

Attachments for material-handling technology



LIEBHERR

Attachments tools Everything from one source



Liebherr attachments for hydraulic excavators were developed as problem solutions for the most widely differing operational situations. The well-matched range offers a large number of different attachments, such as grapples, quick-change systems, and special attachments for very different applications. Equipped with highly effective design formats suited for the individual area of use, Liebherr attachments achieve maximum productivity with long service life.

Top performance

Liebherr attachments are particularly high-performing excavating components, representing the very latest state of the art. These attachments were developed and designed especially for the Liebherr for hydraulic excavator, thereby providing users with an optimum high performance total system. Liebherr attachments come with service and customer care all from one source.

Reliability

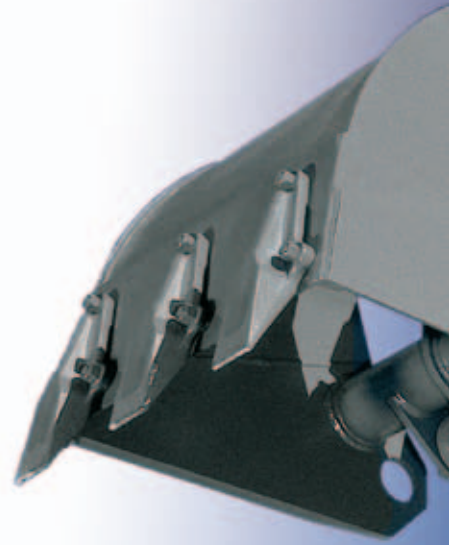
Liebherr attachments are developed and manufactured in-house, with the careful choice of materials, special heat treatment, and demanding manufacturing methods combined to achieve their characteristic robustness and long service life. The compelling result: maximum reliability, even under the hardest operating conditions.

Easy to use

The careful combination of form, content, and supply creates the ideal attachment for every application concerned. The LIKUFIX quick-change system allows the tools to be changed over safely and reliably in a matter of seconds, at the push of a button in the cab.

Economical performance

Liebherr attachments also offer maximum economy. The hydraulic quick-change system in conjunction with the specific purpose attachments boosts productivity in all areas of material handling technology. The immediate availability of parts that are subject to wear right round the clock, and their easy replacement, saves time and money too. Thanks to the modular design, the alternating systems and attachments are ideally prepared for the tasks of the future as well.





Overview Attachments

Whatever the application and the material in question, the quality and effectiveness of each individual excavating operation is determined by the careful choice of the most suitable tool. This is why Liebherr has developed a large number of attachments which are tailored in their shape, material and technical fittings to tackle specific situations in the best possible way. The wealth of experience gained from everyday operations and continuous product care mean that attachments from Liebherr always represent the very latest state of the art.

Multi-tine grapples

Handling technology on an industrial scale calls for special multi-tine grapples for the most widely differing applications. Depending on requirements, Liebherr can provide four-tine or five-tine grapples in open, half-open, and closed tine formats. Thanks to the modular design, the grapple suspension and mechanical systems, shell carrier and grapple tines can be separately fitted, providing the greatest possible flexibility.

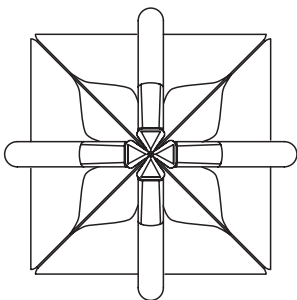
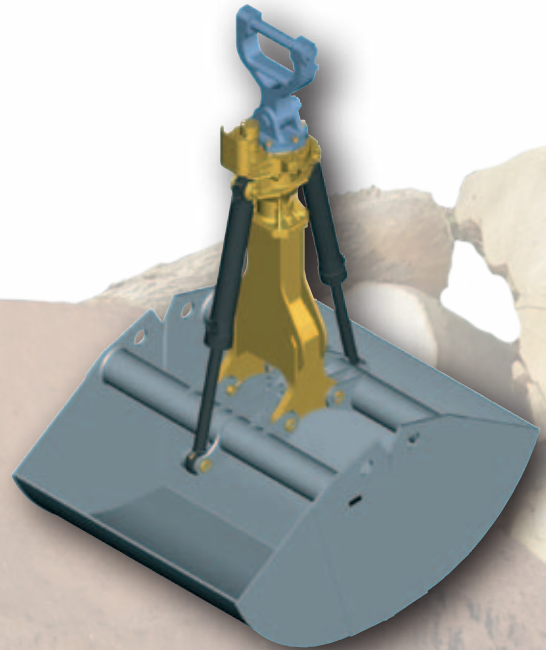
Shells for Loose material

The shells for loose material is used for loading and unloading troughs, wagons, or the holds of ships. The most widely differing types of waste can be conveyed with the Liebherr waste grapple, safely and conveniently, into the containers intended for the purpose. The grapples are designed to provide particularly high closing force.

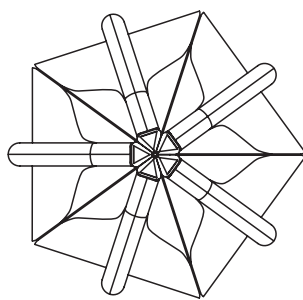
Multi-tine grapples



Shells for Loose material



View from above of a 4-tine grapple, closed tine format



View from above of a 5-tine grapple, closed tine format

Wood grapples

Liebherr wood grapples are carefully designed and vertically adjusted to make them ideally suited for unloading wagons. The widest possible range of claw dimensions mean transport to or transfer between wood yards and loading points is safe and fast. The claws are specially designed so that the most varied quantities and types of wood can be picked up rapidly and transported in any number of ways.

