

Sulzer Heat Exchangers SMR™

Maximizing ice cream quality

Advanced cooling technology drives production excellence. High-speed, precision cooling for perfect sauce integration in ice cream manufacturing.



Industry challenge

Ice cream manufacturers face a critical challenge in their production process: cooling premium ingredients like caramel, chocolate, and fudge without compromising quality or efficiency. Traditional cooling methods present significant obstacles:

- **Traditional plate heat exchangers:** Fail to handle high-viscosity products.
 - **Scraped surface heat exchangers:** Create excessive shear and require high maintenance.
 - **Screw coolers:** Cost-prohibitive and maintenance-intensive.
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The solution – Sulzer SMR Heat Exchangers

Our innovative static mixing technology delivers precise temperature control and is widely used in the food industry to cool high-quality products.

The SMR technology utilizes a unique static mixing principle with a large and constant heat-transfer area.

- Maintains homogeneous heat transfer across the entire product batch.
 - Prevents product splitting and varying residence times.
 - Better heat transfer compared to other alternatives.
 - Enables uniform cooling without dead zones.
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Case study – Successful application in ice cream manufacturing

A premium ice cream manufacturer faced challenges in their sauce integration process for specialty products. The existing cooling methods were limiting their ability to efficiently blend premium ingredients such as caramel, chocolate, and fudge into their ice cream varieties.

Traditional plate heat exchangers did not operate well due to the high viscosity of the additives, which can range from 1 Pas up to 100 Pas, especially when the temperature difference between the cooling media and the heat exchange inlet was huge.

Scraped surface heat exchangers (SSHE) or screw coolers were not suitable as they created too much shear and were also too expensive to purchase and maintain.

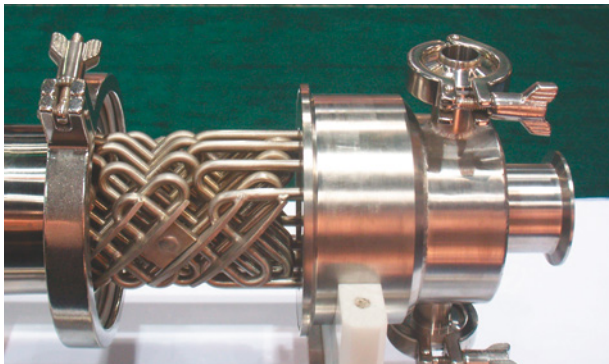
Technical requirements for the heat exchanger solution:

- Ability to handle high-viscosity toppings.
- Easy cleaning and maintenance.
- Highly efficient cooling for precise pattern formation – avoiding melting or crystallization.

Customer-centric solution

The Sulzer SMR heat exchanger system delivered exceptional cooling performance through its innovative modular design. The rapid deployment capability enabled swift integration into existing production lines while minimizing operational disruption. In performance testing, the system consistently achieved optimal cooling temperatures between 3-6°C using ice water as the cooling medium, while maintaining precise homogeneous viscosity with Bostwick values of approximately 13. This level of control was achieved with notably short residence times, maximizing production efficiency.

The system's modular design provided significant cost advantages, with both CAPEX and OPEX, falling well below



those of traditional scraped surface heat exchangers.

The removable component design facilitated thorough inspections and ensured superior cleanability, contributing to reduced maintenance requirements and enhanced operational efficiency.

Technical results

The new system delivered measurable improvements:

- Enhanced heat transfer efficiency (7-10 times versus empty tubes)
- Uniform product temperature distribution
- Consistent sauce integration
- Reliable CIP/SIP capability
- No dead spots where product could deposit
- Higher throughput

Business impact

The implementation of the SMR heat exchanger technology transformed the manufacturer's production capabilities. The precise temperature control resulted in superior final product quality, with perfectly integrated sauce additions and consistent texture throughout.

Production throughput increased due to the elimination of frequent maintenance stops and cleaning cycles required by previous systems. This operational efficiency enabled the manufacturer to meet growing market demands while maintaining premium product standards without compromising production schedules.

Conclusion

The integration of advanced cooling technology resolved the manufacturer's ingredients blending challenges while improving overall production efficiency. The successful implementation led to system adoption across multiple production facilities and the SMR is the set technology when it comes to cooling of toppings.

How can we help you?
Contact us today to find your best solution.

[sulzer.com](https://www.sulzer.com)

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