Bundeskriminalamt

EU Tape, Paint, Glass Data Sets

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Central Analytical Services, Materials Analysis & Trace Evidence

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Bundeskriminalamt

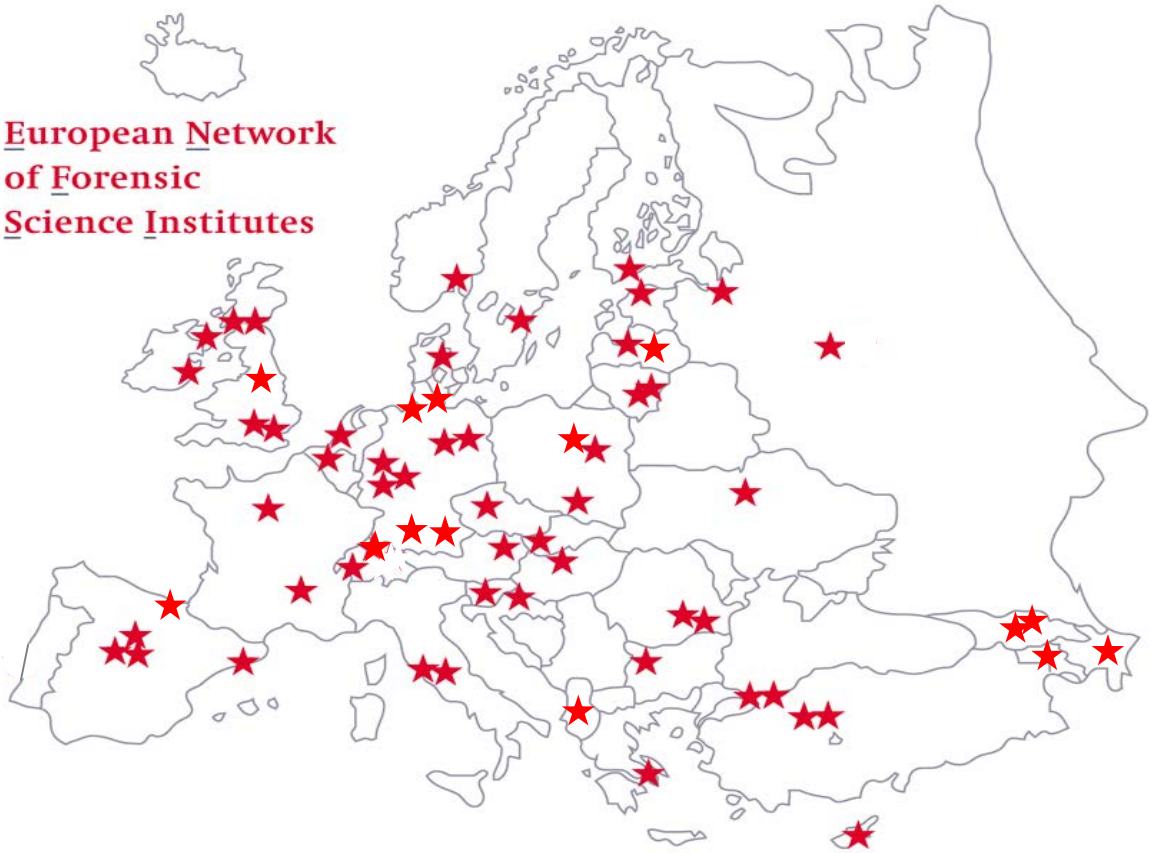
structure

- ENFSI
- EU
- EPG

- ENFSI

European cooperation
ENFSI

European Network
of Forensic
