Crawler Excavator

R 960 SME
Litronic®

Operating Weight with Backhoe Attachment:	**58,980 – 60,600 kg**
Operating Weight with Shovel Attachment:	**61,100 – 61,800 kg**
Engine Output:	**250 kW/340 HP**
Bucket Capacity:	**3.00 – 3.50 m³**
Shovel Capacity:	**3.50 m³**

LIEBHERR

Crawler Excavator R 960 SME

Super Mass Excavation

Undercarriage

To meet the requirements of a super mass excavator, the R 960 SME is equipped with the undercarriage of the next larger excavator. This undercarriage also features the following characteristics:

- Double grouser, beveled track pads as standard for better working and driving conditions in every types of ground
- Dual-pivot carrier rollers for increased reliability and long-term durability

Equipment and working tool

Equipment on the R 960 SME is designed to withstand the stresses and demands of a mass excavator. This equipment includes:

- Stick and bucket cylinders with increased diameter and purposely designed equipment result in higher breakout and digging forces
- Boom and stick with locking plate on internal side, increasing service life
- Optional equipment includes cylinder protection, cab front guards and much more
- HD bucket standard for increased service life and others types as option

Operator's cab

The new operator's cab features exceptional soundproofing, air conditioning and is standard equipped with a pneumatic seat with heating. Other improvements equipped standard:

- 7" high resolution color touchscreen
- Fully automated A/C with 13 air vents
- Cab is mounted on viscoelastic studs
- Optional equipment includes a FOPS and FGPS front windshield guard
- One-piece impact resistant window (optional)

Uppercarriage

The uppercarriage has been designed to increase visibility to the rear of the machine. To improve this visibility even more and increase safety during movements, the machine is equipped as standard with a backup camera mounted in the counter-weight. Additional features of this uppercarriage are:

- A new engine with increased power, compared to the R 956, that complies with stage IIIB/Tier 4i emissions standards
- Heavy counter-weight, for greater stability and performance

Technical Data

Engine

Rating per ISO 9249	250 kW (340 HP) at 1,800 RPM
Model	Liebherr D 936 A7
Type	6 cylinder in-line
Bore/Stroke	122/150 mm
Displacement	10.52 l
Engine operation	4-stroke diesel Common-Rail, bi-turbo exhaust-gas recirculation (eagr)
Exhaust gas treatment	particle filter with active regeneration emission standard stage IIIB/Tier 4i
Cooling	water-cooled and integrated motor oil cooler, after-cooled and fuel cooled
Air cleaner	dry-type air cleaner with pre-cleaner, primary and safety elements
Fuel tank	800 l
Electrical system	
Voltage	24 V
Batteries	2 x 180 Ah/12 V
Starter	24 V/7.8 kW
Alternator	three phase current 28 V/100 A
Engine idling	sensor-controlled
Motor management	connection to the integrated excavator system controlling via CAN-BUS to the economical utilisation of the service that is available

Hydraulic System

Hydraulic pump for attachment and travel drive	two Liebherr variable flow, swash plate pumps
Max. flow	2 x 350 l/min.
Max. pressure	350 bar
Pump regulation	electro-hydraulic with electronic engine speed sensing regulation, pressure compensation, flow compensation, automatic oil flow optimizer
Hydraulic pump for swing drive	reversible, variable flow, swash plate pump, closed-loop circuit
Max. flow	211 l/min.
Max. pressure	355 bar
Hydraulic tank	380 l
Hydraulic system	670 l
Hydraulic oil filter	2 full flow filters in return line with integrated fine filter area (5 µm)
Hydraulic oil cooler	compact cooler for water cooler, after-cooler, fuel cooler and transmission pump oil, sandwiched with cooler for oil and condenser of air-conditioning with hydrostatically controlled fan drives
MODE selection	adjustment of engine and hydraulic performance via a mode pre-selector to match application for especially economical and environmentally friendly operation or for maximum digging performance and heavy-duty jobs
RPM adjustment	stepless adjustment of engine output via RPM at each selected mode
Tool Control	10 preadjustable pump flows and pressures for add-on tools

Hydraulic Controls

The controlling is conducted via the integrated excavator system technology, input and output modules, communicated via the CAN-BUS with the electronic central unit.

