

# dahréntråd



Part of Liljedahl Winding Wire



## LWW – YOUR TOTAL PARTNER

*“FROM THE MINE TO YOUR DOORSTEP”*

---

### Liljedahl Bare Wire

- ❑ 150 000 tons of Cu & Al products
- ❑ Three productions units
- ❑ 800 MEUR turnover
- ❑ 250 Employees

### Liljedahl Winding Wire

- ❑ 90 000 tons of copper & aluminum products
- ❑ Four production units
- ❑ 300 MEUR turnover
- ❑ 350 Employees

**A 150 000-ton global partner in  
copper and aluminum**

# LILJEDAHL WINDING WIRE – ORGANIZATION



## COMPANY FACTS

---

ONE OF EUROPE'S LARGEST AND MOST MODERN MANUFACTURERS OF WINDING WIRE

- ✓ Production capacity – 50.000 t/year
- ✓ Annual turnover – 220 MEUR
- ✓ Export share – 93 %, mainly in Europe
- ✓ Employees – 170
- ✓ 32.000 m<sup>2</sup> factory and office space
- ✓ Certificates
  - Quality according to ISO 9001
  - ISO TS16949
  - Environment according to ISO 14001
  - Working environment OHSAS 18001
  - Energy SS 627750



## PRODUCT RANGE COPPER AND ALUMINIUM

---

### ROUND WIRE

Dimension range 0,20-5,00 mm, insulated with different types of enamel for varying types of properties

- ✓ Heat resistant
- ✓ Solderable
- ✓ Bondable

### RECTANGULAR WIRE

Dimension 4 - 100 mm<sup>2</sup>, insulated with or without enamel

- ✓ Glass fibre
- ✓ Glass polyester
- ✓ Nomex® paper
- ✓ Kapton® film
- ✓ Mica tape

## CORNER STONES

---

### **Quality**

- ✓ In every aspect of our business

### **Flexibility**

- ✓ An active partner

### **Environment**

- ✓ Industrial leader for a better environment



## QUALITY AND FLEXIBILITY IN EVERY ASPECT OF OUR BUSINESS

---



- Service and flexibility
  - Understanding customers' wants and needs
  - Long-term partnerships
  - Right product at the right time
- Continuous improvements
- Clearly documented quality policy
- Customer demands and expectations rule all our processes

## INDUSTRY LEADER IN ENVIRONMENTAL ISSUES

---

### ➤ Emissions

World-class in reducing solvent emissions, **<0,5 g/kg wire**

Maximum allowed solvent emission, 2007 EU-directive, **5 g/kg wire**

➤ Copper waste is 100 percent recycled

➤ All packing is reused

➤ Minimized discharge of copper into water supplies

➤ Excess energy from the production is used to heat the premises





## ONGOING PROJECTS

2012-2013

---



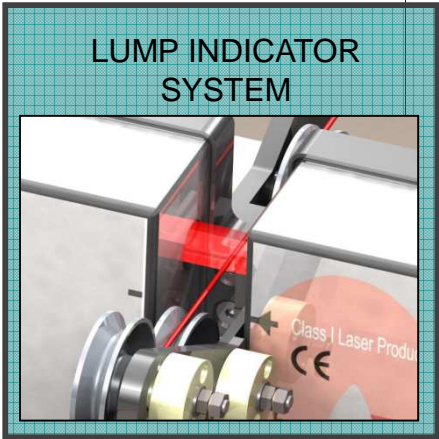
- ✓ 1 vertical round wire machine
  - ✓ CU and/or AL
  - ✓ 0,71-6,00 mm, 2000 tons
- ✓ 1 wrapping machine
- ✓ TS certification
- ✓ Process control system

# QUALITY PROJECTS

## PROCESS CONTROL

### VISUAL MANAGEMENT

The image shows a visual management board for 'dahréntråd'. It features a header with the company logo and name. Below the header, there are several sections: a table with columns for 'PROBLEM', 'CAUSE', and 'ACTION', a section with icons for 'STOP', 'START', and 'REPAIR', and a section with photos of workers and equipment. The board is designed to provide a clear overview of the production process and any issues that arise.



# LUMP INDICATORS

## SYSTEM OVERVIEW

### Description of system

Two laser fields covers 240 degree orientation

Pulsed system; 300 readings per second

Setting possibilities: 0-20 micro

Continuous dimensional reading

Readings displayed at machine for operator

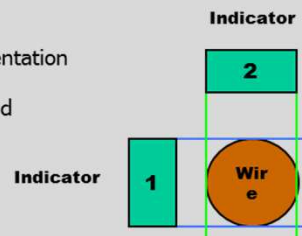
Historical data records of:

- Machine/ line / reel number
- Meters on reel
- Total no of detections on reel
- Average detection per 30 meters

Detects if blister is present.

