QuantoLux

EASES

European Academic Symposium on EAF Steelmaking

shaping the future of OES

Achieving a new level of process efficiency in EAF steelmaking

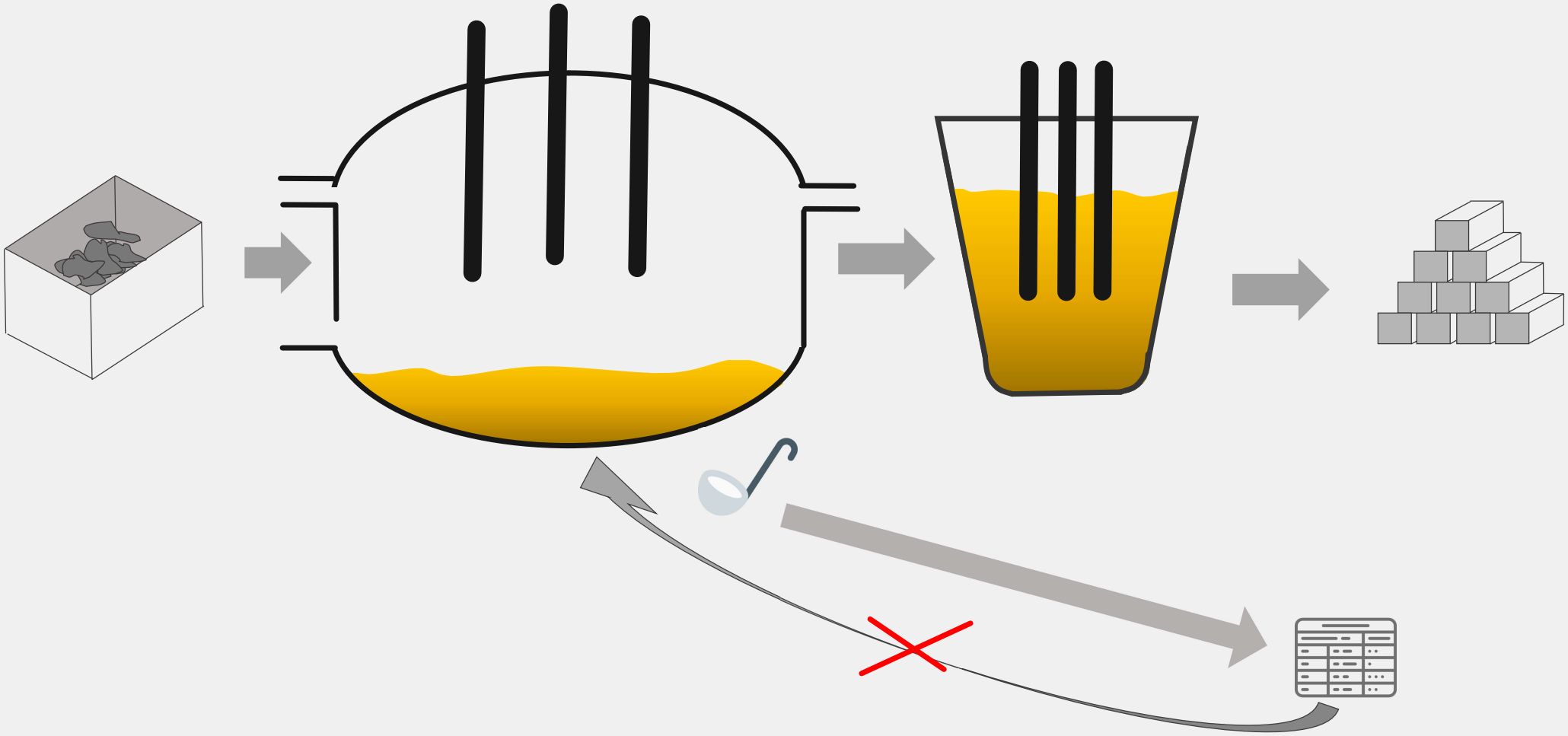
- with sample preparation free slag analysis based on Laser OES

