

Evolution of Bulk Handling

SmartGrip®



LIEBHERR

Mode of Operation

SmartGrip operates as an intelligent system which optimises grab filling rates in a self-learning manner and has the potential to increase bulk turnover significantly. Test and analysis in the field have shown an average grab filling rate of 70%. SmartGrip utilizes the remaining 30%.

System

Without any driver interaction the algorithm learns the machine setting and material properties autonomous within the first five lifts. In operation, the self-learning system automatically adjusts its behaviour by recognizing bulk density, compression and granularity as well as current frame conditions like depth of impression or type of grab.

Driver

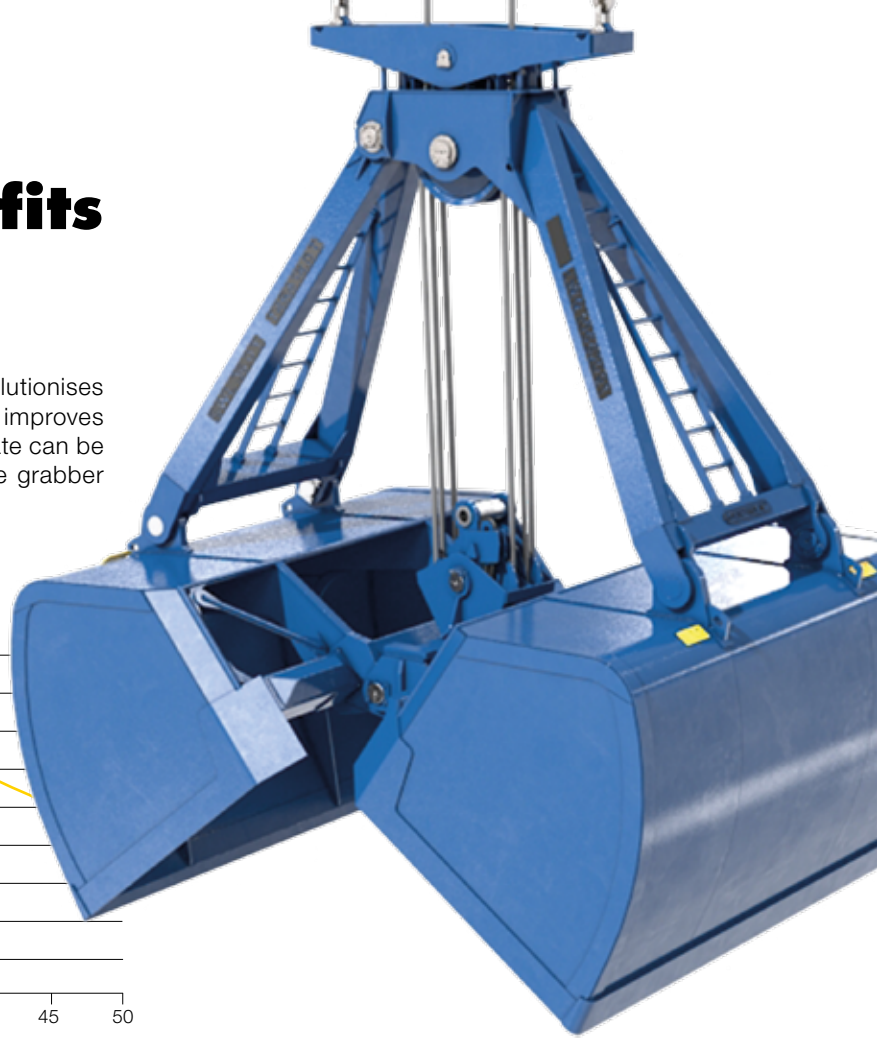
For crane operators the estimation of the material density and the right grabbing angle may turn out to be a real challenge. Using SmartGrip the driver just controls the closing of the grab. The system controls the filling of the grab to suit the load curve of the crane. This leads to a perfect crane utilization without overloads.



