

Grevenbroich

Industry benchmark and
platform for excellence

Dr Stefan Kästner
Plant Manager



Mastering safety, means to master processes

We continuously improve HSE

- Focus on high risk incidents, awareness and employee involvement
- Special attention on contractor management and involvement
- Key tools: near-miss reporting, training, WOC*, LOTO** and auditing

Hydro TRI Rate



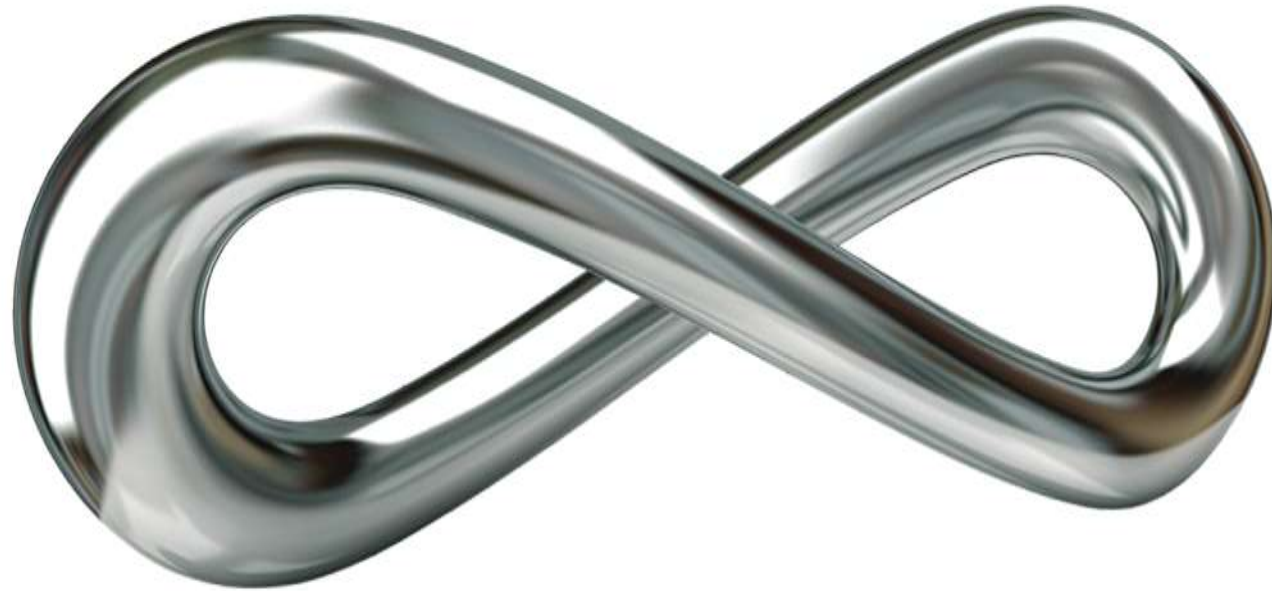
*WOC = walk, observe, communicate.

**LOTO = Lockout, a system to make sure all energy has been disconnected from machines during maintenance or inspections

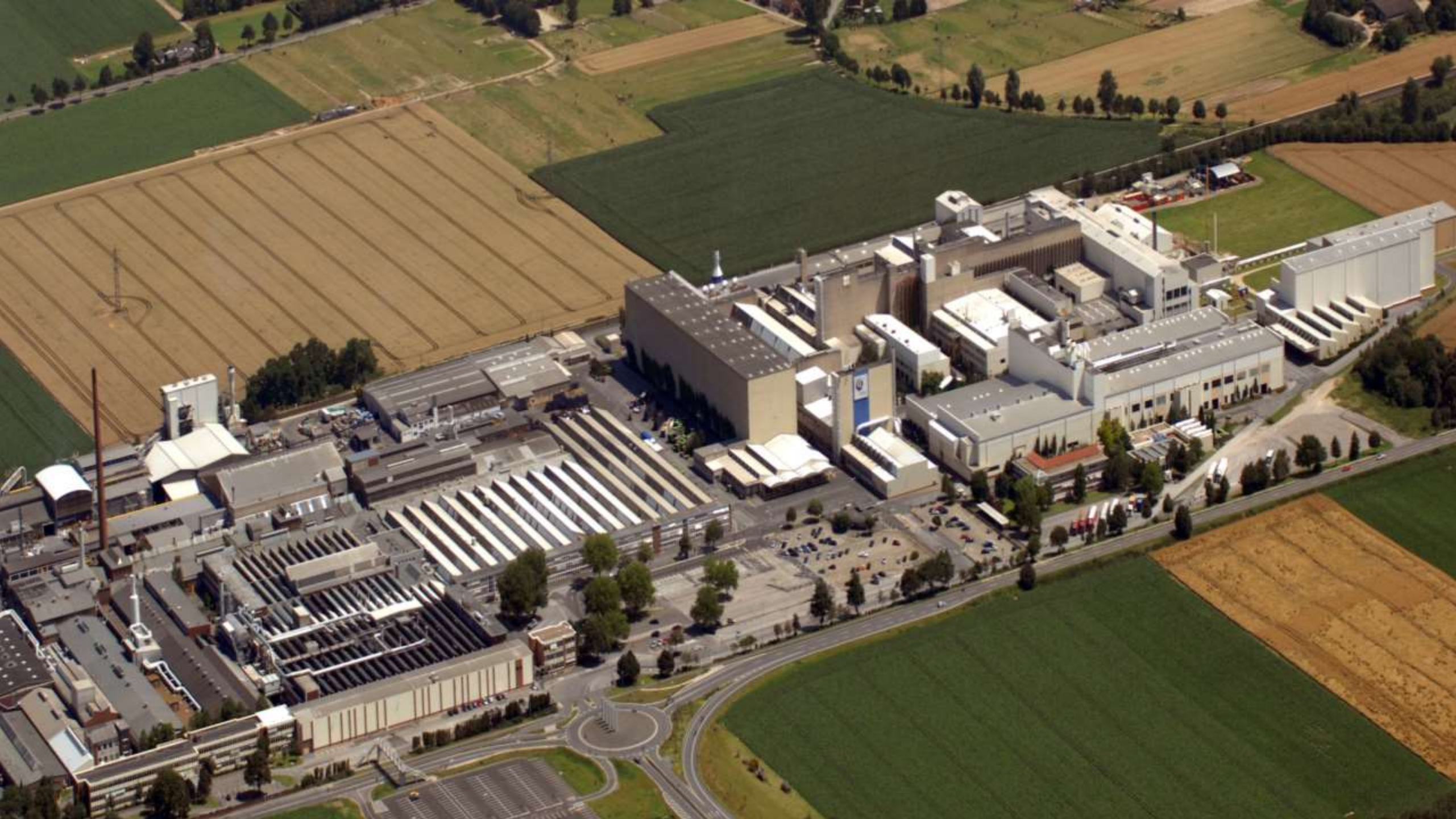
We campaign to raise awareness and establish safe standards

- **Safety at work info event** for >1300 colleagues
- Annual **Health and Safety week**:
Event with lots of info stations, tests, exercises, practising etc.
- Special **courses**, e.g. for drivers of forklift trucks
- **Eye Catcher** Campaigns for > 200 colleagues
- **Near-miss** reports and follow-up: > 5300 in 2014
- **Risk assessments**: 1,500,
triggering about 15,000 corrective measures

