MANUFACTURING QUALITY

LTW
INTRALOGISTICS

120 YEARS OF ROPEWAY STANDARDS

AN OVERVIEW OF DOPPELMAYR

Since its foundation in 1981 LTW has been a member of the Doppelmayr Group. Originally the global market leader in ropeway systems entered the technology of high-bay warehouses in order to compensate seasonal fluctuations in production. Since then LTW has emerged as a pillar of the group.

The manufacturing of stacker cranes according to ropeway standards is one of the outstanding quality features LTW has to offer. Ingenious constructions and extremely fine manufacturing tolerances guarantee exact material handling, even at heights of 40 m plus.

Doppelmayr today

- Global market leader in ropeway systems
- More than 14,300 installations implemented worldwide
- Subsidiaries and agencies in 33 countries
- Export into 87 countries around the world (Export content 80 %)
- Employees worldwide approx. 2,200
- Turnover approx. 620 Mio. EUR

Milestones

1893 Company foundation by Konrad Doppelmayr

1937 First ski lift in Zürs, Austria

1953 First overseas commission

1972 First detachable gondola

1976 First detachable chairlift

1981 LTW foundation

1996 Michael Doppelmayr in 4th generation

1998 First detachable 8-seater chairlift

1999 First Cable Liner Shuttle in Las Vegas

2001 Doppelmayr Holding AG with integration of CWA Constructions SA/Corp.

2002 Merger with Garaventa Seilbahnen AG

2002 First tricable and bicable ropeway

2004 World novelty: first seat heating for chairlifts

2006 World novelty: first ferris wheel Funitel, Galzigbahn/St. Anton am Arlberg, Austria

2008 Longest tricable ropeway in the world: peak 2 peak gondola in Whistler Blackcomb, Canada

2010 Novel recovery concept for ropeways

2012 First urban ropeway in London

Karl-Heinz Zündel, Manufacturing

“Our production plants offer an ideal platform for all manufacturing requirements of the Doppelmayr Group.

We produce only highest quality, whether ropeway system, cable liner or stacker crane. Our machinery is always up to date as well as our employees. In order to pass on the existing knowledge to the whole company, we have integrated, besides the training workshop, our own occupational field into the production.

In total approx. 75 trainees are being exposed to the latest manufacturing technologies before being integrated into the different departments.”

EXPERIENCED QUALITY

OVERVIEW OF THE PRODUCTION PLANTS

LTW stacker cranes and conveyor system components come a long way before being able to be used by the customer.

Since 2002 the components spend an essential part of the company-internal round trip in the plant “Hohe Brücke”, the biggest production plant of the Doppelmayr Group.

In the plant “Güterbahnhof” located opposite, the assembly of the components and the pre-commissioning take place.

Manufacturing according to ropeway standards

All Doppelmayr plants attach importance to the highest quality and safety standards for ropeway systems. Passenger transport demands extremely close tolerances, specialist knowledge of employees and appropriately reliable machinery always up to date.

Lots of room for highest quality

Beside the pertinent office units, steelwork, mechanical manufacturing, storage area and preceding and following services such as manufacturing organization and quality management are located in the plant “Hohe Brücke”.

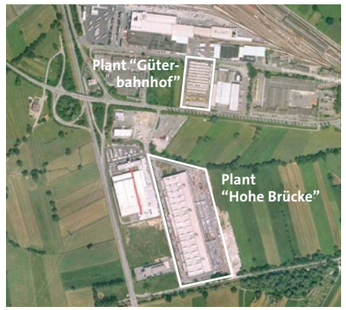
On a floor area of 26,000 m² approx. 250 dedicated employees make sure that high class certified materials such as sheets and tubes turn into warp resistant mast segments and other component parts for LTW systems. More than 50 cranes on two levels are there to support.

Assembly and pre-commissioning

Opposite the plant “Hohe Brücke” the plant “Güterbahnhof” is situated, where LTW products as well as various Doppelmayr components are complemented.

Every stacker crane, every transfer car, every vertical lift including the electric and electronic parts has to pass an intensive test run.

Only if all functions work perfectly, the devices are made ready for shipment so that on site they only have to be set up by the LTW team and are able to start running.