Power distribution	via control valves in single block with integrated safety valves
Flow summation	to boom and stick
Closed-loop circuit	for uppercarriage swing drive
Servo circuit	
Attachment and swing	proportional via joystick levers
Travel	– proportional via foot pedals or removable hand levers – speed pre-selection
Additional functions	via foot pedals or joystick toggle switch

Swing Drive

Drive by	Liebherr swash plate motor, shockless and anti-reaction
Transmission	Liebherr compact planetary reduction gear
Swing ring	Liebherr, sealed single race ball bearing swing ring, internal teeth
Swing speed	0 – 6.1 RPM stepless
Swing torque	165 kNm
Holding brake	wet multi-disc (spring applied, pressure released)
Option	pedal controlled positioning brake

Operator's Cab

Cab	individual windscreens or featuring a slide-in sub-part under the ceiling, work headlights integrated in the ceiling, a door with a side window (can be opened on both sides), large stowing and depositing possibilities, shock-absorbing suspension, sounddamping insulating, tinted laminated safety glass, separate window shades for the sunroof window and windscreen, 12 V plug, storage bins, lunchbox, cup holder
Operator's seat	Liebherr-Comfort seat, airsprung with automatic weight adjustment, vertical and horizontal seat damping including consoles and joysticks. Seat and armrests adjustable separately and in combination, seat heating as standard
Control system	arm consoles, swinging with the seat
Operation and displays	large high resolution colour display with self-explanatory operation via touch screen, video, versatile adjusting, control and monitoring facilities, e.g. climate control, implement and tool parameters
Air-conditioning	standard automatic air-conditioning, ambient air function, fast de-icing and demisting at the press of a button, air vents can be operated via a menu; ambient air and fresh air filters can be easily replaced and are accessible from the outside; heating-cooling unit, designed for extreme outside temperatures, sensors for solar radiation, inside and outside temperatures
Noise emission	
ISO 6396	L_{pA} (inside cab) = 72 dB(A)
2000/14/EC	L_{WA} (surround noise) = 106 dB(A)

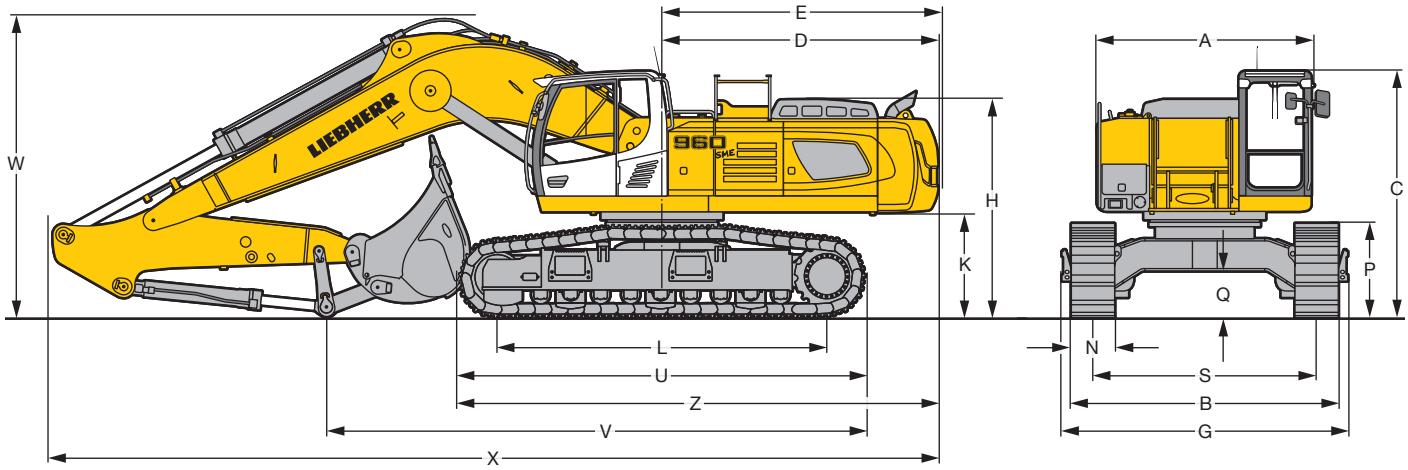
Undercarriage

S-HD	gauge 3,100 mm
Drive	Liebherr swash plate motors with integrated brake valves on both sides
Transmission	Liebherr planetary reduction gears
Travel speed	low range – 3.0 km/h high range – 3.6 km/h
Net drawbar pull on crawler	478 kN
Track components	D 8 K, maintenance-free
Track rollers/Carrier rollers	9/2
Tracks	sealed and greased
Track pads	double grouser
Digging locks	wet multi-discs (spring applied, pressure released)
Brake valves	integrated into travel motor
Lashing eyes	integrated