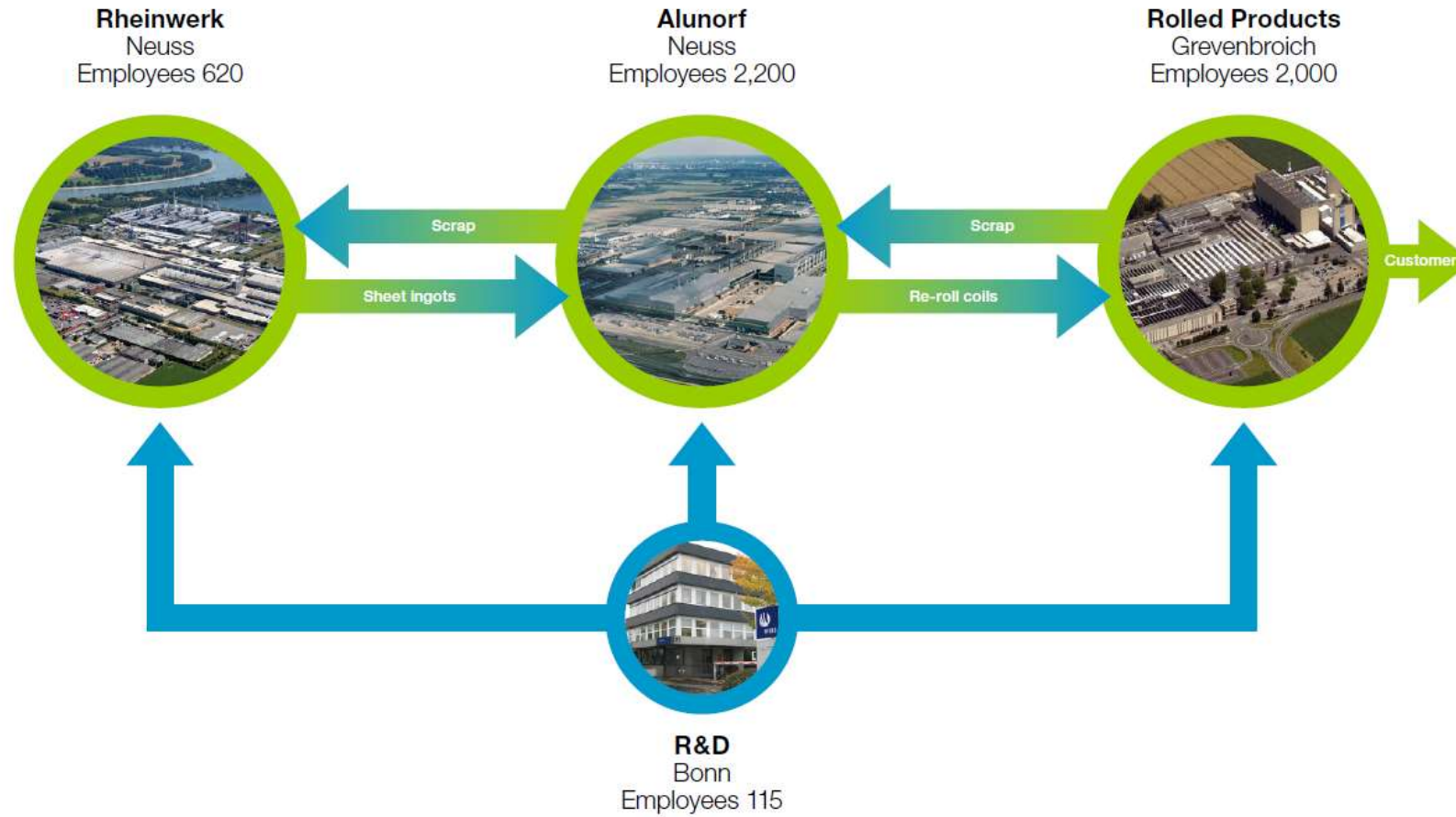




*Better **Bigger** Greener*

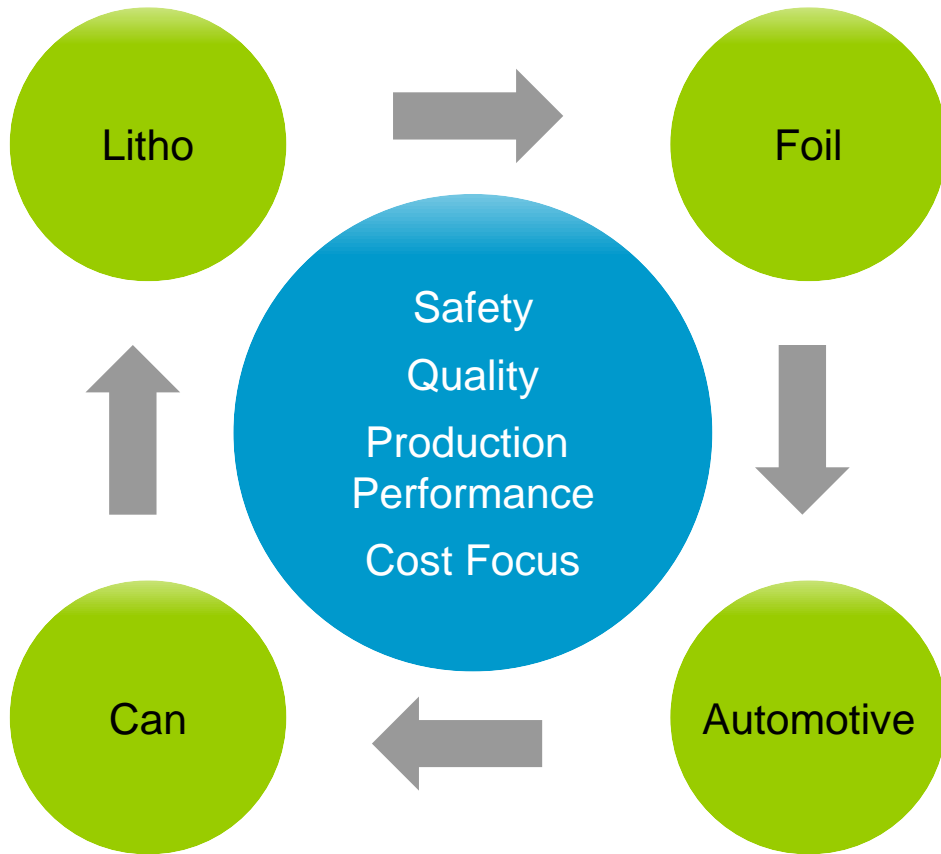


Unique «Aluminium triangle» utilizing logistical, cost and process synergies



Grevenbroich: the largest finishing plant in the world

Building our future on four strong pillars



- Quality and technology leadership with strong cost focus
- Selective growth in future-oriented products

Grevenbroich plant

balance the factors of excellence

People / Know-How

- highly educated operators and maintenance technicians
- skilled engineers in production maintenance and technical departments
- well developed organizational structure



Processes

- mastering complex production processes
- highest standards for operational procedures and quality
- process innovations

