

EASES

*European Academic Symposium on
EAF Steelmaking*

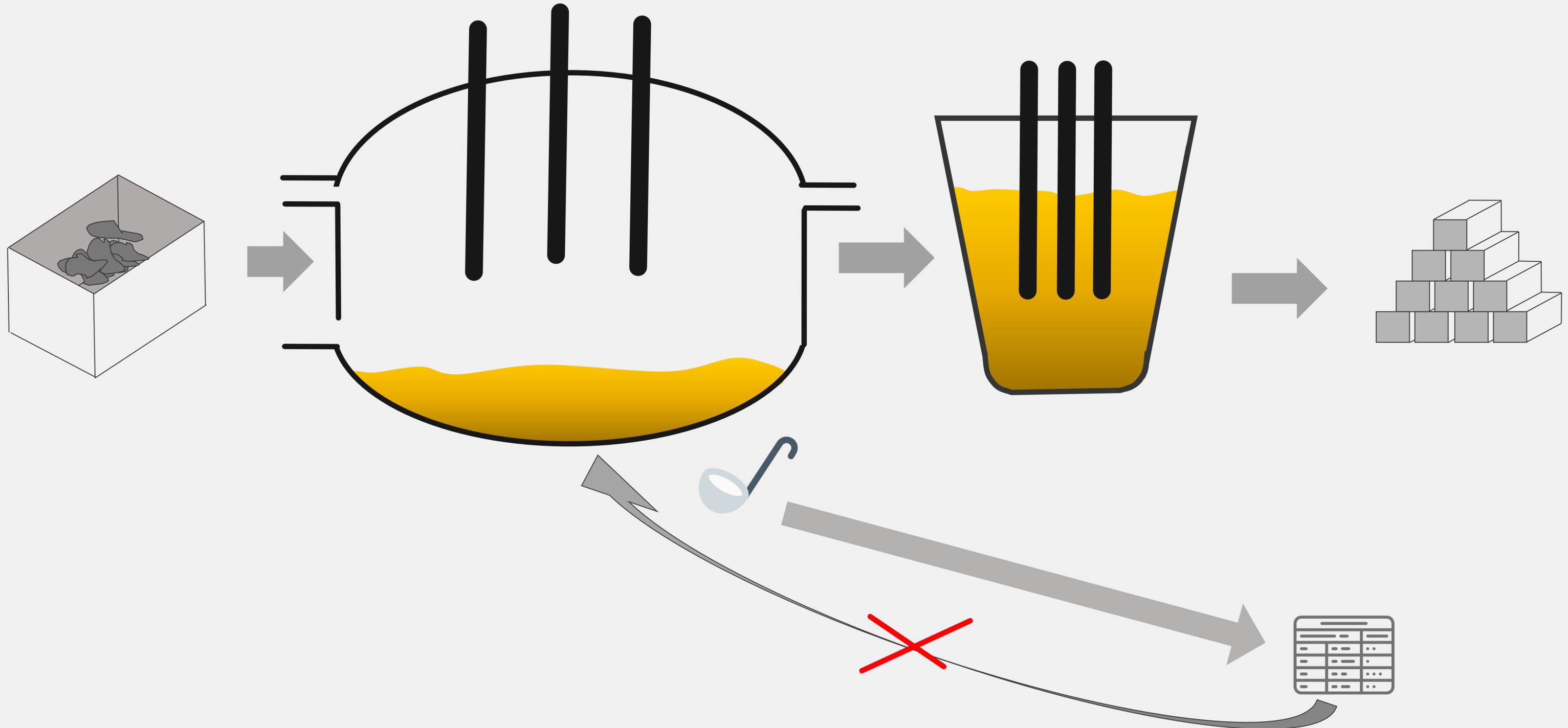
shaping the future of OES

- Achieving a new level of process efficiency in EAF steelmaking
- with sample preparation free slag analysis based on Laser OES