Possibility to determine and set different limits for "big or small blisters"

Eg. 0-4 detection at 16 micro/ 30m OK, 1 detection at 20 micro/30m NOK



### Current settings

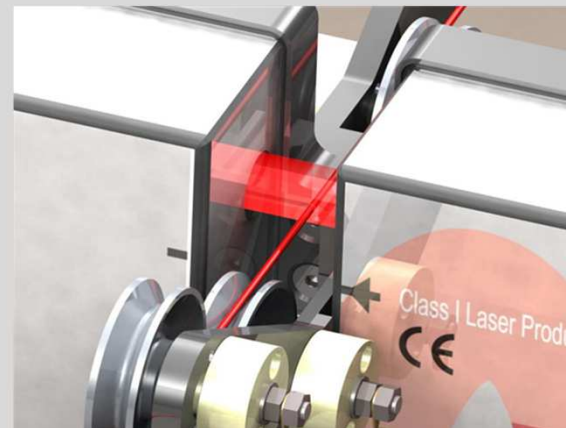
16 micro or above

30 meters reading sections

0-4 detections/ 30 meters – no alarm, wire released

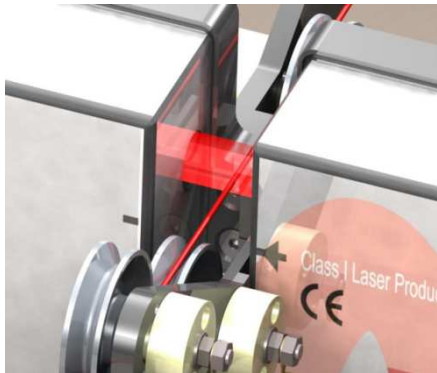
5 detections or more – alarm; wire should be scrapped, analysis and corrective actions by operator

(Investigate possibility for automatized reel change when alarm to support operator in segregation)



# INDICATOR SYSTEM

## Laser system



Two laser head continuously reads wire, detects variation of wire as blister/ lumps and indicate if above set limits.

Line	Meters	Tot	Ave	Act	A	m	S	A	s1	s2
1	1776	4	0	0	0	A	A	0	0	0
2	18761	8	0	0	0	A	A	0	0	0
3	17967	46	0	0	0	A	A	0	0	0
4	8070	31	0	0	0	A	A	0	0	0
5	8267	9	0	0	0	A	A	0	0	0
6	7729	9	0	0	0	A	A	0	0	0
7	80	1	1	1	0	A	0	0	0	0
8	2334	40	1	0	0	B	0	0	0	0
9	OFF	0	0	0	0	A	0	0	0	0

MACHINE L49

## Operator display

## Contact system



The detector uses two v-shaped flat ceramic guides to contact the wire. The ceramic guides are spring loaded. The guides move outward when a blister/ lump hits them.

A sensor on each side detects the movement of the reeds.

The two v-shaped flat ceramic guides have a DC voltage applied to them. Current will flow from the ceramic guides to the copper wire when there is a break in the insulation.

## QUANTITY PLAN 2014

---



50.000 t

- Round wire 30 000 t
- Round and flat AL 4000 t
- Flat enamelled wire 10 500 t
- Flat covered wire CU & AL 6000 t