Science Institutes



★ *66 institutes from 36 countries*

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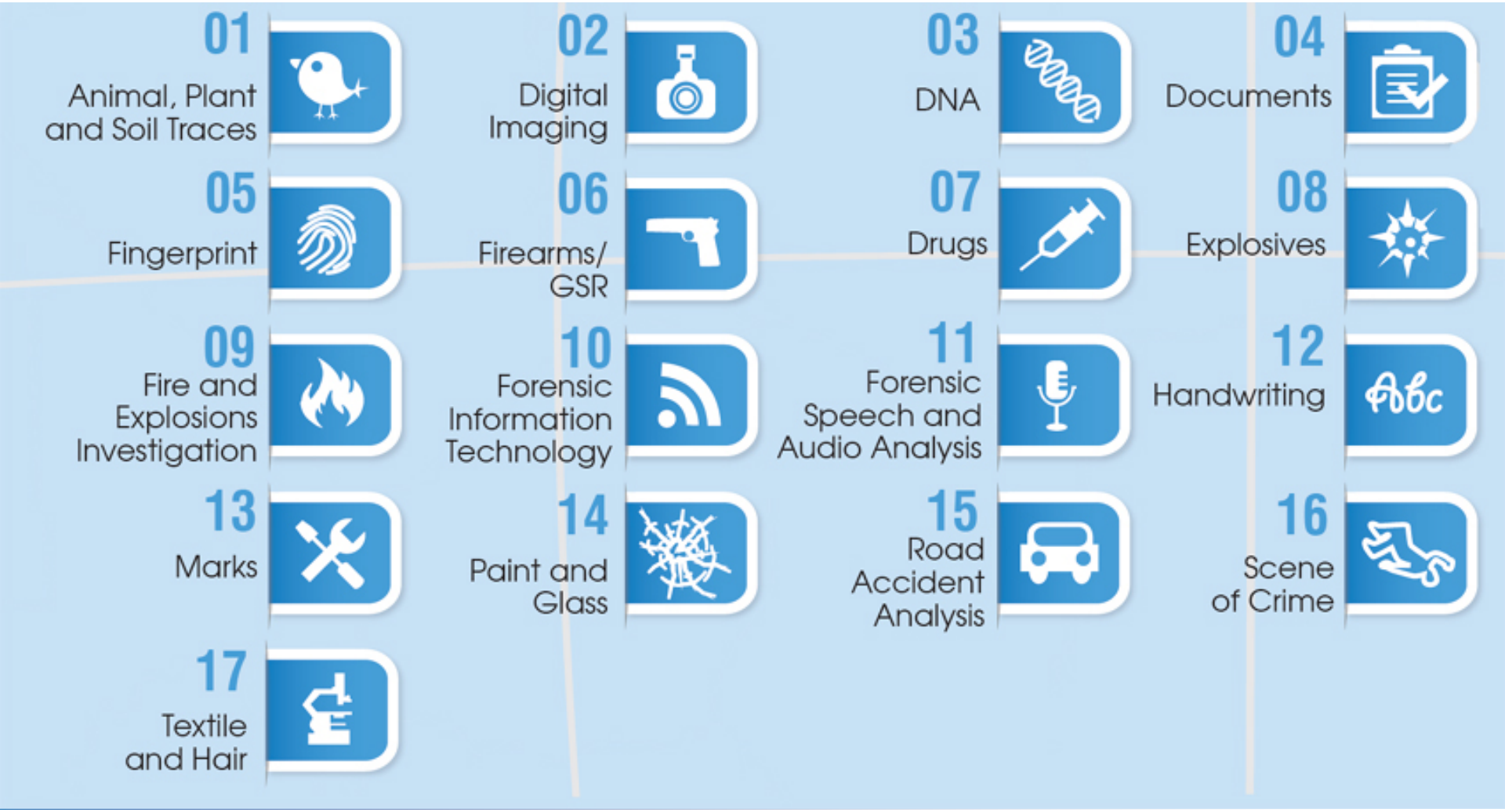
ENFSI

17 Expert Working Groups



ENFSI
Monopoly Projects

ENFSI has been identified by the European Commission as a body in a de facto *monopoly situation*
as it is the only network of Forensic Science Institutes of the Member States in Europe.