Wood grapples

Demolition and sorting grapple

The sorting grapple was developed especially to meet the demands of demolition and recycling operations. These grapples are used for sorting and loading, and also for demolition work. They are fitted with an endless slewing device, and in sorting operations are extremely effective universal add-on tools. The tough design and high closing force make the grapple a really effective tool in demolition operations as well.

Demolition and sorting grapple



Multi-tine grapples

Closed tines Half-closed tines The tried-and-trusted multi-tine grapples are essential tools for every Liebherr hydraulic excavator. Thanks to their carefully designed geometry, Liebherr multitine grapples are ideally matched to Liebherr machines – resulting in excellent loading behaviour and high productivity.

Multi-tine grapples (technical data on page 20/21)

- Capacity from 0.4 to 4.5 m³
- Four or five tines
- Open/half-closed/closed tines

Tines in special designs

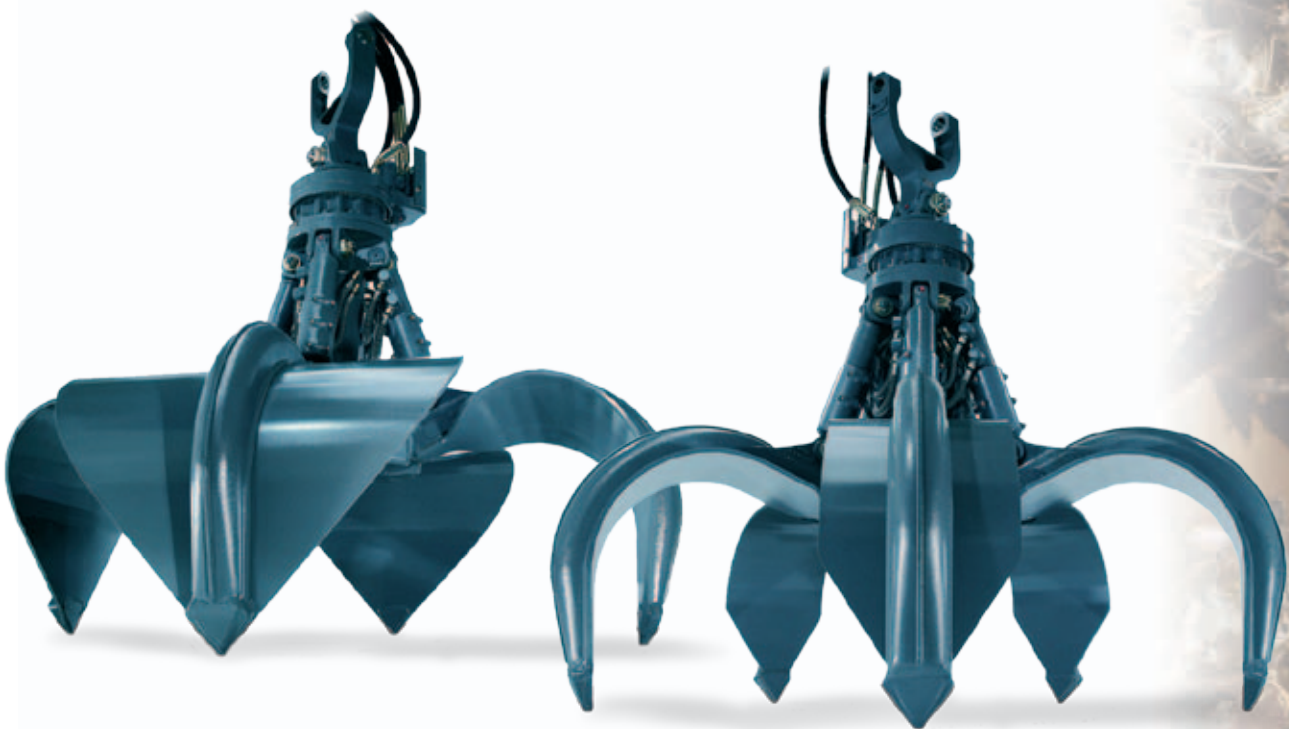
- Open forms:
Large unit items, scrap, automobiles, etc.
- Half-closed tine forms:
Universally applicable
- Closed forms:
Bulk-goods loading, small scrap

Features

- Reinforcement with wear-resistant material
- Robust processing
- 360° endless rotation
- Optimum maintenance and servicing characteristics
- Grapples can be extended in modular format

Benefits

- Multi-tine grapples are perfectly matched to the type of excavator
- Versatile in application
- High closing power



Closed tines

Half-closed tines



A 934 C Litronic at scrap operation

Shells for Loose material

The shells for loose material is the ideal attachment for the mass handling of bulk materials, such as ore, coal, sand, gravel, grain. Thanks to its optimum shaping, the shells for loose material ensures excellent penetration, maximum filling performance and rapid emptying capabilities.

Shells for Loose material (technical data on page 22/23)

- Capacity from 0.17 to 6.0 m³
- Element widths from 320 to 2,400 mm

Job reports

- Bulk-goods material handling

Features

- Designed and manufactured to Liebherr quality standards
- 360° endless rotation

Benefits

- Own weight is low, resulting in increased material holding capacity
- Good penetration
- High level of grapple filling



Shell for loose material with teeth



R 944 C Litronic at loading of freight wagons

Grapples for wood handling

The wood grapple is a hydraulic attachment for hydraulic excavators, used for picking up and transporting logs and round wood. It is used mainly in open country or on timber yards. The wood grapple has a large opening width and is specially designed so that large quantities of logs and round wood can be transported, as well as individual tree trunks.