Alexander Schlemminger

Kleve, July 21

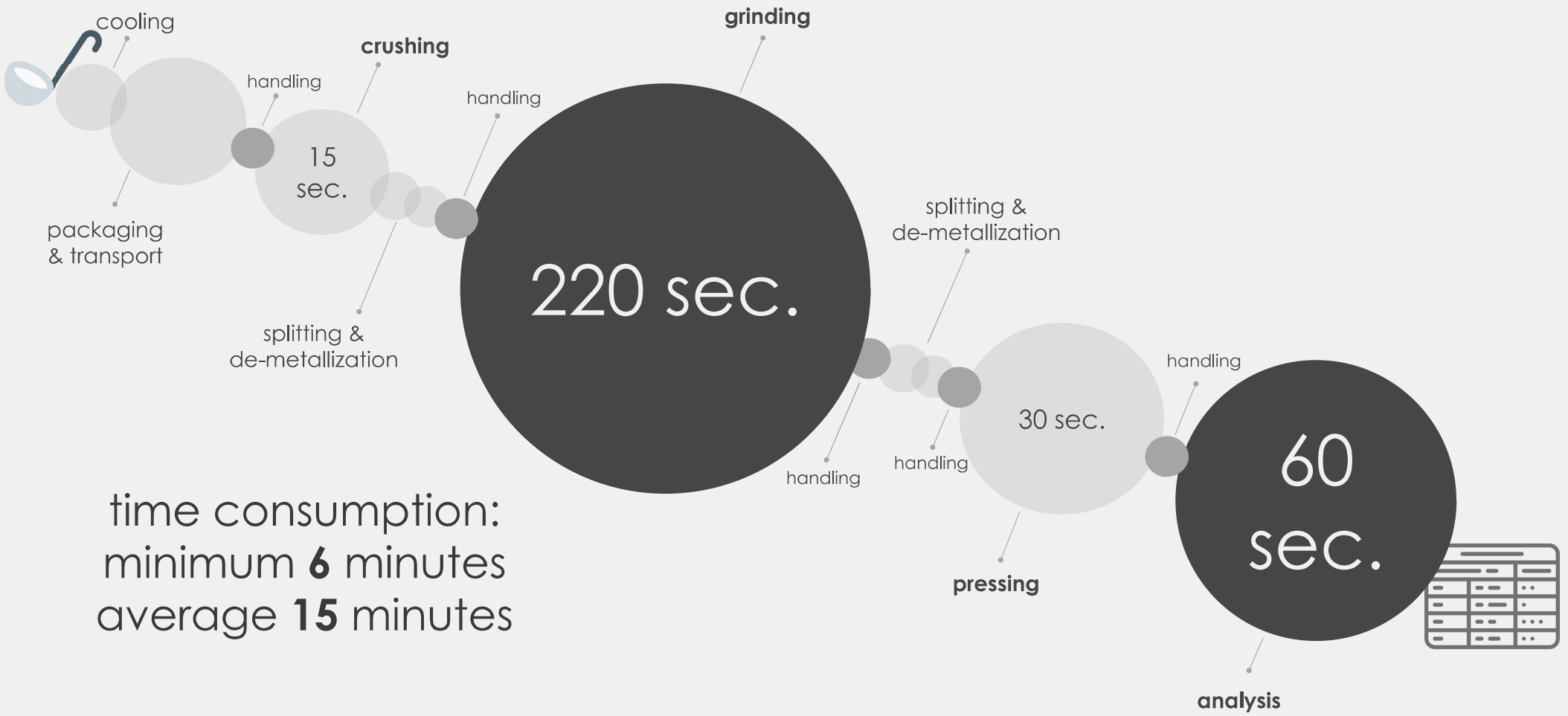
the current situation

effect of slow analysis – **post mortem analysis.**



the current situation

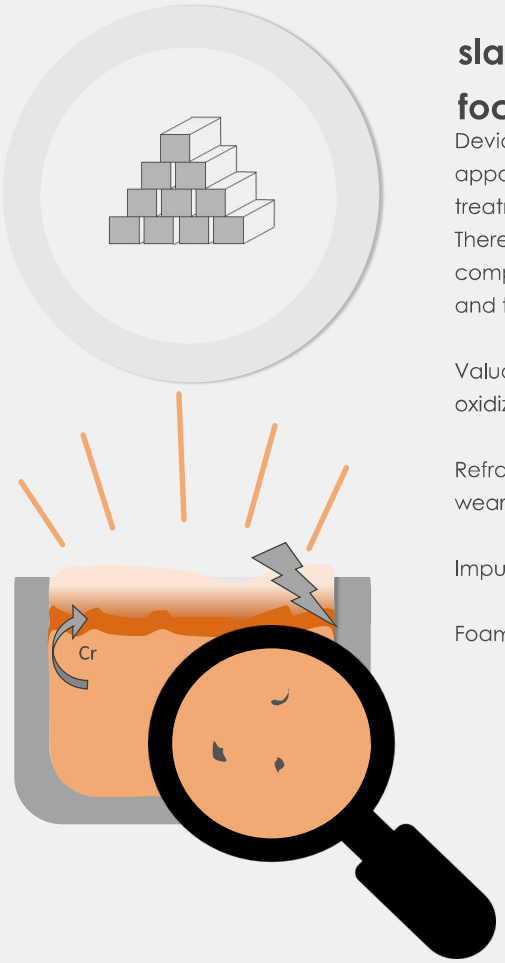
established slag analysis – **complex and slow.**



time consumption:
minimum **6** minutes
average **15** minutes

the current situation

effect of slow analysis – **tradeoff yield vs. quality.**



slag analysis free production – focus on yield

Deviations may only become apparent after steel is in the LF treatment or even already solidified. Therefore an unfavorable slag composition can not be corrected and the process is less efficient.

Valuable alloying elements can oxidize into the slag.

