Linde Material Handling





SAFE AND EFFICIENT FLEET MANAGEMENT



LINDE CONNECT

We make your fleet intelligent

Our software and hardware connect your vehicles and deliver comprehensive information. allowing you to make efficient use of your fleet.



Portfolio

How Linde connect products interact to make your day-to-day work easier.

ightarrow 4

Infrastructure

Whether Bluetooth, Wi-Fi or mobile broadband technology, all the options are available for your fleet data communications. $\rightarrow 8$

Software

Plan fleet usage, manage drivers' details, monitor and manage vehicles, analyze data, and generate reports: thanks to our programs, you can handle all of this effortlessly from your desk.

 \rightarrow 6

Reports and Analysis

Make your fleet as efficient as possible. Over 15 different interactive reports are available for that purpose. \rightarrow 10

Exploit the opportunities offered by

digitization: Modern machinery constantly collects data that gives an insight into its state and its capacity utilization. We at Linde connect make this data available to you locally or via the Internet. With the connect product family, we have developed a fleet management solution that connects your vehicles and your staff, meaning you are always up to date on the status of your

logistics in your production plants or your warehouses. This transparency makes using your fleet safer and more economical, and increases the availability of each vehicle.

- → Transparency
- → Cost-effectiveness
- \rightarrow Security
- → Service optimization



Simple vehicle and driver management



Effective access control

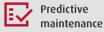


More safety in traffic on premisses





Clear analysis of fleet usage





Visible reduction of violent damage

Training

The Linde Academy offers courses for connect:desk users focusing on a variety of subjects.

ightarrow 12

Арр

The connect pre-op check app simplifies vehicle checks and simultaneously provides access control.

ightarrow 13

Hardware

Our hardware will reliably communicate with a vehicle, collate information, and transmit it wirelessly.

 \rightarrow 14

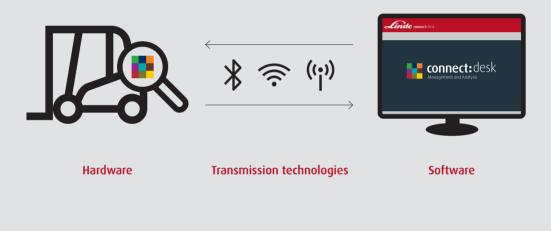
Functional

Our connect portfolio is modular in design, allowing you to choose precisely the functions for your fleet that you actually need.

ightarrow 15

MODULAR FLEET MANAGEMENT

Our fleet management solution consists of various hardware and software modules. connect offers you transparent data on usage and vehicle deployment, as well as an overview of planned service intervals and upcoming driver training. For you that means improved on-site traffic safety, higher vehicle availability and increased cost-effectiveness.



The connect hardware components

connect your vehicles and databases using communication technology. The hardware collects data from sensors and control unit and passes it on. Transmission technologies of the fleet management systems are diverse. According to requirements and equipment you can choose the technology that suits you best.

- → Data transmission via GPRS, Bluetooth or Wi-Fi
- → Wireless transmission of firmware and function updates
- → Straightforward retrofitting of existing vehicles thanks to simple installation

The connect software gives you a clear view of all your fleet data. It is used to manage vehicle and driver data, and it makes it easy to generate reports.

- → Data constantly updated
- \rightarrow Tailored and automated reporting
- \rightarrow Suitable for all fleet sizes
- $\rightarrow~$ A wide range of customization options and intuitive operation

Access control

With connect:ac, you can control access to your fleet: who is currently behind the wheel of which vehicle? This creates the basis for your planned fleet usage.



Electronic key

Pre-shift check via app

Vehicle data

connect:dt documents the usage of fleet vehicles: Has a vehicle been used a lot or has it often been idle? Have there been accidents? Is the vehicle functional?

Usage analysis

connect:an enables fleet managers to analyze and monitor the performance of their fleets: How often does a vehicle make a trip or lift something? How much energy does it consume?



dt connect:dt

trouble codes

Electronic damage monitor

Digital logbook

Automated error code transmission from truck



an connect:an

Digital battery maintenance

Digital usage analysis

SOFTWARE

connect:desk - the data cockpit

The connect:desk application is the centerpiece of our connect portfolio. This is where all the data collected by the hardware comes together and is analyzed and monitored. The software is used to manage the drivers, the vehicles, and the fleet as a whole, putting all the relevant information at your fingertips.