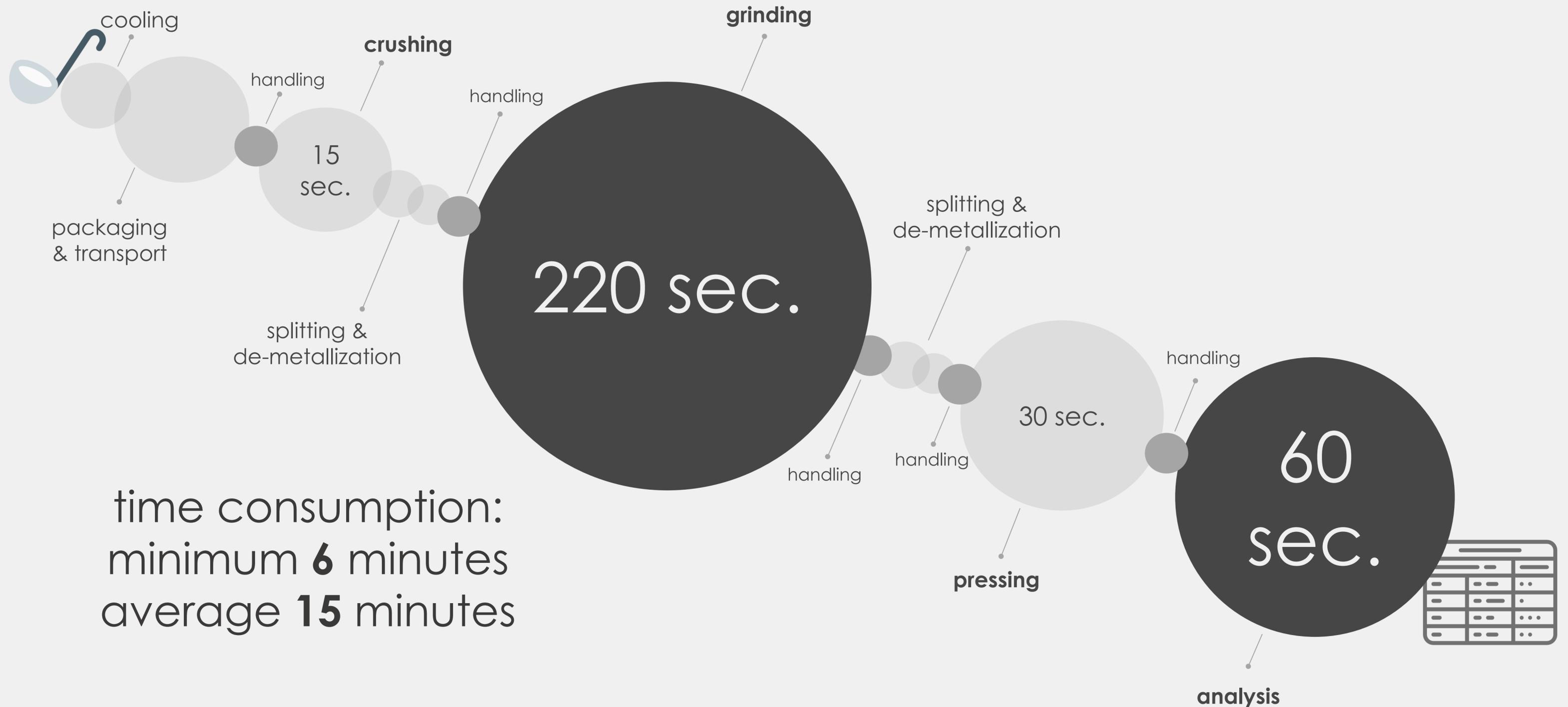
Alexander Schlemminger

Kleve, July 21

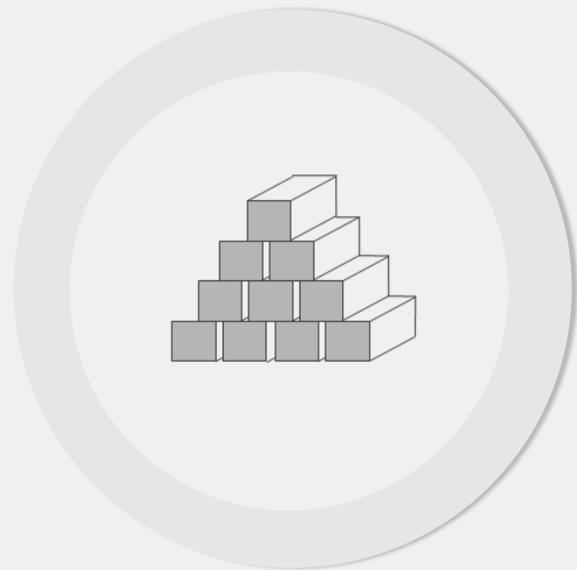
effect of slow analysis – **post mortem analysis.**



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



effect of slow analysis – tradeoff yield vs. quality.



slag analysis free production –

focus on yield

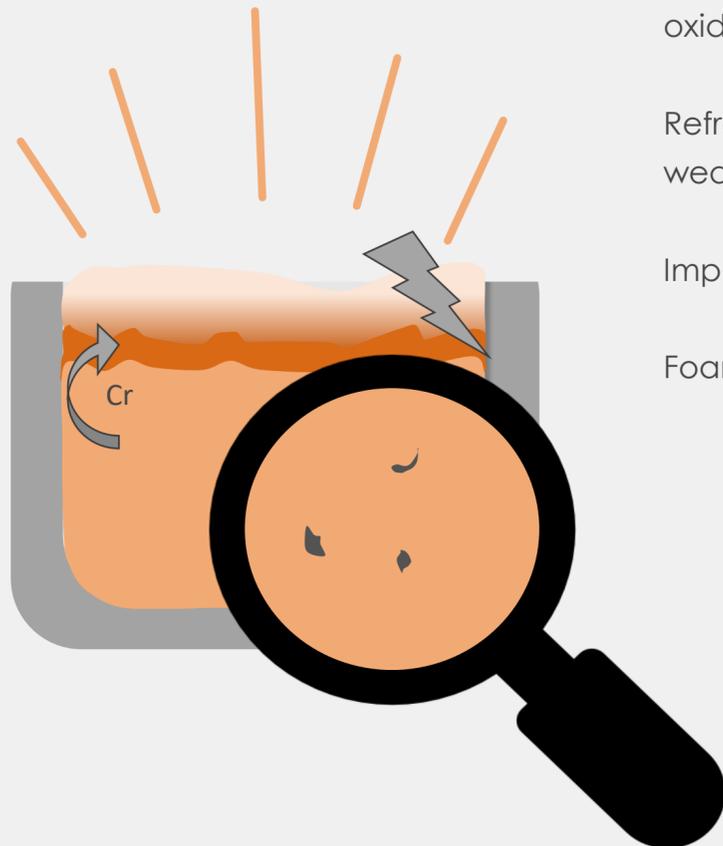
Deviations may only become apparent after steel is in the LF treatment or even already solidified. Therefore an unfavorable slag composition can not be corrected and the process is less efficient.

Valuable alloying elements can oxidize into the slag.

Refractory lining can suffer high wear

Impurities in the steel increase

Foaming capability reduces

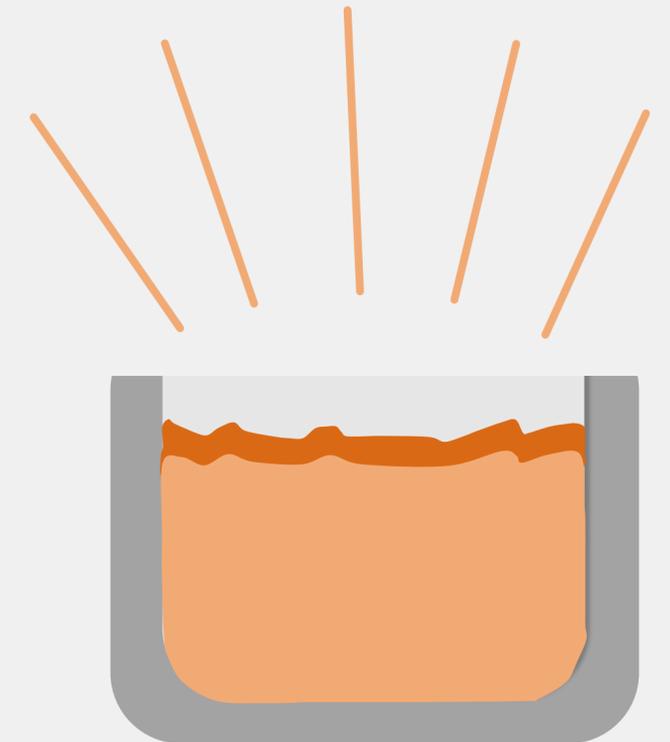
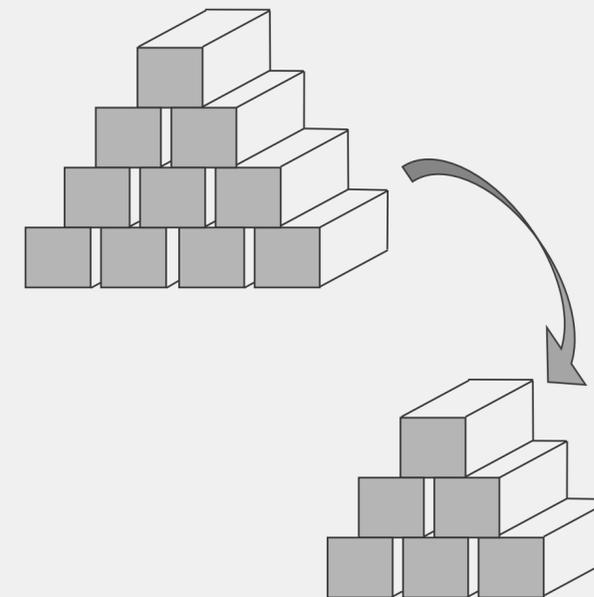