Assets

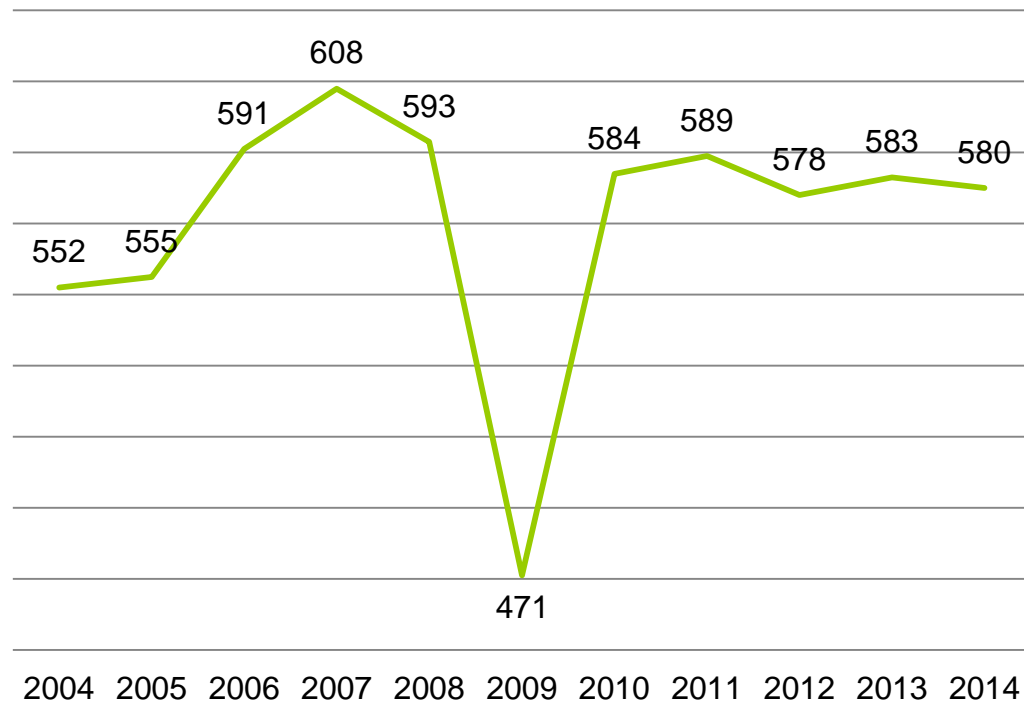
- adequate plant infrastructure
- excellent machinery
- highest standards for safety and environment