Wood grapple (technical data on page 24)

- Size from 0.8 to 4.0 m²
- across round shells, across cutoff shells, heart-shaped shells

Job reports

- Handling of logs and round wood
- Loading and offloading of trucks, railway wagons, and ships
- Loading and emptying of transverse conveyors
- Operations in sorting plants

Features

- Robust, service-friendly rotary drive
- Long mechanical service life
- High closing force
- 360° endless rotation

Benefits

- The claw for virtually every application
- Optional wagon unloading design
- Allows for rapid load cycles
- Precise and safe placement of logs and round woods
- Optimum filling and clamping performance



Wood grapple





A 944 C HD Litronic at timber operation

Demolition and sorting grapple

Demolition and sorting grapples are designed for both recycling and handling operations. Depending on the type of work involved, they can be fitted to the excavator range for materials handling technology from 22 to 60 tonnes operational weight, and that makes easy work of sorting, loading, or demolition. One special version of the demolition and sorting grapple is the rock grapple, with a special shape that makes it ideal for the placement and loading of rocks.

Sorting grapple (technical data on page 25)

- Capacity from 0.5 to 1.3 m³

Job reports

- Sorting operations in recycling plants
- Demolition work
- Quarry and waterway construction work

Features

- Solid Liebherr components
- Optimum own weight
- Easy maintenance and service-friendly
- Sealed bearing points
- Optimum lubrication system
- Endless hydraulic slewing device
- complete hydraulics system located internally

Benefits

- High closing force
- Lightweight construction
- Highly sensitive in sorting work
- Different tine shapes for individual applications



Sorting grapple (perforated)





A 904 C Litronic at recycling operation

Quick change systems

Mechanical and hydraulic quick change system

What is a quick change system?

The quick change system is a tough, low-wear arrangement for rapid and safe changeover of mechanical and hydraulic add-on tools.

The technical advantage:

- The right tool can be put to use, every time and in every situation
- No need to undo nuts, bolts, or pins
- Modular add-on system (quick and easy retrofitting of hydraulic quick change systems to LIKUFIX)
- Positive-fit system: That means long service life and no stress on the mechanical locking elements during work.
- Hydraulic coupling system with spring bearing arrangement
- Designed for the toughest operational situations
- Added safety when locking in place thanks to position monitoring instead of pressure monitoring
- Backhoe bucket can also be used as high bucket
- Can also be fitted to excavators from other manufacturers

The convenience advantage:

- No problem at all in retrofitting existing hydraulic excavators
- Low operating and maintenance costs
- Add-on tools can be changed from the driver's cab

The financial advantage:

- Short-term, uncomplicated load increase thanks to two load lift hooks fitted as standard
- Add-on tools can be changed in only a matter of seconds – and that means increasing the rate of utilisation thanks to the same machine taking on entirely different tasks
- Excavator as multifunctional tool carrier
- Tools can be used by several carrier devices

Quick change systems	SW33	SW48	SW66	SW77
SW mechanically (M)	•	•	•	•
SW hydraulic (H)	•	•	•	•
LIKUFIX (L)	•	•	•	•
Liebherr Excavators:*				
A 316 Litronic	M/H/L	M/H/L		
R 317 Litronic	M/H/L	M/H/L		
A 904 C/HD Litronic		M/H/L		
A 924 C/HD Litronic		M/H/L		
R 924 C Litronic		M/H/L		
A 934 C/HD Litronic				
A 934 C/HD ERC Litronic		M/H/L	M/H/L	
R 934 C Litronic		M/H/L	M/H/L	
A 944 C HD Litronic			M/H/L	M/H/L
R 944 C Litronic			M/H/L	M/H/L
LH 60 M Litronic			M/H/L	M/H/L

* also be mounted on comparable competitive machines

LIKUFIX

What is LIKUFIX?

Likufix is a hydraulic quick-change system combined with an automatic hydraulic coupling device designed for quick, reliable changing of mechanical and hydraulic attachments, directly from the cab. Likufix is the ideal supplement to Tool Control. The combination of Likufix and Tool Control makes it possible to change hydraulic attachments easily – without even leaving the cab.

The technical advantages:

- Fully automatic play compensation
- Tight connection between the hydraulic circuits thanks to the hydro-mechanical compensation system
- More than 25 years experience in fully-automatic coupling systems
- Reliable system with long service life
- No problem at all in converting an existing hydraulic quick change system to LIKUFIX

The convenience advantage:

- Reliable hydraulic connection free of oil leaks
- Low operating and maintenance costs
- Add-on parts can be changed from the cab

The economic advantage:

- Easy equipping of existing hydraulic excavators
- Hydraulic add-on parts changed in a matter of seconds – meaning better machine utilisation with different applications on the same unit
- Major time savings in comparison with hydraulic-hose changes
- Low operating and maintenance costs with maximum productivity
- Carefully selected use of the add-on parts for long tool service life



Moving to the unit

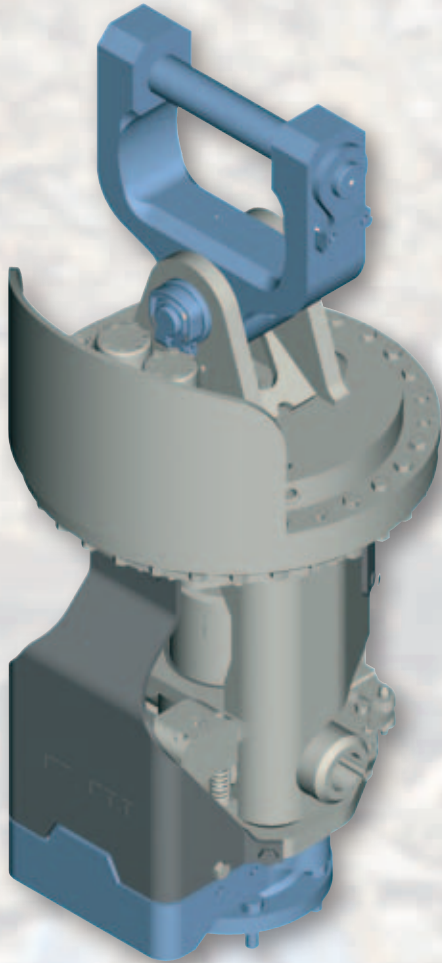
Coupling into the unit

Connected to the unit, mechanically and hydraulically

Quick change system MH40 / MH110

MH40 / MH110

MH40/MH110 is a fully-automatic coupling system for mechanical, hydraulic, and electrical connections. Based on the technology of LIKUFIX, it is ideally suited for suspended add-on tools such as multiple tine grab, waste grapples, load lifting magnets, etc. This quick change system makes it possible for hydraulic add-on tools to be changed, easily and with no problem at all, in just a matter of seconds. This provides an enormous boost to the flexibility, productivity, and economy of the load carrier.



