

## **Accumulation - They are beautiful and will keep you warm for longer**

Every year Czech company, Romotop, retains its position as the market leader in stove manufacturing, introducing new products and improved concepts for fireplace stoves to the global market.

In 2011 we launched Arona and Lugo fireplace stoves and later more types with accumulation set. The family of stove possible to use original Lugo accumulation contains following types (Lugo, Belo 3S A, Belorado A, Evora A, Soria). Each combine new and innovative technology with top-notch design and that 'extra something' that Romotop is famous for.

In this case the 'extra something' is the stoves ability to store the heat generated and radiate it over a long period of time. Read on to find out exactly how extraordinary the length of heat radiation time is.

The Arona fireplace stove with heat accumulation technology is truly exquisite. The Arona features Hein & Co. ceramics, which have been especially selected for their renowned high quality. There are few companies that produce ceramic tiles of the size, quality and precision required for the luxury Arona fireplace stove; Hein & Co offer thirty colour combinations with an enamel, gloss or opaque finish, proving that ceramic tiles can be used on even the most modern products and should not be limited to the traditional tiled stove. These stoves introduce a new trend, where ceramics provide a pleasant and tactile feel as opposed to the more pious texture of stone.

At the heart of the Arona is the high-quality and time-tested fireplace insert, the Romotop KV 075/02. These inserts are the perfect partner for the Arona fireplace stove; with a nominal output of 9kW and an efficiency of 90%, they comply with not only European standard EN 13 240 but also the strict Austrian and German standards Din+ and BimschV at both first and second level, and even the 15aBVG standard, which will enter into effect in 2015!

Many features have been developed to ensure an excellent partnership between the Arona fireplace stove and the Romotop KV 075/02 insert, for example the Arona has metalised coating double glazed doors that reflect the heat back into the combustion chamber. This reduces 'sharp heat' radiation escaping through the glass thus improving combustion quality and further ensuring that the door glass remains perfectly clear during combustion. The only maintenance required will be a quick dust with a moistened cloth to remove ash.

The box-shaped ashtray is also very handy; once full, the ashtray can be covered with the screw-on lid and the cool ash can emptied directly into the waste bin without risk of spilling or blowing ash into your home.

The stove also features the CPV system, a central air intake that directs air from outside into the combustion chamber via a top or rear connection to the chimney.

Customers are also able to choose from two different door frames finished in black varnish or bevelled stainless steel.

And what about the excellent heat storing properties of the Arona Stove? Besides the tiles weighing a respectable 130kg, heat is retained in the accumulation exchanger located above the internal fireplace insert. The tin box of the exchanger is lined with unique Romotop heat accumulation sculpted material, which results in an additional 130kg of heat storage material.



*ARONA fireplace stove with heat accumulation technology*



*View of the heat accumulation exchangers under the extensive ceramic cladding*

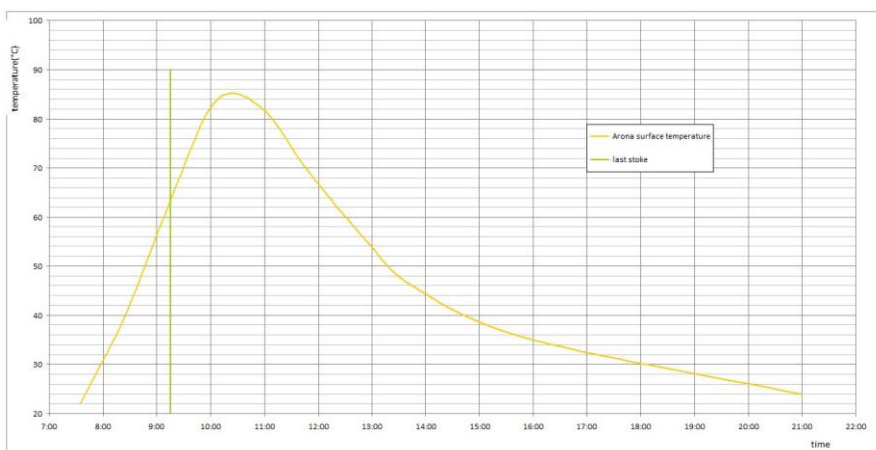


*View of the heat accumulation mass inside the accumulation exchangers*

Luxury fireplace stoves should be more than simply a luxury design; they must also provide excellent heating and efficiency. The following graphs, assimilated at the Romotop test facilities, illustrate the performance of the Arona in this area.