Develop the clusters of excellence on a standardized GV-Norf-Rheinwerk platform

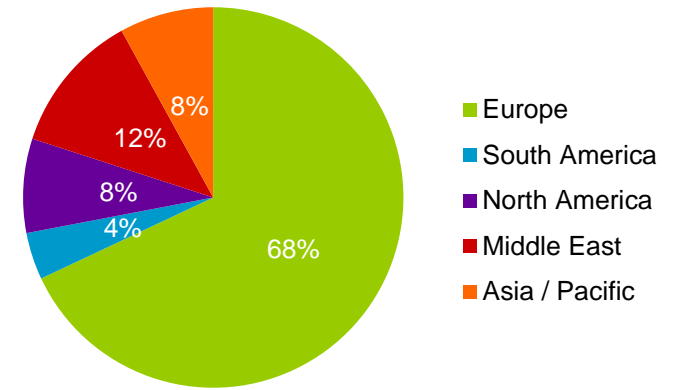
Our products span worldwide

Sales in thousand tonnes

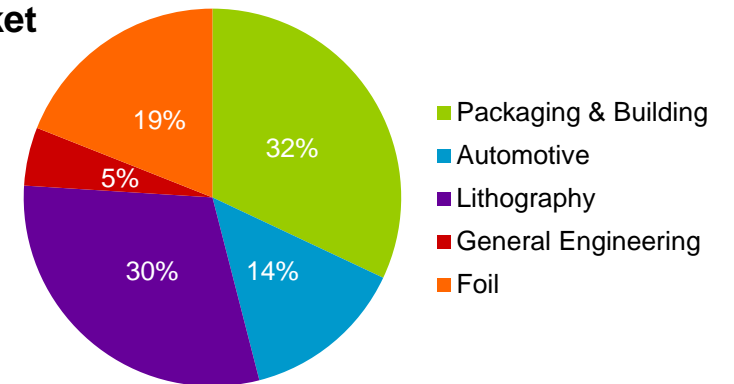
incl. Norf-deliveries



Sales per region in %*



Sales per market segment in %*

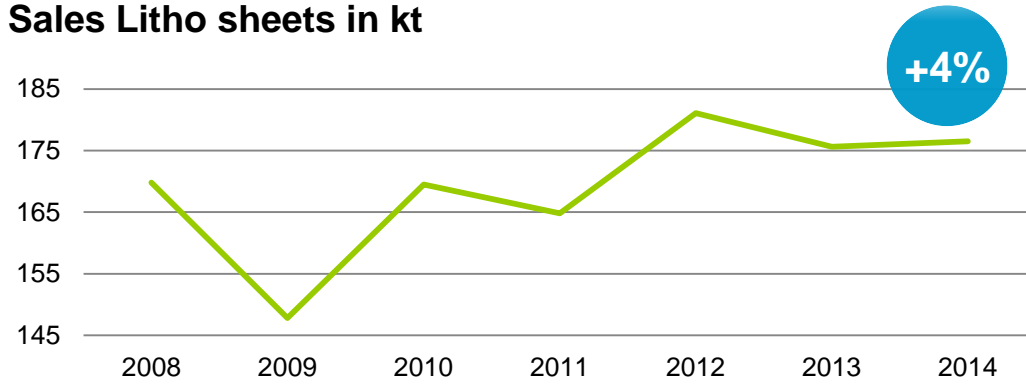


* 2014 numbers

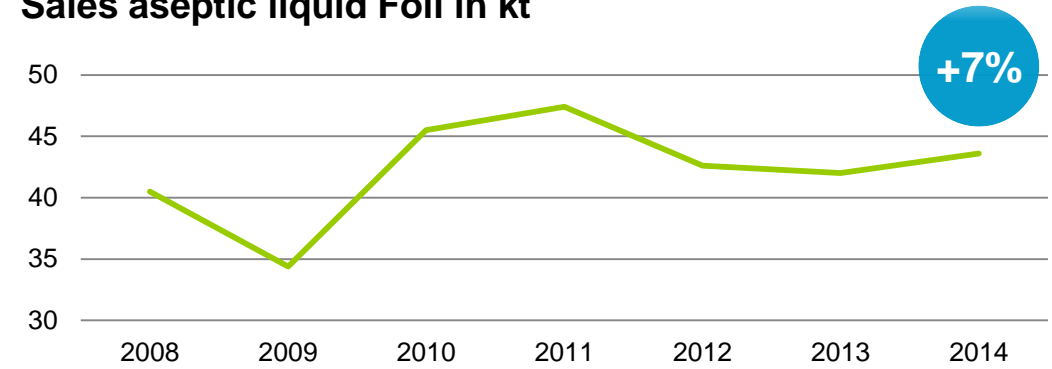
Grevenbroich Plant

Selective growth in future-oriented products

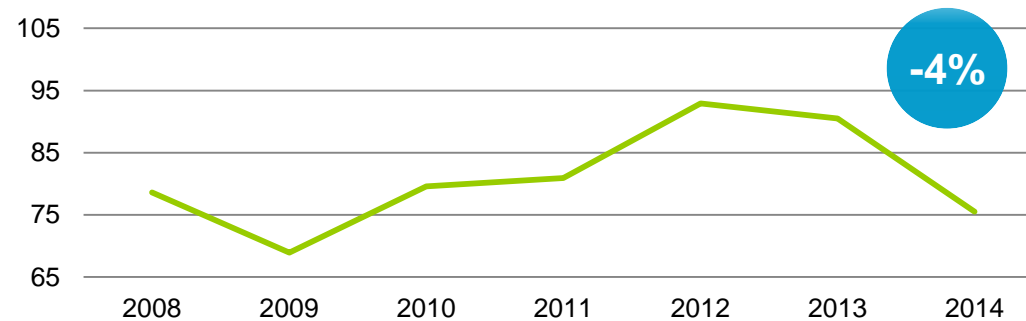
Sales Litho sheets in kt



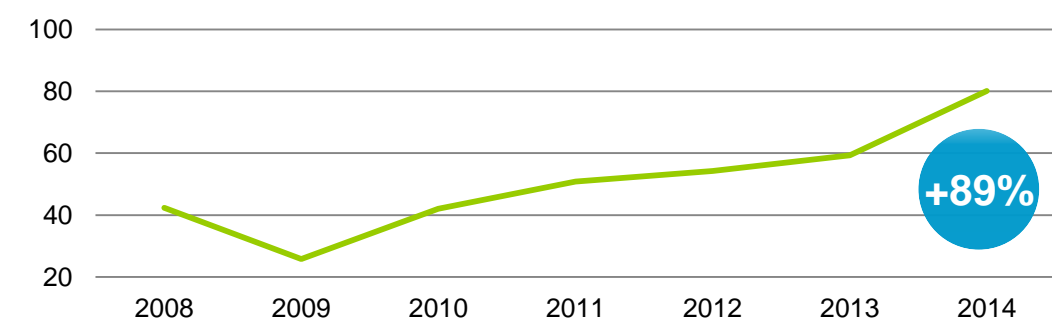
Sales aseptic liquid Foil in kt



Sales Can End in kt



Sales Automotive in kt



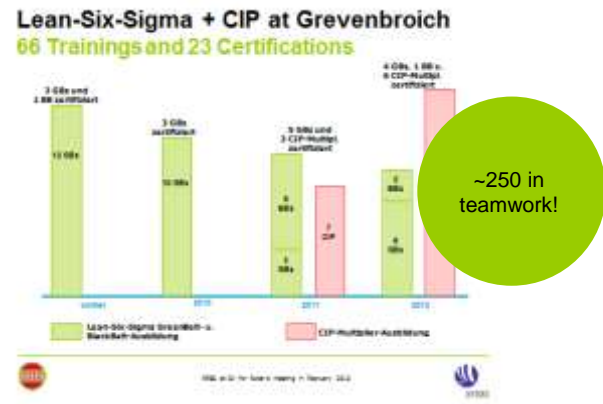
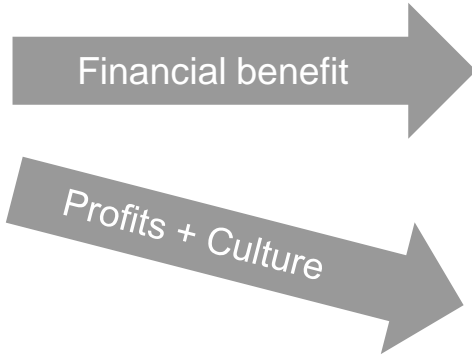
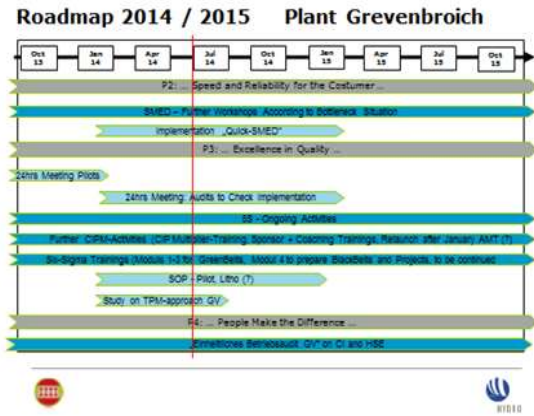
Intimate cooperation with European industry leaders

Most of these are served from our Grevenbroich base

	Our products	Our customers	Our position
Global reach	Litho 	FUJIFILM Kodak AGFA 	World market leader
	Foil 		
European reach	Can 	  CROWN REXAM <i>Brand-Building Packaging™</i>	Leading position in Europe
	Auto 	PSA PEUGEOT CITROËN  MAHLE  Mercedes-Benz	Leading position in Europe
	GE/ Building 	VELUX®  multi metal distribution ThyssenKrupp Materials	

Grevenbroich Plant – The Business System

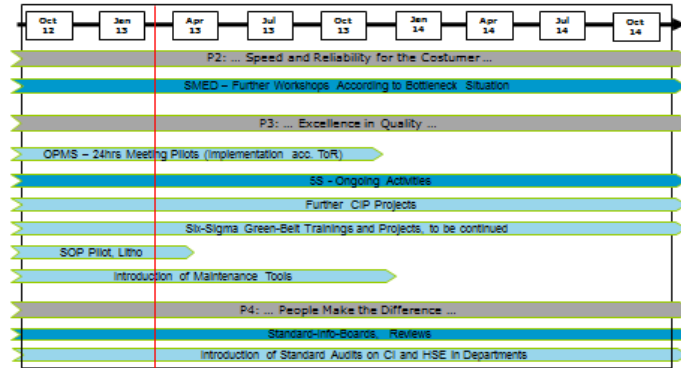
Creates culture and generate benefits



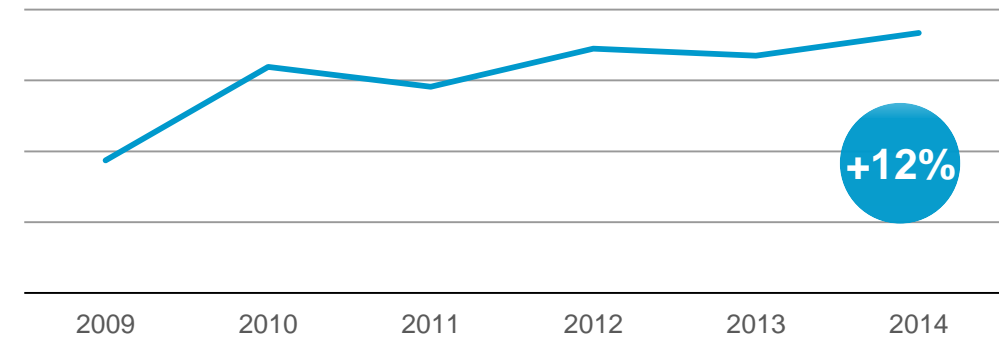
Continuous improvement of KPI's in Grevenbroich