Overview quick change systems * MH40 / MH110

A 316 Litronic	-
R 317 Litronic	-
A 904 C/HD Litronic	MH40
A 924 C/HD Litronic	MH40
R 924 C Litronic	MH40
A 934 C/HD Litronic	MH40
A 934 C/HD ERC Litronic	MH40
R 934 C Litronic	MH40
A 944 C HD Litronic	MH40
R 944 C Litronic	MH40
LH 60 M Litronic	MH40
A 954 C HD Litronic	MH40** / MH110
R 954 C Litronic	MH110
LH 80 M Litronic	MH110
LH 80 C Litronic	MH110
R 974 C Litronic	MH110
LH 120 C Litronic	MH110
R 984 C Litronic	MH110

* also be mounted on comparable competitive machines

** only for loose materials



Tool-Control and Tool-Management

Tool-Control

Tool Control is an additional electro-hydraulic function which makes working with hydraulic attachment very convenient. Up to ten combinations of oil flows and pressures can be programmed with the name of the tool and selected directly from the display. With the help of Tool Control, the operator can select the parameters for the hydraulic tool he wishes to use with a simple press of a button – no elaborate readjustment needed when it comes to a tool change. This function is already available as standard on most hydraulic excavators.

Tool-Management

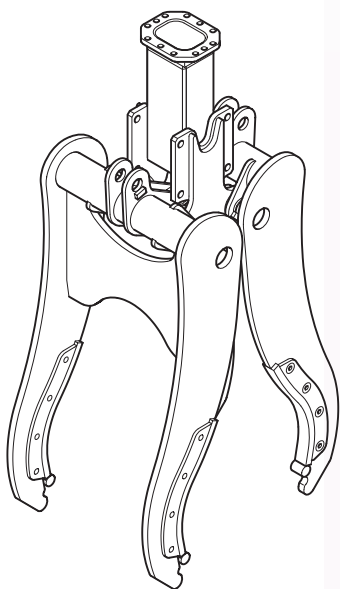
Tool Management makes it possible for the hydraulic excavator to identify tools automatically. The reader device on the LIKUFIX block of the excavator reads out the data stored on the chip in the tool, and passes it on to the driver's position. By pressing a button the driver confirms the acceptance of the data, and so also the automatic adjustment of the oil volume and oil pressure. In addition to this technical data, the oil type and working hours are also stored on the chip.



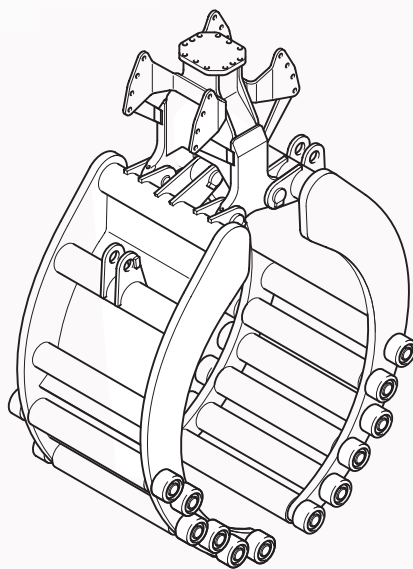
Special attachments

Liebherr manufactures the most widely differing attachments, specially tailored to specific situations. Thanks to the special tools, applications which might on their own appear impossible can be carried out rapidly and profitably.

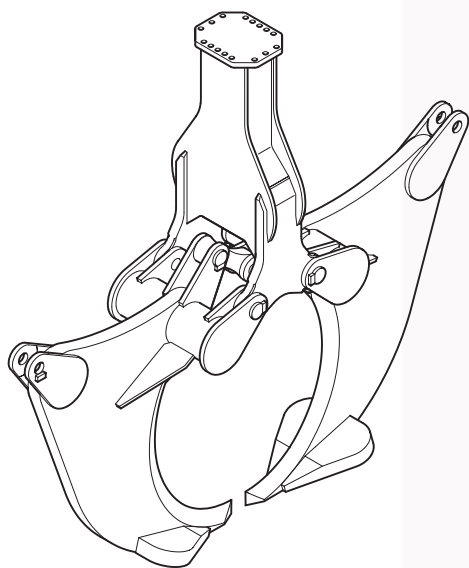
Our on-site designers have many years of experience and Liebherr know-how in special attachments to draw on. The tools manufactured in-house at Liebherr also ensure that both machine and attachment are optimally matched to one another, and that excellent operating results are achieved.