→ Monopoly projects
2009-2014: ∑over 4.3 Mio €

MP 2013 Monopoly projects

Project Title	Project Leader
T1. Creation and shared use of an international database of ignitable liquids and substances.	NFI-The Hague, NL
T2. Development and implementation of new analytical methods and databases for the detection of additives in fuels and fire debris.	BKA-Wiesbaden, DE
T3. Proficiency tests for the fingerprint domain.	RaCIS-Rome, IT
T4. SmartRank: Likelihood ratio software for searching national DNA databases with complex DNA profiles.	NFI-The Hague, NL
T5. DNActivity: International cooperation in activity level interpretation of forensic DNA evidence.	NFI-The Hague, NL
T6. The development of a statistical software package for likelihood ratio calculations.	NFI-The Hague, NL

Monopoly Projects

MP 2014 Monopoly projects

Towards the Development of Pan-European Databases in Forensic Science (TDPEDFS)	Project Leader
N1. Towards Big Forensic Data (TBFD)	LKA-Berlin, DE
N2. Geographical distribution of firearms and gunshot residue throughout Europe: databases that help experts to report beyond the source level.	BKA-Wiesbaden, DE
N3. European Smoke and Ink Staining System Plus (EuSISS+)	INPS-Lyon, FR
N4. Forensic Substance Database on Explosives (FoSDE)	NFI-The Hague, NL
N5. Data platform for the combination of various existing databases and research-projects in the field of forensic document examination	LKA Stuttgart, DE

- EU

EFSA 2020

COUNCIL OF
THE EUROPEAN UNION

EN

Council conclusions on the vision for European Forensic Science 2020 including the creation of a European Forensic Science Area and the development of forensic science infrastructure in Europe

3135th JUSTICE and HOME AFFAIRS Council meeting
Brussels, 13 and 14 December 2011

The Council adopted the following conclusions:

"THE COUNCIL OF THE EUROPEAN UNION

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EFSA goal
formulated in 2011

To foster cooperation between police and judicial authorities across the EU

by suggesting 10 activities:

accreditation
best practice manuals
proficiency tests/ collaborative exercises
minimum quality standards for scene-of-crime
minimum competence criteria

forensic awareness
equivalence of forensic activities

forensic databases
research and development
use of advances in forensic science

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EFSA 2020

Council Conclusions decided VI 2016

Council of the European Union

Brussels, 29 April 2016
(OR. en)

6078/3/16
REV 3

ENFOPOL 34
COPEN 40
DAPIX 26
COSI 44

NOTE

From:	Presidency
To:	Delegations
Subject:	Draft Council Conclusions on the way forward in view of the creation of an European Forensic Science Area

Action plan for the way forward for the creation of a European Forensic Science Area with six core activities:

Action 2: Stimulating exchange of forensic information from databases, for example in the areas of weapons and ammunition, explosives and drugs

- EPG

EPG materials of interest

Paint

Tape

Glass

Security Dyes

EUCAP:

European Collection of Automotive Paints

- Founded by European Paint Group in 1995
- EPG - Expert Working Group of ENFSI

wrong EUCAP

COMMON SECURITY AND DEFENCE POLICY

The EUCAP Sahel Niger civilian mission

Updated: April 2016

EU civilian mission under the Common Security and Defence Policy (CSDP)

European Collection of Automotive Paint (EUCAP)

History

1985:
Establishment of central collection of automotive paints at BKA/ Germany (ZALS)

1995:
Establishment of EUCAP by members of the European Expert Working Group Paint (EPG)

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PDQ/ FBI-EUCAP collaboration legal issues / data exchange

- **Cooperation RCMP/ BKA:**

  1995 MoU

- **Cooperation FBI / BKA:**

  1997 Contract of non-disclosure

- **Data transfer RCMP/ PDQ:** annual PDQ-update per USB-stick for EPG members which have signed the RCMP agreement of n-d and confidentiality

- **Data access EPG/ EUCAP:** permanent access for FBI and RCMP to the EPG website to download the latest spectra libraries

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PDQ/FBI-EUCAP collaboration sample exchange

- **FBI:** paint samples from the U.S.-market for EUCAP
- **EUCAP:** Annually, new EUCAP paint samples are send to RCMP/FBI

