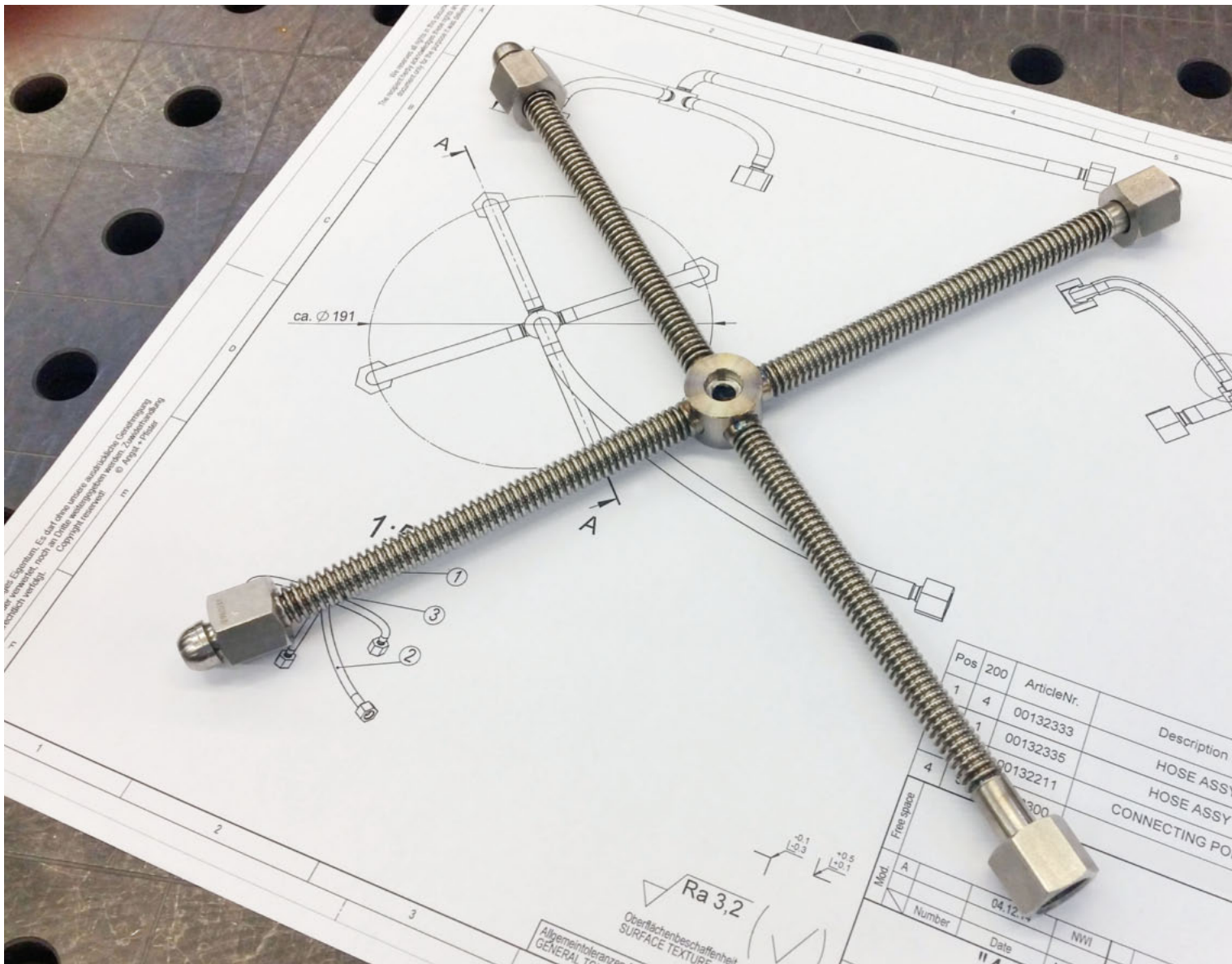


So soup stays hot without melting the ice cream It's true: There is a revolutionary new serving trolley that keeps soup warm and ice cream cold without any need for electricity. Engineers Laurent Rigaud and Francis Kindbeiter, founders of the innovative French start-up company Coldway, have perfected the autonomous thermochemical system. Angst + Pfister is providing engineering support and speeding up the time-to-market process through production of rapid prototypes to large series.



