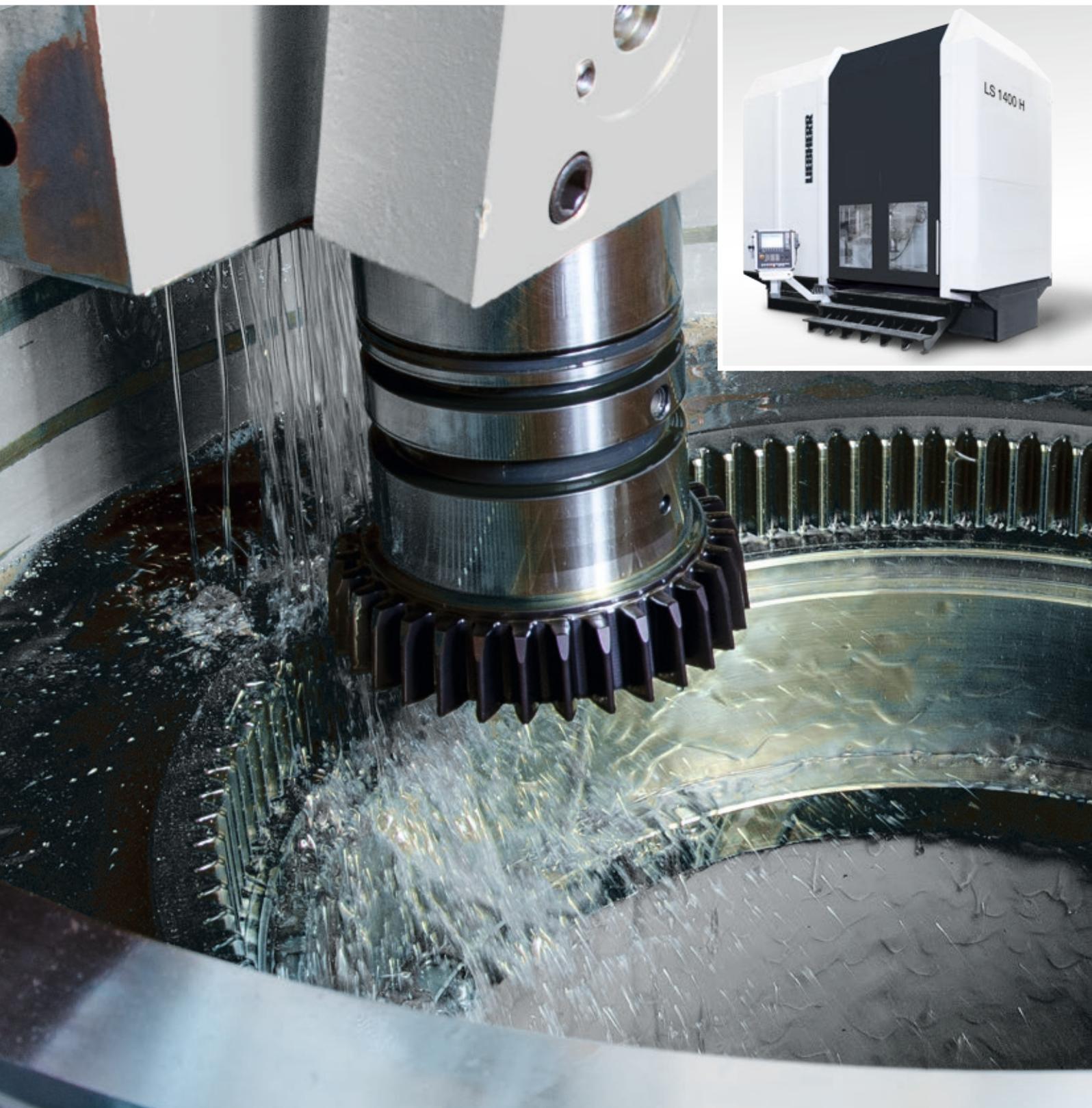


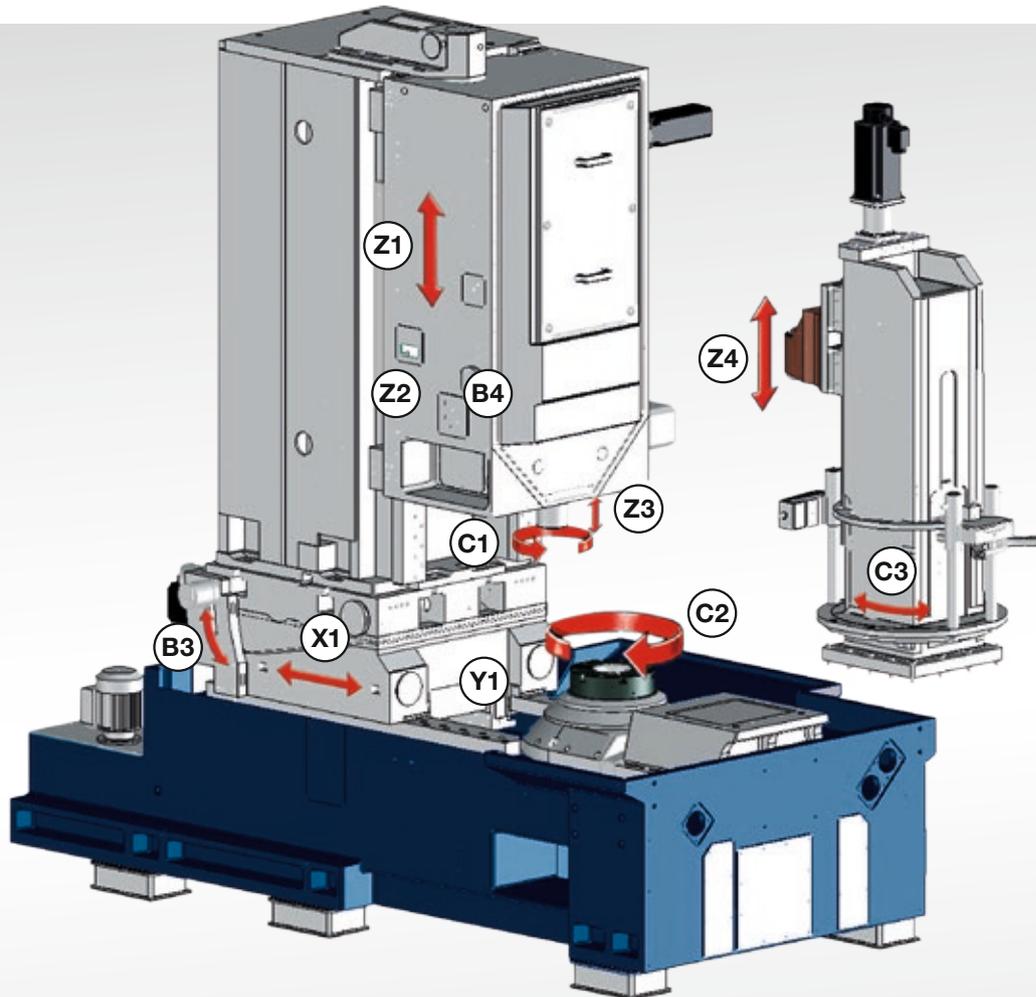
# Universal-Gear-Shaping Machines

**LS 600-1600 F/E and LS 800-1600 H**



# LIEBHERR

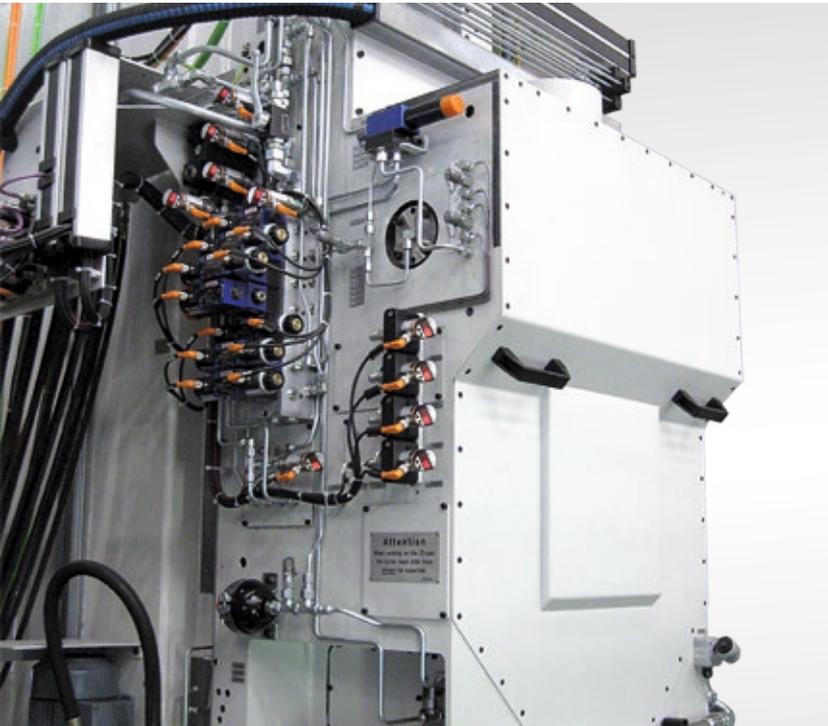
# The Machine Concept



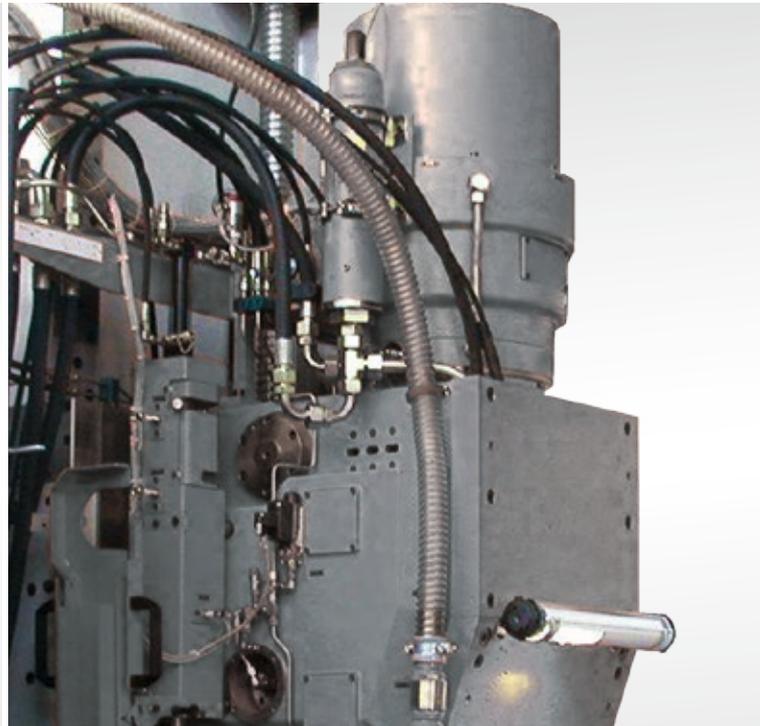
## Axis

- X1 - Radial travel main column
- Y1 - Column offset
- Z1 - Stroke position adjustment
- Z2 - Stroke length adjustment
- Z3 - Stroke travel tool
- Z4 - Vertical travel tailstock arm
- B3 - Swivel of column
- B4 - Tool relief motion
- C1 - Rotary motion tool
- C2 - Rotary motion work piece
- C3 - Rotary motion ring loader





Electromechanical shaping head



Hydraulic shaping head

The Liebherr-Gear Shaping Machines are a synonym for gear wheel production at the highest stage and stand for high quality, economy and productivity. This is not least due to the modular platform system, which