

Beyond Grade Libraries:  
Total Materia & ELEMENTAL.SUITE  
Joint Webinar Bruker AXS & Key To Metals AG

A 3D perspective view of a grid of squares, some of which are highlighted in blue, creating a sense of depth and digital structure.

**OES**



Total Materia

**ELEMENTAL.SUITE**

# Total Materia & ELEMENTAL.SUITE Agenda & Meet your Speakers



- Introduction
- ELEMENTAL.SUITE
  - Analysis Viewer & searching grades
  - Internal quality library, limit cards
  - Total Materia integration
  - Search against Total Materia
  - Exporting grades from TM  $\Rightarrow$  ES
- Total Materia (more advances topics)
  - Finding equivalents to foreign materials and compare them side by side
  - Searching for materials worldwide by chemical composition or mech. properties
  - Deciphering material specifications
- One last thing...
- Q&A Session



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# spark-Optical Emission Spectrometry for Metal Analysis



The workhorse for all metal analysis tasks

- Analytical tool with high flexibility
- Full alloy analysis with excellent data quality (compared to XRF: superior for light elements, better suited for traces and lower concentrations)
- Speed: Time-to-result 25-35 s
- Easy sample preparation
- Reliability: high uptime and robustness of hardware and method, even in the 3<sup>rd</sup> shift
- Cost-effective: moderate acquisition costs, low operational costs, able to adopt to changing requirements



# Total Materia & ELEMENTAL.SUITE Chemical Analysis – Interpretation?



## Analytical Results ...

- What do you do with them?
- Is your material “in specification”?
  - What is the specification?
  - How differs “A” from “B” in terms of chem. composition?
- Is chem. composition a complete description of the material and its properties (e.g. thermal processing)?
- How to rate, how to assess?

Element	Unit	Value (Mean)	Average	High (Mean)	Min. (Mean)	Max. (Mean)	Std. Dev.	1	2	3	4	5
C	%	0.025	0.03	0.0007	2.61	0.026	0.025	0.025	0.025	0.025	0.025	0.025
Si	%	0.316	1	0.0015	0.48	0.315	0.316	0.315	0.315	0.315	0.315	0.317
Mn	%	1.625	2	0.0070	0.43	1.623	1.629	1.621	1.617	1.625	1.625	1.625
P	%	0.0038	0.045	0.0005	1.35	0.037	0.038	0.038	0.038	0.038	0.038	0.038
S	%	0.027	0.03	0.0010	3.52	0.026	0.027	0.028	0.028	0.028	0.028	0.028
Cr	%	16.5	16.58	18.3	0.025	0.15	16.61	16.58	16.54	16.57	16.57	16.57
Mo	%	2	2.000	2.5	0.011	0.53	2.009	2.000	2.003	2.006	2.006	2.003

Element	Unit	Value (Mean)	Average	High (Mean)	Min. (Mean)	Max. (Mean)	Std. Dev.	1	2	3	4	5
Ni	%	10	10	10	10	10	10	10	10	10	10	10
Cu	%	0	0	0	0	0	0	0	0	0	0	0
Al	%	0	0	0	0	0	0	0	0	0	0	0
B	%	0	0	0	0	0	0	0	0	0	0	0
Co	%	0	0	0	0	0	0	0	0	0	0	0
Nb	%	0	0	0	0	0	0	0	0	0	0	0
Pb	%	0	0	0	0	0	0	0	0	0	0	0
Sn	%	0	0	0	0	0	0	0	0	0	0	0
Ti	%	0	0	0	0	0	0	0	0	0	0	0
V	%	0	0	0	0	0	0	0	0	0	0	0
W	%	0	0	0	0	0	0	0	0	0	0	0
Zr	%	0	0	0	0	0	0	0	0	0	0	0
H	%	0	0	0	0	0	0	0	0	0	0	0
Ca	%	0	0	0	0	0	0	0	0	0	0	0
Fe	%	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4

## > 74 Standard Organizations w.w.

- Different classification schemes for metals (complex, convoluted and internationally not harmonized)



# Total Materia & ELEMENTAL.SUITE Chemical Analysis – Interpretation?



We have also a mess of terms ...