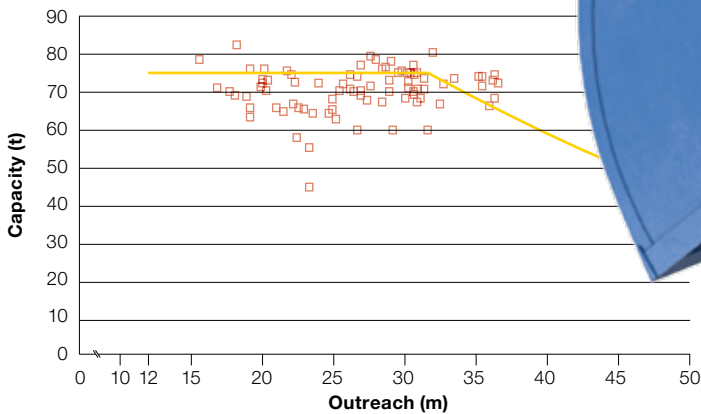
SmartGrip® Benefits

Turnover

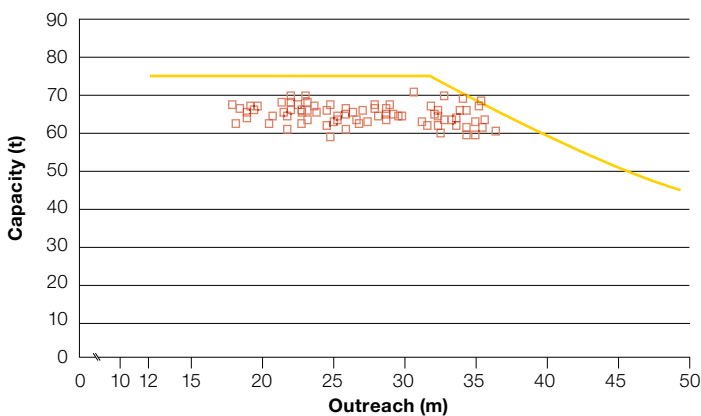
The intelligent SmartGrip grabbing technology revolutionises bulk handling in ports. The self-learning system improves the material handling performance. The handling rate can be increased by up to 30% as the system utilises the grabber capacity in full.



Load Diagram without SmartGrip



Load Diagram with SmartGrip



Lifetime

No Overloads

- Less dynamic influence when handling sticky material: therefore bigger grabs can be used without harming crane structure
- Bigger grab can be used while system fills grab to optimum: that means one grab can handle wide range of materials of different densities

Optimised Filling Rate

- Independent of incident angles
- Grab volume fits to max. outreach

Reduced Cycle Times

- Less time for grab filling / MultiGrip
- Less fuel needed

Reduction of Turnover Variance

- No need to change from a big grab to a small one if overloads accrue. SmartGrip prevents overloads with every grab size and ensures constant turnover.

Driver

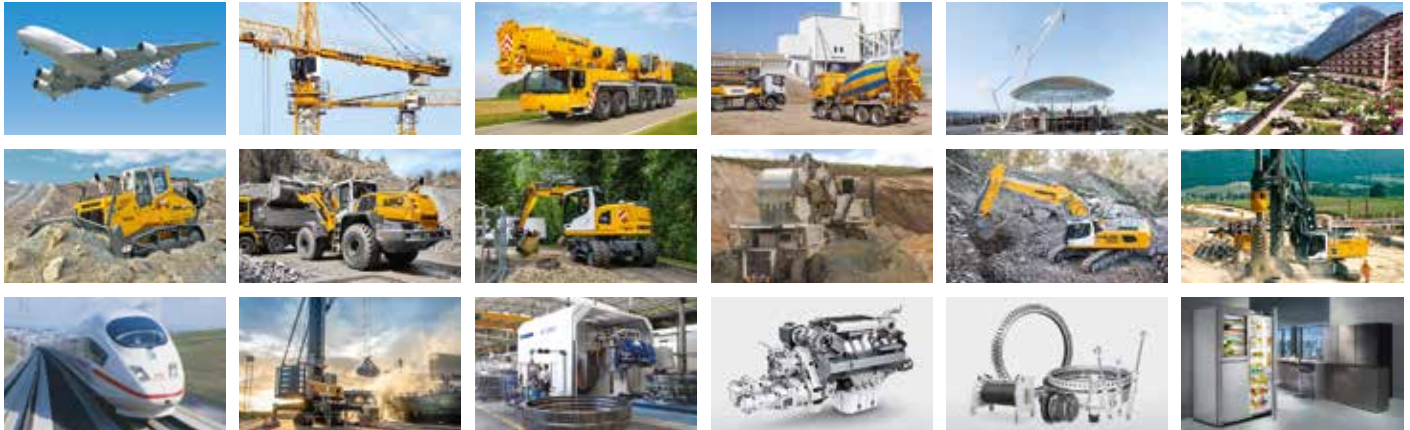
Reduced Stress

- The system adjusts to different materials and densities
- Significant improvement of less skilled drivers

Setting Target Loads Manually

- Avoids overfilling for open grabs
- Can be used to prolong grab's life time
- Can be used to load specific amount of material e.g. 40 tonnes to load lorry

The Liebherr Group of Companies



Wide Product Range

The Liebherr Group is one of the largest construction equipment manufacturers in the world. Liebherr's high-value products and services enjoy a high reputation in many other fields. The wide range includes domestic appliances, aerospace and transportation systems, machine tools and maritime cranes.

Exceptional Customer Benefit

Every product line provides a complete range of models in many different versions. With both their technical excellence and acknowledged quality, Liebherr products offer a maximum of customer benefits in practical applications.

State-of-the-art Technology

To provide consistent, top quality products, Liebherr attaches great importance to each product area, its components and core technologies. Important modules and components are developed and manufactured in-house, for instance the entire drive and control technology for construction equipment.

Worldwide and Independent

Hans Liebherr founded the Liebherr family company in 1949. Since that time, the enterprise has steadily grown to a group of more than 130 companies with about 42,000 employees located on all continents. The corporate headquarters of the Group is Liebherr-International AG in Bulle, Switzerland. The Liebherr family is the sole owner of the company.

www.liebherr.com