Organized

connect:desk displays information broken down by company organization and assigns the drivers accordingly.

Planned

connect:desk reminds you about regular fleet maintenance and driver training, and assists you in planning work rotas to accommodate these measures.

Number of users and features of the software are fully scalable and the user interface is intuitive. connect:desk is therefore equally suited to vehicle fleets both large and small. Not only experienced fleet managers with complex tasks, but also occasional users who only need individual functions find it easy to use. **connect:desk** is normally installed on a PC or notebook. There is also an optional browser version. Simply ask your dealer about it. The database can be hosted on a local server or at Linde Material Handling. This gives you full control of your data. Any number of users can be incorporated, and their access rights and available functions can be configured individually.



-		-	-	-	-		_	_		_			
Drivers In	xis												
												No.	
											11	AA	
_													
+ # -													
Designation A	Chassis no.	Manufacturer =	Insck type =	Series a	Drive type =	Operating hours =	Synchronisation +	Note *	Load capacity #	speed a	FDE-ID *	Driving licence	
	H2039257374	Manufacturer = Unde	H45	Series *	Drive type =	Operating hours =	Synchronitation + 12/10/20170754		Load capacity =	20 km/h	321625	Draing licence	1
1257374												Driving licence	
1257274	H2XM257374	Urde	HIS	394	Diesel	1940	12/10/2017074	1-UNIE	431 451	20 km/h	321625	Driving licence	
1257374 1257375 1257275	H2XM257374 H2XM257375	Unde Unde	H45 H45	394 394	Diesel Diesel	1940 2501	12/10/20170754 12/10/201709:1	W-UNIE	451 451	20 km/h 20 km/h	321625 3226559	Driving licence	
1257374 1257375 1257375 1257377	H2XH257374 H2XH257375 H2XH257375	Unde Unde Unde	H45 H45 H85/1100	394 394 394	Diesel Diesel Diesel	1940 2861 5152	12/10/2017074 12/10/2017091 12/10/2017092	W-UNIE- W-UNIE-	451 451 81	20 km/h 20 km/h 20 km/h	320825 320859 330480	Driving ficence	
1257374 1257375 1257275 1257277 1257377	H2XM257374 H2XM257375 H2XM257375 H2XM257377	Unde Unde Unde Unde	845 845 865 860	394 394 396 396	Diesel Diesel Diesel Diesel	1940 2801 5152 10877	12/10/20171754 12/10/20171741 12/10/20171941 12/10/20171945	0-UNB 0-UNB 0-UNB	431 431 11 11 11	20 km/h 20 km/h 20 km/h 20 km/h	321825 321859 335428 335428 335490	Driving ficence	
1257374 1257375 1257375 1257377 1257377 1257378 1257301	H2XM257374 H2XM257375 H2XM257375 H2XM257377 H2XM257377 H2XM257378	Unde Unde Unde Unde Unde	H45 H45 H85/1100 H80 H80	394 394 396 396 396	Dissel Dissel Dissel Dissel Dissel	1940 2801 5152 10677 12505	12/10/20171274 12/10/20171041 12/10/20171041 12/10/20171045 12/10/20171042	0-UNB 0-UNB 0-UNB 0-UNB 0-UNB	451 451 81 81 81 351	20 km/h 20 km/h 20 km/h 20 km/h 20 km/h	321825 321859 330485 330490 330499	Driving ficence -	