waiting for results

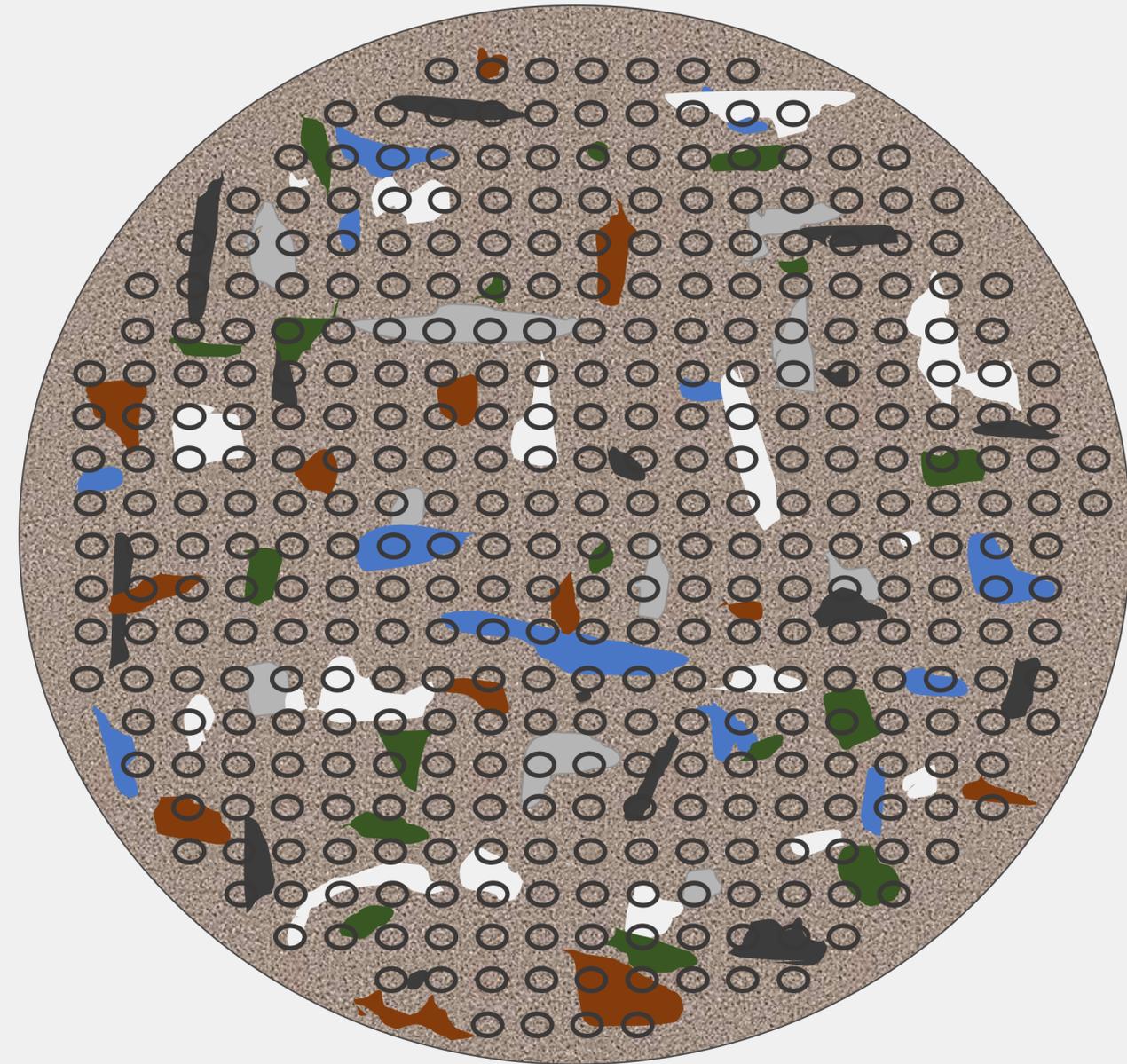
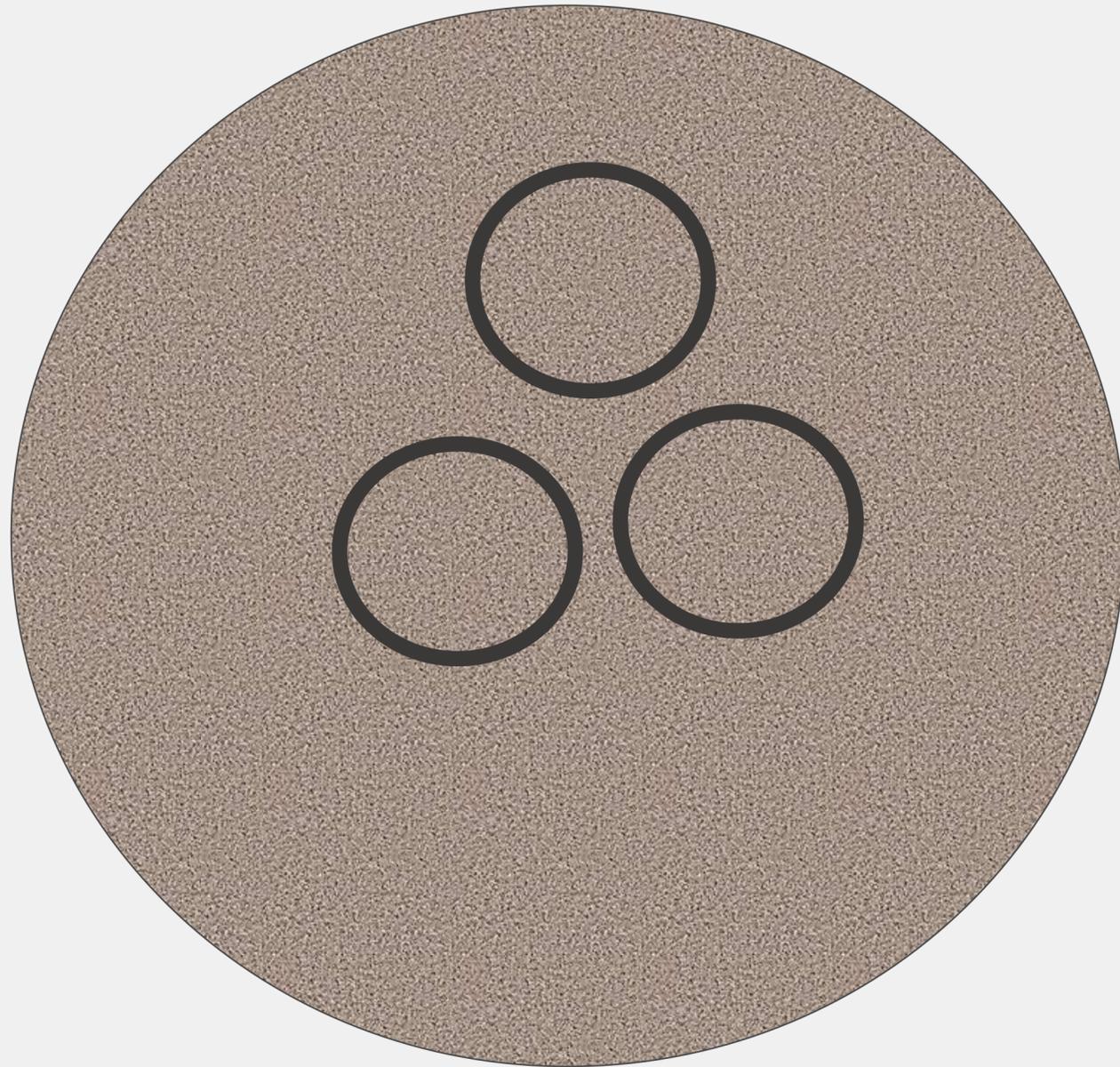
focus on quality