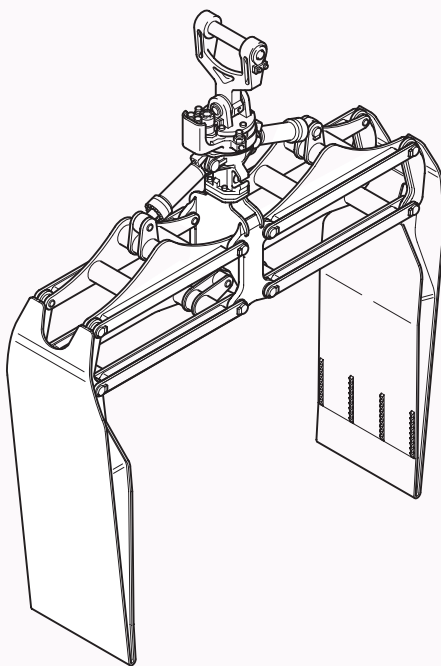
Wheel-set claw



Recycling claw

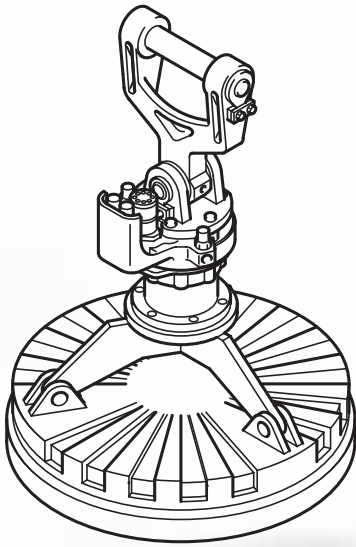


Wood splitting claw

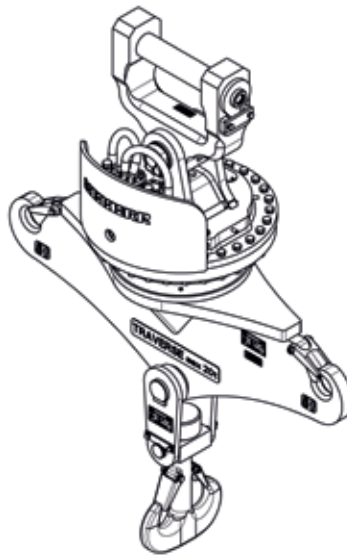


Parallel claw





**Magnet Devices/
Lifting Magnets traverse**



**Crane Hook with
Suspension**



Multi-tine grapples

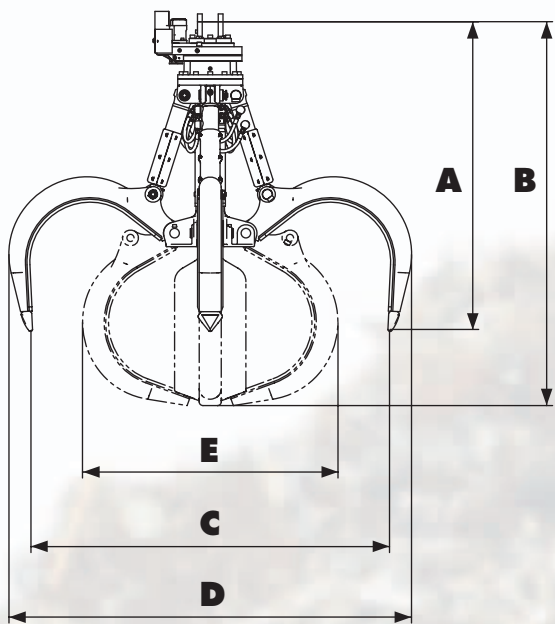
4-tine grapples	Capa- city m³	A	B	C	D	E	Weight in kg		
		mm	mm	ø mm	ø mm	ø mm	open shells	half-open shells	closed shells
GM 64 (excavator class: 20 - 30 t)									
	0.4	1,670	1,960	1,705	2,000	1,265	845	1,055	1,060
	0.6	1,710	2,100	2,040	2,310	1,390	1,130	1,330	1,520
GM 69 (excavator class: 20 - 47 t)									
	0.8	1,890	2,400	2,280	2,540	1,600	1,345	1,535	1,900
	1.1	1,880	2,400	2,290	2,595	1,770	1395	1,640	2,060
GMM 80-4 (excavator class: 47 - 71 t)									
	1.1	2,145	2,520	2,420	2,715	1,800	1,950	2,130	-
	1.4	2,120	2,595	2,550	2,865	1,915	1,990	2,195	-
	1.7	2,145	2,655	2,660	3,005	2,075	2,050	2,250	-
GMM 120-4 (excavator class: 71 - 100 t)									
	1.7	2,270	2,830	2,770	3,100	2,100	2,200**	2,500**	-
	2	2,285	2,865	2,855	3,190	2,235	2,260**	2,550**	-
	2.5	2,325	2,970	3,050	3,390	2,335	2,315**	2,635**	-
	3	2,365	3,070	3,230	3,585	2,430	2,365**	2,740**	-

5-tine grapples	Capa- city m³	A	B	C	D	E	Weight in kg		
		mm	mm	ø mm	ø mm	ø mm	open shells	half-open shells	closed shells
GM 55 (excavator class: 18 - 21 t)									
	0.4	1,560	1,815	1,695	2,020	1,325	1,055	1,130	1,180
GM 65 (excavator class: 20 - 30 t)									
	0.4	1,670	1,960	1,705	2,000	1,265	1,150	1,285	1,325
	0.6	1,790	2,145	2,040	2,310	1,400	1,230	1,415	1,520
GM 70C (excavator class: 20 - 47 t)									
	0.8	1,915	2,405	2,280	2,540	1,615	1,485	1,705	1,950
	1.1	1,885	2,405	2,290	2,595	1,770	1,590	1,860	1,995
	2*	2,035	2,755	2,910	3,235	2,045	-	-	2,345
GMM 80-5 (excavator class: 47 - 71 t)									
	1.1	2,145	2,520	2,420	2,715	1,800	2,190	2,400	2,550**
	1.4	2,120	2,595	2,550	2,865	1,915	2,240	2,480	2,600
	1.7	2,145	2,655	2,660	3,005	2,075	2,310	2,550	2,720
GMM 120-5 (excavator class: 71 - 100 t)									
	1.7	2,270	2,830	2,770	3,100	2,100	2,500	2,840	2,950**
	2	2,285	2,865	2,855	3,190	2,235	2,570	2,900	3,145**
	2.5	2,325	2,970	3,050	3,390	2,335	2,640	3,010	3,300**
	3	2,365	3,070	3,230	3,585	2,430	2,700	3,140	3,465**
GM 75B (excavator class: 82 - 110 t)									
	2	2,850	3,540	3,200	3,470	2,310	3,400	4,100	4,500
	2.5	2,885	3,620	3,350	3,630	2,445	3,550	4,250	4,650
	3	2,930	3,745	3,580	3,860	2,520	3,700	4,400	4,800
GM 85 (excavator class: 82 - 120 t)									
	3.1	3,025	3,565	3,300	3,700	2,685	-	5,500	-
	3.5	3,060	3,630	3,430	3,885	2,780	-	5,700	-
	4	3,125	3,755	3,660	4,215	2,850	-	5,800	6,700