Refractory lining can suffer high wear

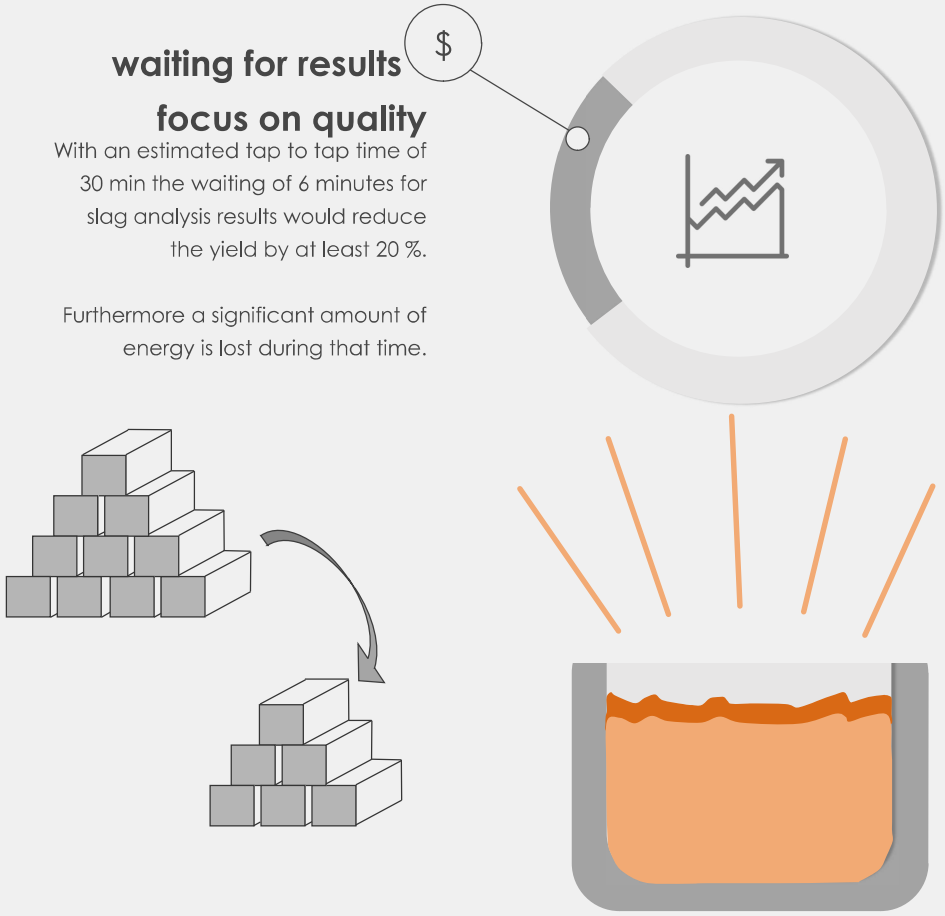
Impurities in the steel increase

Foaming capability reduces

waiting for results focus on quality

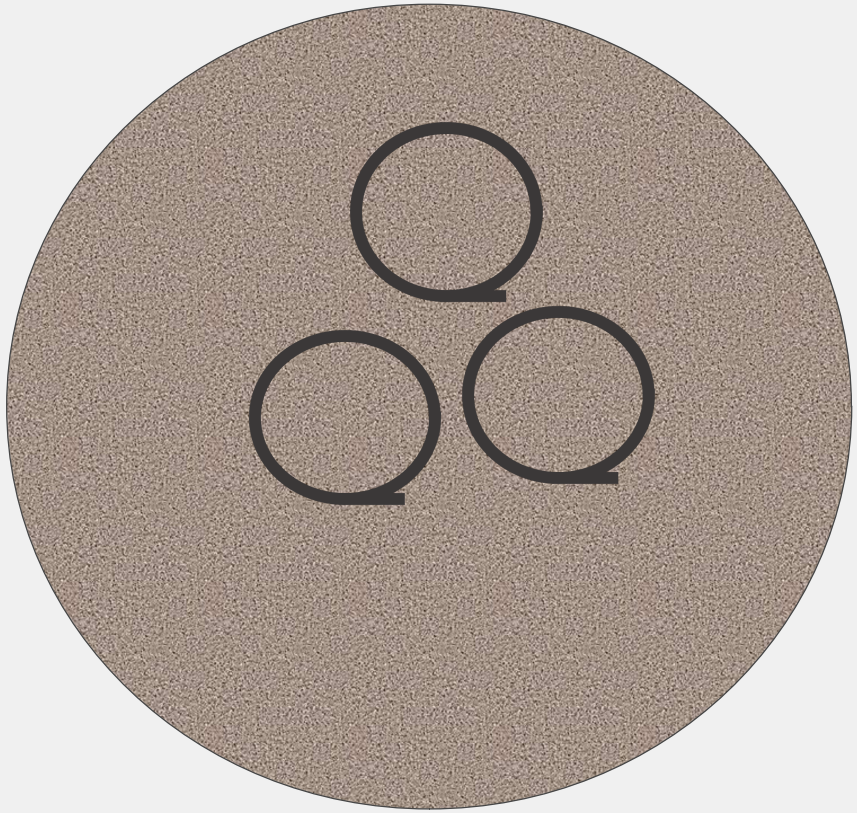
With an estimated tap to tap time of 30 min the waiting of 6 minutes for slag analysis results would reduce the yield by at least 20 %.