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 %.

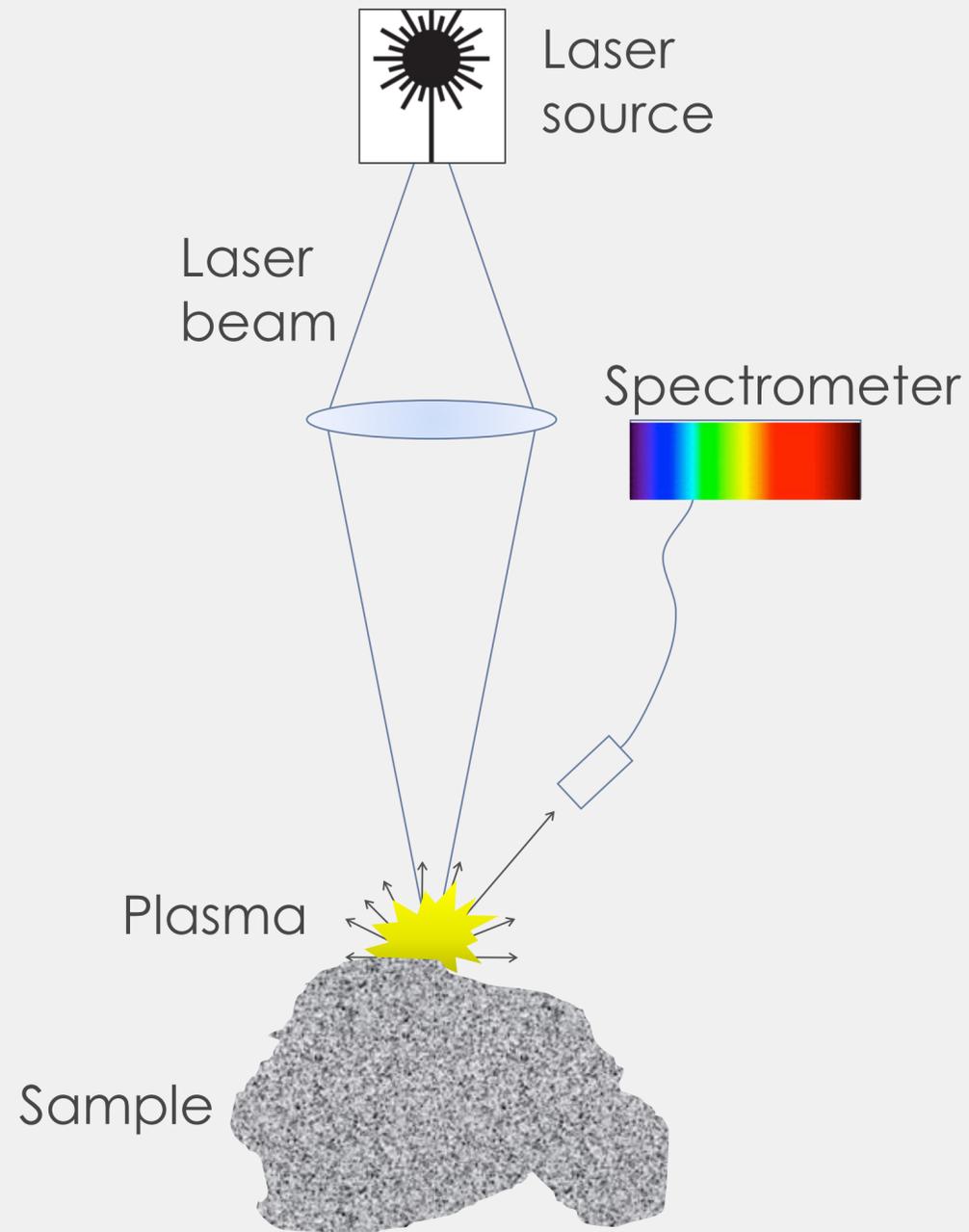
Furthermore a significant amount of energy is lost during that time.



laser OES slag analysis – digital homogenization.



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.

Deliver Results !