...supported by a structured Business System approach

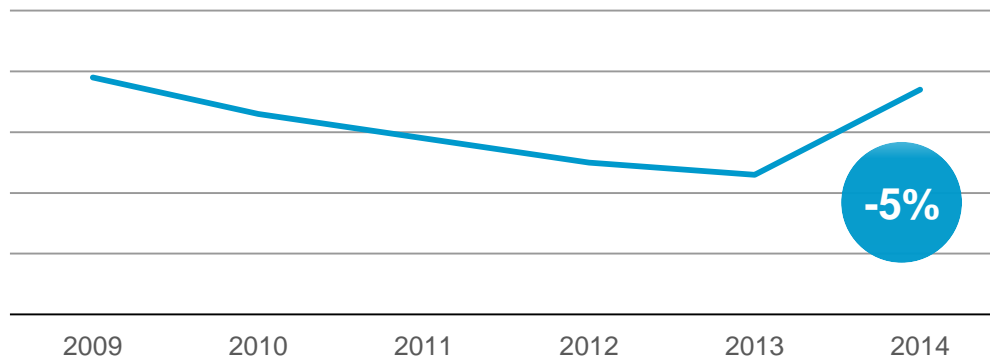
Roadmap 2013 / 2014 Plant Grevenbroich



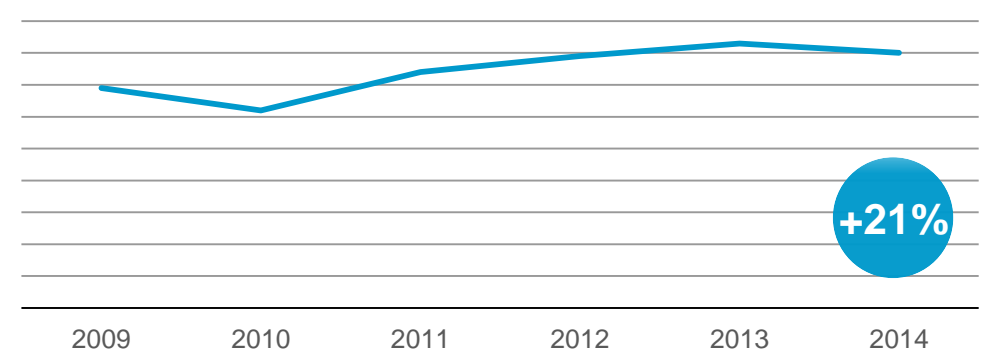
Productivity in kg/manhour



Claim rate in %

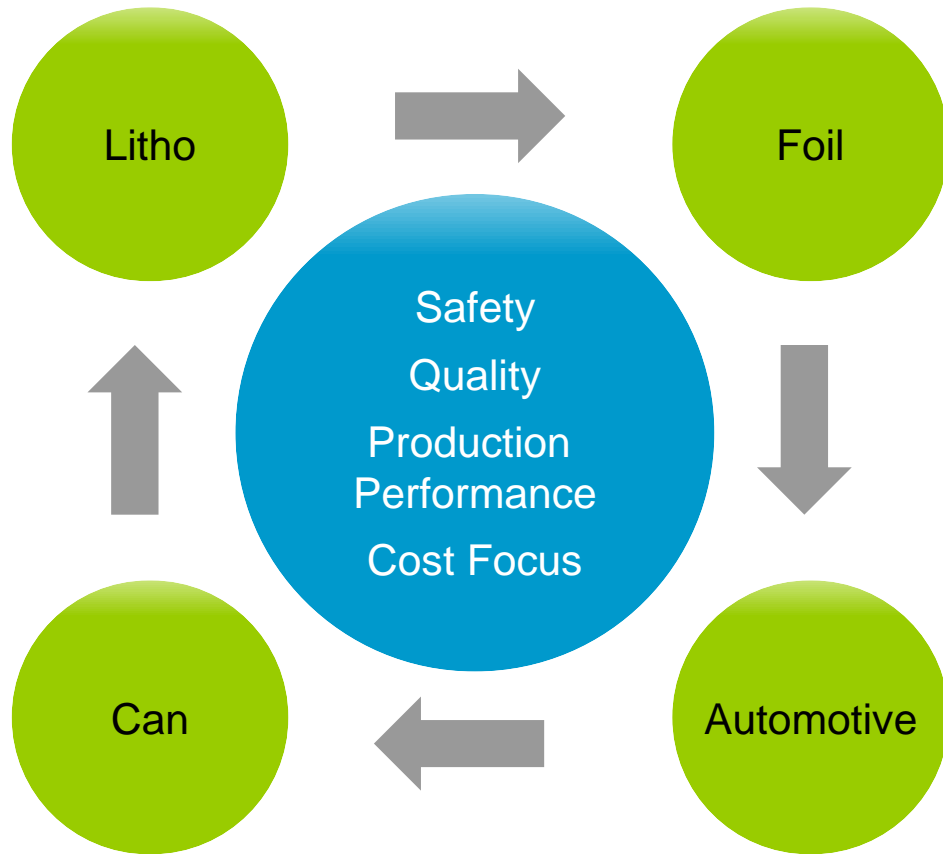


Delivery performance in %



Grevenbroich: the largest finishing plant in the world

Building our future on four strong pillars

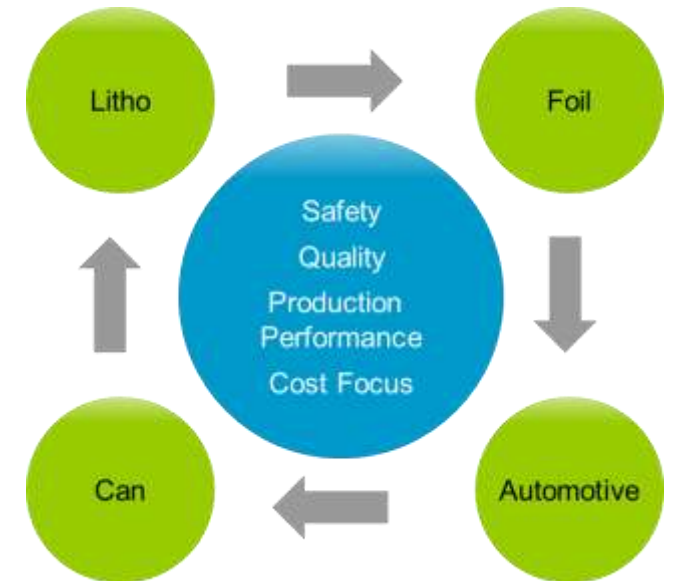


- Quality and technology leadership with strong cost focus
- Selective growth in future-oriented products

World class know-how in foil production

Leading global supplier for aseptic liquid foil

- More than 90 years of experience
- First liquid packaging foil in the world and first to make it 2 m wide
- First computer-integrated manufacturing foil line
- Strong focus on resource efficiency