C

## PROJECT COVERED WIRES

### RECENT ACTIVITIES

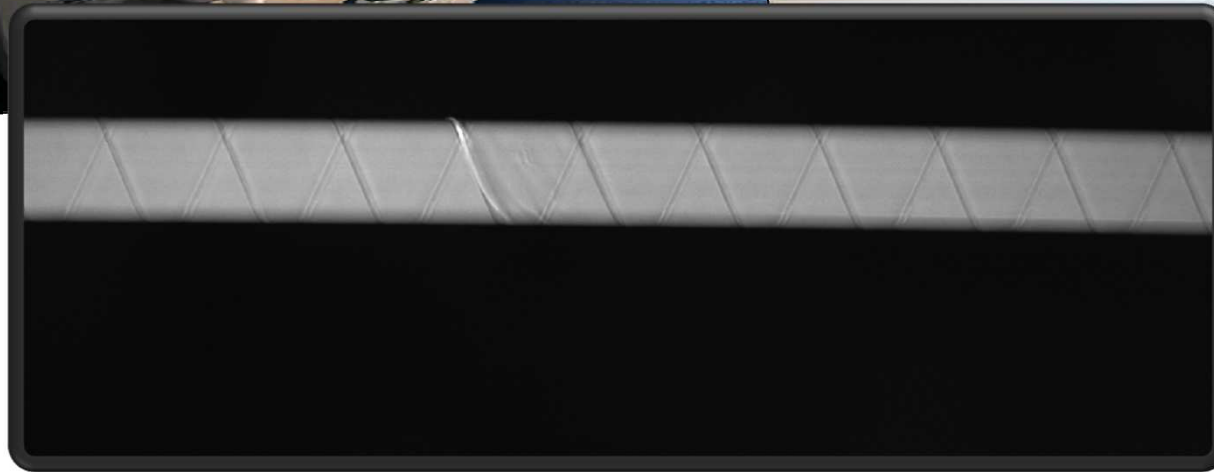
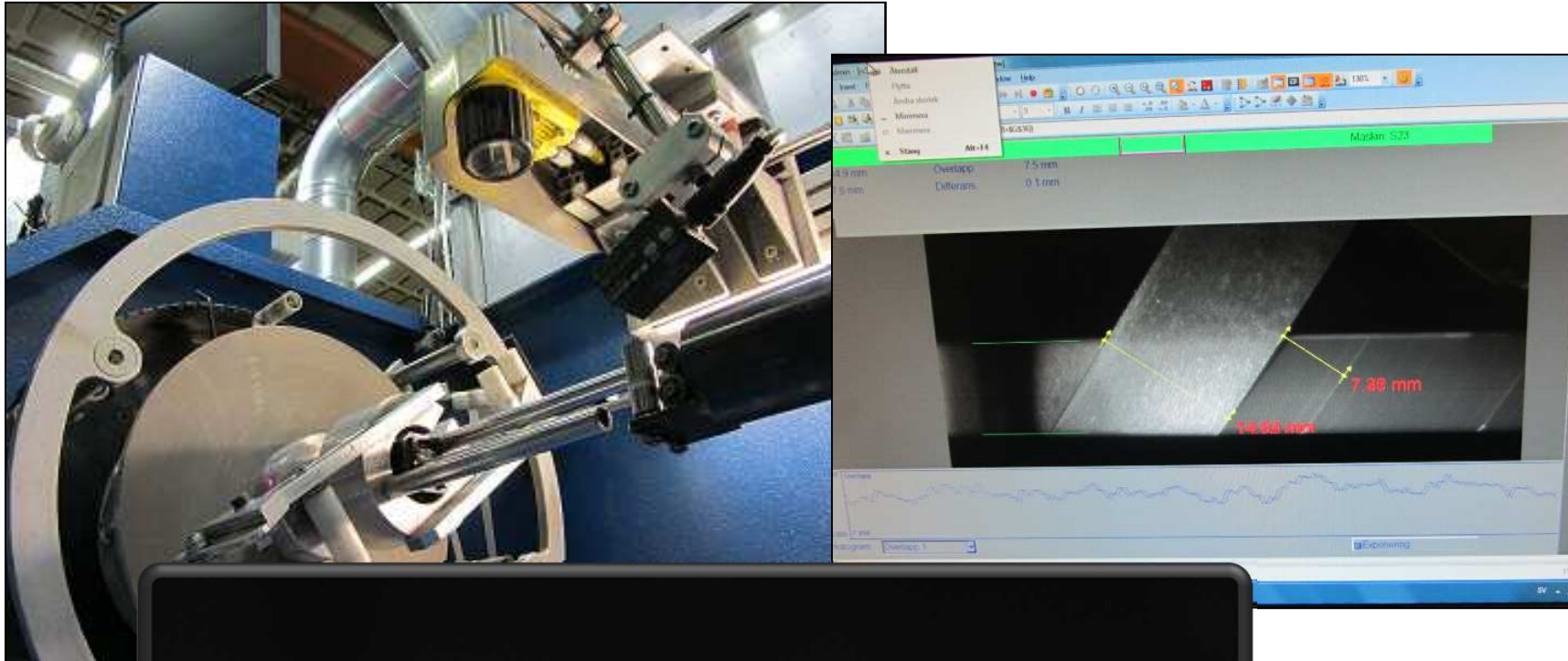
---

- Investing in knowledge
  - Quality manager
  - Process engineer
  - Quality engineer
  - Experienced operators
  
- 2 new wrapping machines
- 1 machine refurbished by WTM
- 8 cameras



# CAMERA

## CONTROLLING OVERLAP AND DEFECTS



## WRAPPED WIRES PROCESS CONTROL

---

- ✓ Camera system controlling overlap and defects
- ✓ Scan reel label
  - ✓ Picture saved with reel label no.
- ✓ Alarm operator
- ✓ Measurement counting meters on reel
  - ✓ Colour indication and alarm to help operator
  - ✓ Knows where defect can be found
  - ✓ Can deliver needed quantity per reel



