

BÖLLHOFF

Joining together!

Böllhoff - Partner of the solar power industry



Historic milestones within the Böllhoff Group

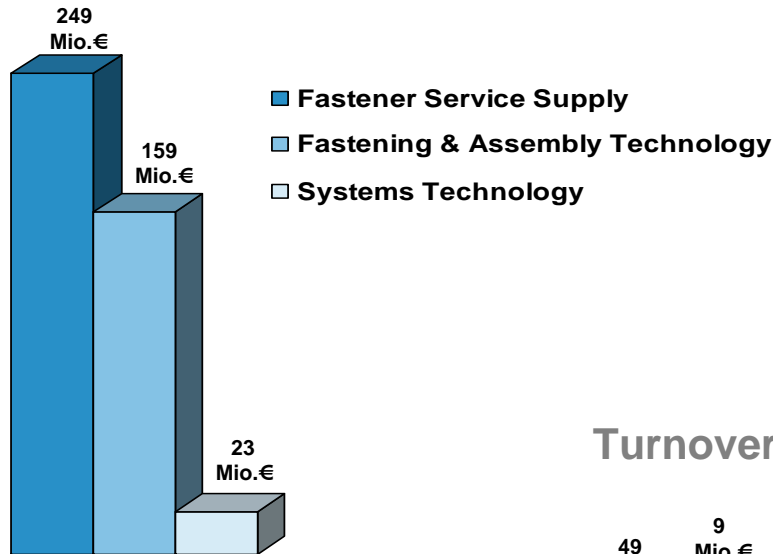
- 1877 Founded by Wilhelm Böllhoff in Herdecke as a hardware wholesaler supplying metalworkers, forgers and other industrial users.
- 1923 Headquarters moved to Bielefeld.
Specializing in screws, bolts, and threaded components under Josef Böllhoff.
- 1952 Established first own production facility in Bielefeld for HELICOIL® inserts (a license for several countries in Europe had been acquired).
- 1959 Dr. Wolfgang Böllhoff entered the company in 3rd generation.
- 1952-2007 Developed an international network with production facilities for various fastening technologies at 6 locations, subsidiaries in 22 countries and other sales agencies around the world.
- 1995 / 1998 Wilhelm A. Böllhoff and Michael W. Böllhoff entered the company in 4th generation, taking over full responsibility in 2005.



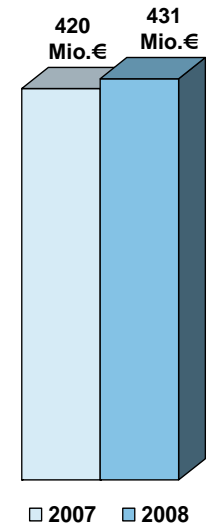
Business figures for the Böllhoff Group

2008 total:
Group turnover: 431 Mio. €
Employees: ~ 2,000 people

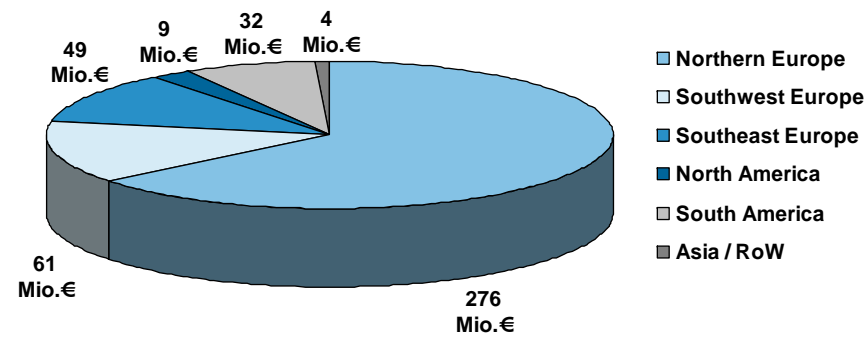
Turnover divisions 2008



Turnover development 2007/2008



Turnover world regions 2008



Fastening & Assembly Technology Division

We are...