Specification Quality Limit Card  
Grade Material Designation  
Alloy

All relating to the name/designation of material, based on chemical composition (and allowed deviations/ranges)

Often used as synonym (careful, that we mean the same thing)

# Total Materia & ELEMENTAL.SUITE Need Help and Expert Knowledge?

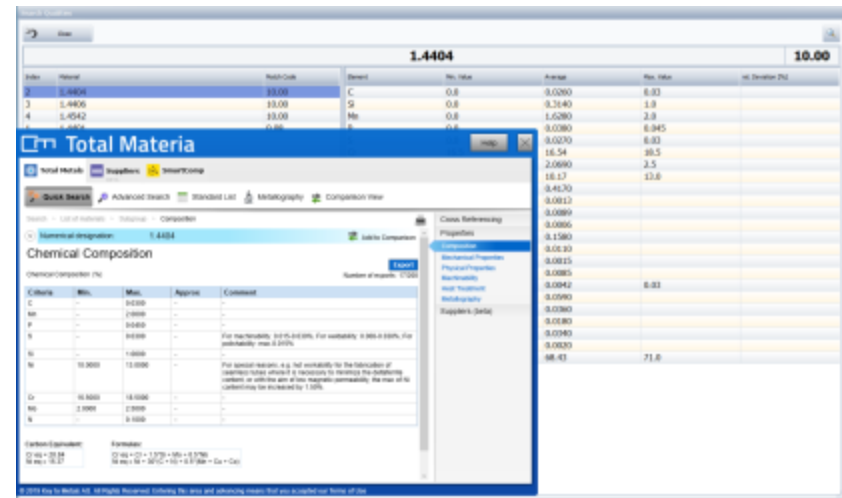


Fortunately, there is a solution helping you to maintain an overview over complex worldwide regulations and providing expert knowledge: Total Materia

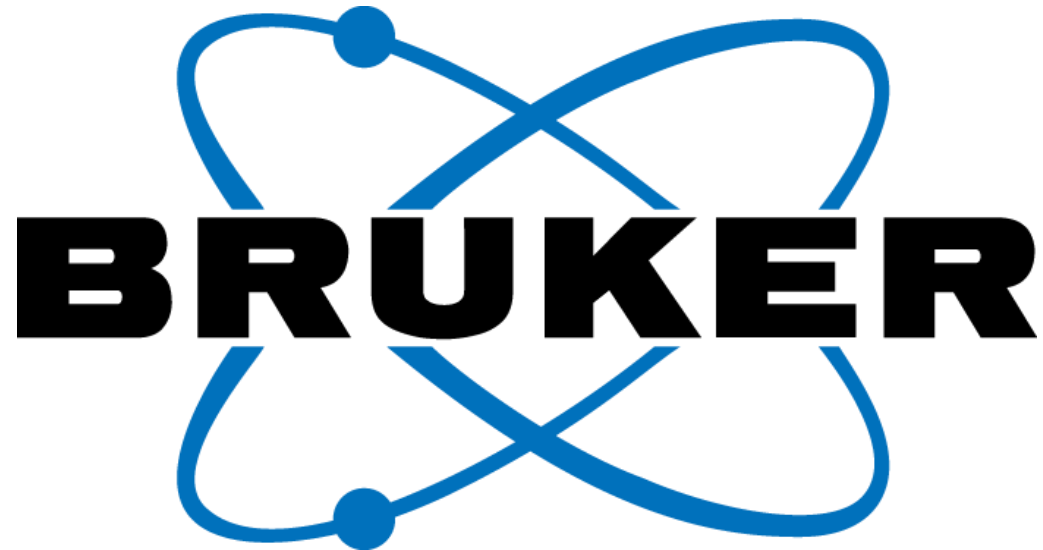
- > 350,000 alloys from >75 countries
- Queried by patented search algorithm: SmartComp
- Desktop version does not require internet connection, up to 200 exports to the internal library