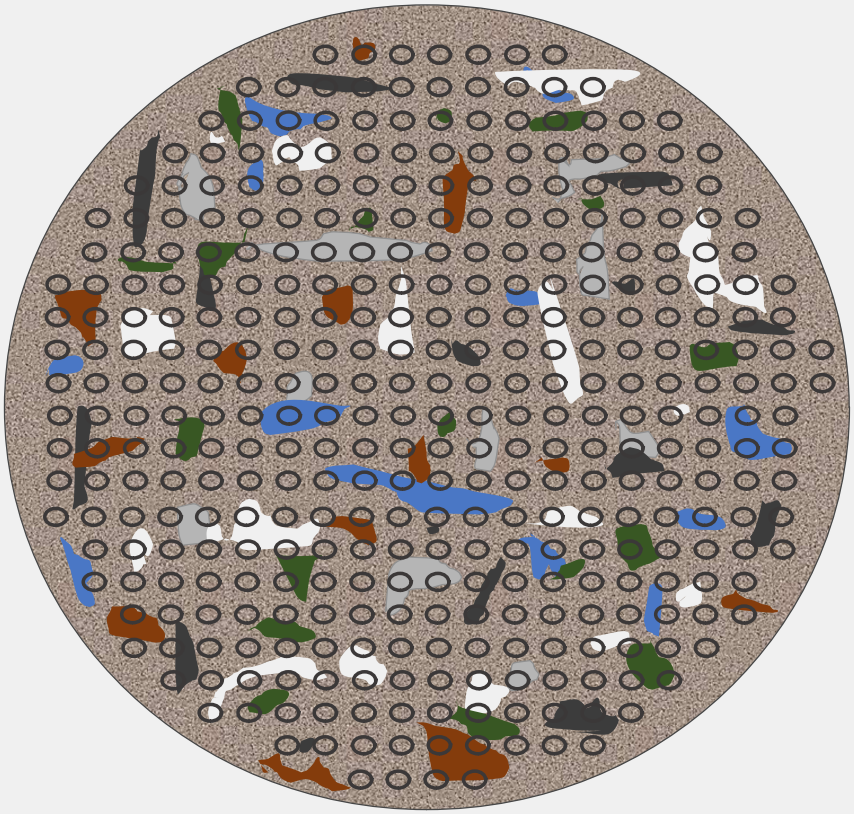
Furthermore a significant amount of energy is lost during that time.



the future

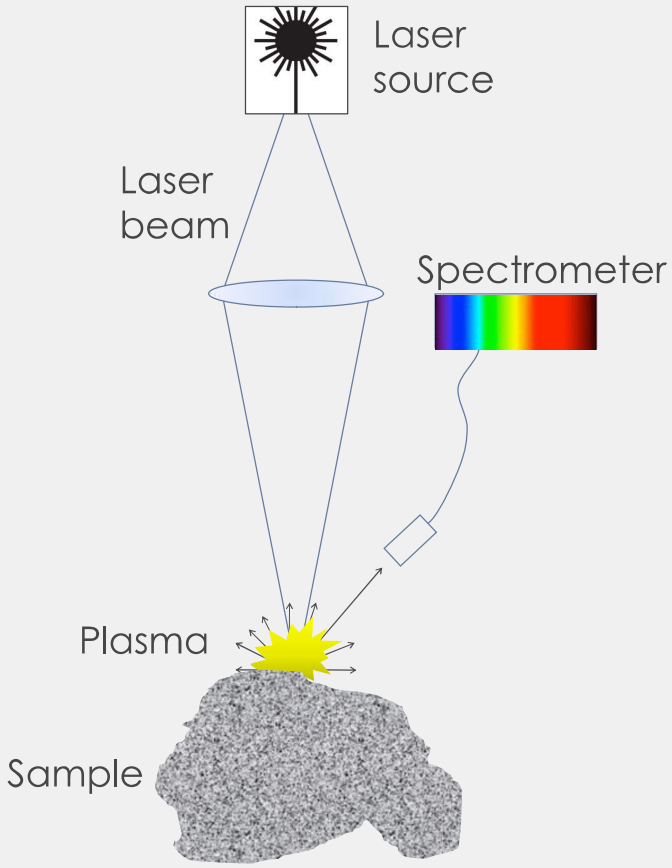
laser OES slag analysis – **digital homogenization.**





the future

laser OES – **the promising alternative.**



Zero **Maintenance**

$0

No time and money to be spent on maintenance. An annual check-up, however, is recommended ;-)

Fast **Analysis**

8x

Laser OES is typically 8 times faster. Deliver results quicker, do more analyses.