- ... a manufacturer today mainly serving the automotive industry and other industries, e.g. aerospace, manufacturers of electronic devices, machines or metal and plastic parts.
- ... development partner for our customers.
- ... market leader in the European automotive industry for blind rivet nuts.
- ... prepared for future trends with metal, plastic and hybrid fastening solutions.
- ... supplier of both fasteners and associated assembly technology.

We want to...

- ... further establish ourselves as a development partner for innovative fastening solutions for the solar power industry.

Our world-wide network



Our products for the solar power industry



Joining without a fastening element?

RIVCLINCH® Technology to join sheets using a mechanical interlock

- Without additional fasteners
- Manual systems or systems for automated manufacturing

Production site: Bielefeld, Germany



Application

- Joining the corner assembly of solar modules
- Cost-optimized production
- Fast and simple handling

Our products for the solar power industry

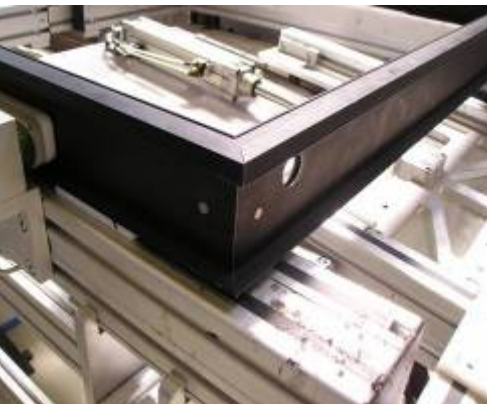


Optimized fastenings by self-pierce riveting?

RIVSET® Self-pierce riveting for high-strength, process-reliable fastenings

- No pre-preparation of holes
- Form-fitting and non-positive
- Self-pierce riveting replaces alternative processes e.g. welding

Production site: Sonnewalde/Bielefeld, Germany



Application

- Corner joining assembly of solar modules
- Safe and easy installation
- Visually appealing

Our products for the solar power industry



Bolt setting in high-speed?

RIVTAC® Portable – A new dimension in joining

- Joining without pre-drilling with access from one side only
- Reducing jointing and cycle time
- Universal application for multi-layer and hybrid assemblies

Production site: Sonnewalde/Bielefeld, Germany



Application

- Corner joining of solar collectors
- Joining after complete frame assembly

Our products for the solar power industry



Screw-driving – hand-held or fixed?

UNIQUICK® Screw-driving units and hand-held screwdrivers

- Very flexible
- High process reliability

Production site: Bielefeld, Germany



Application UNIQUICK® Vario

- Fully automatic screwing
- Always the correct downforce for all applications
- 8 screw connections for each component

Our products for the solar power industry



Deep threads in thin-walled components?

RIVKLE® Blind rivet nuts and studs

Innovative solution for fastening high-strength nut and bolt threads in thin-section components

- High strength thread
- „Blind“ assembly from one side only

Production site: Chambéry, France / Wuxi, China / Kendallville, USA / Sao Paulo, Brazil / Cold-forming process

Application

- Fastening systems for solar modules (on-roof, inside-roof, open air assembly)
- RIVKLE® blind rivet nuts, available in aluminium or steel
- Creating threads in closed steel tubes



Further Böllhoff products



Joining of thin-walled components?

RIVQUICK® High-strength blind rivets for the joining of metal-sheets and profiles under extreme stress

- High-strength joint
- Installation can be checked visually



High-strength threads?

HELICOIL® Inserts for thread reinforcement in metals and composites

- High-strength wear-free threads
- Corrosion and temperature resistant



Threads in plastics?

AMTEC® Metallic inserts for thread reinforcement of plastic parts

- Prevention of relaxation in the plastic components
- High torsion and pull-out values

Further Böllhoff products



Compensation of tolerances?