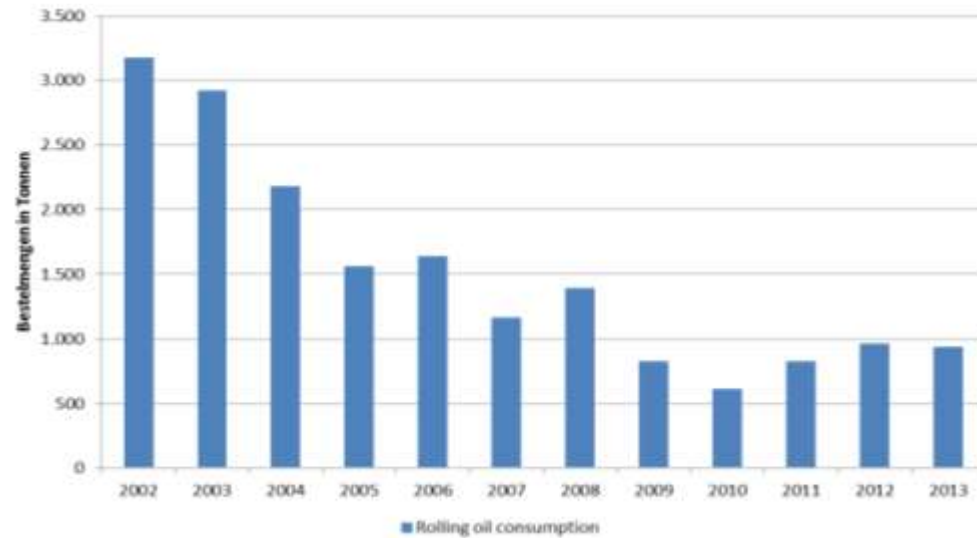
Foil production line

Rolling, cutting and annealing

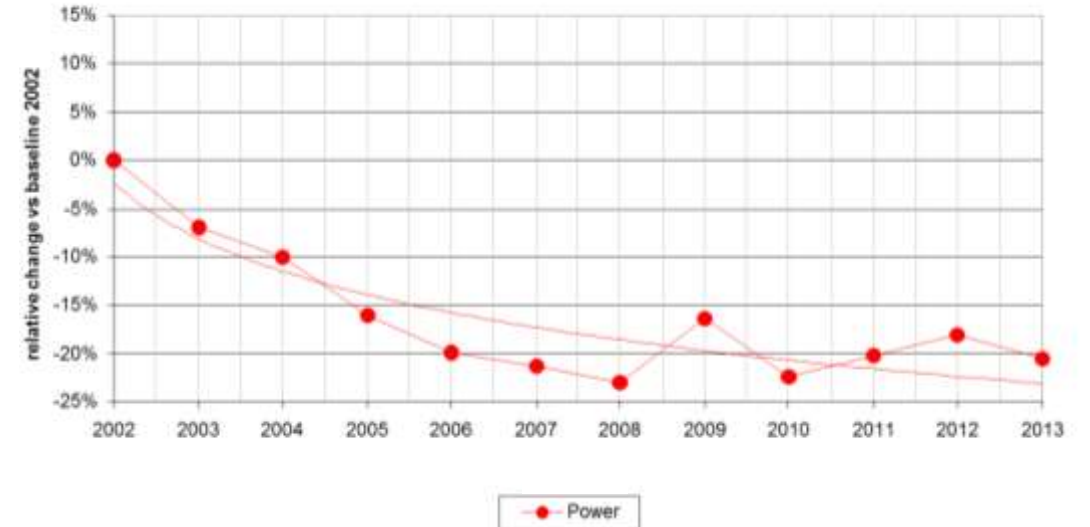


Improving our resource efficiency in foil production

Rolling oil consumption in tonnes



Specific power consumption in MWh/mt



Setting a new industry benchmark in energy efficiency

First catalytic
waste air purification
on final annealing
furnaces
in the world



Lithography production line

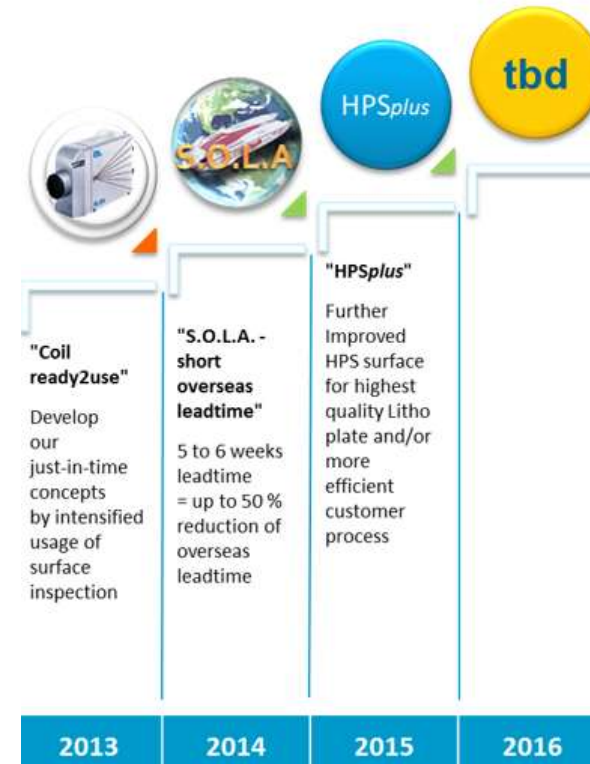
Rolling, stretching and degreasing



Strengthening Litho

Global market leader through technology lead and high efficient production

- First dedicated litho line in the world installed 1985, expansion lines built 1992 and 2005
- Hydro produced first aluminium lithographic sheet in the world and is market leader ever since
- State-of-the-art asset base
- One step change per year
- Retain quality and technology leadership with strong cost focus



Strengthening Can

Global leader in quality & performance for end stock

- Strengthening product focus and process chain including “aluminium triangle” Grevenbroich-Rheinwerk-AluNorf
- Greening up our profile:
 - New UBC line to raise recycled content and improve metal base

Product innovation

- Hydro’s brilliEND™ offers cleaner surface and brighter, shiny appearance
- Production capacity increased by 40 per cent over the last five years



Packaging and building production line

Lacquering and cutting



Boosting Automotive

Leadership through innovation, service & quality

- First investment in automotive BIW capacity in 2008
- Joint effort of Sales, Production, R&D and Technical Customer Service enabled smooth ramp-up
- Excellent technology platform built up
- Hydro today positioned as preferred partner for product developments
- New automotive line 3 under construction
- Quadrupling capacity in a world class set-up

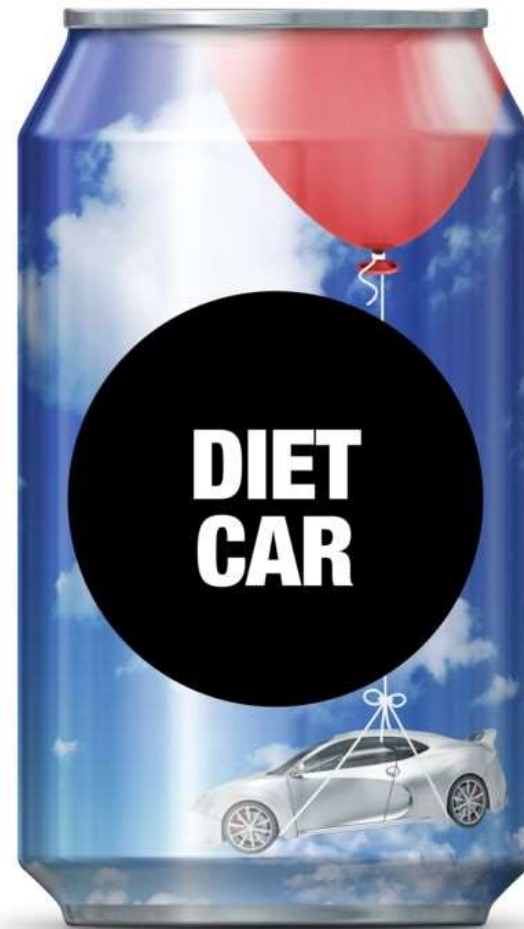


Automotive production line

Rolling, cutting, annealing and stretching



Automotive Line 3 Investment



Automotive line 3 contributing to our aspiration

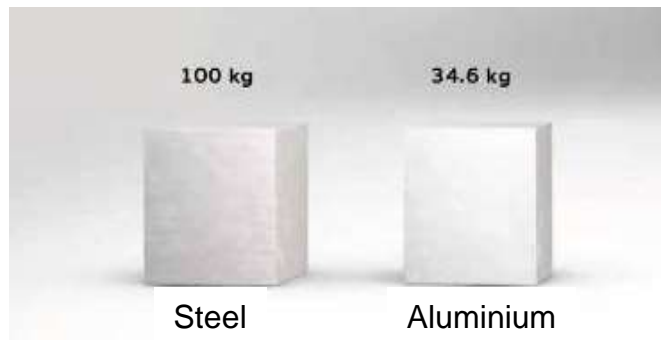


- Better* «AL3» will become benchmark in the aluminium world
- Bigger* Capacity boost to 200,000 tpy
- Greener* Significant reduction of CO₂ emissions

