

SIAP

# Pioneers of skiving<sup>3</sup> technology



Partnership  
Strategic

SIAP's machine park comprises more than 200 machines – about 30 are from Liebherr.

## Pioneers of skiving<sup>3</sup> technology

**The first LK 500 skiving machine is in use at the Italian gear specialists SIAP. An innovative investment that will increase both productivity and quality.**

The town of Maniago, Italy, is principally known for two things: Knives and cutting tools. The whetstones of cutlers at the Còlvera stream, at the foot of the Carnic Alps, have been operated with hydropower since the 15th century – the start of a big handcraft tradition from which an industrial center developed. Since 1960 SIAP has been manufacturing gears, and since 1988 as part of the international Carraro Group. Gear boxes, axles, and contract manufacturing are the businesses conducted by the Italians.

“We are always growing”, explains COO Paolo De Col. In recent years, the premises underwent constant expansion. “We have to add a new hall practically every year.” This of course also means a continuous expansion of the fleet, which now includes over 200 machines – around 30 of which are from Liebherr. The most recent acquisitions were a LCS 500 generating grinding machine, a LC 300 gear hobbing machine, and the LK 500 gear skiving machine - the first of its kind in a production environment.

# LIEBHERR



The first LK 500 in serial operation at SIAP – another one is already on the wish list.

### Partnership with a long history

“We have a long history with Liebherr. Firstly, two Liebherr companies are our customers, the connection to the group has therefore existed for a very long time. Secondly, we opened a plant in India in 2004, which we equipped with around 25 Liebherr machines” states Paolo De Col. “The parts were manufactured in Germany and assembled in In-

dia. Liebherr Machine Tools India was set up in Bangalore at the same time as our subsidiary. We believe in Liebherr India and Carraro, who was confident of the excellent quality of the machines in our production, released an order of 25 machines, thereby opening up the Indian market.”

In addition, when it comes to gear skiving, SIAP demonstrated its huge confidence in the Kempten-based technologies. The company’s first manufacturing gear skiving machine is in Maniago. “For us, skiving is a new and very interesting topic. Together with Liebherr, we have the opportunity to jointly develop a new machine with a new process. Liebherr is familiar with all challenges of mass production – we have access to the developers and can bring about improvements, both to the machine, and to the process and tools.” The Liebherr skiving<sup>3</sup> (machine, tool, and technology) approach is also very effective in the collaboration with SIAP.

### Focus on costs and quality

Luca Cadelli, sales manager of SIAP, responds to the question about why SIAP is mainly introducing the new technology: “The market requires this machining method. Gear skiving promises better quality while reducing costs. This combination is irresistible for our customers, because everyone pays attention to costs and quality.” Cadelli and De Col expect that a successful introduction of the skiving<sup>3</sup> process will be critical for gaining a competitive edge in the medium term.



At SIAP the LK 500 produces, e.g. various internal gears – a classic application for gear skiving, as here only the considerably slower gear shaping technology can be used. “We are extremely satisfied with the production speed”, reports the COO. “The machine works roughly five times faster than our shaping machines. If we want to expand our production, we compare the procurement of a skiving machine to the purchase of three shaping machines in the latest generation.” Other costs are included in this comparison: number of operators, installation space, tool costs and set-up times. “A single machine has clear benefits of course.” Even without the gear skiving machine, SIAP currently has a daily production capacity of 3,000 internal gears.

### Skiving will partly replace the broaching process

SIAP uses five broaching machines for large quantities. As the broaches are very expensive for low volumes due to the high tool and sharpening costs, SIAP uses broaching for straight gears. The company expects a partial replacement of the process in the future with skiving. “In the future broaching will only be worthwhile for mass productions of part numbers with high volume. Especially for large toothed gears, the tool costs will decide whether we broach or skive”, predicts Paolo De Col. From a certain size the broaching tools become so expensive that the process is no longer worthwhile.

Another decisive benefit of skiving: The quality remains consistently excellent across the entire tool life. “The process is completely stable. Skiving thus satisfies four requirements: quality, cost benefit, consistency and reliability of the pro-



cess.” As SIAP not only produces toothed gears, but also complete gearboxes – for example for forklifts – the company has extensive process and quality competence. The latter is also reflected in the production equipment: Test engineers examine the products in labs for metallurgy, measurements, and purity. One project is “clean production”, the contamination-free production for preferably pure components.

“We are always open to innovative approaches and technologies”, highlights Paolo De Col. “We are therefore also happy to pursue the skiving<sup>3</sup> path with Liebherr.” A display of trust which Liebherr appreciates and led to a fruitful partnership. The machine should be fully integrated in production by the end of the year and manufactures the entire range of parts. Then SIAP will decide about more procurements – another LK 500 is also on the wish list.