enables the alternatives of different platforms. By selecting the corresponding modules, the machine can be adapted optimal to the respective process. Depending on the corresponding application, it is possible to select between a electromechanical and hydraulic shaping head. The hydraulic shaping head is used for machining of big gears and big module. The electromechanical shaping head provides advantages at high stroke rates and in connection with the NC-helical guide. Furthermore, the constructive execution enables the production of the most various components with minimum setup effort.

### Characteristics

- Moveable cutter head slide
- 6 NC axes
- various no. of stroke ranges executable
- Fast return stroke (optional)
- Stroke length up to 440 mm (optional)
- Automatic back-off cam switching (optional)
- Up to 3 different back-off cams

### The machine bed as a platform

Performance and accuracy require a mechanically rigid and themally stable machine. The machine bed with its thermo-symmetrical design meets the high demands for the different gear cutting technologies.

### The machine table

The tables are executed with a wearless high-precision hydrostatic bearing. Double worm drives, free from backlash, are exclusively used as table drive.



Machining Examples

### **SSM (Shuttle Stroke Method)**

The SSM-method was developed in order to extend the availability of Gear Cutting Machines. Herewith, oversized cutting widths, being larger than the maximum working range of the machine, can be realized. The required cutting width is divided into several partial lengths with the corresponding stroke lengths. With corresponding infeed, these partial lengths are machined subsequently until the total cutting width is reached.