Aluminium sheet for cars offers reduction of energy consumption and CO₂ emissions

Lighter cars are more fuel efficient

- For 10% reduction in vehicle weight, car manufacturers achieve a 5-7% fuel saving
- Each 1 kg of aluminium replacing mild steel, cast iron or high strength steel in cars saves between 13-20 kg GHG emissions



Significant reduction of the specific energy consumption through new AL 3 line



	Current	AL3	
Gas consumption [kWh/t]	600	435	-27,5 %
Electricity consumption [kWh/t]	334	214	-36,0 %

Sustainable reduction of the carbon footprint

Investing in developing our value chain

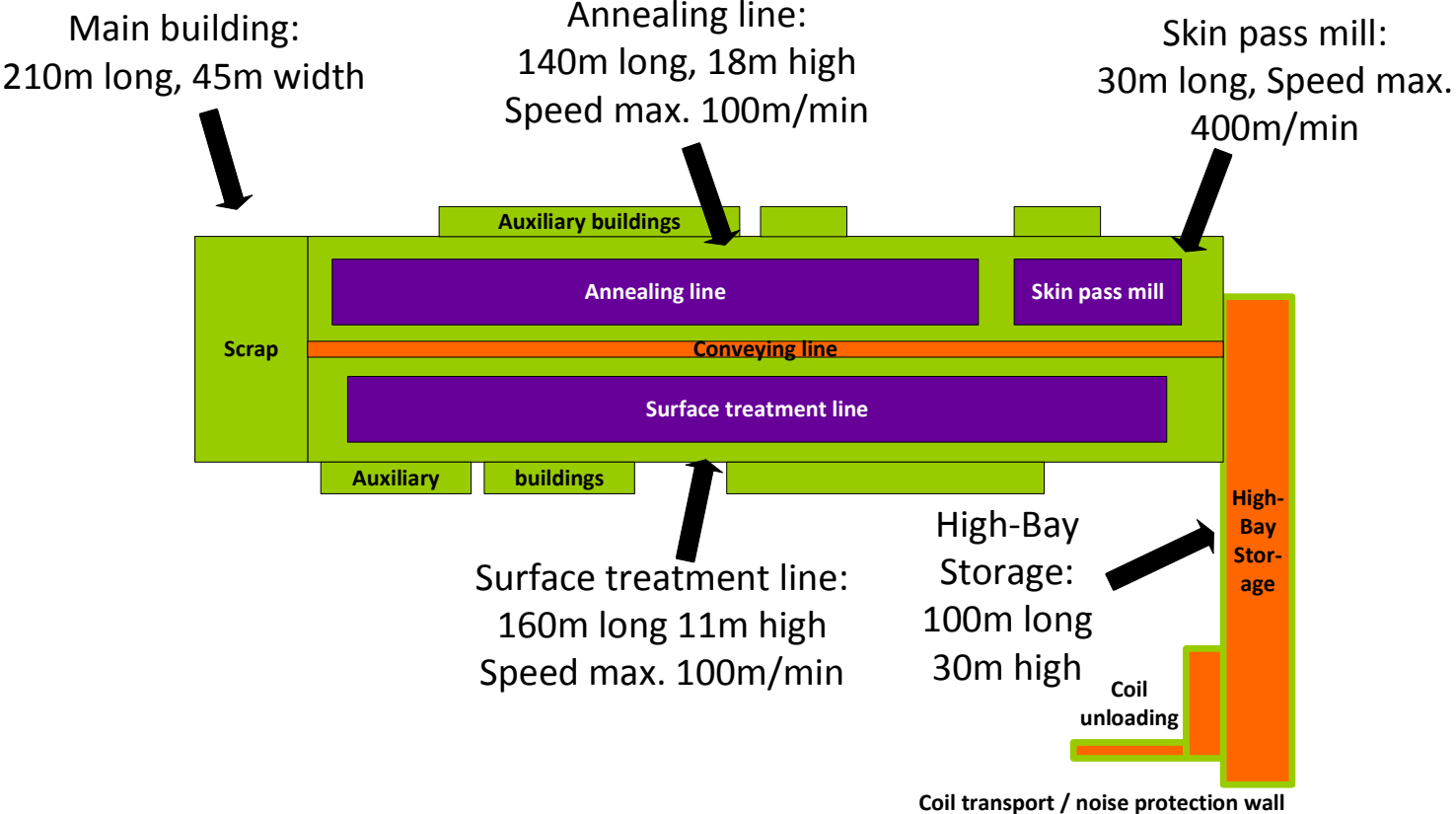


- Automotive line 3 «AL3» world class
- Capacity increase to 200,000 tpy
- Investment of €130 million
- 55 employees on the new line
- Ground-breaking in January 2015
- Production start 2nd half 2016



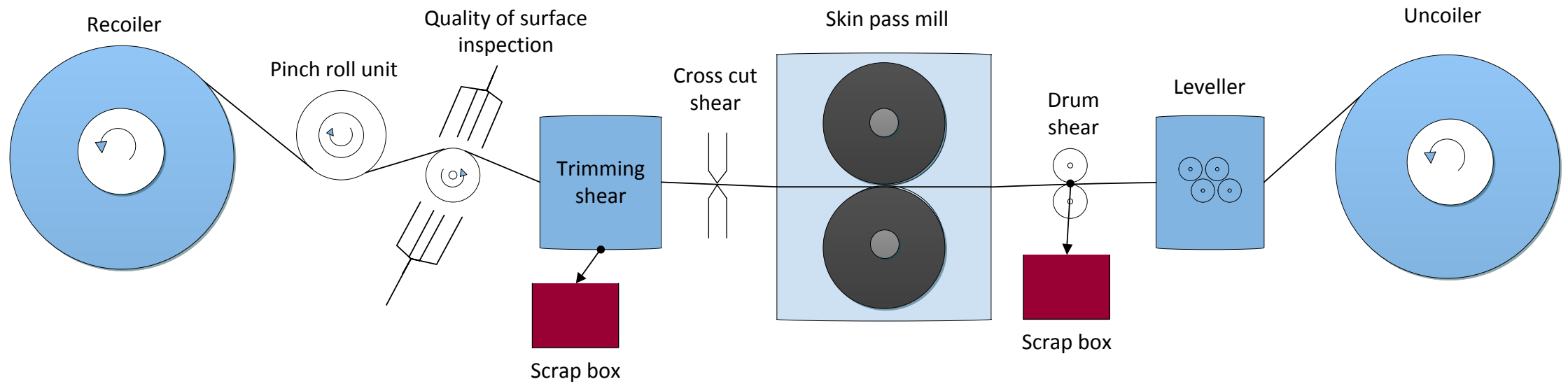


Dimensions and process speed:



