

NEWS **KOHLER**

COMPETENCE CENTER
LEVELING

EDITION 31



Leveling for the world champion

New: compact precision leveling machine for connector industry

Part leveling machine in steel processing

Contract leveling with high demand



TENSION IN THE ICE CHANNEL – BUT NOT IN THE MATERIAL

KOHLER LEVELS SLED PARTS FOR USE BY THE GERMAN SKELETON TEAM

High-tech equipment for German top-class sport is the specialty of FES, the German institute for research and development of sports equipment. This is where equipment including sleds for the German skeleton team are built. Precision and quality are decisive when competing. KOHLER Maschinenbau GmbH has been responsible for the precise and material-friendly leveling of the high-strength steel parts since 2020. Working together with its technology partner, FES developed the individual sleds that saw the German “Skeletoni” team race to several medals at the 2021 World Championships.

Calm but fully focused, Christopher Grotheer stands at the start of the artificial ice track in Altenberg, Saxony, one of the most challenging bobsleigh and luge tracks in the world. On his head he wears a helmet with face and chin protection, in his hand he holds a flat metal sled. It is Grotheer's last run at the 2021 World Championships, and he is already in the top spot after the first three runs. The starting signal sounds. Grotheer takes a runup of a few meters, throws himself onto his sled, and races head-first down the ice channel at up to 140 kilometers per hour. In less than a minute, the breakneck ride ends at the

finish line. Run done, and in the fastest time. Christopher Grotheer is now the former and the new skeleton world champion.

His teammates are also able to celebrate success at the 2021 World Championships: in both the men's and women's events, the German team takes first, third, and fourth place, and in the mixed team competition even claims both gold and silver. This outstanding overall result is not only down to the impressive skills of the athletes, but also the quality of the material: the skeleton sleds are required to comply with clearly defined regulations and must be individually tailored

to the riders. Every change, no matter how small, can influence the running behavior and spell the difference between victory or defeat.

Sports equipment developed to the highest standards

German winter sports athletes receive support in this regard from FES, the German institute for the research and development of sports equipment. The Berlin-based institute sees itself as the technological center of top-level sports for Germany and develops equipment for sports such as canoeing, rowing, cycling, sailing, speed skating – and for



bobsleigh, luge, and skeleton. “Our aim is to develop sleds that have optimum running and sliding properties under a variety of conditions,” explains Erik Zerbe, skeleton project manager at FES. “This requires that we take into consideration aspects such as the riding ability and habits of the athlete, as well as weather, temperature, ice quality, and the characteristics of the track.” In order to achieve a good result, it is necessary to match the required angles, chamfers, surface structures, and track courses on the sled with extreme precision – a very challenging task.

The skeleton sleds are manufactured from stainless and high-strength steels with a thickness of between three and eight millimeters. They consist of cowling, a frame, and two runners. “We can influence the properties and weight of the sports equipment by means of the material thickness and the type of steel used,” says Zerbe. This is important, for example, because the sled and athlete together must not exceed a certain maximum weight so as not to skew the competition. “In addition, of course, the precision of the workmanship plays a decisive role in whether a sled is ultimately suitable for competition or not,” explains the expert.

Leveling: a flexible alternative to in-house machining

The frame of the skeleton sled consists of several longitudinal and transverse struts, as well as base panels. These parts are leveled before assembly to meet the high requirements for straightness and accuracy, and to eliminate tension in the material. However, this step is not performed in-house at FES: “We construct around eight sleds per season for our athletes. With such quantities, it is not economically viable to purchase a leveler,” explains Zerbe. “Furthermore, we work with many different thicknesses and demanding high-strength materials, which also requires a high degree of flexibility from the leveling technology.”

KOHLER has been the reliable technology partner of FES since 2020. The company, based in southern Germany, is not only a leading manufacturer of part leveling machines and strip feeding lines for industry, but also offers contract leveling as a flexible service at its own leveling center. An extensive range of machinery and competent, experienced employees allow the company to fulfill even highly complex or short-term orders and leave customers fully satisfied.

“The quality of the parts we receive from KOHLER is always high.”

Volker Zerbe, Skeleton project manager at FES

The ideal machine for every requirement

KOHLER’s leveling center has part leveling machines of different sizes. Each of these Peak Performer machines is designed for different dimensions and thicknesses. This means that the necessary flexibility is available for all requirements, including the broad range of parts covered by FES. The machines are state-of-the-art and boast equipment such as hydraulic-free direct drives: this makes them particularly energy-efficient, while also being suitable for leveling larger cross-sections. The patented electromechanical leveling gap control facilitates optimum results by reliably keeping the leveling gap constant, even when it comes to complex parts with changing cross sections made of high-strength materials. Extra-wide supporting rollers also provide particularly rigid support for the leveling rollers, which ensures a reliable and precise process.

In order to protect the material to be leveled from contamination, the machines are thoroughly cleaned at regular intervals in the KOHLER leveling center. A major advantage here is the Peak Performer’s advanced



The longitudinal and transverse struts as well as the base panels of the frame are leveled before assembly, in order to satisfy the high requirements for levelness and precision, and to eliminate tension in the material. Photo: German institute for the research and development of sports equipment (FES)

cleaning system, which allows supporting rollers and leveling rollers to be cleaned quickly and easily. “This is particularly important when machining high-tech components such as our sled parts because any scratch or dirt can have serious repercussions later on,” emphasizes Zerbe.

From manufacturing advantage to competitive advantage

The skeleton project manager is fully satisfied with his new technology partner and the results of the contract leveling. “The struts and base panels of our sleds exhibit a very high degree of precision after leveling, even with long lengths and different material grades,” he sums up. “We can use this to simplify the further assembly process because we are required to perform significantly less manual rework.” Leveling also almost entirely eliminates tension in the material. “Our athletes therefore benefit from very clear advantages in competition because they can use the best possible equipment,” Zerbe is delighted to report, adding: “We are already carrying out leveling tests with KOHLER in the luge area too, so there will be additional collaboration here in the near future.”



KOHLER’s leveling center includes several different variants of the state-of-the-art Peak Performer part leveling machine.



The skeleton sleds are manufactured from stainless and high-strength steels with a thickness of between three and eight millimeters. They consist of cowling, a frame, and two runners. Photo: German institute for the research and development of sports equipment (FES)

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