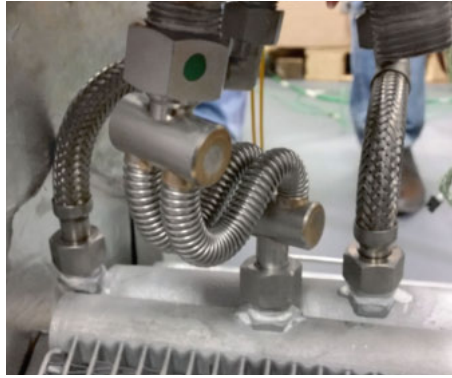
Angst + Pfister engineers developed hose lines for the Coldway thermochemical system that make installation and maintenance easier.

Some like it hot. And not just in the classic American comedy film of the same name starring Marilyn Monroe. It is also true in the town of Pia in southern France, where Coldway is headquartered. For Coldway's engineers, "hot" means fast, economical and customer-oriented. In a short time, after ac-

quiring just one more pending certification; the remarkable new serving trolley featuring the Coldway self-refrigerated thermochemical system for keeping foods warm and cold will be launched worldwide to leading



The hose is standard; the fittings have been specifically designed.



ASSIWELL® all-metal hoses: robust and extremely flexible.

industrial companies in the meals distribution market. Early in the morning, the trolleys will be at the ready so breakfast can be served, and they will remain in service tirelessly the rest of the day, until the last dinner has been brought round and served at the desired temperatures.

Eco-friendly and electricity-free "The thermochemical system is extremely environmentally friendly," emphasizes Laurent Dutruy, head of industry at Coldway, first and foremost: It uses no substances like chlorofluorocarbons that harm the ozone layer and contribute to global warming. Instead, Coldway employs ammonia. It starts out in liquid form and is vaporized in the first chamber, the evaporator, thus generating cold. When the ammonia gas enters the second chamber, the reactor, it is trapped within solid salts to generate heat. When, after roughly 24 hours, the entire reserve of ammonia has been exhausted, heating the solid mass is all that's required to regenerate the system in a few hours overnight. In this process, the bonded ammonia evaporates from the salts and returns to the first chamber, where condensation takes place. This pro-

Coldway in Pia, Angst+Pfister in Paris and Zurich: "Our cooperation could not have gone any better."

Laurent Dutruy, Industrial Director, Coldway France

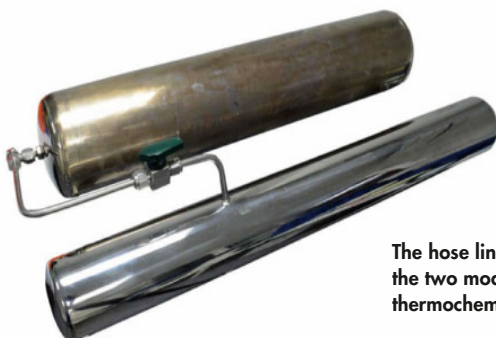
cess of cold and heat generation, carried out autonomously without electricity, can begin again the following morning. A simply smart system.

A clear case for ASSIWELL® A third module contains technology for the thermochemical process. Naturally, all three elements must be connected with one another; ammonia as well as heat and cold must be transported during the process – and this is a clear case for ASSIWELL®, the all-metal corrugated hose with stainless steel braiding from Angst+Pfister. It has been designed to handle a vast temperature range: The evaporated ammonia in Coldway's thermochemical system reaches freezing temperatures of down to -30°C ; the absorption process inside the reactor can generate temperatures in excess of 100°C . The ammonia causes no damage to the all-metal hose; moreover, the hose is flexible and non-aging. Thus, ASSIWELL® significantly prolongs the maintenance intervals of the entire system.

A custom fittings design The fluid handling technology experts at Angst+Pfister headquarters in Zurich chose the ASSIWELL® 066/100 for the job. It's a standard hose, but the system they designed around it goes well beyond that: The solution features customized fittings for the unions on all three chambers, which also make industrial installation easier. Angst+Pfister's own welding shop offers Coldway engineers added value in the form of precision welding technology and through the rigorous pressure, breakage and vacuum testing that documents the reliability of the all-metal hoses. After all, in Coldway's thermochemical system, the hoses must withstand a pressure of 30 bar at a temperature of 260°C . And of course, not a single drop of ammonia may escape. The customized 60° conical fittings ensure that the hoses are 100% leak-free.

To date, the Coldway system is available in over 30 different versions. Each of these requires hoses of varying lengths and diameters as well as specially designed fittings. This poses challenges to Angst+Pfister's manufacturing and logistics processes that are carefully mastered by the integrated supply chain management approach.

Coldway in Pia, Angst+Pfister in Paris and Zurich: "Our cooperation went off without a hitch," states Laurent Dutruy. The "hot" project has achieved its goal. It was carried out economically and in the shortest time possible thanks to the close engineering, production and logistical coordination.



The hose lines will connect the two modules in the thermochemical system.