Attachment

Type	combination of resistant steel plates and cast steel components
Hydraulic cylinders	Liebherr cylinders with special seal-system, shock protection
Pivots	sealed, low maintenance
Lubrication	automatic central lubrication system (except link and tilt geometry)
Hydraulic connections	pipes and hoses equipped with SAE split-flange connections
Bucket	standard equipped with Liebherr tooth system

Dimensions



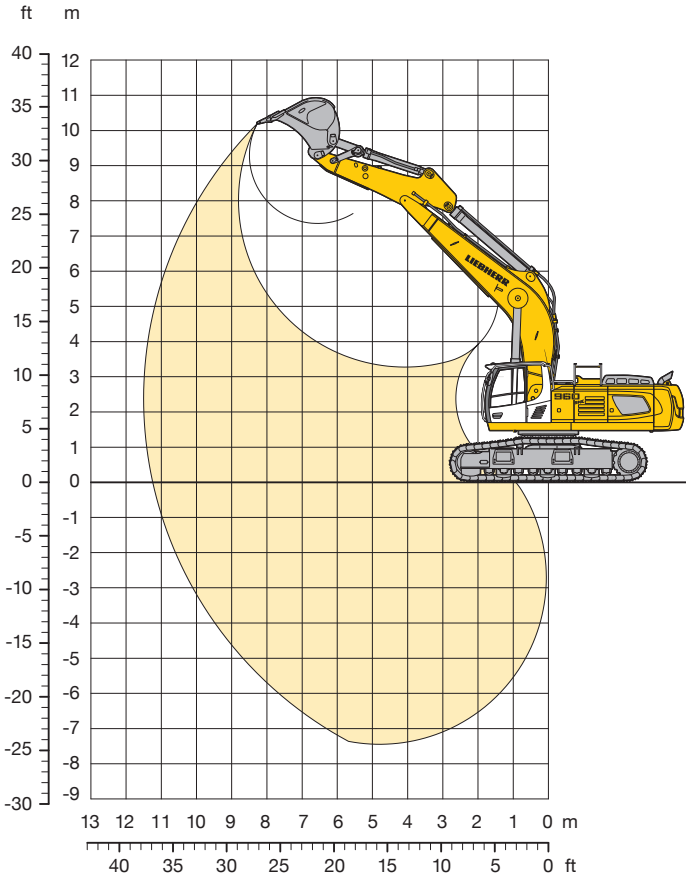
			mm
A*			2,970
C			3,420/3,615**
D			3,830
E			3,850
H			3,030
K			1,440
L			4,575
P			1,315
Q			655
S			3,100
U			5,695
Z			6,680
N	500	600	750
B	3,710	3,710	3,850
G	3,960	3,960	3,960

* without door stop device and spacer
** with FOPS top guard

Mono Boom 6.70 m SME **Stick Length 2.80 m SME**	mm
V	7,500
W	4,200
X	12,350

Backoe Bucket

with Mono Boom 6.70 m SME



Digging Envelope

Stick length	m	2.80 SME
Max. digging depth	m	7.45
Max. reach at ground level	m	11.25
Max. dump height	m	7.35
Max. teeth height	m	10.20
Digging force ISO	kN	287
	t	29.3
Breakout force ISO	kN	346
	t	35.3

Operating Weight and Ground Pressure

Operating weight includes basic machine with mono boom SME 6.70 m, stick SME 2.80 m and bucket HD 3.25 m³ (3.400 kg).