QuantoLux

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



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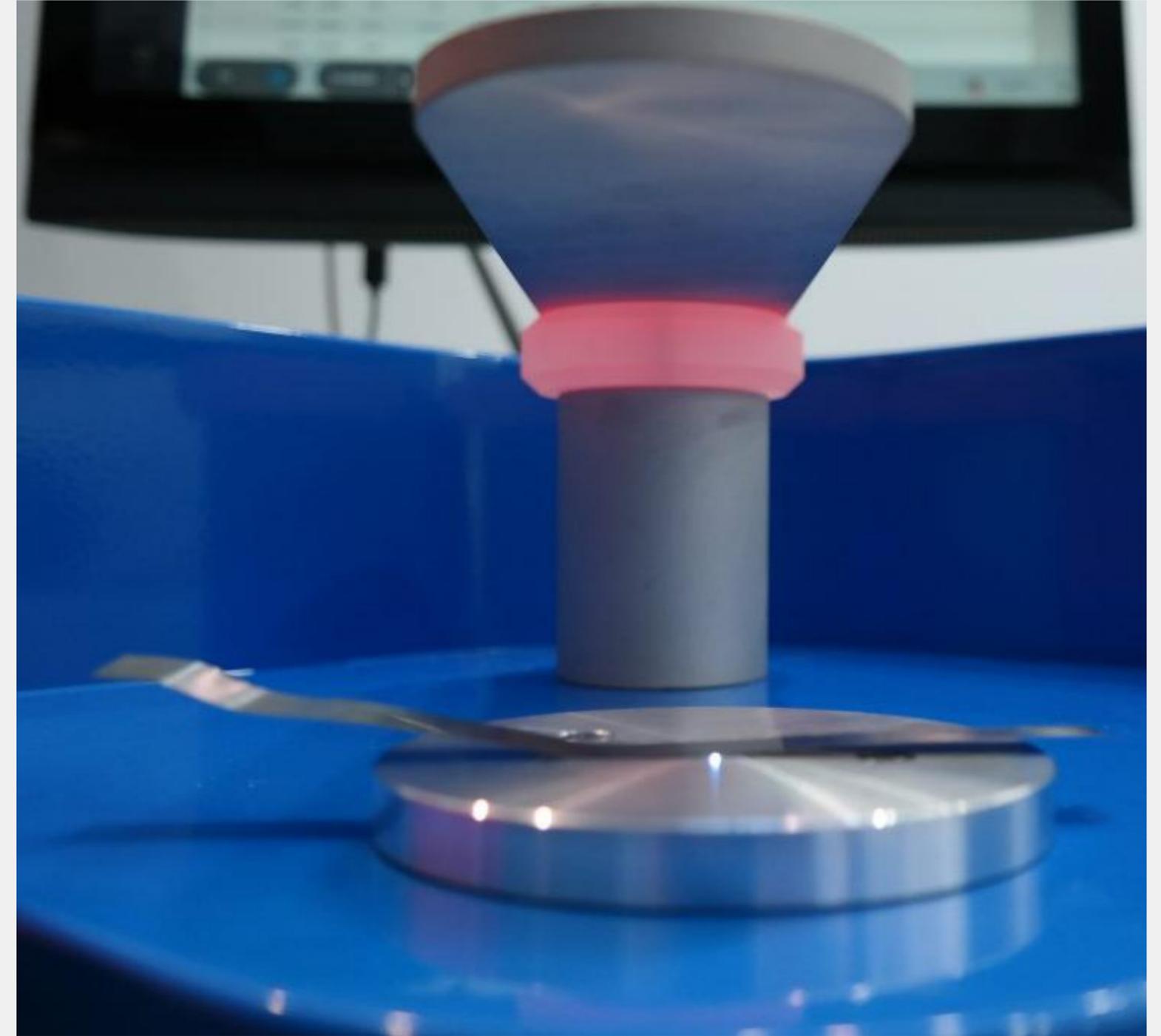
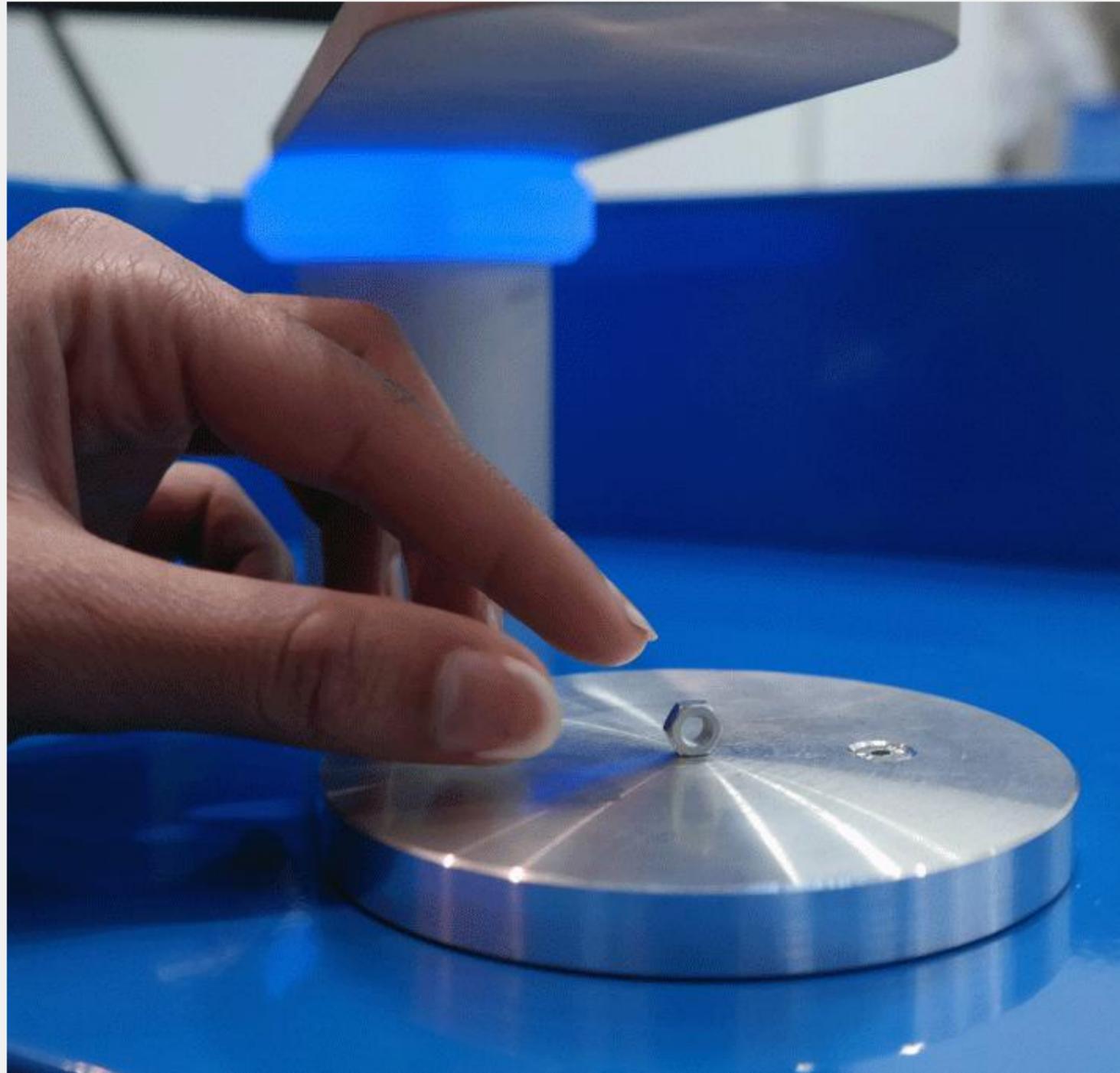
Deliver Results !