Total Materia not only contains chemical compositions, but also

- > 15 million properties (physical, chemical, mechanical, and metallurgical data), including suppliers and proprietary data sheets



Integration of TM into the spectrometer software allows seamless (**P**ositive) **M**aterial **I**dentification



Innovation with Integrity

**Transfer to application lab**



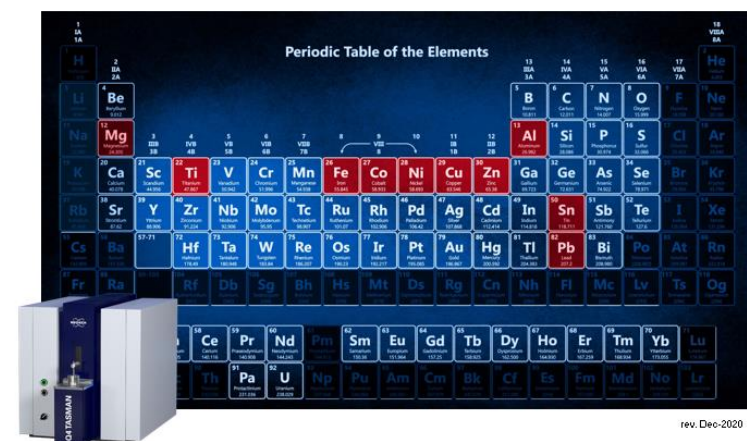
# Total Materia & ELEMENTAL.SUITE Time-Limited Q4 TASMEN Series 2



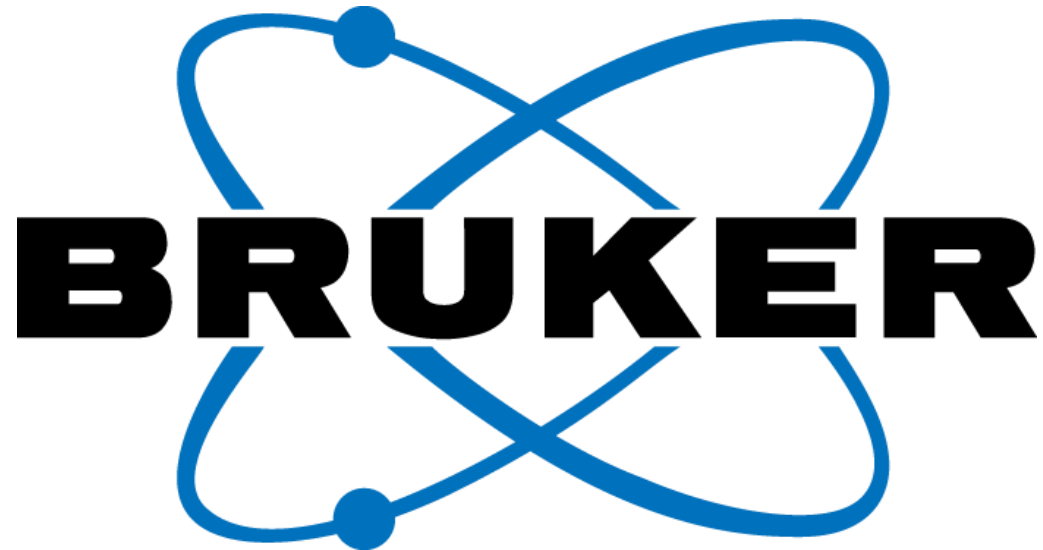
## Announcement

Dec. 2020 we launched the new generation of Bruker's OES-blockbuster:  
Q4 TASMEN Series 2

- Starting from Mar. 1<sup>st</sup>, 2021 we will bundle **a free license of Total Materia** with every order received
- Promotion ends June 30<sup>th</sup>, 2021 (end of Q2/2021)







Innovation with Integrity

## Questions & Answers