Undercarriage		S-HD		
Pad width	mm	500	600	750
Weight	kg	58,950	59,650	60,600
Ground pressure	kg/cm²	1.19	1.00	0.81

Buckets Machine stability per ISO 10567* (75% of tipping capacity)

	Cutting width mm	Capacity ISO 7451 m3	Weight kg	S-HD-Undercarriage SME-Attachment
HDV[1]	1,950	3.00	3,850	□
HD[2]	2,100	3.25	3,400	□
	2,250	3.50	3,500	△

* Indicated loads are based on ISO 10567 max. stick length, lifted 360° on firm

[1] HDV bucket with teeth Z 70 (appropriate for materials above classification 6, according to VOB, Section C, DIN 18300)

[2] HD bucket with teeth Z 70 (appropriate for materials above classification 6, according to VOB, Section C, DIN 18300)

Other backhoes available on request

Max. material weight □ = ≤ 1.8 t/m³, △ = ≤ 1.65 t/m³

Lift Capacities

with Mono Boom 6.70 m SME

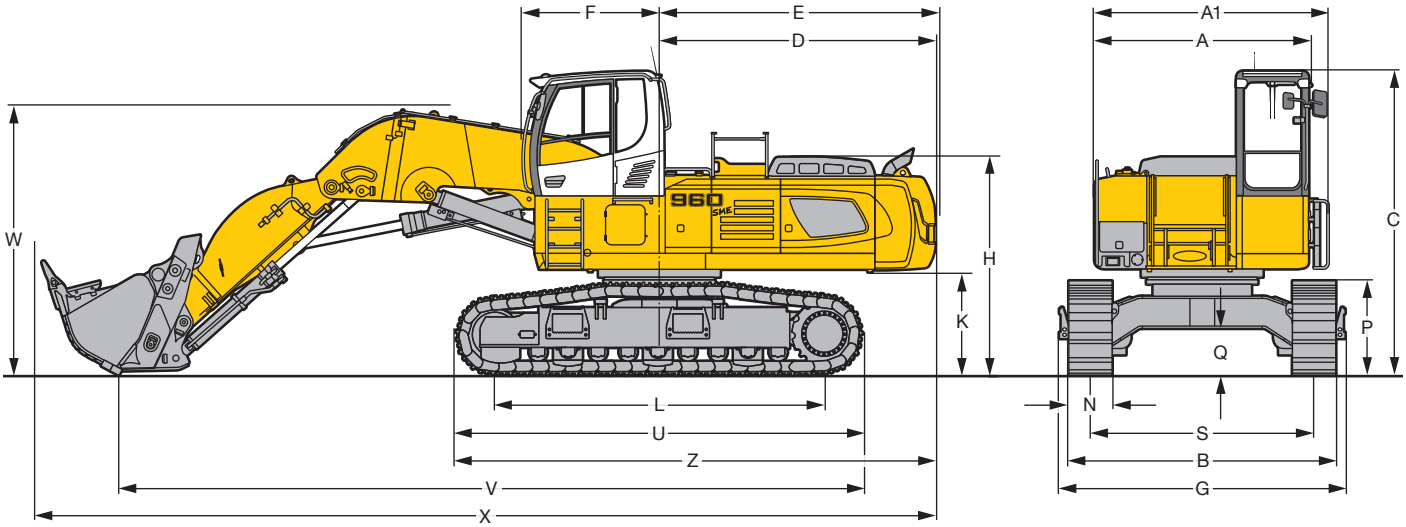
Stick 2.80 m SME

m	Under-carriage	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m				m
9.0	S-HD											10.1*	10.1*	6.9
7.5	S-HD							10.1*	10.1*			9.2*	9.2*	8.1
6.0	S-HD							10.5*	10.5*			8.9*	8.9*	8.9
4.5	S-HD			18.6*	18.6*	13.6*	13.6*	11.3*	11.3*	10.1	10.2*	8.9*	8.9*	9.4
3.0	S-HD					15.6*	15.6*	12.4*	12.4*	9.8	10.7*	8.8	9.2*	9.7
1.5	S-HD			13.9*	13.9*	16.6	17.1*	12.2	13.3*	9.5	11.1*	8.6	9.8*	9.6
0	S-HD			23.3*	23.3*	16.1	17.7*	11.8	13.7*	9.3	11.3*	8.8	10.7*	9.4
-1.5	S-HD	20.1*	20.1*	23.0*	23.0*	16.0	17.3*	11.7	13.6*			9.5	11.0*	8.8
-3.0	S-HD	27.2*	27.2*	20.7*	20.7*	15.9*	15.9*	12.0	12.3*			11.1	11.2*	8.0
-4.5	S-HD	21.5*	21.5*	16.7*	16.7*	12.7*	12.7*					10.9*	10.9*	6.6