1257374 1257375 1257375 1257375 1257375 1257378 1257378 1257301 1257301	H2XM257374 H2XM257375 H2XM257375 H2XM257377 H2XM257376 H2XM257376 H2XM257376	Unde Unde Unde Unde Unde Unde	H45 H45 H85 H80 H80 H80 K80 K80 K80	294 294 294 295 296 296 296 397	Dissel Dissel Dissel Dissel Dissel Electric	1940 2001 5512 10477 12500 6065	12/10/2017074. 12/10/2017074. 12/10/2017091 12/10/2017045 12/10/2017042 12/10/2017042	IF-UNIE IF-UNIE IF-UNIE IF-UNIE IF-UNIE IF-UNIE	451 451 81 81 81 351 351	20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b	320825 320859 330489 330499 330499 330499 331018	Detailing licence	
4257774 4257775 4257775 4257778 4257778 4257778 425778 425778 425778 425778	H2XM257374 H2XM257375 HXX454124215 H2XM257377 H2XM257377 H2XM257376 H2XM257378 H2XM257381	Unde Unde Unde Unde Unde Unde Unde	H45 H45 H85 H80 H80 H80 £35% H05	394 394 205 396 396 396 397 393	Diesel Diesel Diesel Diesel Diesel Electric Diesel	1940 2001 5132 10077 12900 6005 1721	12/10/2017 074 12/10/2017 074 12/10/2017 091 12/10/2017 045 12/10/2017 042 12/10/2017 042 12/10/2017 091	IF-UNB IF-UNB IF-UNB IF-UNB IF-UNB IF-UNB IF-UNB	451 451 81 81 351 351 351 451	29 km/b 29 km/b 29 km/b 29 km/b 29 km/b 29 km/b 29 km/b	320825 320859 20040 330490 330699 331018 330407	Detuing licence	
1257774 1257775 1257775 1257775 1257775 1257775 1257761 1257761 1257761 1257762 125762	H2XM257374 H2XM257375 HXX451541542125 H2XM257377 H2XM257377 H2XM257377 H2XM257371 H2XM257381 H2XM257382	Unde Unde Unde Unde Unde Unde Unde	H45 H45 H45 H45 H45 H45 H45 H45	394 394 394 395 396 396 307 303 394	Disal Disal Disal Disal Disal Disal Disal Disal	1940 2861 5152 10677 12900 6065 1771 6065	12/10/2017 074 12/10/2017 074 12/10/2017 091 12/10/2017 092 12/10/2017 092 12/10/2017 091 12/10/2017 091	8-UNB 8-UNB 8-UNB 8-UNB 9-UNB 8-UNB 8-UNB	451 451 81 81 81 351 351 451 351	20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h	3228823 3228539 320485 330496 331018 330087 33087 330801	Detuing licence	
4257774 4257775 5257275 4257778 4257778 4257778 4257701 4257701 4257701 4257701 425702 4264511 4214516	H23/0257374 H23/0257375 H23/0257375 H23/0257377 H23/0257377 H23/0257377 H23/0257391 H23/0257391 H23/0257391 H23/0257391	Unde Unde Unde Unde Unde Unde Unde Unde	H45 H45 H45 H80 H80 H80 E398 H05 H45 H05	394 394 394 395 396 396 397 397 393 394 293	Desel Desel Desel Desel Desel Desel Desel	1940 2001 5152 10077 12900 6005 17711 6005 1462	12/10/2017074. 12/10/2017091 12/10/2017091 12/10/2017092 12/10/2017092 12/10/2017092 12/10/2017093 12/10/2017091	0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE - 0-UNE -	431 451 41 81 81 81 331 351 431 351 351 351	20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h	3228825 3228559 320485 320496 330499 331018 330407 330407 330401 330413	Detuing licence	
