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# **CDX Webinar**

**Validation of Material Information and  
Collection of Material Analysis**

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## **Combination of Data Base Systems and Material Assay Testing: Answer Increasingly Complex Material Related Questions with Confidence**

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## Material Assay Testing - General

Material Assay Testing is powerful if:

- No information about a material composition is available
- Regulatory requirement and/or
- Customer related substance info requirement with threshold is well known
- Test method is available
- Lab is skilled (e.g. demonstrated by accreditation)

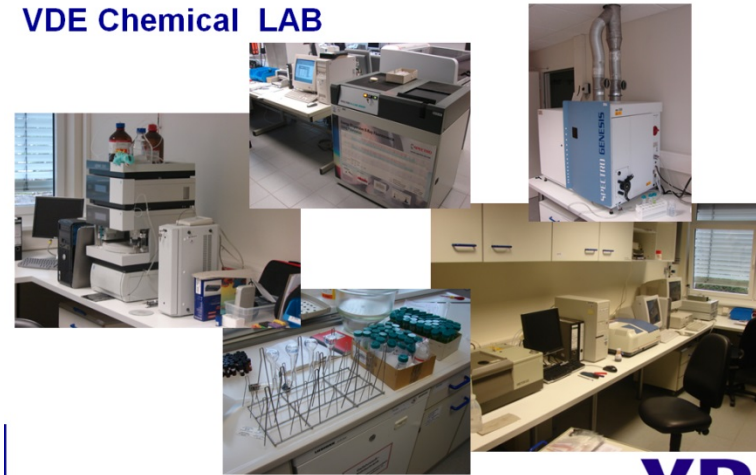
Not necessarily required:

- Information about substances present or DoCs
- Information about sources of material
- Intellectual Property or commercial names regarding substance composition or processes

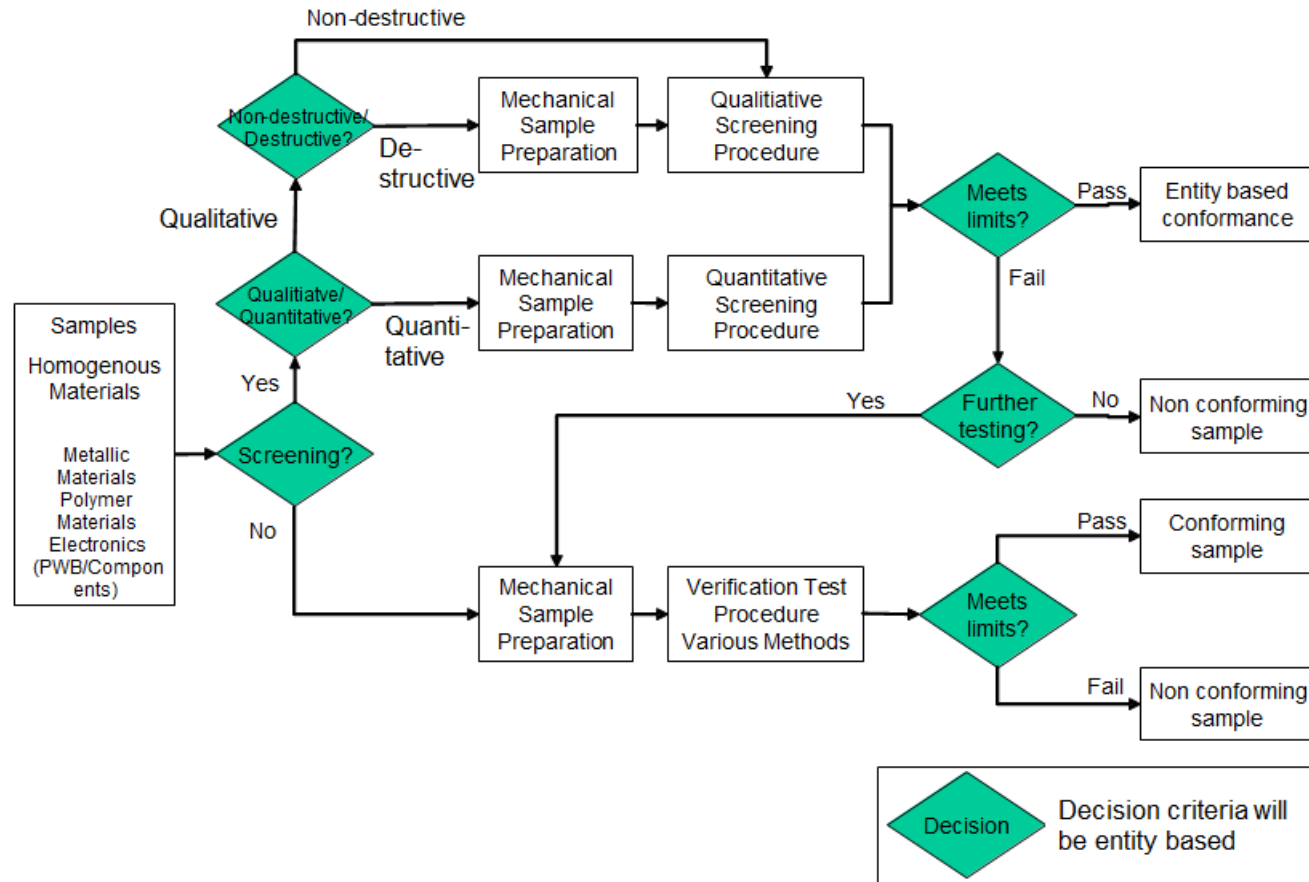
## Material Assay Testing - Material Information Gained