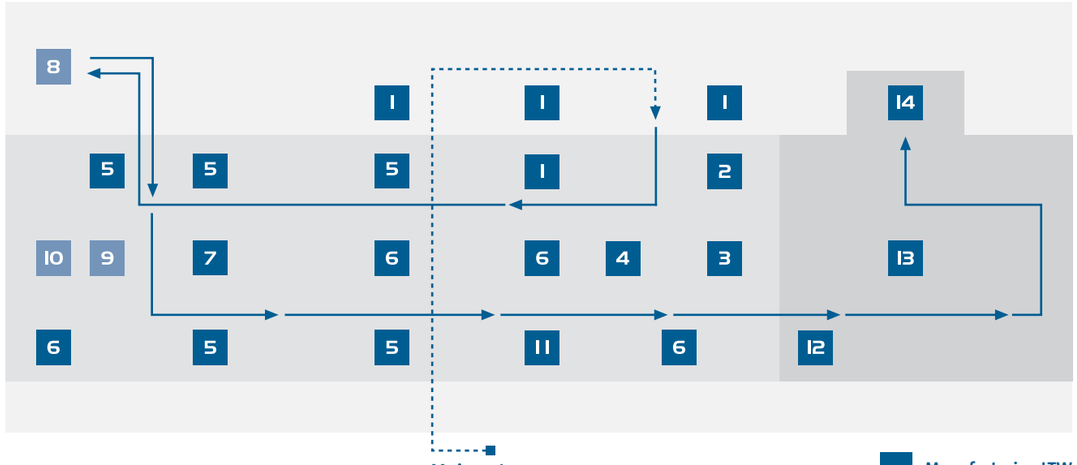


PLANT DATA

Plant “Hohe Brücke”
Hall area/offices: approx. 18,000 m²
Roofed open area: approx. 8,000 m²
Approx. 250 employees

Plant “Güterbahnhof”
Hall area: approx. 3,000 m²
Open area: approx. 5,000 m²
Approx. 30 employees

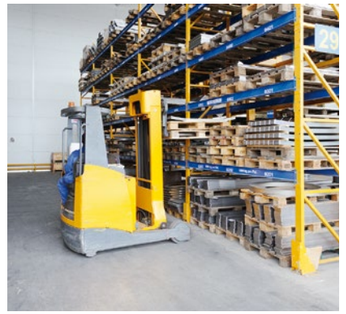
PLANT “HOHE BRÜCKE” – MANUFACTURING



1	Storage area and production setup		6 Welding area (tacking, welding, adjusting, cleaning)		11 Training steelwork	
2	Marking and cut		7 Quality assurance welded seams		12 Training mechanical manufacturing	
3	Surface preparation		8 Annealing furnaces		13 Mechanical manufacturing	
4	Steel pre-fabrication		9 Robot for bullwheel manufacturing		14 Test range and measuring zone	
5	Welding robot		10 Manual bullwheel manufacturing			

1 STORAGE AREA AND PRODUCTION SETUP


Storage bar material


Order related picking

Bar material
- More than 1,000 items
- Delivered in final dimensions

Steel sheets
- Material thickness from 4 mm to 130 mm
- Leftovers from cutting are reprocessed

Setup area
- Order related picking of fitted components, preparation for steelwork

2 MARKING AND CUT


Marking and drilling facility


Oxyfuel cutting equipment

Marking and drilling facility
- Clear marking of the individual components with an ID number
- 3,800 bar water pressure

Oxyfuel cutting equipment
- CNC controlled
- Material thickness from 20 to 130 mm

Plasma cutting equipment
- Material thickness up to 40 mm
- Temperatures up to 30,000 °C

3 SURFACE PREPARATION


Ball shot blasting

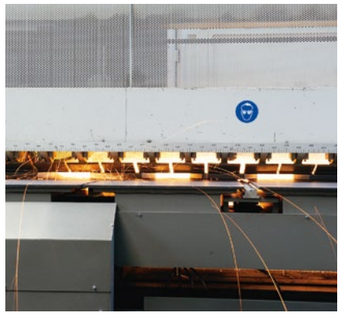

Belt grinder

Ball shot blasting
- Removes scale and slag from the sheets

Belt grinder
- Removes cutting ridge and sharp edges

Troughed blasting system
- Removes scale, rust and cutting burr of small parts

4 STEEL PRE-FABRICATION



Welding edge grinder

Sheet orientation – Edge bending / adjusting

Welding edge grinder
- Preparation of components to be welded (chamfering)

Sheet orientation
- Bending sheet edges for welding, adjusting bent sheets

5 WELDING ROBOT

Welding robot for small parts

Welding robot for large parts

Welding robot
- 11 welding robot equipments for small and large parts
- Max. component size 15 x 2.5 x 2.5 m
- Max. component weight 10 tons
- 1 welding robot for occupational field

6 WELDING AREA

Worker-friendly designed welding area

7 QUALITY ASSURANCE WELDED SEAMS

Ultrasonic testing of welded seams

Workplaces for manual tacking, welding, adjusting and cleaning
- Special light concept, Wood-block paving for effortless and back-friendly working
- Complete air exchange in the hall area within 40 minutes