QuantoLux

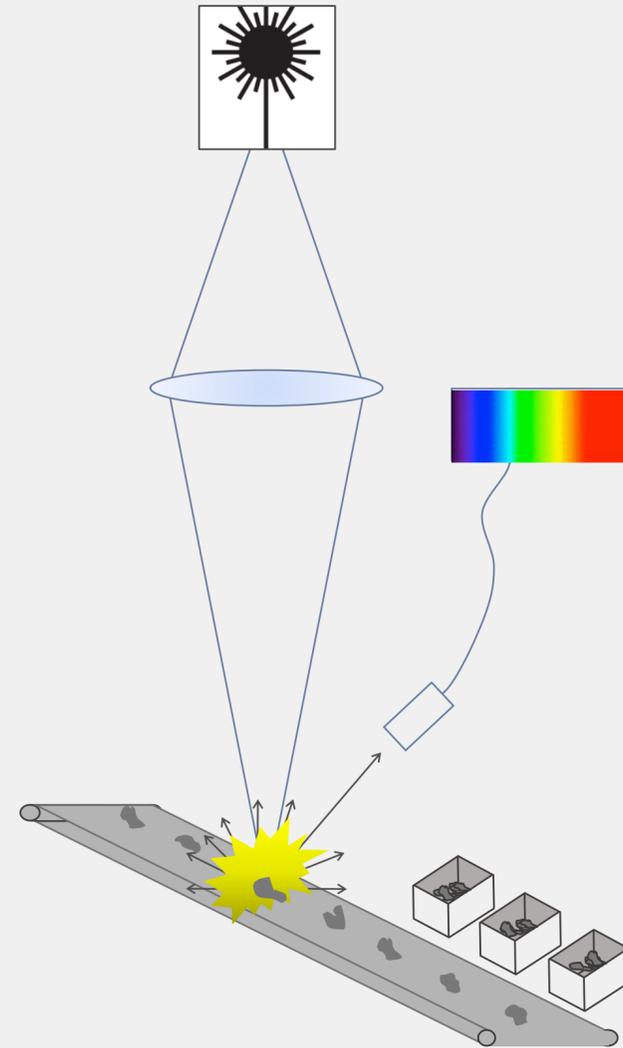
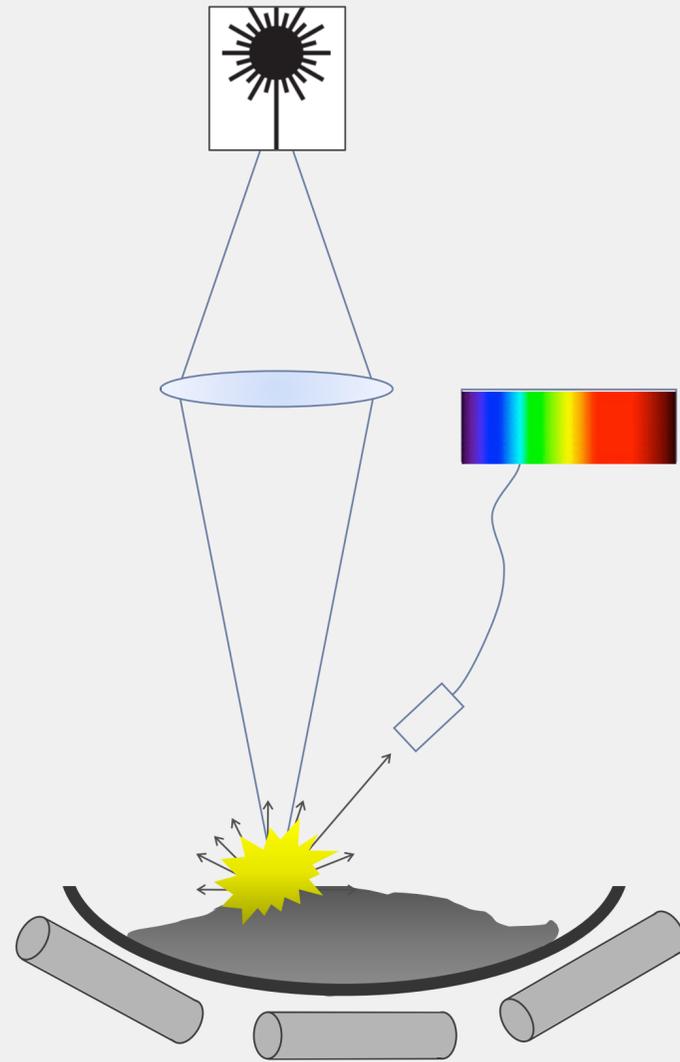
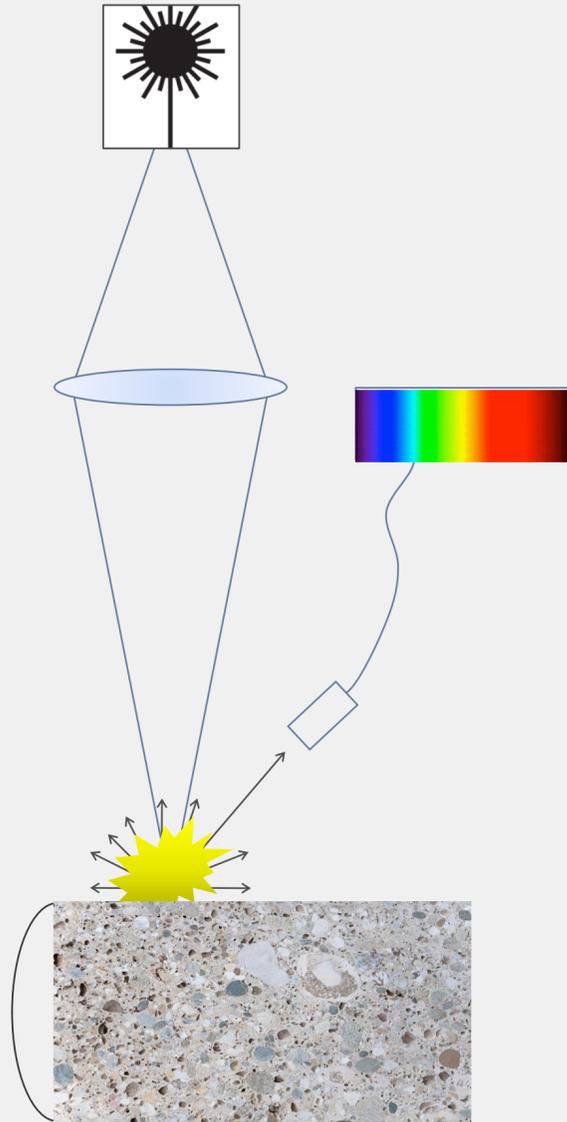
the future
laser OES – **in use today.**



