

# Perfectly sized for limitless power

When performance is vital, there is no room for compromise. KTM, the leading manufacturer of motocross motorcycles, knows this and so do its business partners. Since mid 2017, Angst+Pfister has been supplying a series of bolt seals for the valve covers of the new KTM model 450 SX-F. The development process also caught the attention of the motor biking employees of Angst+Pfister.



Despite extreme conditions:  
Motocross riders must be able  
to rely on their machines.

High speed, narrow curves and spectacular leaps – this is the world of motocross. And here – there is no doubt about this – KTM's off roaders are setting the pace.

For the bikers, KTM equates to pure enjoyment along with total concentration. And these machines have to withstand a lot when racing through rough terrain on punishingly muddy or dusty trails with the engine roaring at full throttle.

A basic priority is the safety of the biker, which depends on the safety of the bike and can only be guaranteed with quality components built for a long service life and engineered to withstand extreme conditions. Durable components also reduce costs.

As a long-established partner of KTM, Angst+Pfister is now providing the sealing technology for the bolts on the valve covers of the new KTM model 450 SX-F.

#### Long-term partnership on an equal footing

The employees of Angst+Pfister care a lot about the manufacture of components like these. "Emotion is part of the game," notes Andreas Gogl, General Manager of Angst+Pfister Austria and CEE, with glint in his eye.

Angst+Pfister has been in partnership with KTM for several years. "We are very proud to have an internationally-established, highly-regarded company with such a strong brand as our partner," says Andreas Gogl. He emphasises that the collaboration has always

been very professional, which is not always a given. "This is due, for instance, to the early planning and coordination between Engineering, Purchasing, Quality and us as suppliers".

#### Minimum tolerance for the shape and size

Finding the right rubber is fundamental when it comes to bolt seals. "On the one hand, the part must have a high degree of chemical resistance to petrol and cleaning materials," explains Andreas Gogl. "On the other hand, it has to withstand temperatures up to 200 degrees Celsius." The most difficult thing, however, is to maintain the tolerances with regards to the available space and size of the components. The part measures 19 millimetres in diameter and may only deviate from this by 0.2 millimetres. "That is not easy when it comes to rubber, because we are dealing with an organic material." A standard seal from Angst+Pfister provided the basic form that was then modified to suit the specific needs of KTM. The Angst+Pfister specialists worked meticulously to produce the solution; the wealth of engineering and production experience Angst+Pfister is able to call upon an essential part of the process.

#### Optimisation of production technology

"The dimensions of this product were novel," continues Andreas Gogl. The design and the materials were chosen in close coordination with the customer with Angst+Pfister primarily responsible for optimisation of production and the questions: How can the seal be manufactured? How can the tolerances be maintained? What is the right material?

First, Angst+Pfister adapted a drawing KTM had provided for the engineers. The optimum dimensions for keeping production costs as low as possible were then calculated by the partners together – the seal was going to be manufactured in large numbers. "The volume of the component needed to be as low as possible to save on materials – while at the same time, we had to guarantee as long a life span as possible," remembers Andreas Gogl.

#### Prototype tests

First Angst+Pfister delivered a sample part to KTM. To the customer's satisfaction, their prototype test results were the same as those produced by the engineers of Angst+Pfister. "The sample testing went very well, no additional finishing was required. It was very important to err on the side of caution before we started series production," explains Andreas Gogl.



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