- Allows material comparison (e.g. from pre-production and serial production)
- Assessment of even complex products can be done in a reasonable amount of time and cost
- All manufacturing and material handling / supply chain steps are included (e.g. from soldering and repair)
- Material Assay data are typically broken down to the homogeneous material, therefore later information can be easily replaced.

VDE Chemical LAB



# Material Assay Testing - Process



Source: IEC TC 111 WG3

## Material Assay Testing - Risk Evaluation

- If more than one product of a product series is tested parts may be tested twice or more often material assay testing is a measure to reduce risk
- At the same time cost and time is directly correlated with the complexity of products
- Regarding evaluation of the RoHS compliance EN 50581:2012 suggests testing materials according to their risk
- This approach requires that the risk is known – which might not always be the case
- In case of RoHS testing hand soldering processes and anti-corrosion coatings with Chromium VI content are higher risk but this does not cover all potential risks, still flame retardants such as DecaBDE, Lead and Cadmium in plastics or other issues occur frequently
- As soon as even more complex requirements such as REACH SVHC, REACH Annex XIV or REACH Annex XVII or customer specific requirements need to be addressed with the testing the assessment of the risk of non-compliance is even more

## Material Assay Testing - Data Evaluation

### Material Assay Testing Process

- Product Breakdown – typically to the level of homogeneous materials
- Prepare samples for testing
- Apply test methods
- Interpretation of test results and test data review
- Electronic test data transfer

### Information Obtained:

- Material Identity
- Absence of materials of concern
- Presence of chemical elements and organic substances

## Common formats

- In order to exchange material composition data between companies upon request common data formats are required: For example IPC1752A, IEC62474 or a common format like CDX.
- Reporting Levels relate to Product or Homogeneous Materials
- Substance lists need frequent update, as soon as substance additions are made or exemptions are changed (added or removed)



## Resolved Issues

<b>Electronic Data Management</b>	<b>Material Assay</b>
Validity of data	Data volume
Completeness of data	Traceability / Backlink of information
Data availability	Missing link to product in case of updates
Trade Information or Intellectual Property	

## Advantages of Combination of Material Assay and Electronic Data Handling

- Reasonable timeframe for completing full data sets
- Validation of Information from the supply chain
- Dynamic data update possible
- Overall Cost Savings
  
- Link of material assay test reports and electronic declarations
- Additional link to Certificates and Statements of conformity



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**Material Data Information  
Management**

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# Material Data Information Management

- Material Data Information Management requires systematic data handling structures
- High amount of test data have to be managed
- Maintenance and tracking of test data
- Maintenance and tracking of product information
- Assignment and link to product structures to allow data management down to parts and materials
- For Example: Replacement of data in case paint color of product housing is changed
- Information on material sources and other information can be linked

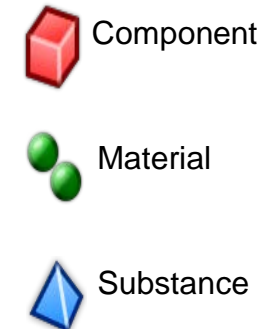


# Management of Test Results in a Data Base System

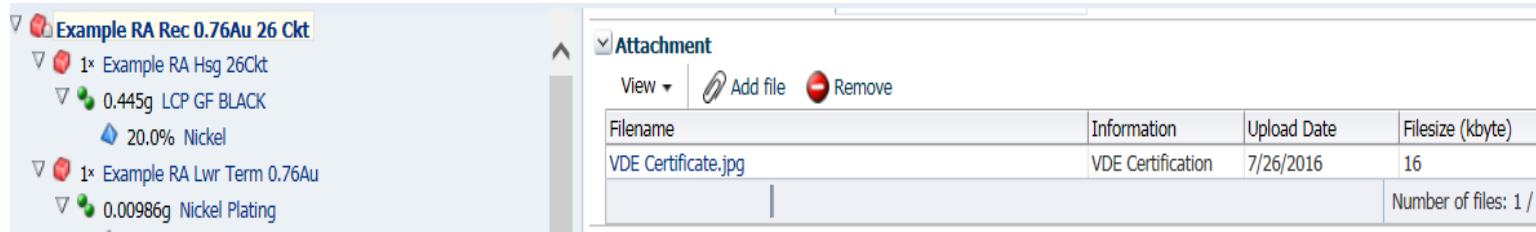
- **CDX Compliance Data eXchange**  
[www.cdxsystem.com](http://www.cdxsystem.com)
- CDX can collect data from supply chain within CDX
- CDX can upload external sources like IPC1752A, Class D, and IEC62474 (future)
- Material information can be full material disclosure or to the best knowledge
- Provided information can be aggregated easily to more complex assemblies

