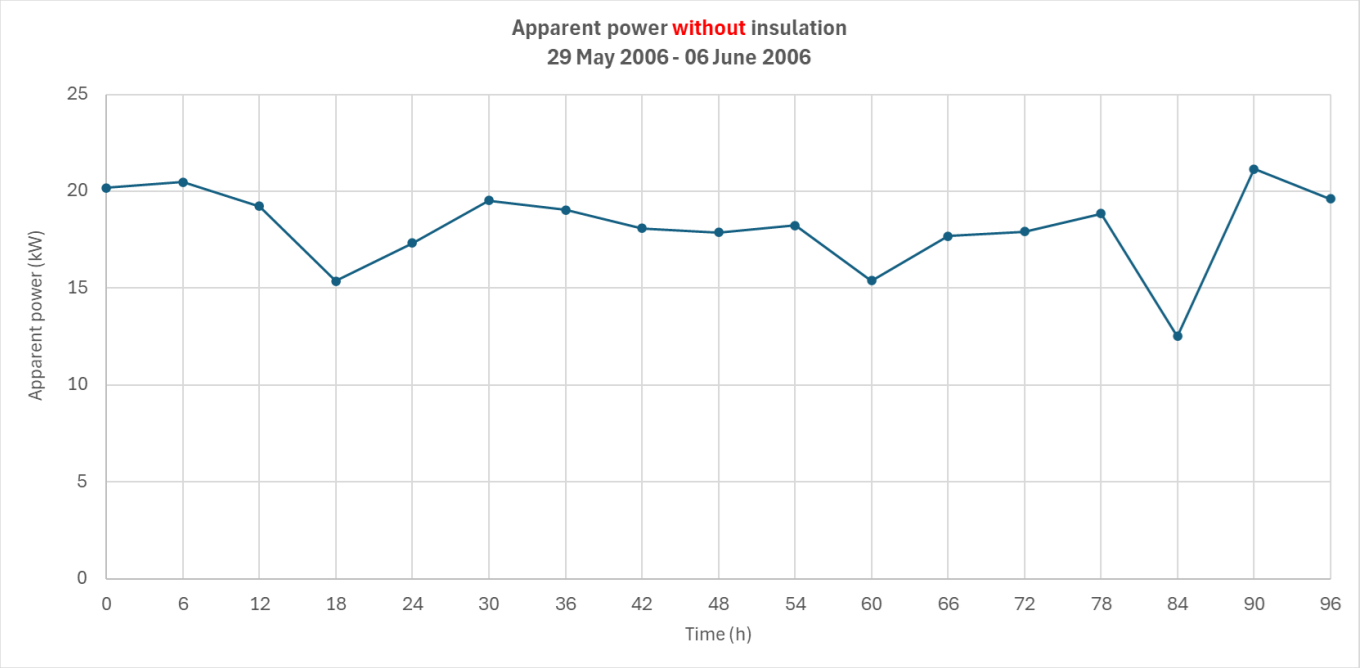
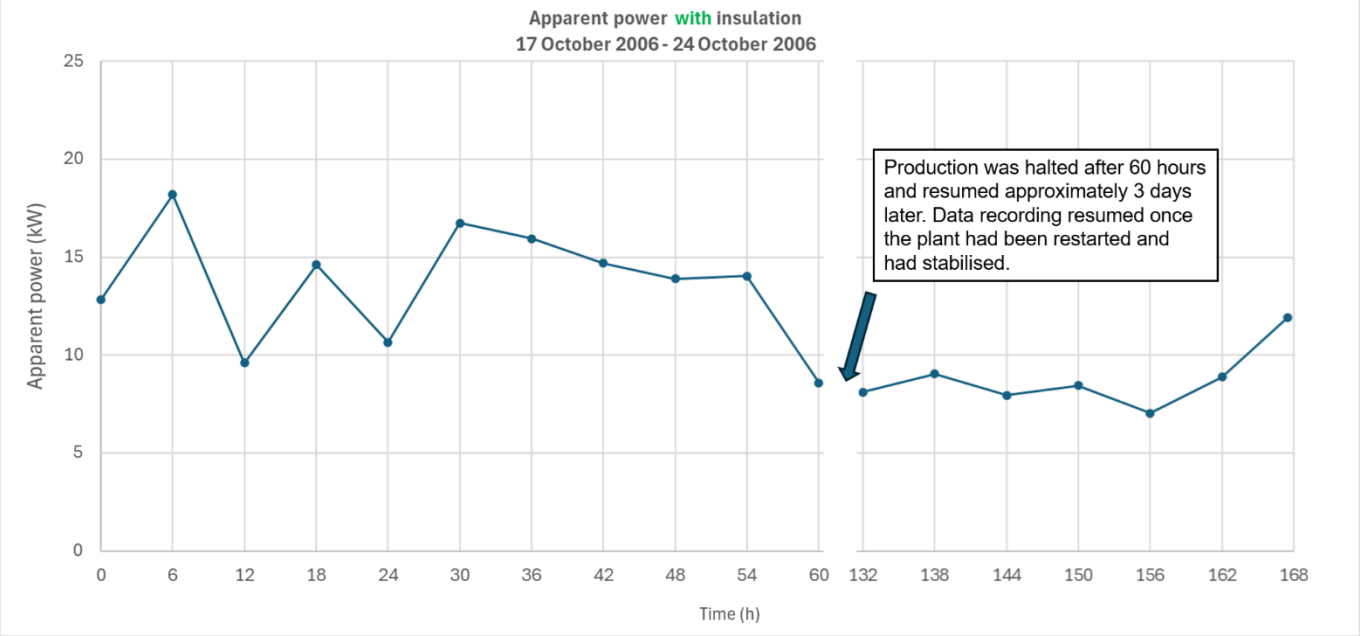
Apparent power comparison of an injection moulding machine