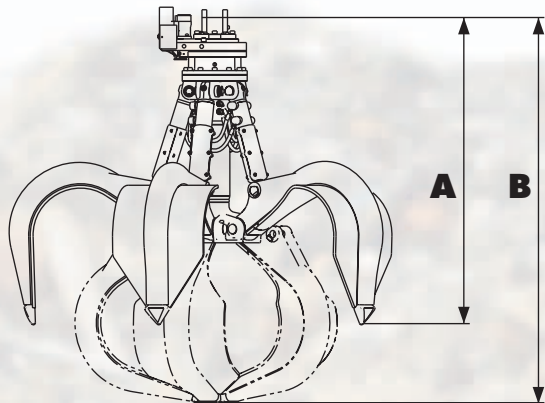
* For lightweight scrap, ** figures are provisional, all weights determined by CAD

A: Height of grapple, open, B: Height of grapple, closed, C: Grapple opening; D: Span width of grapple, open, E: Span width of grapple, closed

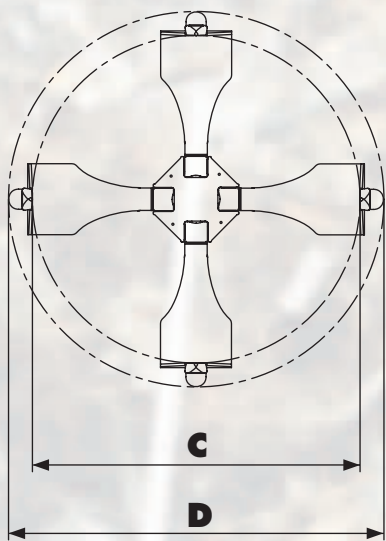
4-tine grapple, lateral view



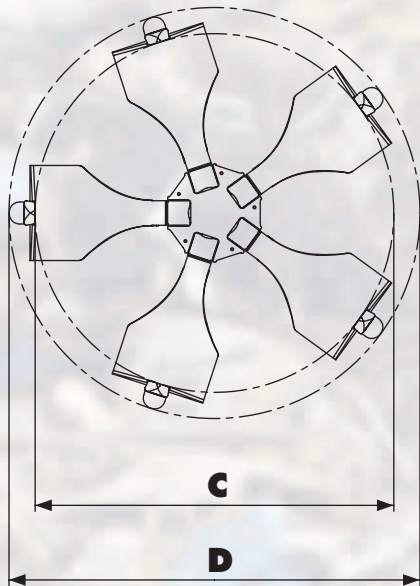
5-tine grapple, lateral view



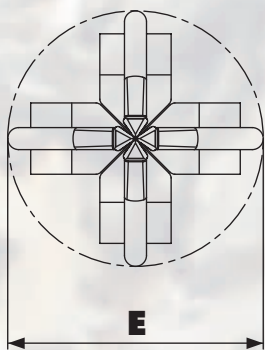
4-tine grapple, bottom view, open



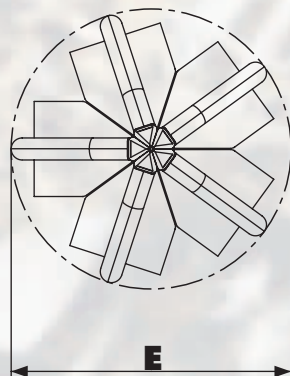
5-tine grapple, bottom view, open



4-tine grapple, bottom view, closed



5-tine grapple, bottom view, closed



Shells for loose Material

	Capacity	A	B	C	D	E	Weight
	m ³	mm	mm	mm	mm	mm	kg
GM 10B (excavator class: 18 - 30 t)							
Digging shell	0.17	320	1,645	1,540	1,970	1,440	765
	0.22	400	1,645	1,540	1,970	1,440	805
	0.25	450	1,645	1,540	1,970	1,440	820
	0.35	600	1,645	1,540	1,970	1,440	860
	0.45	800	1,645	1,540	1,970	1,440	915
	0.6	1,000	1,645	1,540	1,970	1,440	970
	0.7	900	1,645	1,540	1,970	1,440	1,195
Clamshell	1	1,000	1,980	1,445	2,125	1,830	1,040
	1.3	1,300	1,980	1,445	2,125	1,830	1,120
	1.5	1,500	1,980	1,445	2,125	1,830	1,180
	1.8	1,800	1,980	1,445	2,125	1,830	1,425
GM 20B (excavator class: 20 - 47 t)							
Digging shell	0.45	600	1,955	1,920	2,420	1,650	1,160
	0.6	800	1,955	1,920	2,420	1,650	1,210
	0.75	1,000	1,955	1,920	2,420	1,650	1,285
	0.9	1,200	1,955	1,920	2,420	1,650	1,350
Clamshell	1.3	1,000	2,250	1,825	2,560	2,090	1,355
	1.5	1,200	2,250	1,825	2,560	2,090	1,415
	2	1,600	2,250	1,825	2,560	2,090	1,550
	2.5	2,000	2,215	1,825	2,555	2,090	1,820
GM 22C (excavator class: 47 - 71 t)							
Digging shell	1.4	1,150	2,555	2,910	3,035	2,240	2,100
	1.6	1,300	2,555	2,910	3,035	2,240	2,250
Clamshell	1.6	1,300	2,355	2,255	2,895	2,235	2,250
	1.85	1,500	2,355	2,255	2,895	2,235	2,300
	2	1,500	2,405	2,260	2,920	2,320	2,350
	2.2	1,500	2,515	2,270	2,975	2,410	2,400
	2.5	2,000	2,355	2,255	2,895	2,235	2,550
	3	2,000	2,645	2,285	3,030	2,510	3,050
	3.5	2,000	2,805	2,305	3,110	2,655	3,150
GM 25B (excavator class: 71 - 100 t)							
Digging shell	1.8	1,300	2,860	2,810	3,335	2,380	2,900
	2	1,500	2,860	2,810	3,335	2,380	3,000
	2.3	1,700	2,815	2,740	3,310	2,405	3,250
Clamshell	2.3	1,700	2,600	2,490	3,195	2,405	3,200
	2.8	1,700	2,875	2,520	2,330	2,500	3,250
	3	2,000	2,690	2,495	3,210	2,590	3,550
	3.5	1,800	3,000	2,540	3,395	2,600	3,300
	4	2,000	2,945	2,525	3,335	2,860	3,550
	4.5	2,200	2,985	2,530	3,375	2,895	3,750

