# Development of supportive feet for heat exchangers

By Daniel Rundström

*Energy efficient equipment are vital to reach a sustainable industry and heat exchangers are one of the key components. The newly developed design of supportive feet decreases the stresses in the feet and enables a wider application of the heat exchanger. With the new feet the heat exchanger could be used in a tougher environment where the apparatus is exposed to severe loads from piping systems and earthquakes.*

In the transition towards a more sustainable industry, energy efficient production is highly important. The gasketed plate heat exchanger is a key component in many industrial fields such as chemical production, heating, ventilation, and air conditioning. It enables an efficient transfer of heat between most commonly fluids and thus minimises the energy losses. The heat exchanger is a relatively heavy apparatus as it is assembled of tightly packed metal plates. On top of the heavy weight, the apparatus can be exposed to severe external loads induced by the connecting piping system and even earthquakes. These loads create tough requirements for the supportive components of the heat exchanger, the feet with its different components.

The project of developing new feet that can sustain the great forces began with investigating the existing feet and the needs from different fields within the company. Service, product management, and the engineering perspective was in focus when exploring the needs and requirements. Based on the identified requirements, a wide range of concepts with different approaches were generated by a diverse team of engineers. All generated concepts then went through a scoring process where the concepts were evaluated based on fields such as manufacturing, service, and cost. The three best scoring concepts were then elaborated and further developed to investigate potential implementation. In the end, the third best scoring concept was deemed best after further development and was proceeded to be verified through calculations. To verify the best concept a new, more time-efficient analysis method was established in a simulation program. In reference to the current designs of feet, the newly developed design turned out to decrease the level of stresses in all parts of the foot. In some cases, the damaging stresses were decreased by up to 67%. During the verification it also turned out that the most critical part of the foot was not the anticipated one. Therefore, there are room for even greater improvements to the new design of foot.

**A gasketed plate heat exchanger that could use the newly developed foot to sustain heavier loads.**