1237274 1237275 1237275 1237275 1237277 1257278 1257278 125728 125728 125728 125728 125728 125728 125728 125728 125728 125728 125728 125728 125727 1257777 125777 1257777 125777 12577777 12577777 1257777 12577777 1257777 1257777 1257777 1257777 125777	H2XM257274 H2XM257375 H2XM257375 H2XM257377 H2XM257378 H2XM257381 H2XM257381 H2XM257381 H2XM257382 2112 H246311 001 M256416	Unde Unde Unde Unde Unde Unde Unde Unde	H45 H45 H85 H80 H80 H80 H85 H85 H85 H85 H85	294 294 295 295 295 295 295 295 295 293 293 293	Desel Desel Desel Desel Desel Desel Desel Desel Desel	1940 2801 5952 10077 12900 6005 17711 6005 1452 1679	12/10/2017/074 12/10/2017/074 12/10/2017/04 12/10/2017/02 12/10/2017/02 12/10/2017/02 12/10/2017/041 12/10/2017/041 12/10/2017/041	IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE IF-UNE	431 431 11 81 81 331 331 331 331 331 331 431	20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h 20 km/h	327825 328559 330485 330485 330485 330489 331018 330687 320407 320401 320413 330537	Detuing licence	
N257274 N257275 N257275 N257277 N257278 N257278 N257201 N257201 N257201 N257201 N257201 N257201 N257201 N257201 N255205 N255208	KIXW257374 HXXX257375 HXXX257375 HXXX257377 HXXX257377 HXXX257377 HXXX257378 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257381 HXXX257378 HXXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX257377 HXX25737 HXX257377 HXX25737 HXX2577 HXX27 HXX2577 HXX2577 HXX277 HXX2777 HXX2777 HXX2777 HXX2777 HX2	Unde Unde Unde Unde Unde Unde Unde Unde	H45 H45 H80,71100 H80 E33M H85 H85 H85 H85 H85 H85 H85 H85	294 394 394 396 396 397 393 394 393 393 394	Disal Disal Disal Disal Disal Disal Disal Disal Disal Disal Disal	1940 2861 5152 10677 10675 10685 4005 17211 6005 11659 11659 11659	12/10/20171254 12/10/20171254 12/10/2017102 12/10/2017102 12/10/20171042 12/10/20171042 12/10/20171043 12/10/20171043 12/10/20171043 12/10/20171041 12/10/20171043	1-UN 8 1-UN 8	431 431 11 81 81 331 331 331 331 331 331 431	20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b 20 km/b	327825 328559 330495 330495 330495 331018 330607 330607 300401 300401 300571 3305271 330266	Druing licence	
Designation 4 10257274 10257275 1025727 10257278 10257278 10257278 10257278 10257278 10257278 10257278 1025151 10234516 1023451 10234516 10234516 1023451 10234516 1023451 10234516 1023451 1023451 1023451 1023451 1023451 1023451 1023451 1023451 102345 102345 102345 102345 102345 10234 10234 10234 1023 1023 102 102 102 102 102 102 102 102 102 102	KXXX227374 KXXX227375 KXXX227375 KXXX227375 KXXX227377 KXXX227377 KXXX227379 KXX227379 KXX227392 212 K224511 KXX227392 212 K224511 60 K244511 60 K244511 7 12 K216108	Unde Unde Unde Unde Unde Unde Unde Unde	H45 H45 H80/1100 H80 H30 H35 H45 H45 H45 H45 H45 H45	294 294 394 396 396 396 307 393 394 393 394 394 394	Disal Disal Disal Disal Disal Disal Disal Disal Disal Disal Disal Disal	1940 2001 510277 12409 6005 1452 1659 1652 993	12/10/20171574-, 12/10/20171674-, 12/10/20171642-, 12/10/20171642-, 12/10/20171642-, 12/10/20171642-, 12/10/20171643-, 12/10/20171643-, 12/10/20171643-, 12/10/20171642-, 12/10/20171642-,	19-000 B 19-000 B 19-000 B 19-000 B 19-000 B 19-000 B 19-000 B 19-000 B 19-000 B 19-000 B	431 431 431 431 44 84 84 331 331 331 331 331 431 431 431 431	22 km/h 22 km/h 22 km/h 22 km/h 23 km/h 23 km/h 23 km/h 23 km/h 24 km/h 24 km/h 24 km/h	322825 322859 322859 330499 331018 330499 331018 330497 330407 330407 330407 330407 330407 330407 33040 330232	Druing lionee	