Romotop gave great consideration to customer requirements when designing the Arona test procedures; customers do not want to continually stoke small quantities of fuel to maintain their desired room temperature – they want to be able to stoke a lot of fuel in one go and store the heat they do not require for later. So, Romotop performed the following tests:

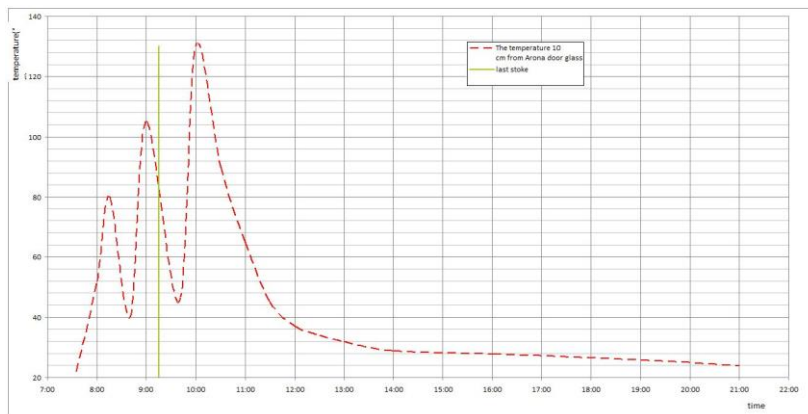
Three 4kg batches of wood were stoked at 50minute intervals from 7.35am until 9.15am, with 12kg of wood consumed in total. The combustion air was then reduced to a quarter and the stove left unattended. Extensive surface temperature measurements were taken from 38 different points on the ceramic panels to gauge the surface heat radiation of the stove, temperature measurements were taken from 10cm in front of the door glass to gauge glass radiation and the temperature of the air was measured from the vents in the stainless steel stove ceiling cover.



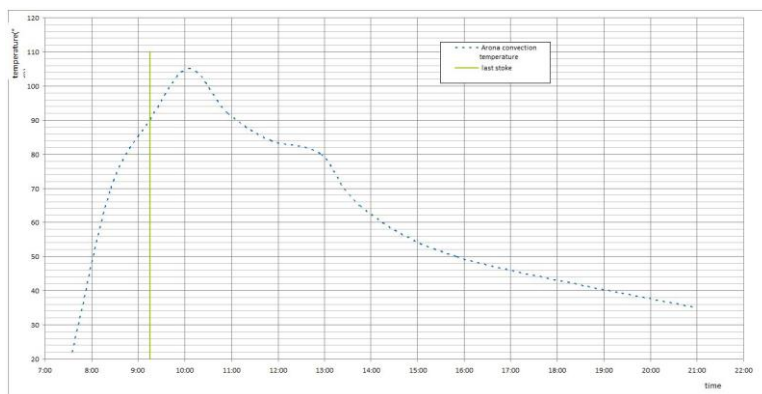
The first graph represents the period of heat radiation from the surface of the stove. This is commonly referred to as 'radiating heat', the same type of heat we receive from the sun and consider to be the most pleasant. The surface temperature must be just right to achieve this pleasant temperature; if the temperature is too high the heat radiation becomes too intense. As the graph illustrates, the surface temperature of the Arona falls within the optimal range,

providing the ideal level of heat radiation for 9 hours after only three stokes of wood – ignoring temperatures below 30°C. The temperature-time curve in the graph demonstrates how the Arona radiates heat over time

as well as during and immediately after stoking. The ceramic cladding absorbs heat but does not significantly contribute to the interior heating. The heating method used in the part of the process is described below, but after the last stoke the stove surface begins to radiate heat and this radiation can last for up to nine hours.

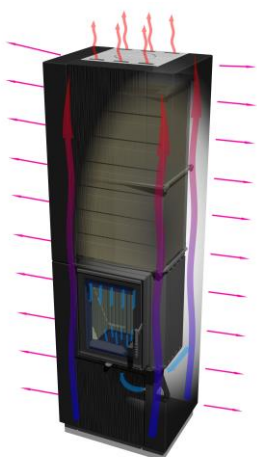


The second graph illustrates the temperatures taken from 10cm in front of the door glass. This clearly shows spikes that represent the individual stokes, demonstrating that heat radiation through the door glass increases soon after stoking the stove, i.e. before the heat radiates from the surface of the ceramics.



The last graph displays the temperature of the air exiting the vents in the stainless steel cover located in the ceiling of the stove. Here you can see how fast the stove begins to provide heat in combination with its gigantic endurance – Arona stoves continue to heat the surrounding air for up to thirteen hours after the last stoke.

