

Using Heat Transfer Compounds

What is a Heat Transfer Compound?

A heat transfer compound (HTC), often referred to as mastic or cement, is a putty-like compound designed and used to enhance the thermal performance of clamp-on jacket style external heat exchangers.



How does it work?

The compound is applied between the heat exchanger jacket and process equipment to fill any irregular surface areas and create a consistent thermal bond between the two surfaces. The putty-like consistency of the HTC allows it to be easily applied to contoured or textured surfaces, while eliminating air voids and gaps between the thermal transfer surfaces.

For installation instructions and how to apply the HTC for use with clamp-on style heat exchangers see **THERMAPLATE** Resources webpage.

By using HTCs, a conductive heat transfer path is created between the surfaces of the heat exchanger and process equipment. This <u>conductive</u> heat path greatly increases the performance of the heat exchanger when compared to a bare surface heat exchanger, which is mostly dependent on less efficient, <u>convective</u> heat transfer.

How much does it improve performance?

The differences in thermal performance between a bare surface heat exchanger and one utilizing an HTC can be seen in the overall heat transfer coefficients (Overall U Value) ranges as shown below:

Bare Surface Clamp-on Heat Exchanger:	1 to 5 Btu/hr·°F·ft ²
Clamp-on Heat Exchanger with HTC:	20 to 40 Btu/hr·°F·ft ²

This increase in performance capacity allows for faster thermal cycle times or ability to reduce the total quantity or size of required heat exchangers. For any questions on clamp-on heat exchanger sizing please contact a **THERMAPLATE** representative.



What are Heat Transfer Compounds made of?

Generally, HTCs consist of graphite and a multitude of binding products. Graphite is used because it is a good thermal conductor, with more than 100 times the thermal conductivity of air.

THERMAPLATE recommends Chemax brand HTCs for use with our clamp-on style jackets. Chemax is backed by decades of proven product performance and they offer a wide range of HTC products that will satisfy most application needs. There are two primary HTC product groups used in clamp-on applications: non-hardening and hardening type cements.



Non-hardening Cement

Non-hardening heat transfer cements are most commonly used for externally heated or cooled tanks and vessels. No premixing or curing is required for these compounds. They have an unlimited shelf life and can be easily removed. **THERMAPLATE** would recommend the following Chemax products for applications which are within the following temperature limits:

<u>Cooling Applications:</u> TRACIT-1000 (Temperature limit 300°F / 150°C) - See <u>TRACIT-1000 specification sheet</u>

Heating Applications:

TRACIT-1100 (Temperature limit 450°F / 232°C) - See TRACIT-1100 specification sheet

Hardening Cement

Hardening heat transfer cements are utilized in high temperature applications. Unlike nonhardening cement, this product must be cured by either air drying or by heating for 4-10 hours. THERMAPLATE would recommend the following Chemax products for applications which are within the following temperature limits:

<u>High Temperature Applications:</u> TRACIT-300 (Temperature limit 750°F / 400°C) - See <u>TRACIT-300 specification sheet</u>

<u>Ultra-High Temperature Applications:</u>

TRACIT-600A (Temperature limit 1250°F / 675°C) - See TRACIT-600A specification sheet

For any additional questions about HTC types or installation options such as factory installed compounds contact a **THERMAPLATE** representative.