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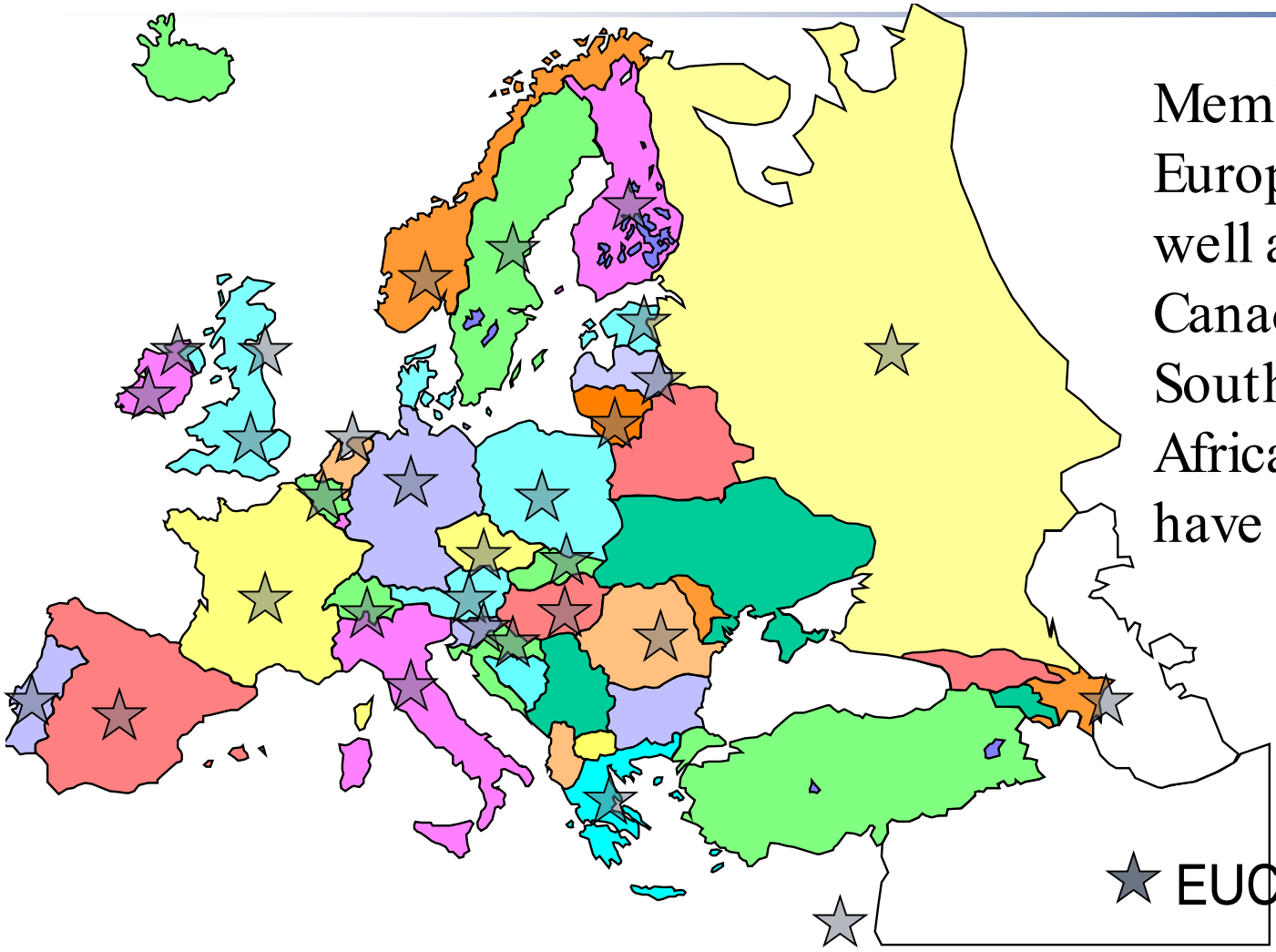
European Collection of Automotive Paint (EUCAP)



Members from 28 European Countries as well as from U.S.A., Canada, Singapore, South Korea, South Africa and Morocco have access to EUCAP.

