



## APPLICATION NOTE

# Thermography helps leading bike fitter find optimal cyclist position

One of the most advanced bike-fitting studios worldwide is tapping into the benefit of Flir thermal imaging technology to push the boundaries of sports science and biomechanics at all levels of cycling. Located in Antwerp, Belgium, Bikefit Van Staeyen uses Flir-generated infrared images to visualize body heat and pressure distribution in real time, subsequently optimizing rider position and bike set up.

Bikefit Van Staeyen offers professional bike fitting based on more than 20 years of experience in cycling. Founded by brothers Kevin and Michael Van Staeyen (a former professional road racing cyclist), the business has built its success on extensive expertise in sports science, biomechanics and cycling. What started as a passion for precision and performance evolved into one of the world's most advanced bike-fitting studios.

The principal differentiator of Bikefit Van Staeyen is its dual-expert approach: every bike fit is performed by both brothers working together, merging technical analysis and professional cycling experience with medical understanding.

"This synergy allows us to identify patterns and dysfunctions far beyond what conventional systems can capture," explains Kevin.

### Real-time insight

Central to the process is the use of advanced thermal imaging technology from Flir, which provides a real-time view into physiological asymmetries, pressure distribution, and underlying muscular imbalances.

"We use a Flir infrared camera to study a heat map of a rider pedaling to optimize body position and bike set up," says Kevin. "By combining thermography



*Flir E96 Thermal Imaging Camera*

with motion tracking, force analysis, and EMG [electromyographic] data, we can see what others can only guess: how the rider's body reacts, compensates, and adapts under load. We've named our thermography application 'Lava.flow', a process that allows us to understand and optimize injury-prone areas, muscle activation, and pressure points in a completely new way."

Bikefit Van Staeyen initially used a Flir E76 thermal imaging camera but has since migrated to the newer E96. The E96 is Flir's first pistol-grip camera with 640 × 480 thermal resolution, allowing users to survey targets safely and quickly. This advanced sensor offers complete coverage of near and distant targets through a range of lens options. In addition, Flir Ignite provides the automatic uploading of E96 images directly from the camera to the cloud for easy, secure storage and sharing.

As pioneers in thermal analysis for cycling applications, Bikefit Van Staeyen works in close collaboration with Thermal Focus, a Flir Partner and stockist of the largest selection of Flir infrared cameras in the Benelux (Belgium, Netherlands, Luxembourg) region.



Thermal image of cyclist legs

## Temperature in focus

The hot spots and cold spots identified by Flir thermal cameras serve as direct indicators of how a cyclist's body functions on the bike. An excessive temperature increase in certain areas can indicate overexertion, friction, or poor posture.

Using the Flir E96, Bikefit Van Staeyen can: detect hot spots and elevated pressure zones on the saddle, shoes, or handlebars; identify asymmetric muscle loading and unbalanced activation patterns; analyze vascular restrictions that may lead to numbness or reduced performance; and detect thermal irregularities that could indicate overload.

With this in-depth thermal analysis, the brothers are able to identify a range of issues that prompt adjustments for the optimal riding experience. For instance, asymmetric heat distribution around the kneecap points to a possible biomechanical problem, while too much heat in the ball of the foot typically means incorrect positioning of the cleat position. Similarly, increased temperature in the lower back could be the result of a compensatory mechanism or incorrect saddle adjustment.

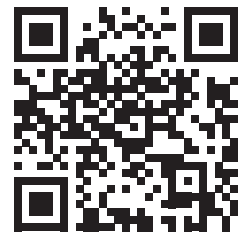
"While traditional bike fits are often based on observation and feel, we use objective, data-driven measurements from the Flir thermal camera," reveals Kevin. "Our Lava.flow process gives us unique, real-time insight into how a rider's body responds while cycling. By way of example, we recently helped a cyclist experiencing unexplained knee pain during rides. Using our Flir infrared imaging technology, we

observed excessive heat accumulation in the tibia [tibialis anterior muscle]. Thanks to the Flir imaging of this increased heat and our leg length software, we discovered that this leg was structurally shorter and that the rider had to pull the pedal excessively upward when cycling, resulting in knee pain."

## All levels of cyclist

Cyclists turning to Bikefit Van Staeyen for assistance range from dedicated amateurs to World Tour professionals. They trust the company for the same reason: attention to detail. From saddle pressure to neural load; from crank dynamics to thermal asymmetry - no variable is left unexplored. The company is also pioneering the bike-fit domain at university level, a first in Europe, by collaborating with the University of Antwerp to integrate data-driven approaches.

"We want to serve as the fundamental partner and reference point for thermal camera technology within the sport of cycling," concludes Kevin. "Our ambition is to help shape the future of performance diagnostics, not just for our own athletes, but as a knowledge and technology hub for teams and riders worldwide. With our expertise and experience we can demonstrate the immense potential of thermography in biomechanical and performance analysis."



To learn more about thermal imaging cameras, please visit:  
[www.flir.com/instruments](http://www.flir.com/instruments)



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