FLEXITOL® Systems for automatic compensation of tolerance stack-up

- Metal, plastic or hybrid versions
- Ensures repeatable assembly in mass production



Decoupling vibration and noise?

SNAPLOC® Detachable fasteners

- Fast and simple assembly
- Variety of different types and concepts



Quick-release fasteners?

QUICKLOC® Clamp, turn and push-in fasteners for quick, repeated, unlockable fastenings

- Cost-effective and easy to mount
- Vibration resistant and robust

Further Böllhoff products and services



Procurement of DIN/ISO standard fasteners and custom-made parts?

ECOTRADE for reduction of suppliers diversity

- Over 70,000 fasteners and fixings made from steel, stainless steel, brass or plastic, direct from stock
- Fasteners with various coatings and strength levels
- Certificate documentation as per 3.1 and 3.2 EN 10204



Optimisation of fastening technology?

ECOTECH for reduction of system costs

- Standardisation of products by reducing fasteners diversity and by optimising components
- Optimisation of assembly processes, e. g. by using efficient drive systems



Economic packaging of fasteners?

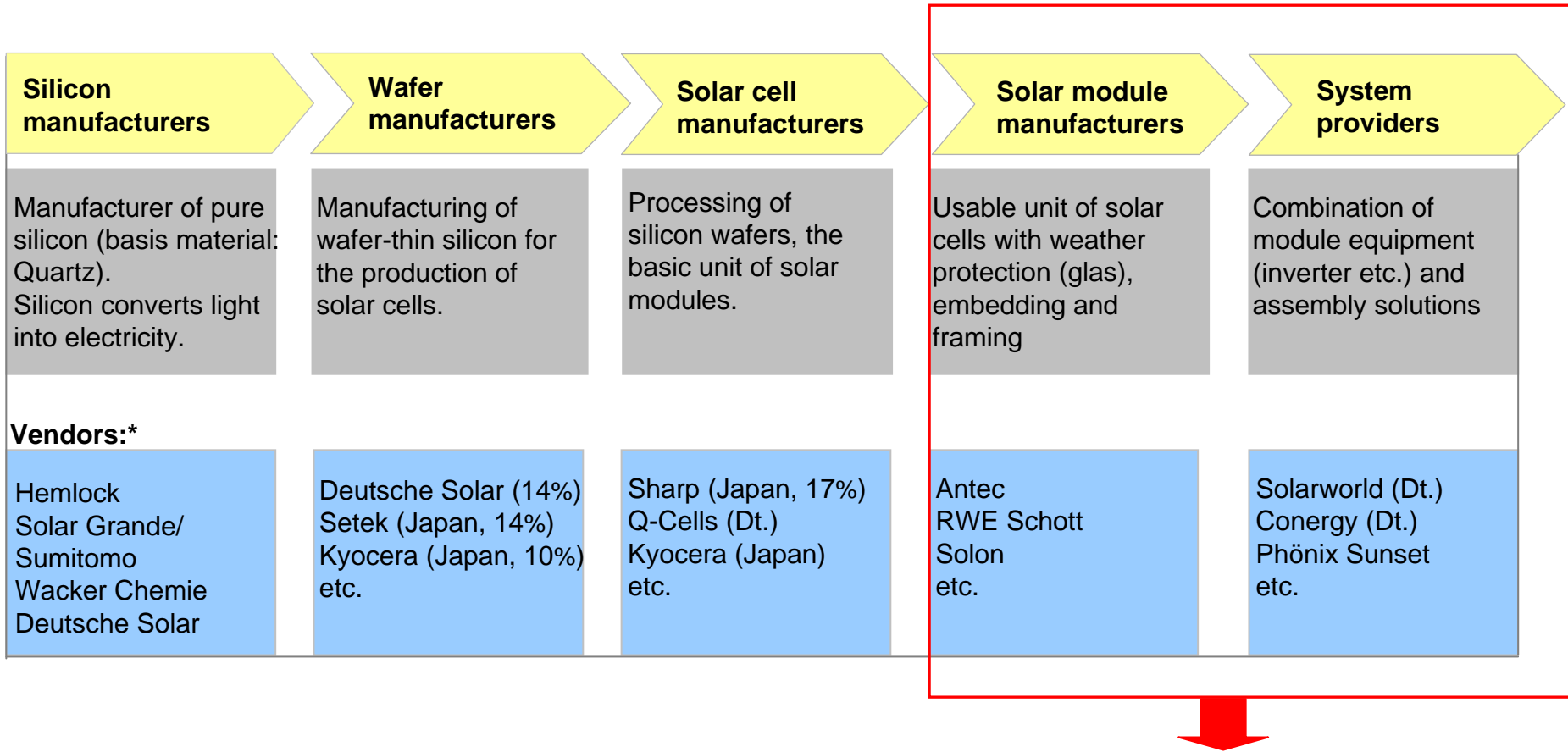
ECOPACK for procurement of fasteners and individual bag packaging