★ EUCAP - member

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European Collection of Automotive Paint (EUCAP)

Aim:
Identification or characterisation of paint systems

Application:
Hit &run cases, all cases in which paint systems occur as trace evidence

European Collection of Automotive Paint (EUCAP)

Use of EUCAP:

- **Characterisation**

  Hit & run cases; determination of:

  Colour, car make, model, year of production

- **Comparison**

  Cases in which trace evidence from suspect & scene of crime are available

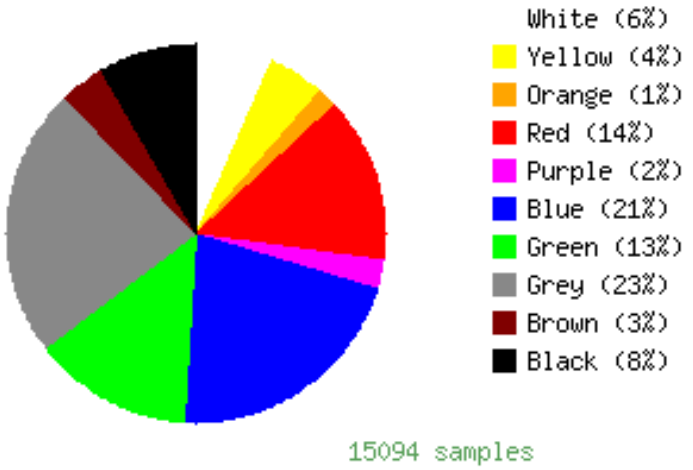
Sample collection at BKA Wiesbaden/ Germany

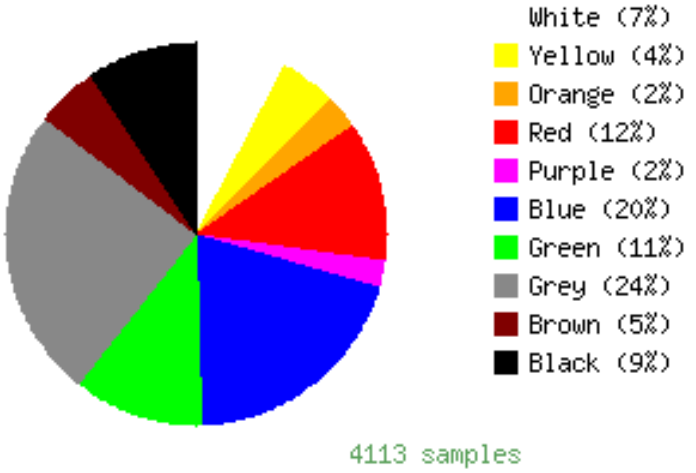
~20.000 samples

EUCAP

Database hosted by IRCGN Pontoise/ France

62.000 IR spectra and corresponding sample properties from almost 20.000 paint samples





Current validation of EUCAP 1/2

- The novel possibilities offered in the recent versions of the KnowItAll®/ Bio-Rad software are used to estimate the validation parameters of the EUCAP database system (sensitivity, specificity, false rejection rate and false acceptance rate).
- Especially, the multi-layer search is applied.

Current validation of EUCAP 2/2

- Evaluation is based on a selection of 123 samples considering the model years 2000 until 2015 and as much car makes and models/ production plants as possible.
- The samples are taken from casework which has been done over the years.
- The spectra of the selected samples have been made anonymous and distributed to the five participating laboratories as a blind test.

EPG
other spectra databases

IR spectra libraries:

- Spray Paints: 1019 spectra
- Tool Paints: 446 spectra
- Dyes and Pigments: 649 spectra
- Miscellaneous from casework: 3218 spectra
- Adhesives/ Adhesive Tapes: 6007 spectra

Raman spectra libraries:

Dyes and Pigments: 2753; Inorganics: 178 spectra

EUCAP
General remark

The significance of EUCAP is different for the various countries and even among the forensic institutes within one country
because of
- differences in jurisdiction about hit-and-run,
- different significance given to material analysis
- different strength of the network between the forensic science institutes and the investigating police officers/ SOC officers.