Quality assurance welded seams
- Visual testing (VT)
- Magneto-inductive testing (MT)
- Ultrasonic testing (UT)

11 TRAINING STEELWORK

Training steelwork

12 TRAINING MECHANICAL MANUFACTURING

Training mechanical manufacturing

Training area
- Area 300 m² each
- Fully equipped workplaces
- Integration into the production, tasks are order related
- Transfer of highly skilled knowledge and latest manufacturing techniques
- Trainees usually remain in the company or a subsidiary after completing their training

13 MECHANICAL MANUFACTURING

Drilling and milling center

Cross linked machining centers

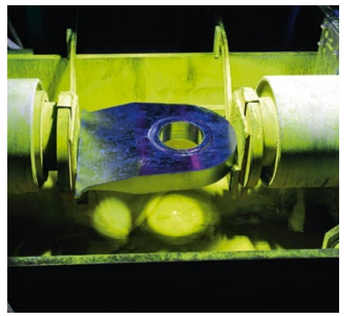
Various CNC lathes and lathe milling center
- Complete manufacturing of components

Various machining centers (drilling and milling)
- Up to five-axis construction
- Cross linking of the machining centers

4 devices for treating large parts
- Treatment of components with up to 16 m length, 4.5 m width and 3.5 m height
- Tool depot with 120 spaces

14 TEST RANGE AND MEASURING ZONE

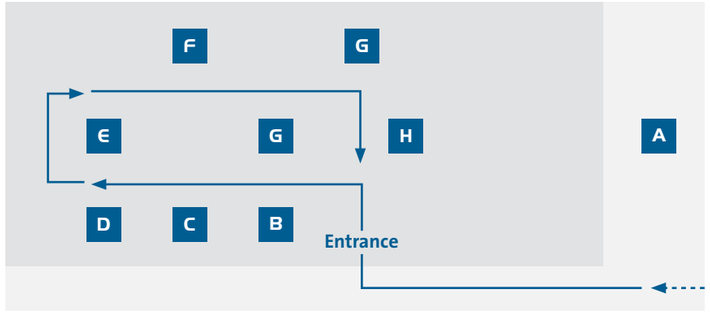
Open test location with Zeiss measuring machine



Crack detection of components

Testing hall and open test location
- Measuring of various components with Zeiss measuring machine (3 x 2 x 1.5 m) or with a flexible arm for large parts
- Magneto-inductive testing (MT)

PLANT “GÜTERBAHNHOF” – ASSEMBLY



After the components have been through the plant “Hohe Brücke” and therefore steelwork and mechanical manufacturing, the surfaces are coated (lacquered or galvanized). Electrical components such as control cabinets are equipped with the relevant components and wired within the Doppelmayr Group.

Bought-in parts such as wheel sets, drive units or safety-related components are ordered from longtime partners, if necessary temporarily stored in the Doppelmayr high-bay warehouse and delivered to the plant “Güterbahnhof” according to the manufacturing progress.

There the combining of all equipment incl. the pre-commissioning takes place – intensive functional tests for the powered components such as the telescopic forks make sure, that the subsequent assembly on site goes smoothly.

Plant “Güterbahnhof” with outdoor storage area

Control cabinet construction in the plant nearby

A OUTDOOR STORAGE AREA

Galvanized stacker crane masts

B PRE-ASSEMBLY

Pre-assembly of small and spare parts

Outdoor storage area
- Storage of large parts such as mast segments, chassis and lifting units

Pre-assembly
- Small parts such as guide roller holders, carrying wheels and platforms
- Spare parts

C LIFTING UNIT

Mechanical assembly of the lifting unit

D CHASSIS

Mechanical assembly of the stacker crane chassis

Lifting unit
- Mechanical assembly of several hundred components per lifting unit such as load handling devices and attachments for sensors

Chassis
- Mechanical assembly of the chassis (wheel sets, drive units, attachments for collectors etc.)

E ELECTRICAL INSTALLATION

Cabling of sensors

F MASTS

Assembly of the parts on the stacker crane mast

Electrical installation
- Assembly of the electrical components on the lifting device (light barriers, limit switches, control lines,...)
- 500 to 2,000 meters of cable per lifting unit

Assembly masts
- Connection of mast segments
- Mechanical assembly of lifting brackets, platforms, control cabinets, ladders etc.

G FINALIZATION

Final assembly of an engine casing

H SHIPPING

Components packaged and ready for delivery

Finalization
- Cabling the components
- Testing the sensors and drives
- Putting into service and test run

Shipping
- Packaging/Foiling
- Temporary storage
- Shipping to the different building sites

carbon neutral
natureOffice.com | AT-157-793602
print production

INTRALOGISTICS

042019/E directed by transfair