Example RA Rec 0.76Au 26 Ckt

- 1x Example RA Hsg 26Ckt
  - 0.445g LCP GF BLACK
    - 20.0% Nickel
- 1x Example RA Lwr Term 0.76Au
  - 0.00986g Nickel Plating
    - 5.0% Nickel
    - 7.0% Dilead-chromate-oxide
  - 0.00192g Gold Plating
    - 1.0% Nickel
    - Rest 97.0% Gold
- 0.001219g Tin Plating
  - 70.0% Tin
- 0.078g Modified Tin Brass Unplated
  - 1.0% Nickel
  - 3.0% Copper
  - 4.0% Tin
  - 5.0% Zinc (metal)
  - 85.0% Iron
  - Rest 2.0% Phosphorus



# Attaching Certificates or Lab Reports



Example RA Rec 0.76Au 26 Ckt

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- 1x Example RA Lwr Term 0.76Au
  - 0.00986g Nickel Plating

Attachment

View Add file Remove

Filename	Information	Upload Date	Filesize (kbyte)
VDE Certificate.jpg	VDE Certification	7/26/2016	16

Number of files: 1 / 5

- Companies can provide customers with proofs of the correctness of the material information provided
- Certificates can declare additionally the compliance to special regulations like RoHS or REACH



# Service maps Substances to Regulations

- CDX provides many regulations and substance groups which can be checked
- The mapping of substances to regulations is taken over by a Chemical Service
- One material declaration can be controlled against many different international regulations in an easy way
- Companies can check their declarations against various regulations



# Automatic Display of REACH and RoHS Information

**Regulations**

**REACH**

REACH Annex XVII

Name	CAS No.	No.	D/P	Limit value / Restriction conditions	Entry	Portion	Weight	Material
Nickel	7440-02-0		P	1. Shall not be used: (a) in any po...	E2009,...	24.65...	0.000...	Nickel Plating
Nickel	7440-02-0		P	1. Shall not be used: (a) in any po...	E2009,...	0.96 %	0.000...	Gold Plating
Nickel	7440-02-0		P	1. Shall not be used: (a) in any po...	E2009,...	39.0 %	0.000...	Modified Tin Brass Unplated

**RoHS**

EC Declaration of Conformity attached

Statement of manufacturer for RoHS attached

Name	CAS No.	D/P	Limit value / Restricti	Entry	Portion	Weight	Material	Exemption
Dilead-chroma...	18454-12-1	P	0.1%	E2009	7.0 %	0.000...	Nickel Plating	Electrical and electronic components containin

**ELV**

Name	CAS No.	D/P	Limit value / Restricti	Entry	Portion	Weight	Material	Exemption
Dilead-chroma...	18454-12-1	P	0.1%	E2009	7.0 %	0.000...	Nickel Platino	

- Information about critical substances in the component in regard to main regulations is displayed automatically
- For RoHS and ELV exemptions can be assigned
- Exemptions are maintained by the Chemical Service



# One Declaration can be provided to many customers

The screenshot displays a software interface for managing material declarations. At the top, the declaration name is 'Example RA Rec 0.76Au 26 Ckt' with ID/Version '1031641 / 1' and Node ID '1031641'. The status is 'Internally released - IPC Class D Imported'. Below this, there are icons for 'Release internally', 'Send', and 'Propose'. A list of recipients is shown, including 'PM Vintage Company [157] not yet browsed (08/24/2016)' and 'PM Plastic Metal [122] not yet browsed (08/24/2016)'. The 'Details' section is expanded to show 'Transfer Information' with fields for Company ('PM Plastic Metal [122]'), Organisation unit ('-'), Recipient status ('not yet browsed'), Supplier Code ('1212'), Name ('Example RA Rec 0.76Au 26 Ckt'), and Part/Item No. (with a dropdown menu showing '22-11-A-33'). A 'Forwarding allowed' checkbox is checked. The 'Drawing' section is also expanded, showing 'Drawing No. -'.

- One material declaration can be sent to many customers in CDX
- The management of status is built in CDX and provided real time
- Changes in material declarations can be easily done within the application



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**Thank you**

Dr. Michael Riess  
Peter Müller