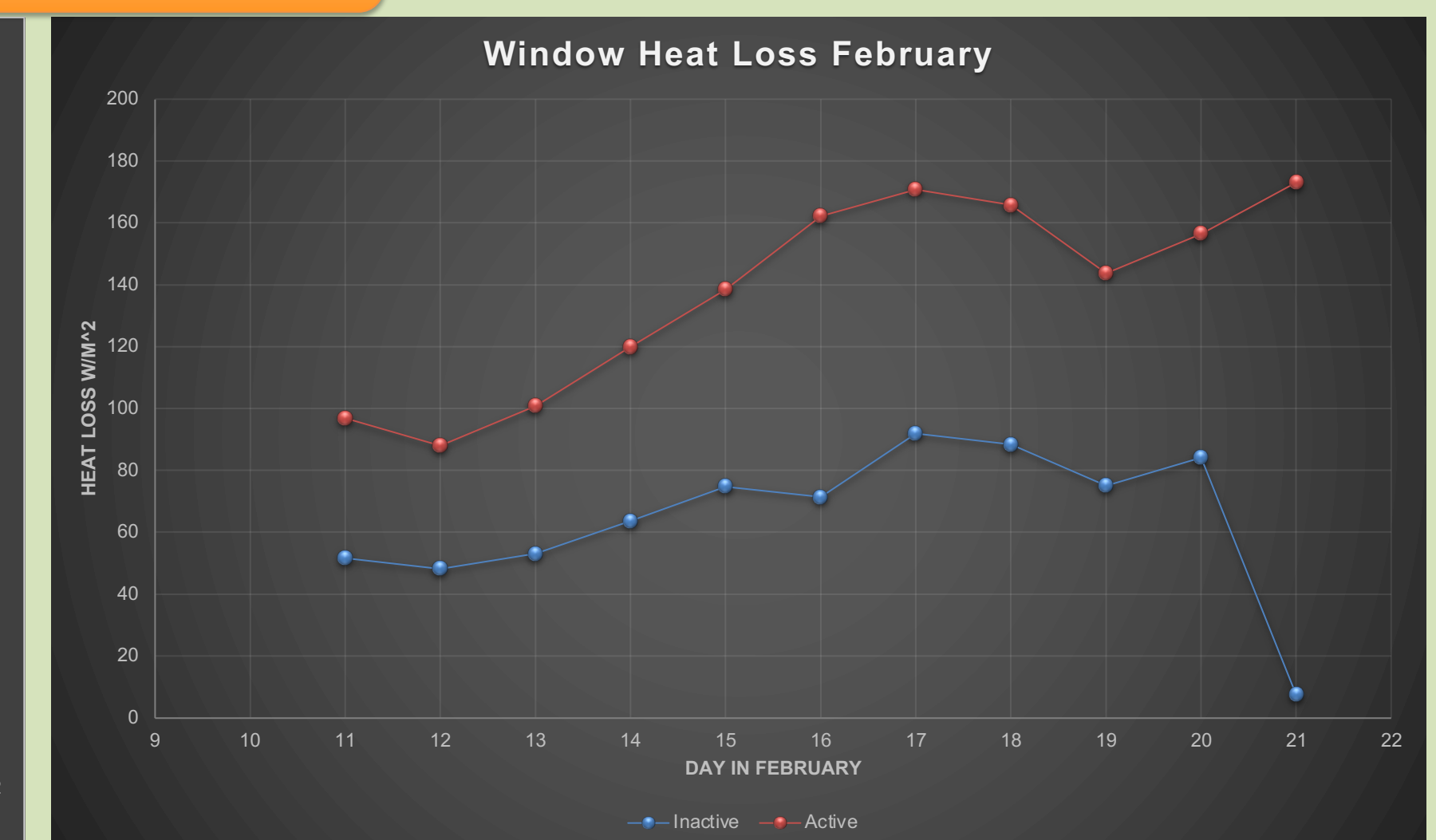


Figure 3 shows the heat loss in window with an active RadiantLink system and the heat loss of a window without the system in February 2021.