Lifetime Value

Lowest operational cost in the industry. Best lifetime value.

the future
laser OES – **in use today.**

the future
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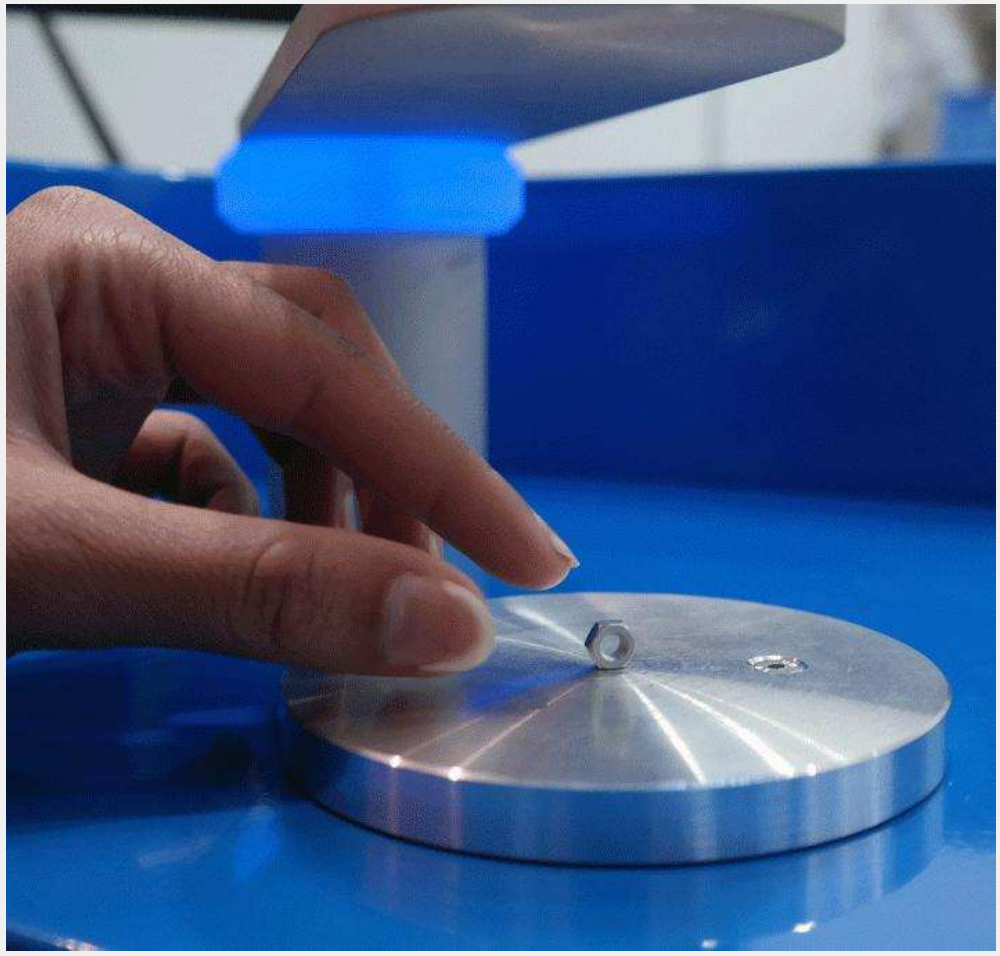
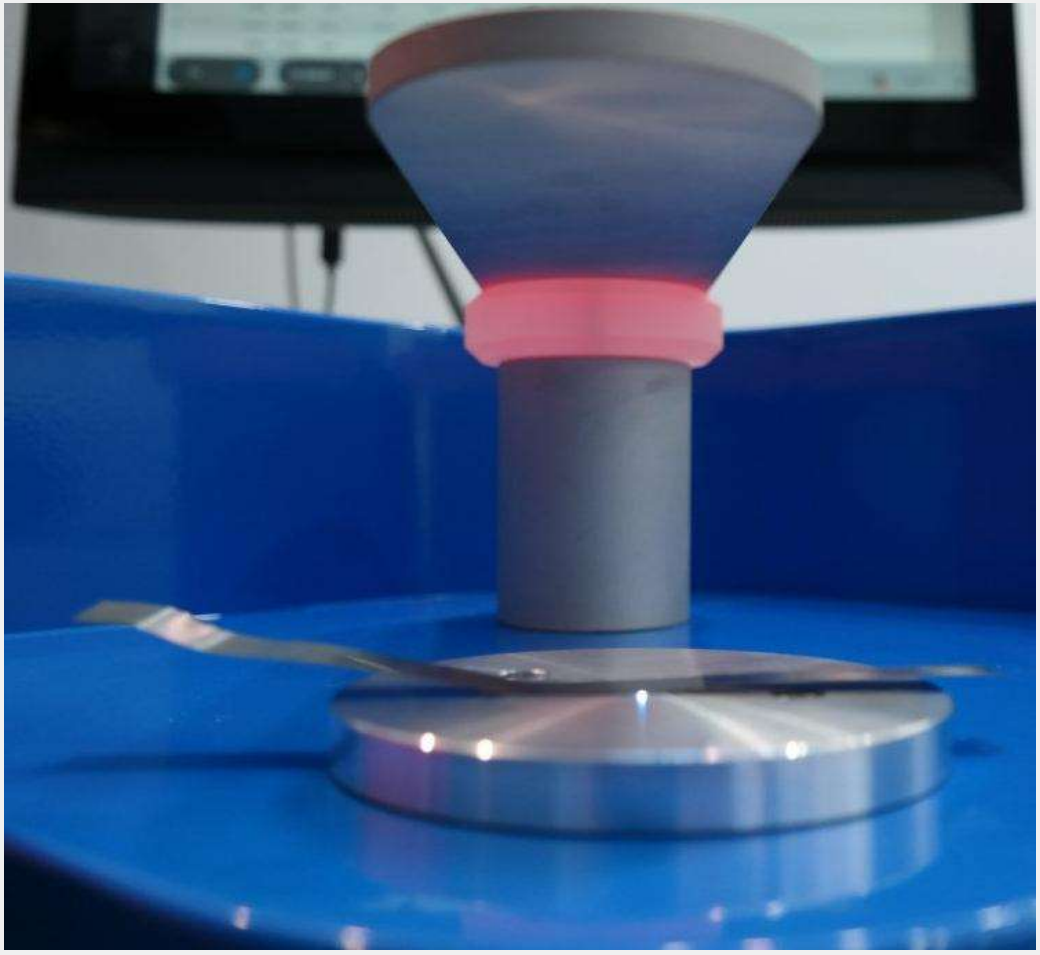
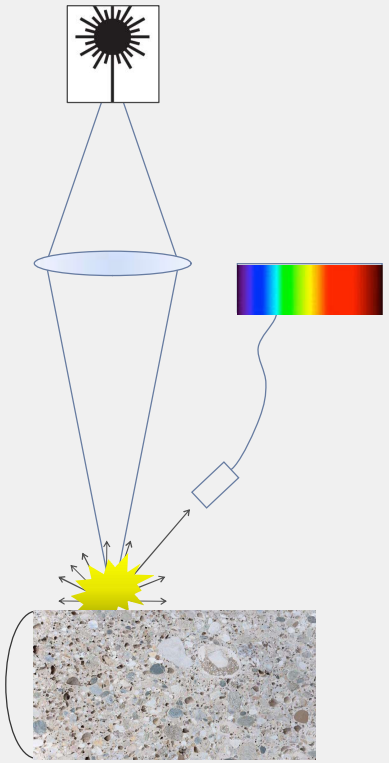
the future
laser OES – **in use today.**