Apparent power comparison of the injection moulding machine 6 by Engel

With & without heat shield coat by Gebr. Bach GmbH on the cylinder



Mean value: 18.2 kW apparent power = effective power, since only ohmic resistance wire used

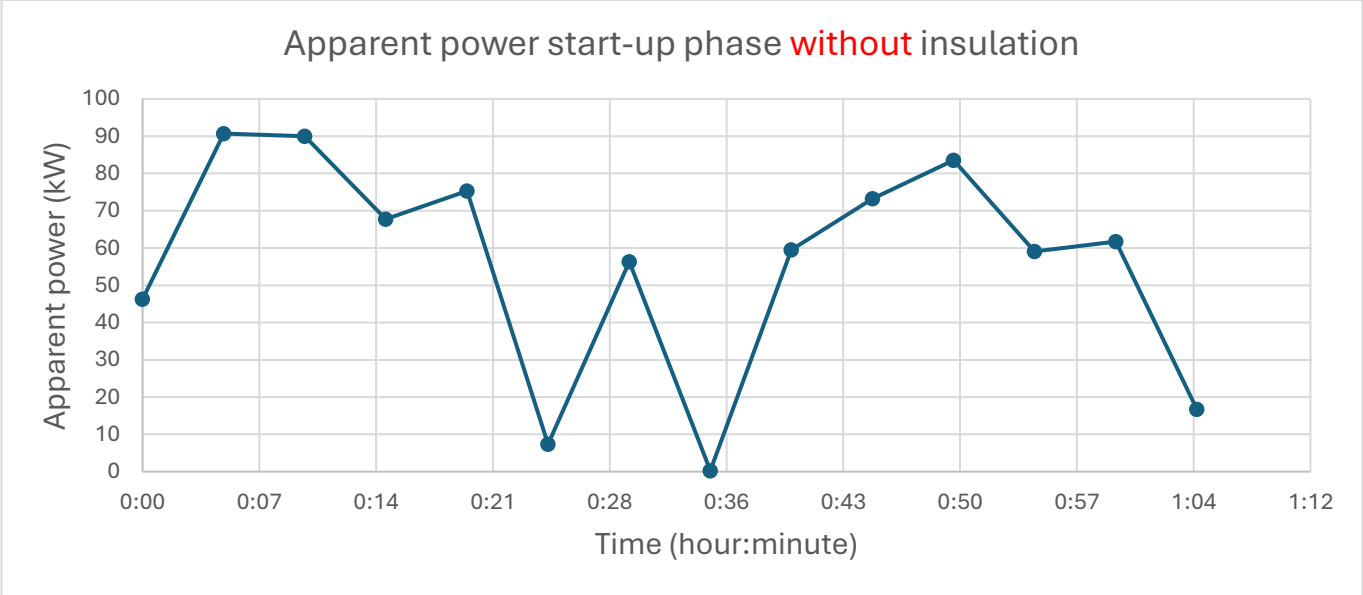


Mean value: 11.7 kW

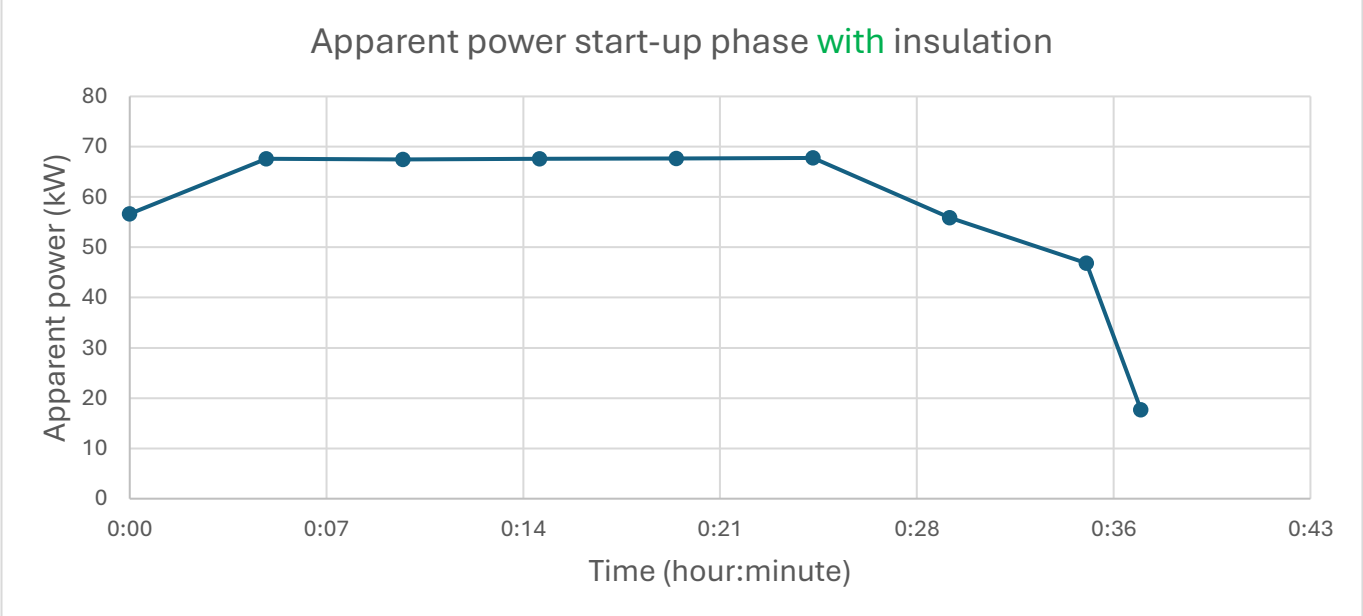
<u>Reduction:</u> 35.7% with insulation versus without insulation

Apparent power comparison of an injection moulding machine

The data was kindly made available for public use by our client, who carried out the measurements in 2006 whilst the machinery was in operation. Based on our experience over the last 20 years, we can say that, depending on the material and weight, savings of between approximately 20% and 50% can be made on the electricity costs for heating of the injection moulding machine's cylinder, provided that the machine is operated in 'continuous operation'.



Heating-up time **65** minutes without insulation



Heating-up time **37** minutes with insulation

Apparent power comparison of an injection moulding machine

The heat-up time was reduced from 65 minutes to 37 minutes as a result of the usage of insulation, using 30 mm thick flexible thermal insulation jackets (WSMF). This represents a time saving of 43%. A stabilisation of the apparent power during the start-up phase is also clearly evident. In most cases, the duty cycle of the individual cylinder heaters can be viewed on the injection moulding machine's PLC. For example, this stands at 70% before insulation and 45% after insulation. As the heaters are only switched ON and OFF by the control system, this is equivalent to the electricity savings achieved by the cylinder heaters. Standard, uninsulated heaters radiate at least 40% of their heating output into the surrounding environment rather than into the cylinder. When insulation is used, the thermal shield on the outside can be touched with bare hands. This eliminates the need for an additional protective cover or metal sheet. In addition to the electricity savings, the associated CO_2 savings should also be noted. As past experience has shown, both are becoming increasingly expensive, meaning that the cost of the thermal insulation material is generally recouped within a few months (2 to 6 months).

It makes sense to install the insulation on an injection moulding machine whilst it is in operation and to calculate the resulting savings and thereby to determine the amortisation period. Injection moulding machines, which are used less frequently, and those with low material consumption or small parts naturally have a longer payback period than machines in continuous operation with a high shot weight or material throughput at melting temperatures of, for example, 230 to 350 °C.