Transparent

connect:desk presents you with the key vehicle data, clearly displayed on a customized dashboard – or in the form of detailed analyses and reports relating to individual vehicles, drivers, or divisions.

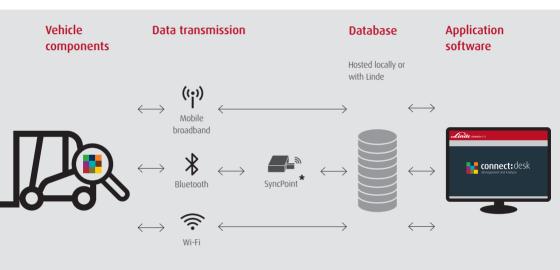
- → Maps the organizational structures of individual divisions or of the entire company
- \rightarrow Assignment of drivers and vehicles to one or more organizational levels
- → Management of access rights based on the vehicle type, driver's license, and period of validity
- \rightarrow Planning and monitoring of vehicle maintenance

- \rightarrow Planning of training and refresher courses
- → Digital archiving driver and vehicle documents
- \rightarrow Generating interactive reports in the form of tables and diagrams
- \rightarrow Generating analyses of fleet optimization and vehicle usage
- → Automatic e-mail dispatch of individually configured reports and messages

INFRASTRUCTURE

Data Communication

Communication between the vehicle and connect:desk can be realized with various systems. You can choose the best way to transmit your data: Bluetooth, Wi-Fi or mobile broadband.



Which requirements determine your infrastructure?

Choose the perfect transmission technology for your needs. You do not have to worry about other processes! All three transmission methods automatically run in the background without the driver or fleet manager actively having to play a part. Incidentally, all three options can be combined and used in one fleet. The data can be hosted locally with you or at Linde Material Handling.

* SyncPoints

... are industrial computers or PCs with a Linde Bluetooth stick that collect data from vehicles via Bluetooth. The software controls communication, processes the data and delivers it to the database so that it is available in connect:desk.







Data is transferred directly from the vehicle to the database within the wireless network.

⁽⁽i⁾⁾ Mobile broadband

Data is transmitted to the database over the mobile broadband network.

Your benefits at a glance

- → No interference in Wi-Fi network
- → Cost-effective: As a rule, already factory installed. A few SyncPoints on your company grounds are already sufficient for data transmission.
- → **Data security:** Data remains inside the company.
- → Data security: Data remains inside the company.
- → No new infrastructure required: connect uses the existing Wi-Fi network within the company.
- → Current data: Blanket coverage enables data to be transferred regularly and kept up-to-date in connect.desk.
- → Authentication on basis of IT standards: Authentication is carried out with WPA2 (password) or WPA2-Enterprise (certificates).
- → No infrastructure required: No hardware is required on company premises.
- → Indoor and outdoor coverage: Vehicles can transmit data indoors and outdoors. The strength of the connection depends on the network of the mobile broadband operator.
- → Fast and simple installation: The data unit is easy to retrofit on older vehicles.

Vehicle components

- → Retrofit kit: The Bluetooth retrofit kit is available for older vehicles that do not have Bluetooth. It can be ordered from the central spare parts warehouse in Kahl.
- → The vehicle has to be equipped with a Wi-Fi box, which is available as a retrofit kit.
- → Almost all new vehicles can be ordered with an online box fitted in the factory.
- → Retrofit kits are available for many older vehicle models; they can be fitted in a few simple steps.

On-site infrastructure

- → SyncPoints are installed at favourable locations in the plant where trucks always pass (e.g. at charging stations, traffic hubs or parking spaces).
- → Experts from connect carry out the one-time setup procedure on site.
- → Cooperation with the company's IT department is necessary to implement Wi-Fi transmission.
- → No additional infrastructure, such as Syncpoints or Wi-Fi hotspots, is required for data transmission.

REPORTS AND ANALYSIS

More than 15 interactive reports about your fleet

The connect:desk software enables you to access over 15 different interactive reports on the entire fleet and individual areas, vehicles or drivers. The data is represented in easy-to-understand diagrams and tables. You will always know exactly who used which truck when and how.

The most important reports at a glance:



Shocks: The shock data enables you to find out when a driver has given a vehicle a jolt – e.g. caused by a collision or a pothole. This increases drivers' sense of responsibility.



Operating hours forecast: Expected fleet operating hours are calculated on the basis of real vehicle usage data. You can determine whether the system should predict the number of operating hours up to a specific time or the time at which a specific number of operating hours is reached.

These categories of reports are available:



Logbook List of all recorded events for each vehicle



Usage Overview of usage and utilization of all vehicles



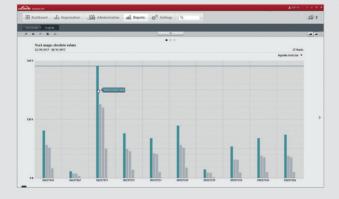
Service Service and maintenance schedules of all vehicles at a glance

≝

Coordination Overview of driver data and vehicle availability and distribution



Availability: This diagram shows whether vehicles are being used, have been parked or are being serviced or repaired. The bars indicate how much potential operational capacity individual vehicles and the entire fleet still have.