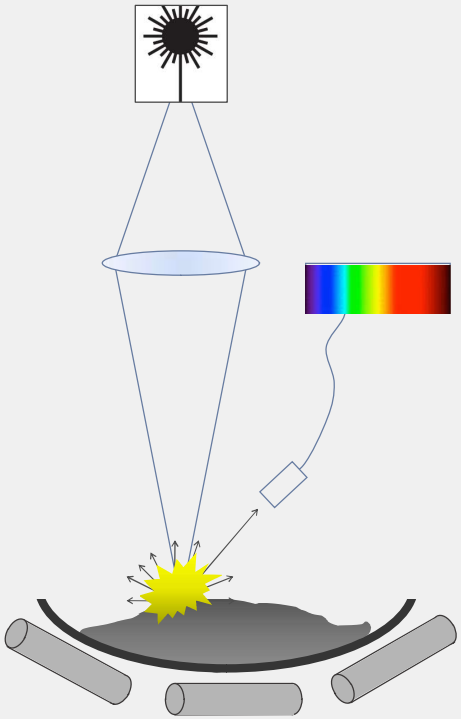


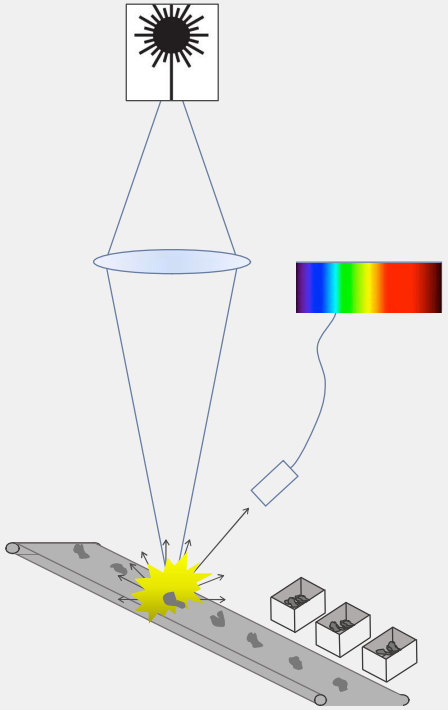


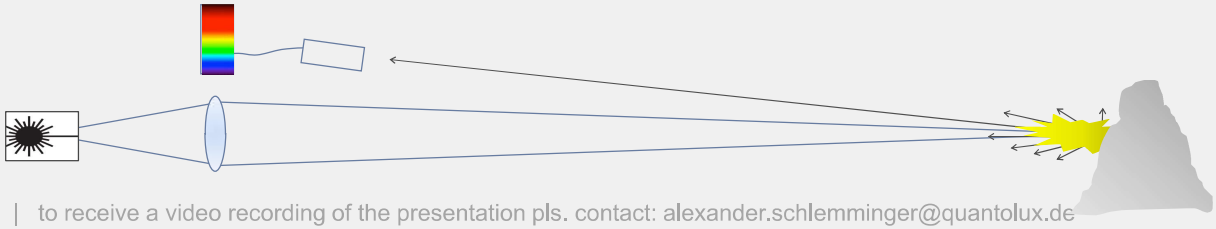
The future

other laser OES setups – **in use today.**









01 contactless

02 fast

03 stable

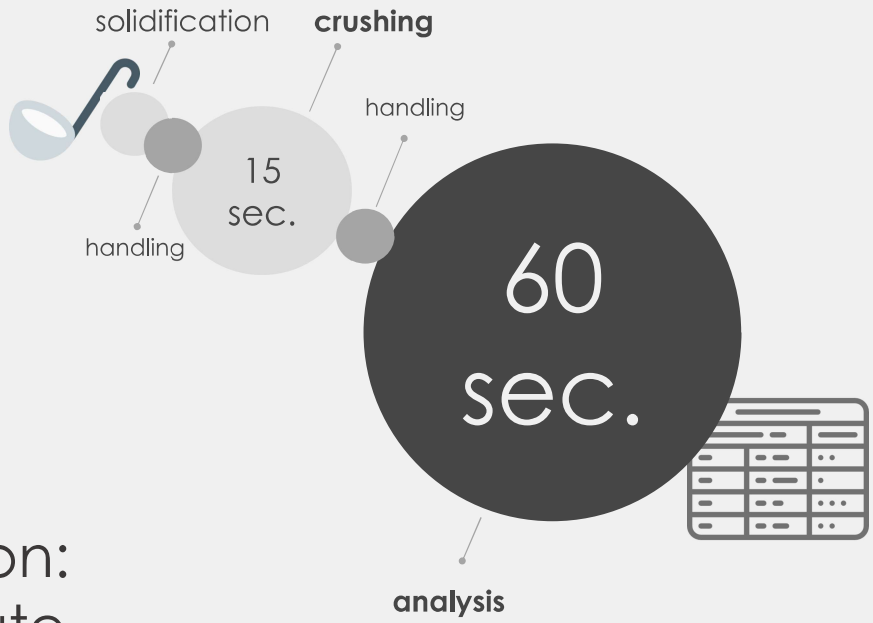
04 non-conductive samples

05 ionizing radiation free

06 all elements

the future

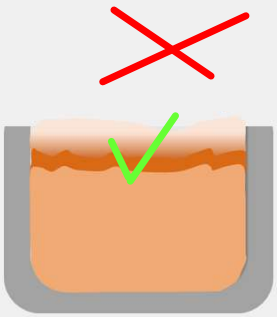
slag analysis – **simple and fast.**



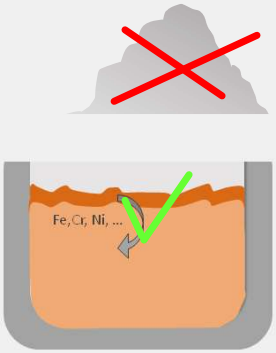
time consumption:
minimum **1** minute
average **2-3** minutes

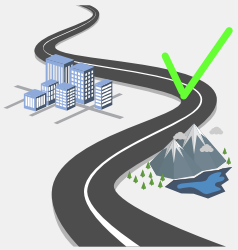
the future

laser OES – **combination of quality & yield.**

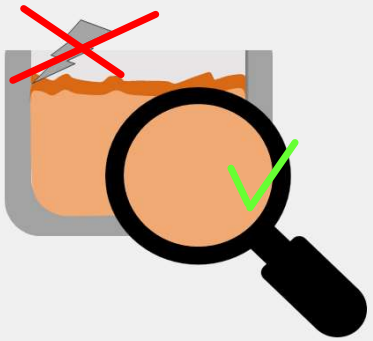


better foaming
=
• reduced
energy loss

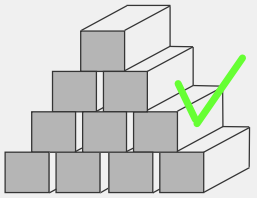




less Fe & alloy oxidization =
• increased yield
• reduced purchasing costs
•fewer slag formers
• spared energy for melting
•simple slag disposal