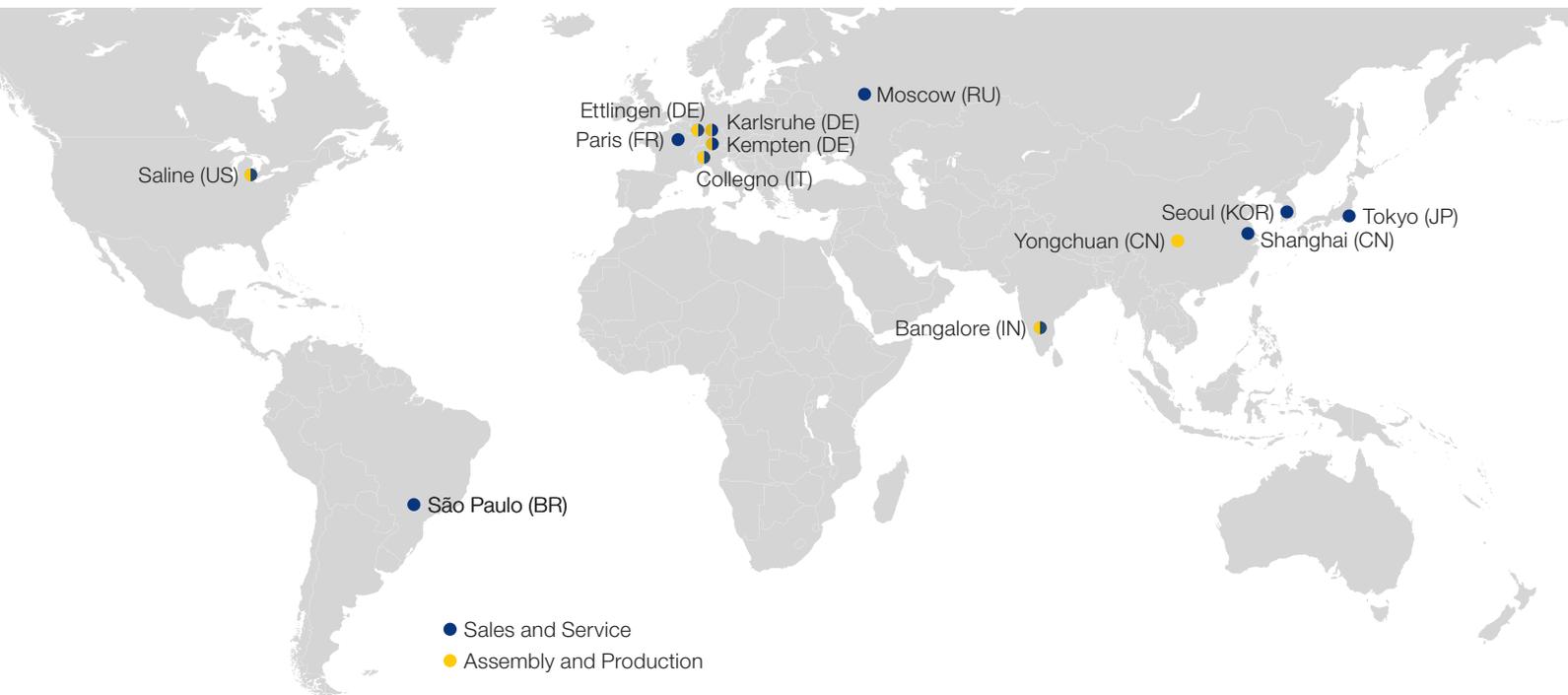


## SIAP



<b>Industries:</b>	Automotive, Trucks, Agricultural Equipment, Construction Equipment, Renewable Energies, Rail, Industrial, Material Handling
<b>Company size:</b>	About 350 employees
<b>Founded:</b>	1960
<b>Headquarters:</b>	Maniago, Italy
<b>Parent company:</b>	Carraro Group
<b>COO:</b>	Paolo De Col
<b>Website:</b>	<a href="http://www.siapgears.com">www.siapgears.com</a>
<b>Liebherr machines at work:</b>	30

# Your solution provider



## Liebherr-Verzahntechnik GmbH Gear Technology and Automation Systems

Kaufbeurer Strasse 141  
87437 Kempten  
Germany  
☎ +49 831 786-0  
☎ +49 831 786-1279  
info.lvt@liebherr.com

## Liebherr-Verzahntechnik GmbH

Plant Ettlingen / Gear Tools  
Hertzstrasse 9-15  
76275 Ettlingen  
Germany  
☎ +49 7243 708-0  
☎ +49 7243 708-685  
tools.lvt@liebherr.com

## Liebherr-Utensili S.r.l.

Via Nazioni Unite 18  
10093 Collegno TO  
Italy  
☎ +39 114 248711  
☎ +39 114 559964  
info.lut@liebherr.com

## Liebherr-Verzahntechnik GmbH

6 Place Du Village  
92230 Gennevilliers  
France  
☎ +33 1 412110-35  
info-machineoutil@liebherr.com

## Liebherr-Gear Technology, Inc. Liebherr Automation Systems Co.

1465 Woodland Drive  
Saline, MI 48176-1259  
USA  
☎ +1 (734) 429-7225  
☎ +1 (734) 429-2294  
info.lgt@liebherr.com

## Liebherr Brasil Guindastes e Máquinas Operatrizes Ltda.

Rua do Rocio, 288 Salas 81 / 82  
Vila Olímpia  
04552-000 São Paulo - SP  
Brazil  
☎ +55 11 3538 1509  
info.lbr@liebherr.com

## Liebherr Machine Tools India Private Limited

353/354, 4th Main, 9th Cross,  
4th Phase  
Peenya Industrial Area  
Bangalore - 560 058  
India  
☎ +91 80 41 1785-91  
☎ +91 80 41 272625  
info.mti@liebherr.com

## Liebherr Machine Tools and Automation Korea Ltd.

174-30, Saneop-ro, Gwonseon-gu  
Suwon-si, Gyeonggi-do  
Korea  
☎ +82 31 294 9888  
info.mak@liebherr.com

## Liebherr Machinery Service (Shanghai) Co. Ltd.

Building 1, 88 Maji Road  
Waigaoqiao FTZ  
200131 Shanghai  
P.R. China  
☎ +86 21 2893 8088  
info.lms@liebherr.com

## Liebherr Japan Co. Ltd

3-7-8, Kudan-Minami  
Chiyoda-Ku, Tokyo  
102-0074  
Japan  
☎ +81 3 6272-8645  
info.lvt.ljc@liebherr.com

## OOO Liebherr-Russia

Bolshoy Palashevskiy pereulok 13/2  
123104 Moscow  
Russia  
☎ +7 495 280 18 91  
☎ +7 495 280 18 92  
info.lru@liebherr.com