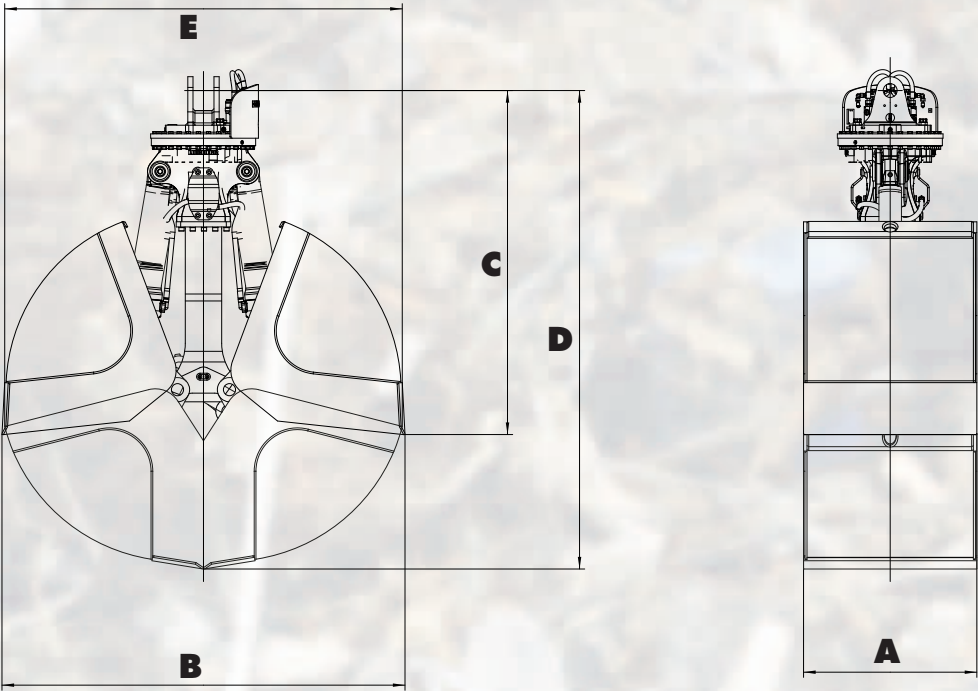
The list does not represent the complete grapple range. Additional dimensions on request.

A: Element width, B: Span width of grapple, open, C: Height of grapple, open, D: Height of grapple, closed, E: Span width of grapple, closed

	Capacity	A	B	C	D	E	Weight
	m ³	mm	mm	mm	mm	mm	kg
GMZ 50 (excavator class: 35 - 120 t)							
Clamshell*	3.5	1,400	3,380	1,715	2,120	3,230	2,670
	4	1,600	3,380	1,715	2,120	3,230	2,800
	4.5	1,800	3,380	1,715	2,120	3,230	2,930
	5	2,000	3,380	1,715	2,120	3,230	3,060
	5.5	2,200	3,380	1,715	2,120	3,230	3,190
	6	2,400	3,380	1,715	2,120	3,230	3,320

* Light material grapple (max. 1,1 t/m³)
 The list does not represent the complete grapple range. Additional dimensions on request.
 A: Element width, B: Span width of grapple, open, C: Height of grapple, open, D: Height of grapple, closed, E: Span width of grapple, closed