precise basicity =
• less refractory wear
• less maintenance
• cleaner steel

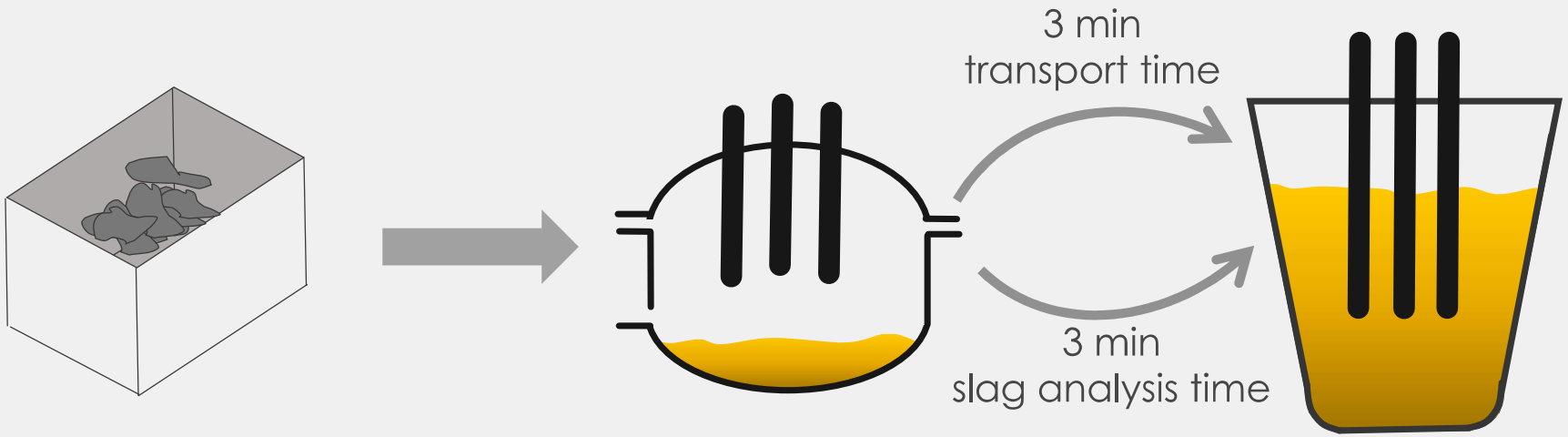


• stable yield

more samples & fast results = no compromises
pinpoint process control & stable yield

the future

rapid EAF slag analysis – **benefits for Ladle Furnace**



last EAF sample provides
precise initial information
for desulfurization process in the LF

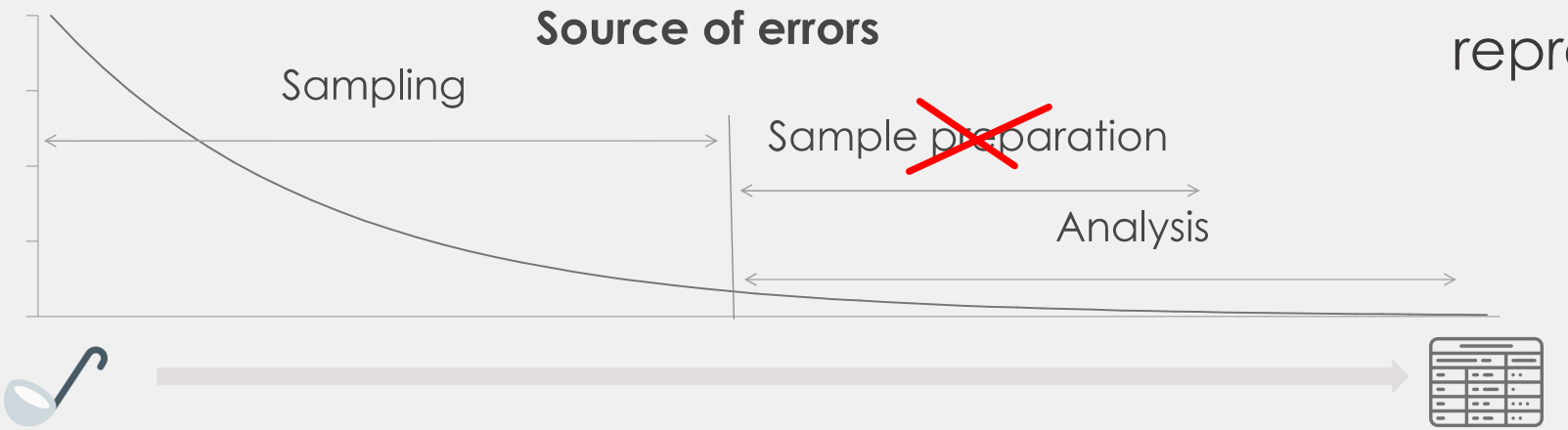
the future

benefit – **amortisation time**

		savings									
		10 cent / t		25 cent / t		50 cent / t		1 € / t		2 € / t	
		annual savings	pay off months	annual savings	pay off months	annual savings	pay off months	annual savings	pay off months	annual savings	pay off months
annual production	300 kt	30.000 €	80	75.000 €	32	150.000 €	16	300.000 €	8	600.000 €	4
	500 kt	50.000 €	48	125.000 €	19	250.000 €	10	500.000 €	5	1.000.000 €	2,4
	1 mio t	100.000 €	24	250.000 €	10	500.000 €	5	1.000.000 €	2,4	2.000.000 €	1,2
	1.5 mio t	150.000 €	16	375.000 €	6	750.000 €	3,2	1.500.000 €	1,6	3.000.000 €	0,8
	2 mio t	200.000 €	12	500.000 €	5	1.000.000 €	2,4	2.000.000 €	1,2	4.000.000 €	0,6

amortization in 6 – 12 months
(realistic case)

the future
additional value – **precision.**



representative results ✓

heterogeneous materials ✓

- any slag type
- alloy materials
- Minerals

all elements ✓

e.g. F
(if Calcium Fluoride is used)

structural information ✓

- elemental distribution analysis
- information on heterogeneity,
- information on metallic inclusions

…

QuantoLux

Thank you for your Attention !

For more information, please contact
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