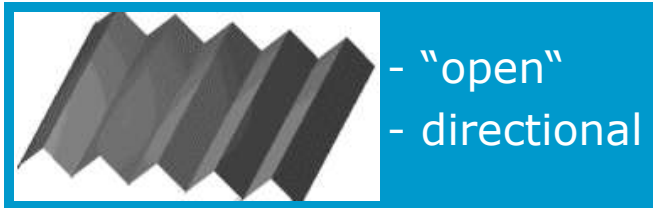
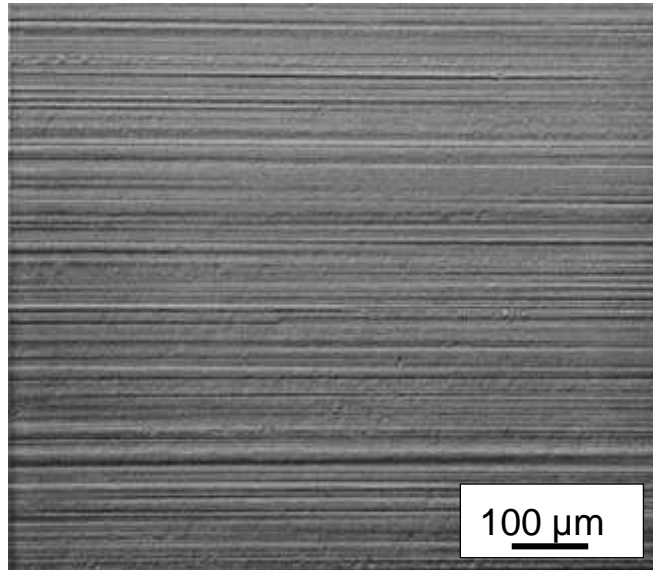
Electric discharge texturing (EDT) line

400 m/min

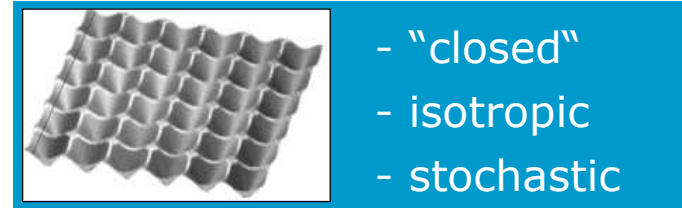
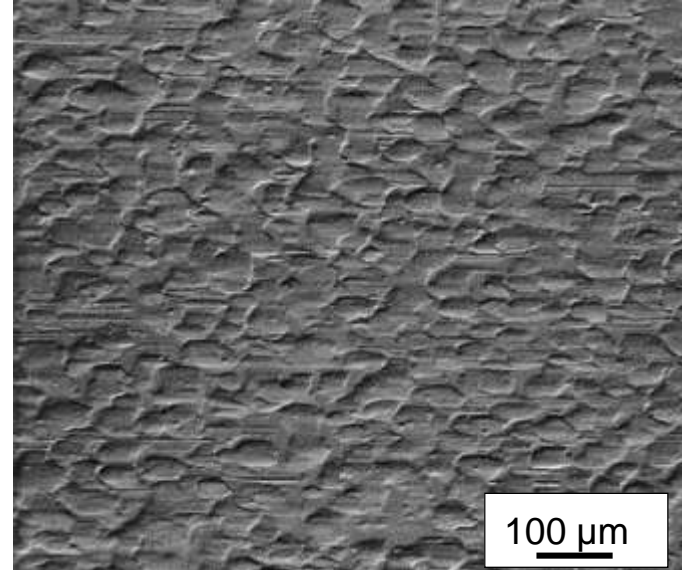


Surface topography of automotive sheet

Mill Finish



EDT - Electro Discharge Texturing



Advantages of EDT topography for car body sheets:

stochastic & isotropic

> appearance after painting

closed structure

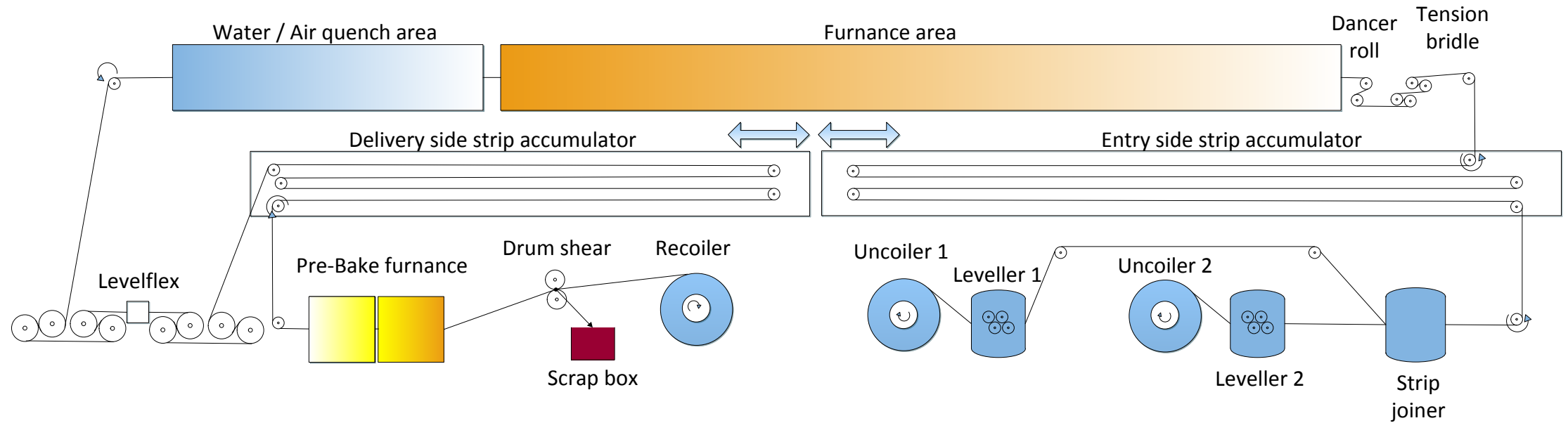
> improvement of tribological properties

isotropic

> same forming properties in all directions

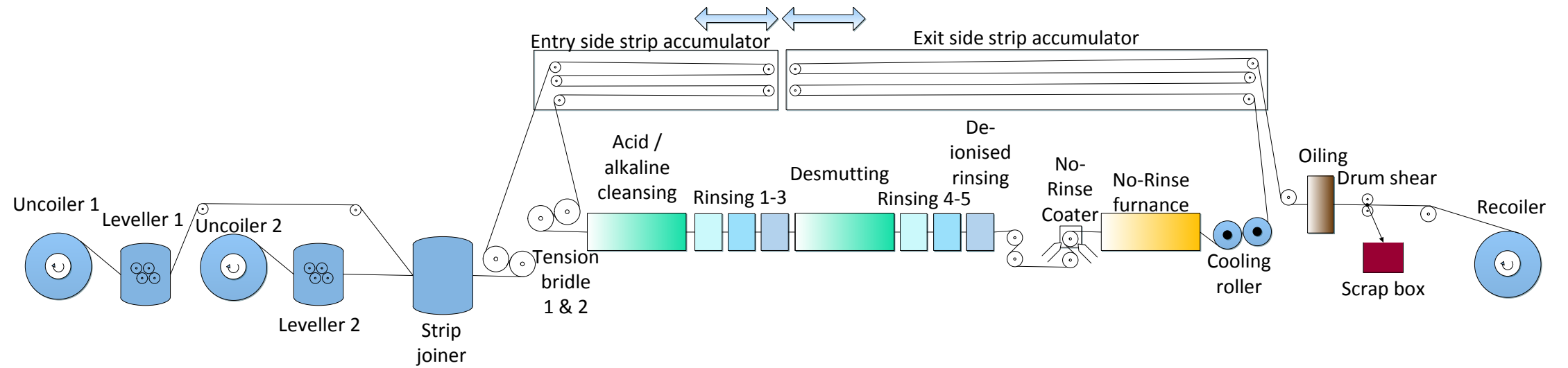
Annealing line

140 m/min



Coating line

100 m/min





Men of steel drive cars of aluminium.