Height **Can be slewed though 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The load values are quoted in tons (t) at stick end (without bucket), and may be swung 360° on firm and even ground. Adjacent values are valid for the undercarriage when in the longitudinal position. Capacities are valid for 600 mm wide double grouser pads. Indicated loads are based on ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity (indicated via *). Without bucket cylinder, link and lever the lift capacities will increase by 700 kg. Lifting capacity of the excavator is limited by machine stability and hydraulic capacity.
According to European Standard, EN 474-5: In the European Union excavators have to be equipped with an overload warning device, a load diagram and automatic safety check valves on hoist cylinders and stick cylinder(s), when they are used for lifting operations which require the use of lifting accessories.

Dimensions Front Shovel

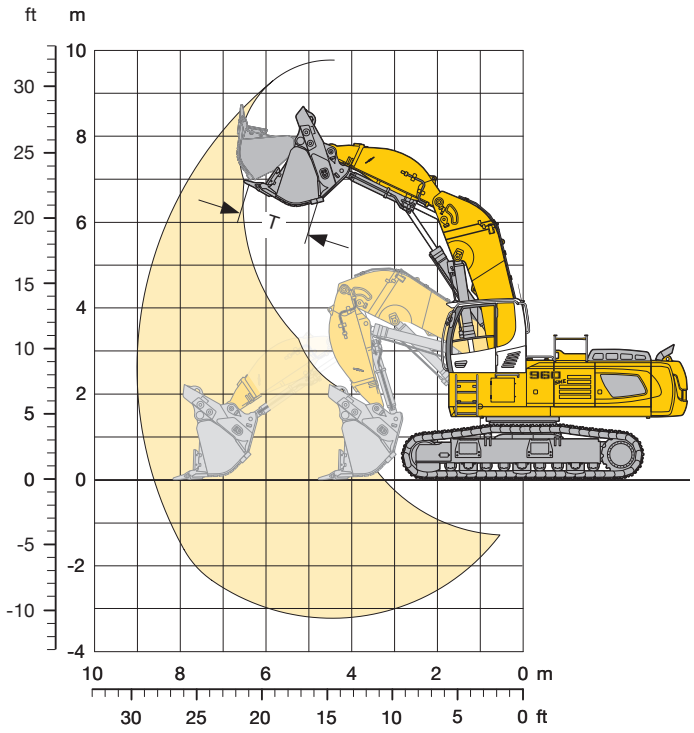


	mm
A*	2,970
A1	3,240
C	4,220/4,415**
D	3,830
E	3,850
F	1,920
H	3,030
K	1,440
L	4,575
P	1,315

	mm		
Q			665
S			3,100
U			5,695
Z			6,680
N	500	600	750
B	3,710	3,710	3,850
G	3,960	3,960	3,960
V			7,050
W			3,450
X			11,350

* without door stop device and spacer
** with FOPS top guard

Front Shovel



Digging Envelope

Max. reach at ground level	8.60 m
Max. dump height	6.35 m
Max. crowd length	3.40 m
Bucket opening width T	1,650 mm
Max. crowd force	435 kN/44.3 t
Max. crowd force at ground level	275 kN/28.0 t
Max. breakout force	355 kN/36.2 t

Operating Weight and Ground Pressure

Operating weight includes basic machine with cab elevation, shovel attachment and front shovel 3.50 m³ (6,150 kg), level II.

Undercarriage		S-HD	
Pad width	mm	500	600
Weight	kg	61,100	61,800
Ground pressure	kg/cm²	1.08	0.95

Front Shovels

Cutting width	Capacity ISO 7451	Weight	Wear kit level	S-HD-Undercarriage
mm	m³	kg		Shovel Attachment
2,450	3.50	5,650	I	□
2,450	3.50	6,150	II	□
2,450	3.50	6,600	III	□

Level I: For non-abrasive materials, such as limestone without flint inclusion, shot material or easily breakable rock, i.e., deteriorated rock, soft limestone, shale, etc.

Level II: For pre-blasted heavy rock, or deteriorated, cracked material (classification 3 to 4, accord. to DIN 18300)

Level III: For highly-abrasive materials such as rock with a high silica content, sandstone etc.