# Technical Data

## LS F-Gear Shaping Machines with mechanically driven shaping heads

	LS F	600	700	800	1000	1200	1400	1600
Max. normal module	mm	12	12	12	12	12	12	12
Max. cutting diameter	mm	600	700	800	1,000	1,200	1,400	1,600
Stroke length	mm	180/240	180/240	180/240	180/240	180/240	180/240	180/240
Centre distance cutter spindle/work table	mm	0 ... 480	0 ... 530	0 ... 600	0 ... 650	0 ... 700	135... 1,030	135... 1,130
Axis angle cutter spindle/work table in conjunction with column swivel axis -1 ... +12°	deg.	±0.15/±0.28/±0.4 (according to shaping head)						
Stroke position range cutter head slide	mm	500/950	500/950	500/950	500/950	500/950	400/850	400/850
Stroke speeds	DS/min	800/600	800/600	800/600	800/600	800/600	800/600	800/600
Feed rotary axis cutter	mm/min	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Total weight	appr. kg	21,000	22,000	22,000	23,000	24,000	24,000	26,000

## LS E-Gear Shaping Machines with mechanically driven shaping heads

	LS E	600	700	800	1000	1200	1400	1600
Max. normal module	mm	8/12	8/12	8/12	8/12	8/12	8/12	8/12
Max. cutting diameter	mm	600	700	800	1,000	1,200	1,400	1,600
Stroke length	mm	120/240	120/240	120/240	120/240	120/240	120/240	120/240
Centre distance cutter spindle/work table	mm	0 ... 480	0 ... 530	0 ... 600	0 ... 650	0 ... 700	135... 1,030	135... 1,130
Axis angle cutter spindle/work table in conjunction with column swivel axis -1 ... +12°	deg.	±0.15/±0.28/±0.4 (according to shaping head)						
Stroke position range cutter head slide	mm	650/750	650/750	650/750	650/750	650/750	550/650	550/650
Stroke speeds	DS/min	1,200/1,000	1,200/1,000	1,200/1,000	1,200/1,000	1,200/1,000	1,200/1,000	1,200/1,000
Feed rotary axis cutter	mm/min	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Total weight	appr. kg	21,000	22,000	22,000	23,000	24,000	24,000	26,000

## LS H-Gear Shaping Machines with hydraulically driven shaping heads

	LS H	800	1000	1200	1400	1600
Max. normal module	mm	16/22	16/22	16/22	16/22	16/22
Max. cutting diameter	mm	800	1,000	1,200	1,400	1,600
Stroke length	mm	270/440	270/440	270/440	270/440	270/440
Centre distance cutter spindle/work table	mm	0 ... 600	0 ... 700	0 ... 820	50 ... 1,000	50 ... 1,100
Stroke position range cutter head slide	mm	400 ... 1,400 (according to machine configuration)				
Stroke speeds	DS/min	270/200	270/200	270/200	270/200	270/200
Feed rotary axis cutter	mm/min	4,000	4,000	4,000	4,000	4,000
Total weight	appr. kg	22,000	22,000	23,000	24,000	26,000

# Machine Tools and Automation Systems from Liebherr

Liebherr employs roughly 1200 staff in the area of machine tools and automation technology and has production facilities in Kempten and Ettlingen (Germany), Collegno (Italy), Saline (Michigan, USA) and Bangalore (India). They are supported by expert and reliable marketing and service specialists at a large number of locations worldwide.

With over sixty years of industrial experience, Liebherr is one of the world's leading manufacturers of CNC gear cutting machines, gear cutting tools and automation systems. The company's innovative products are the result of pioneering ideas, highly qualified staff and state-of-the-art manufacturing systems at each of their locations. They are characterised by economy, ease of use, quality and reliability in combination with a high degree of flexibility.



## System Solutions in the Area of Machine Tools

Included in the production programme are gear hobbing machines, gear shaping machines and generating- and profile grinding-machines, all noted for their high degree of stability and availability. Particular importance is attached to the energy efficiency of the machines.

Gear cutting machines from Liebherr are supplied to renowned manufacturers of gears and gearboxes and large-scale slewing rings worldwide. They are in demand primarily from the automotive and construction machinery industries and also increasingly from the wind power industry for the manufacture of gears for wind turbines.

## High Quality Gear Cutting Tools

Liebherr manufactures high quality, precision tools for the soft and hard machining of gears and all Liebherr gear cutting machines are fitted with Liebherr tools. The range also includes Lorenz shaping tools and products customised for specific customer applications.

## Automation Systems for a Broad Range of Applications

Liebherr has a wide range of products for linear robots, pallet-handling systems, conveying systems and robot integration for projects in all areas of production and can provide above-average availability of systems.

[www.liebherr.com](http://www.liebherr.com)

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