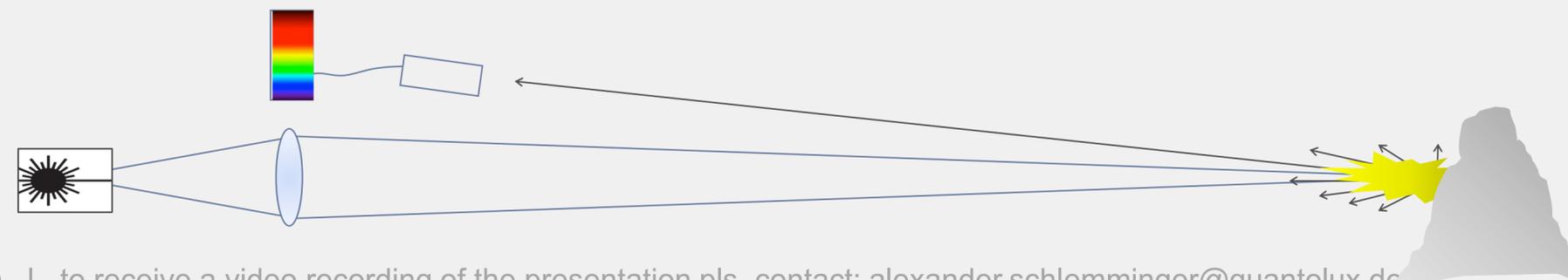
the future
laser OES – **in use today.**



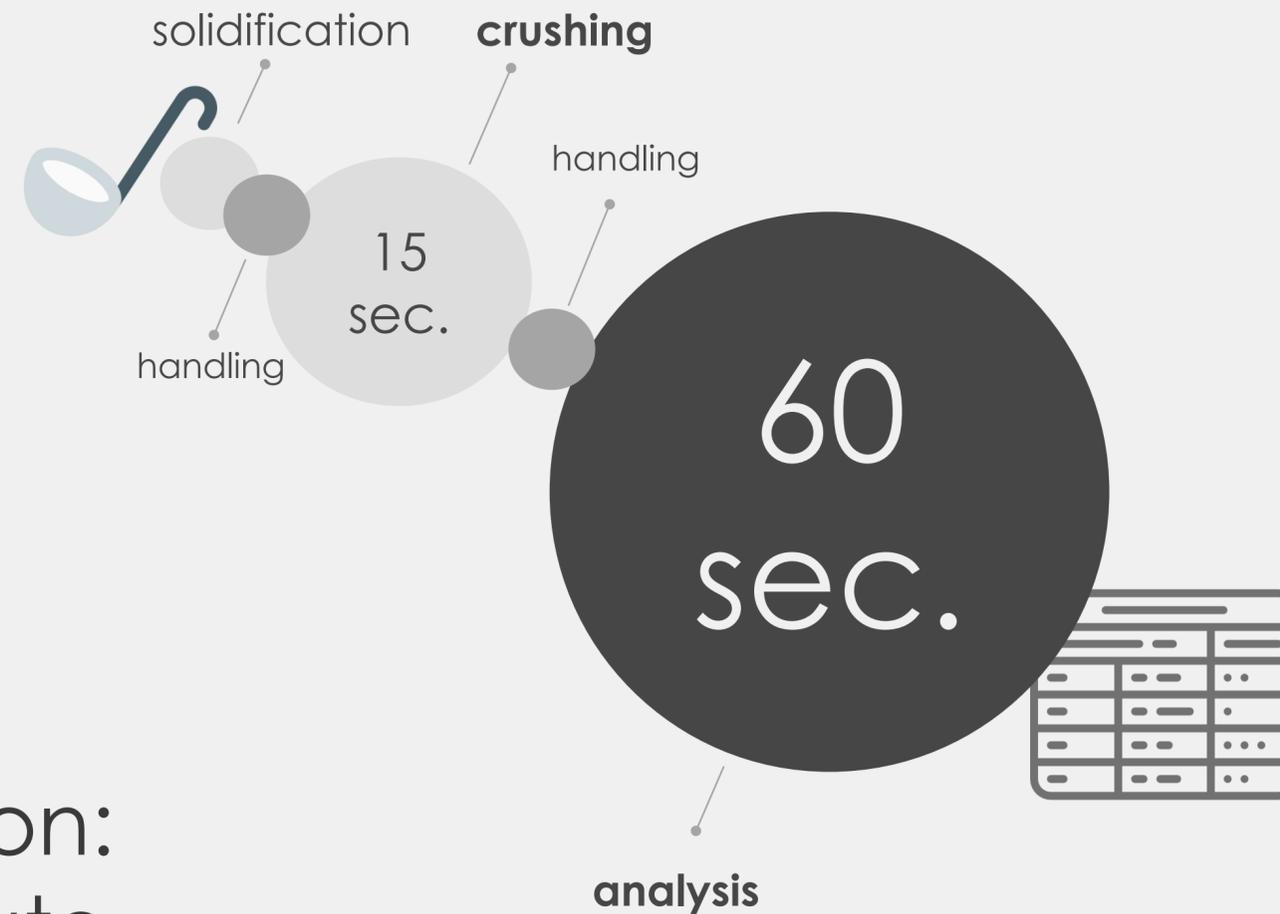
other laser OES setups – in use today.



- 01 contactless
- 02 fast
- 03 stable
- 04 non-conductive samples
- 05 ionizing radiation free
- 06 all elements

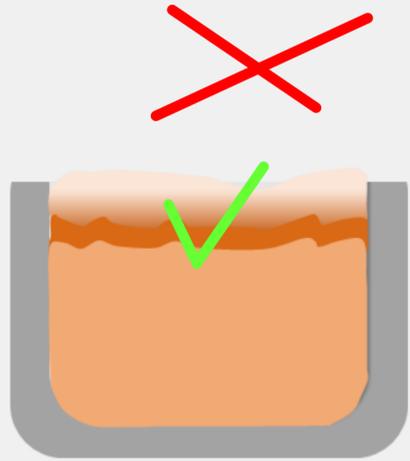


slag analysis – simple and fast.