The Arona fireplace stove uses these three heating systems to keep a modern, average, low-energy house warm while you are at work.



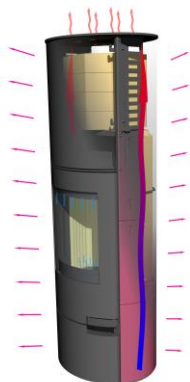
During the test, the stove continued to radiate surface heat until 6pm (heat radiation, surface temperature – 30°C) and until 10pm by convection (min. temperature of convection air - 30°C). The test was performed at the Romotop testing facility with a constant external temperature of 22°C and testers found that 2.5 hours stoking time was sufficient to keep the Arona stove radiating for a further nine hours.

The total energy delivered by the stove was 36.25kW with an average output of 3.3kW. The stove output and length of heat accumulation time can be increased or decreased by changing the fuel levels and the stoking period.

Ordinary stoves provide a large heat output to the surrounding area immediately after stoking, but this output drops rapidly after the fire has gone out, as does the room temperature. This is demonstrated in the next set of tests of the Lugo stoves with and without heat accumulation technology. The quick burst of heat, caused mainly by convection heat (the hot air system), is an advantage but the rapid cool down after the fire has burnt out is a disadvantage.

Pure heat accumulation stoves give the advantage of long term heat radiation, however the heat generated only increases gradually, which means it takes longer to increase the room temperature.

The construction of the Arona stove combines the advantages of both systems. The Arona has a precisely tuned ratio of convection and accumulation, which results in a relatively quick increase in room temperature as well as long-term radiation. Most of the output is delivered in the form of pleasant heat radiation with the remaining heat convected to quickly warm the room. The sophisticated and precisely configured deflectors under the tiles allow an equal distribution of surface temperatures.



**The Lugo family Akum set with heat accumulation technology is another good option with Romotop products.**

Sure to meet customer's aesthetic requirements, Lugo, Belo 3S A, Belorado A, Evora A, Soria are available in different configurations including sheet-metal, sandstone, stone and a variety of ceramics.

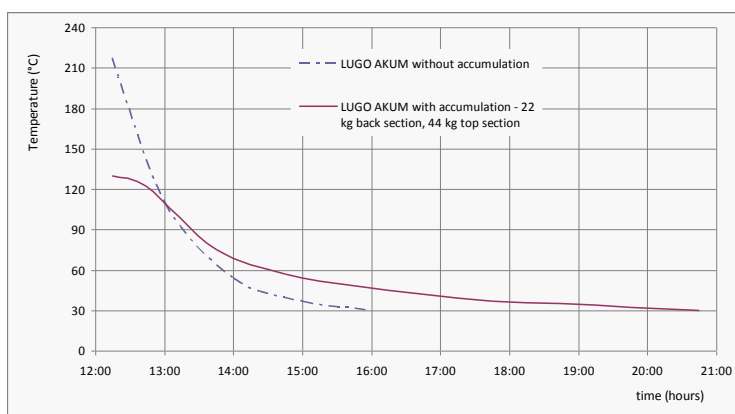
The back of the Lugo Akum fireplace stove and the area above the combustion chamber may be fitted with the unique Romotop heat accumulation sculpted material. Only Lugo can bear also back accumulation set, all other types can bear only top accumulation set.

In total the stove can hold 66kg of heat accumulation sculpted material plus 35kg of ceramic tiles.

*Unique Romotop heat accumulation material for the back, sides and top of the Lugo Akum stove*



Romotop carried out further testing to compare the heat endurance of the Lugo with and without heat accumulation technology to measure the ability of the stove to accumulate heat. Using the same test conditions as before with the same external temperature and an equal number of stokes, the temperature of the front cover above the combustion chamber containing 44kg of heat accumulation material was recorded.



The standard Lugo stove cooled down to 30°C within four hours, whilst the Lugo with heat accumulation material reached the same temperature after 8.5 hours. The radiation time of the Lugo with Romotop heat accumulation material had thus increased by over 100%, proving that the efficiency of the fireplace stove had been significantly improved.

Similarly to the Arona stove test, the maximum temperature the stove reached (i.e. the initial temperature at the start of the cooling phase)

was analysed. The heat accumulation material resulted in a lower surface temperature than the stove without the material, producing a more pleasant heat radiation.

**As you can see, these Romotop products are excellent. Arona, Lugo, Belo 3S A, Belorado A, Evora A, Soria fireplace stoves equipped with heat accumulation sculpted material are the cutting-edge technology of today, both thanks to their fine design and heating comfort.**