- Light barrier detection, camera detection and final weight check
- Bag packaging labelling with logos, bar codes and individual texts

Some of our customers in the solar industry



Supply chain solar (photovoltaic)



* Market share in %

Source: OBS 2008

Need of fastening solutions by

We serve the solar supply chain

Our services for all steps of your supply chain!

Development	Tests	Production	Assembly	Logistics
<ul style="list-style-type: none"> ▪ Application engineering ▪ Prototypes 	<ul style="list-style-type: none"> ▪ Accredited test laboratory to DIN EN ISO 17025 ▪ Performs physical, mechanical, chemical and metallographic tests of all types of fasteners 	<ul style="list-style-type: none"> ▪ Production of 100% controlled fasteners ▪ Mould construction ▪ Certificated to EN 9100 	<ul style="list-style-type: none"> ▪ Systems for manual or automatic assembly 	<ul style="list-style-type: none"> ▪ Sophisticated logistical processes





Your challenges – our solutions

Development of efficient production and assembly processes

- Customized fastening solutions made of steel, stainless steel or aluminium
- Support of simple and flexible frame assembly

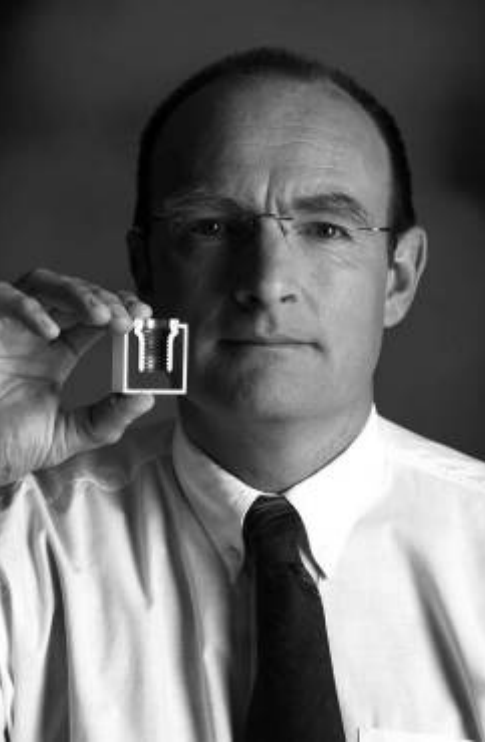
Increase in production capacity

- Automatic processing of fasteners

Development of installation systems

- High-strength and weather-resistant joins for strong wind forces etc.

We increase your competitiveness



Our competence – your benefit

- Develop efficient fastening solutions for your products
- Application engineering:
Technical know how and considerable experience over time
- Design new applications
- Enhanced efficiency in your assembly

Let's always be one step ahead!

Product manager RIVKLE®
Johann-Haig Linden

BÖLLHOFF

Joining together!

Böllhoff: Your expert in fastening technologies