Shells for loose Material

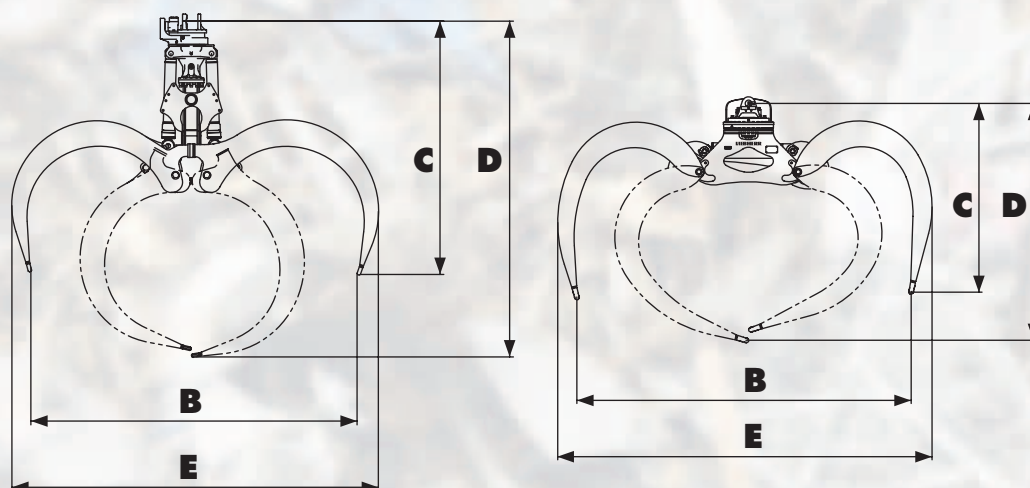


Wood grapples

	Size m ²	A mm	B mm	C mm	D mm	E mm	Weight kg
GM 10B (material handler: 18 - 30 t)							
	0.8	810	2,215	1,735	2,375	2,465	1,270
	1	810	2,410	1,780	2,470	2,665	1,315
	1.3	810	2,685	1,835	2,620	2,960	1,390
	1.5	810	2,805	1,860	2,685	3,085	1,440
GM 20B (material handler: 20 - 47 t; log loader: 25 - 30 t)							
	1	810	2,415	2,265	3,820	2,720	1,580
	1.3	810	2,640	2,325	2,950	2,945	1,675
	1.5	810	2,735	2,355	3,005	3,045	1,725
	1.7	810	2,835	2,380	3,060	3,180	1,775
	1.9	810	3,125	2,460	3,155	3,470	1,910
	2.1	810	3,275	2,505	3,310	3,610	1,950
GMH 50 (material handler: 35 - 80 t; log loader: 35 - 50 t)							
	2.5	870	3,610	2,160	2,600	3,995	2,160
	2.8	1,000	3,735	2,225	2,680	4,290	2,400
	3.2	1,000	3,815	2,265	2,735	4,300	2,455
	3.6	1,000	3,990	2,375	2,895	4,530	2,570
GM 22BH (material handler: 57 - 71 t; log loader: 35 - 50 t)							
	1	900	2,345	2,680	3,250	2,620	1,895
	1.35	900	2,655	2,760	3,425	2,955	1,975
	1.7	900	2,895	2,820	3,555	3,225	2,115
	2	900	3,235	2,825	3,675	3,560	2,155
	2.8	900	4,265	2,975	4,065	4,180	3,110
GM 25BH (material handler: 40 - 90 t; log loader: 40 - 55 t)							
	1.7	1,000	2,975	3,085	3,815	3,300	3,350

A: Claw width, B: Grapple opening, C: Height of grapple, open, D: Height of grapple, closed, E: Span width of grapple, open

Wood grapples



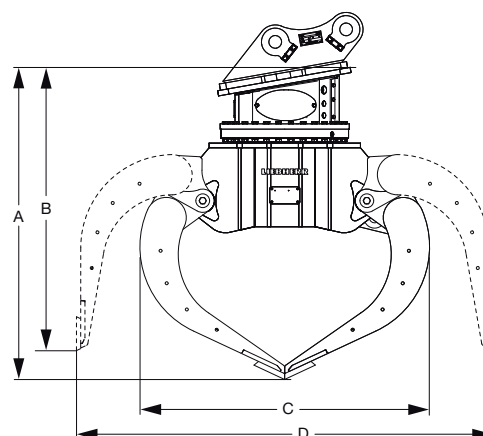
Demolition and sorting grapple

	Capacity	Shell width	Closing force	A Height closed	B Height open	C Width closed	D Width opened	Weight
	m ³	mm	t	mm	mm	mm	mm	kg
SG 25								
Ribbed	0.50	800	6	1,470	1,340	1,370	1,970	1,000
	0.65	1,000	6	1,470	1,340	1,370	1,970	1,080
Perforated	0.55	800	6	1,470	1,340	1,370	1,970	990
	0.75	1,000	6	1,470	1,340	1,370	1,970	1,070
Rock grapple	0.6	800	6	1,565	1,580	1,435	2,220	1,170
SG 30								
Ribbed	0.75	1,000	8	1,625	1,485	1,515	2,140	1,510
	0.90	1,150	8	1,625	1,485	1,515	2,140	1,590
Perforated	0.85	1,000	8	1,625	1,485	1,515	2,140	1,490
	1.00	1,150	8	1,625	1,485	1,515	2,140	1,570
Steinzange	0.8	1,050	8	1,730	1,780	1,530	2,315	1,765
SG 40								
Ribbed	1.10	1,100	10	1,920	1,740	1,790	2,560	2,320
Perforated	1.30	1,100	10	1,920	1,740	1,790	2,560	2,230

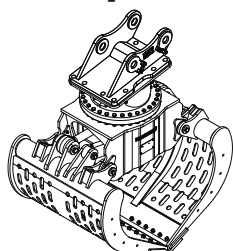
Wheeled excavator* Crawler excavator*	A 316 R 317	A 904 C/ HD	A 924 C/HD R 924 C	A 934 C/HD A 934 C/HD ERC R 934 C	A 944 C HD LH 60M R 944 C
SG 25	■	■	▲		
SG 30		●	■	■	
SG 40			●	●	■

* or comparable competitive machines

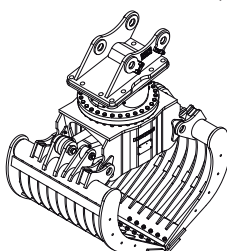
- = ideal for standard use
 ▲ = consultation with manufacturing plant required
 ● = for extremely heavy operational conditions on this excavator



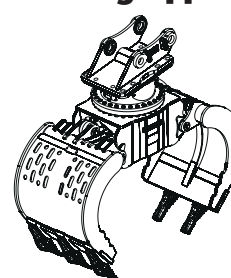
Shells perforated (standard)



Shells ribbed (option)



Rock grapple



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