Max. material weight □ = ≤ 1.8 t/m³

Standard Equipment

Undercarriage

- Lashing eyelets
- Lifetime-lubricated track rollers
- Track guide at each track frame (three pieces)
- Tracks sealed and greased

Uppercarriage

- Engine hood with lift help
- Extended tool kit
- Fuel tank cap, lockable
- Handrails, non slip surfaces
- Heavy counterweight
- Liebherr full-automatic central lubrication system (except connecting link for bucket kinematics)
- Maintenance-free swing brake lock
- Sound insulation
- Toolbox lockable

Hydraulics

- Filter with integrated fine filter area
- Hydraulic tank shut-off valve and pumps
- Liebherr hydraulic oil
- Pressure storage for controlled lowering of equipment with engine turned off
- Pressure test ports for hydraulic
- Stepless work mode selector

Engine

- After-cooled
- Common-Rail system injection
- Conform with stage IIIB / Tier 4i emission standard
- Fuel filter and water separator
- Liebherr particle filter
- Sensor-controlled automatic engine idling
- Turbo charger

Operator's Cab

- 7" colour multifunction display with touchscreen
- All tinted windows
- Automatic air conditioning
- Cigarette lighter and ashtray
- Coat hook
- Completely retractable windscreen
- Cup holder
- Dome light
- Door with sliding windows
- Emergency exit rear window
- Front windscreen (bottom) retractable
- Fuel consumption indicator
- Headlights (two pieces, Halogen)
- Hydro mounts
- LiDAT Plus (enhanced Liebherr data transfer system)*
- Mechanical hour meters, readable from outside the cab
- Operator seat Liebherr-Comfort
- Preparation for radio installation
- Rain hood over front window opening
- Rear space monitoring with camera
- Roll-down sun blind
- Rubber floor mat
- Seat belt
- Storage bin
- Storage space
- Sunroof, right window and windshield with safety glass
- Wiper/washer

Attachment

- Headlight on boom (both-sided, Halogen)
- Protection plate for boom and stick
- Safety check valves hoist cylinder

* optionally extendable after one year

Individual Options

Undercarriage

- Protection plate for wrecking ball operation
- Reinforced cover plate and base plate for centre section
- Track guide at each track frame (four pieces)

Uppercarriage

- Customized colors
- Refuelling pump (electrical)
- Reversible fan drive
- Rock protection (swing gear and lubrication pipes)

Hydraulics

- Bypass filter
- Liebherr hydraulic oil, biodegradable
- Liebherr hydraulic oil, specially for warm and cold regions

Engine

- Air pre-filter with dust trap
- Automatic engine shut-down (adjustable time-period)
- Fuel pre-heating system

Operator's Cab

- Additional headlights front and/or rear
- Amber beacon
- Auxiliary heater with weekly timer
- Electric cool box (12 V)
- Electronic drive away lock
- Engine shut-down (emergency stop) in cab
- FGPS front guard
- Fire extinguisher
- Footrest
- FOPS top guard
- Headlights (two pieces, Xenon)
- Impact resistant front window (one piece, fixed installation – can not be opened)
- Impact resistant front window (two pieces, fixed installation – can not be opened)
- Impact resistant glass panel in roof
- Operator seat Liebherr-Premium
- Proportional controls Liebherr
- Radio Comfort
- Roof wiper
- Sun visor
- Travel alarm system

Attachment

- Headlights on boom (Xenon)
- High pressure circuit
- Hydraulic or mechanical quick coupler
- Liebherr automatic lubrication system for link geometry
- Liebherr line of buckets
- Liebherr tooth system
- LIKUFIX
- Middle pressure circuit
- Overload warning device
- Piston rod guard for bucket cylinders
- Safety check valves stick cylinder
- Security for hoist cylinder in grab or hammer operation
- Tool Control

Options and/or special attachments, supplied by vendors other than Liebherr, are only to be installed with the knowledge and approval of Liebherr in order to retain warranty.

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 application.

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 over 38,000 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

Printed in Germany by Schirmer RG-BK-RP LFR/SP 11213563-3-03.13_enGB

Liebherr-France SAS
2 avenue Joseph Rey, B.P. 90287, FR-68005 Colmar Cedex
☎ +33 389 21 30 30, Fax +33 389 21 37 93
www.liebherr.com, E-Mail: info.lfr@liebherr.com
www.facebook.com/LiebherrConstruction