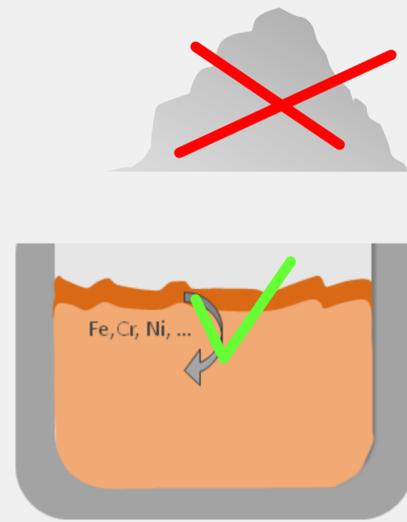


time consumption:
minimum **1** minute
average **2-3** minutes

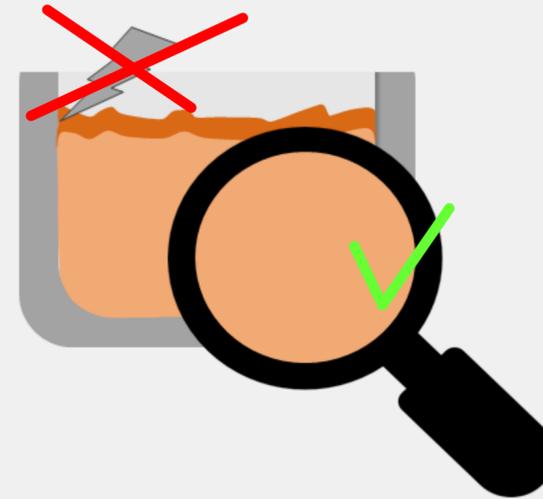
laser OES – combination of quality & yield.



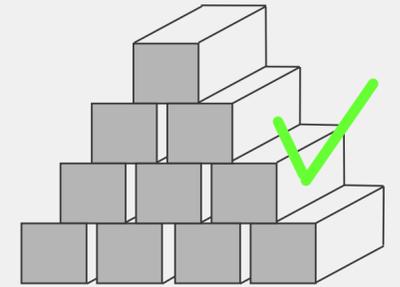
better foaming
=
• reduced energy loss



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



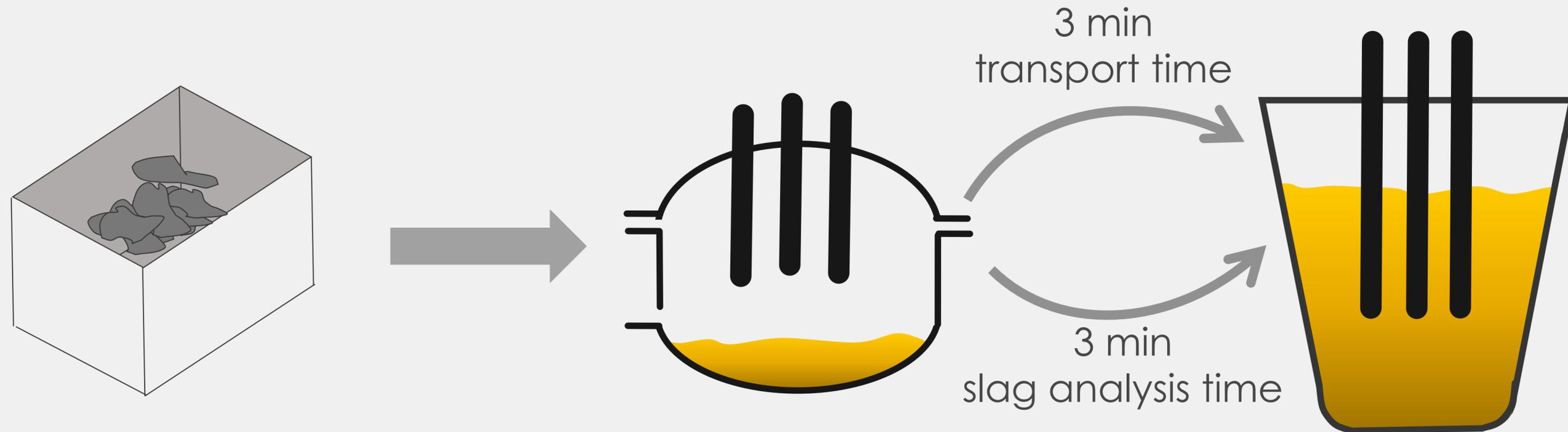
precise basicity =
• less refractory wear
• less maintenance
• cleaner steel



• stable yield

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

rapid EAF slag analysis – benefits for Ladle Furnace



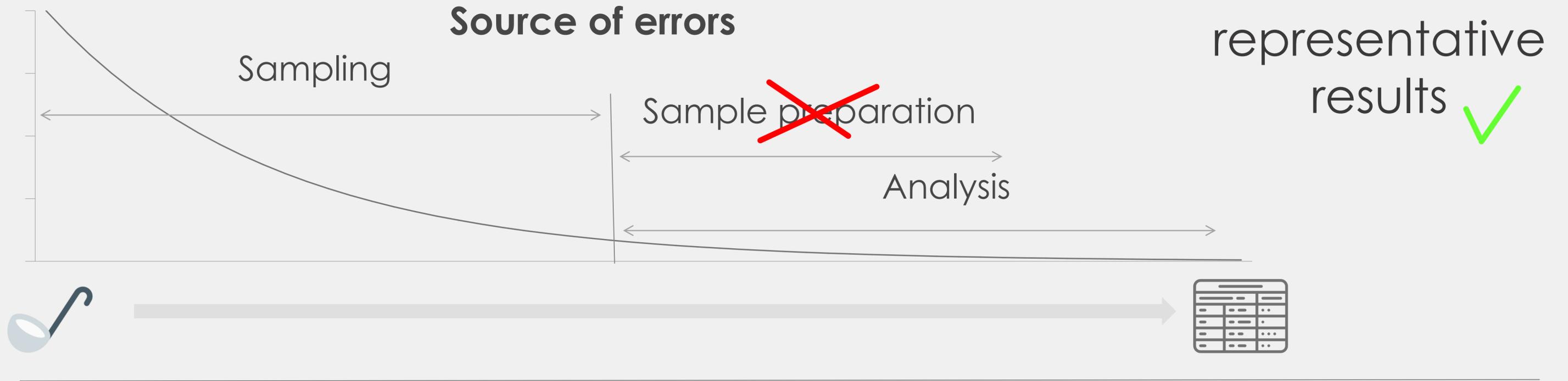
last EAF sample provides
precise initial information
for desulfurization process in the LF

benefit – amortisation time

		savings									
		10 cent / t		25 cent / t		50 cent / t		1 € / t		2 € / t	
		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)

additional value – precision.



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
- ...



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Thank you for your Attention !

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or your local QuantoLux Partner!