NEEDED LENGTH ON DRUM – LESS WASTE

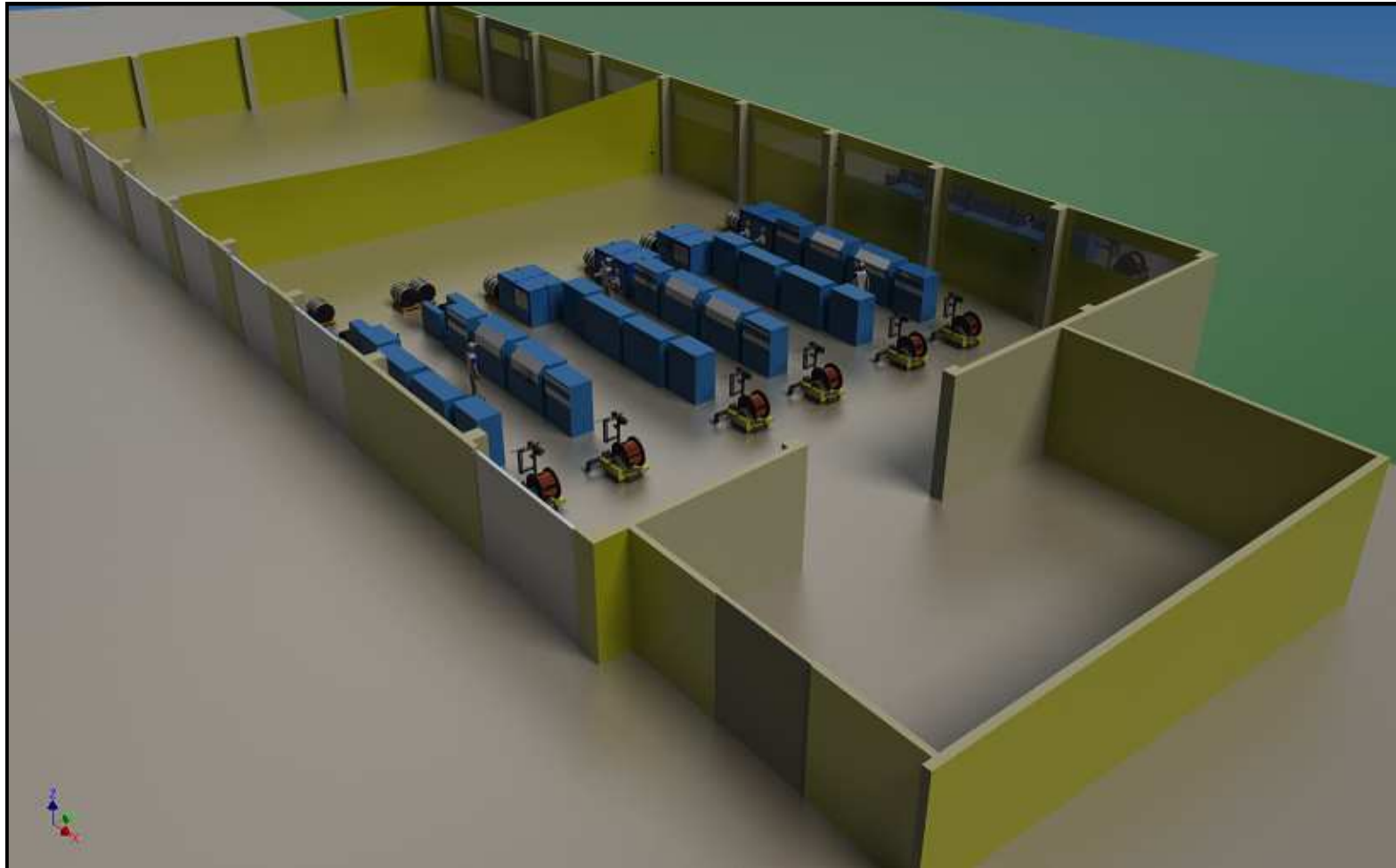
## PROJECT WRAPPED WIRES FUTURE INVESTMENTS

---

- ✓ Further develop process control
- ✓ New Kapton machine
  - ✓ Double wire take up
  - ✓ Quality control in-line
- ✓ Optimizing existing machines
- ✓ New wrapping department at Dahréntråd
  - ✓ Climate controlled
- ✓ Project start 2012
  - ✓ MICA
  - ✓ Kapton

## FUTURE INVESTMENTS "PROJECT WRAPPED WIRES"

---



# LILJEDAHL WIRE

## COMPANY FACTS

---

- ✓ Located in Taicang, Jiangsu
- ✓ Conform capacity – 4000 tons
- ✓ Covered wire capacity – 750 tons
- ✓ Main product – Mica covered
- ✓ Air controlled production
- ✓ Certificates
  - Quality according to ISO 9001
  - ISO TS16949
  - Environment according to ISO 14001
  - Working environment OHSAS 18001
  - Energy SS 627750