Truck usage: Here you will find detailed information about how a vehicle is used: How long is a driver logged in? How high is the proportion of journeys and lifts during that time?

APP

Vehicle check via smartphone

Simplify the vehicle check before each shift and at the same time create effective access control – with the aid of the pre-op check app and the connect:ac pre-operational check function.

Completing a smartphone checklist ensures that the truck can only be started when a check has been carried out and the vehicle is fully operational. Damage or irregularities can be documented with a photo and immediately reported to the fleet manager.

The checklist configurator allows the fleet manager to freely define the desired questions on vehicle condition to suit the requirements of the job or the location. It is also possible to specify when a check is successful and the vehicle can be started, as well as the conditions under which it shuts down or requires a photo to be taken for documentation purposes.



- ightarrow Improved safety on company grounds
- \rightarrow Automatic email report of the checklist results in real time
- $\rightarrow\,$ Photographic record of vehicle damage or irregularities
- ightarrow Regular survey of vehicle condition
- \rightarrow Freely definable questions
- \rightarrow Recording of questions and answers for later analysis possible

HARDWARE

Teaching your forklift to talk

The various connect hardware components are the link between your fleet, the database, and the connect software. They collect and transfer control and sensor data or serve as an electronic ignition switch. Our hardware components can be ordered ex works with new vehicles or are available as a retrofit kit.



1 connect:access unit (CAM)

The access unit (CAM) is available in two different versions: drivers can identify themselves to a vehicle either by means of a personal PIN or using an RFID chip. Vehicle data such as shock readings are transmitted to the SyncPoints via Bluetooth. This unit is likewise available as a retrofit solution.

2 Connectivity retrofit kits

Is part of your fleet not equipped with your chosen transmission technology? Then it is easy to upgrade to wireless data communications with the appropriate retrofit kit for Bluetooth, Wi-Fi or mobile broadband.

3 connect:data unit (CDX)

The data unit (CDX) logs the data on the vehicle and transmits it to the Linde cloud via the cell phone network. It can also send commands back to the vehicle controls. The unit also downloads firmware updates and additional functions via the cell phone network

Retrofitting the connect:data unit is easy and takes very little time. The unit is directly connected to the vehicle controls and is operational immediately.

TRAINING AND SUPPORT

The Linde Academy in Aschaffenburg offers various training courses for using connect:desk. Our trainers will also happily travel to your premises to provide group training sessions.



We sit down with you and put together just the right training components to suit your needs. We help you choose and install everything from the necessary infrastructure all the way up to the finalized connect solution. If questions arise during ongoing operations, support is provided by experts from your contract partner or Linde Service. For more information on the subject of training please contact us:

 \rightarrow www.linde-mh-akademie.de





Pre-shift check via app

The electronic key









Electronic damage monitor

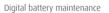


Automated error code transmission from truck





Digital usage analysis



(i)

Are you interested in Linde connect? Please contact your Linde dealer who will be happy to provide information and advice.

Linde Material Handling GmbH,

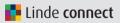
Linde Material Handling, a KION Group company, is a leading global manufacturer of forklift trucks and warehouse trucks, and a solutions and service provider for intralogistics. With a sales and service network that spans more than 100 countries, we are close to customers in all major regions around the world.

With over 100 years of experience in providing material handling solutions to companies in virtually every industry, we help our customers optimise their entire material handling process.

Our experts analyse all workflows from goods receiving to shipping and work with the customer to develop solutions that fully meet their individual requirements.

In the process, Linde Material Handling guarantees smooth implementation, reliable commissioning and responsive service.

For further information, please visit: www.linde-mh.com







Linde Material Handling GmbH | Carl-von-Linde-Platz 63743 Aschaffenburg | Telephone +49 6021 99 0 | Fax +49 6021 99 157 www.linde-mh.com | info@linde-mh.com | Printed in Germany