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Positive Effects of Common Databases

- Harmonization of analytical methods and procedures in casework
- Availability of the same databases as a knowledge base for the EPG community
- Coordinated training to keep a standard of competence
- Availability of a database for PT/ CE
- Quality control is done by all users
- Contribution by all participants helps to keep the content diversity
- Contribution by all participants helps to keep databases up-to-date

EPG materials of interest

Paint

Tape

Glass

Security Dyes

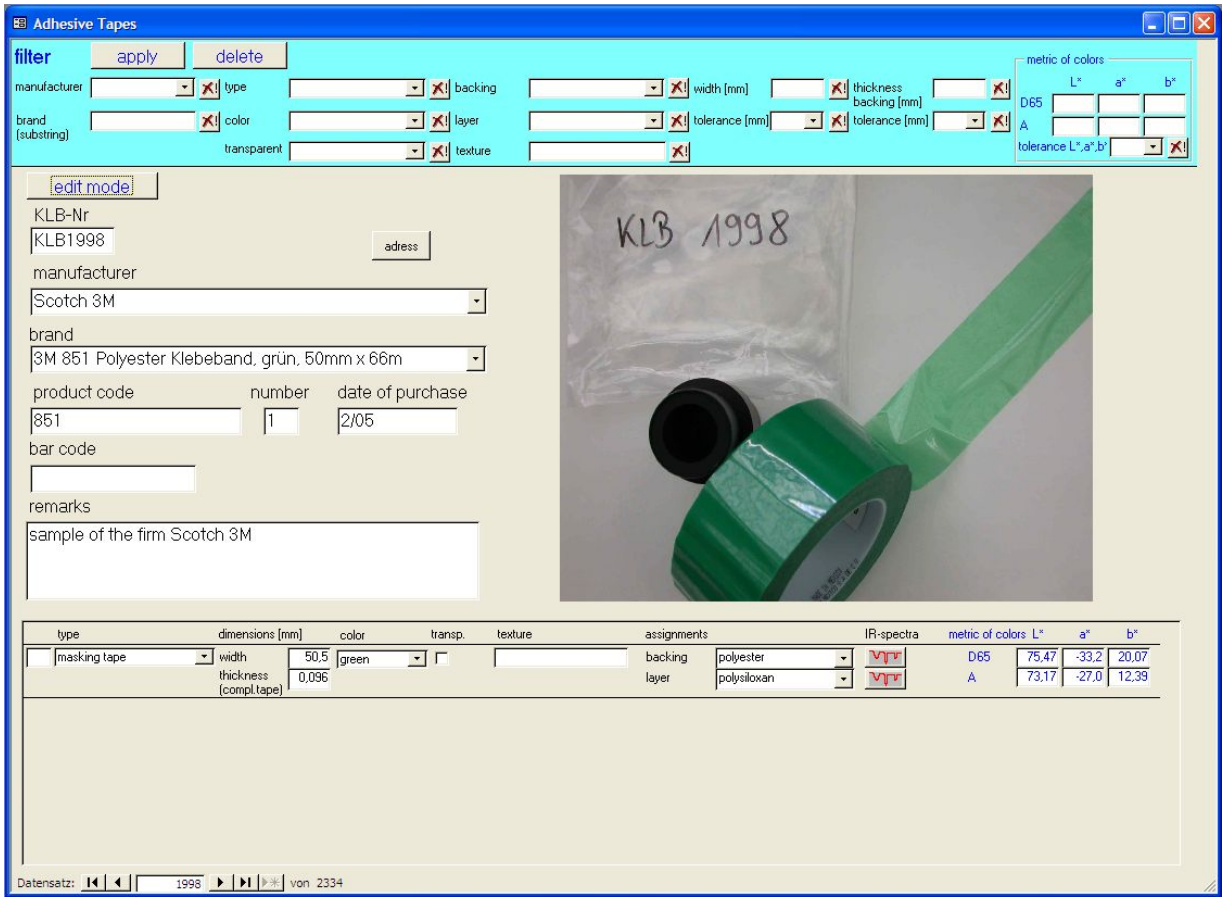
Tape
BKA Tape collection

- Established 2003
- 2.900 tape samples with physical properties, FT-IR spectra
- Most samples off the shelf, few samples direct from production line, no casework samples
- Sample input mainly by BKA, support from various European FSI

Tape
BKA Tape collection

- Service of BKA for EPG & German FSI
- Knowledge pool for studies
- Quick link to manufacturer
- Reference samples (e.g. for additional comparison of processing features)

Tape
BKA Tape collection



- IR-spectra (backing, PSA)
- color data (Lab)
- Pictures of product & package
- thickness & width data
- date of purchase & origin
- MS Access

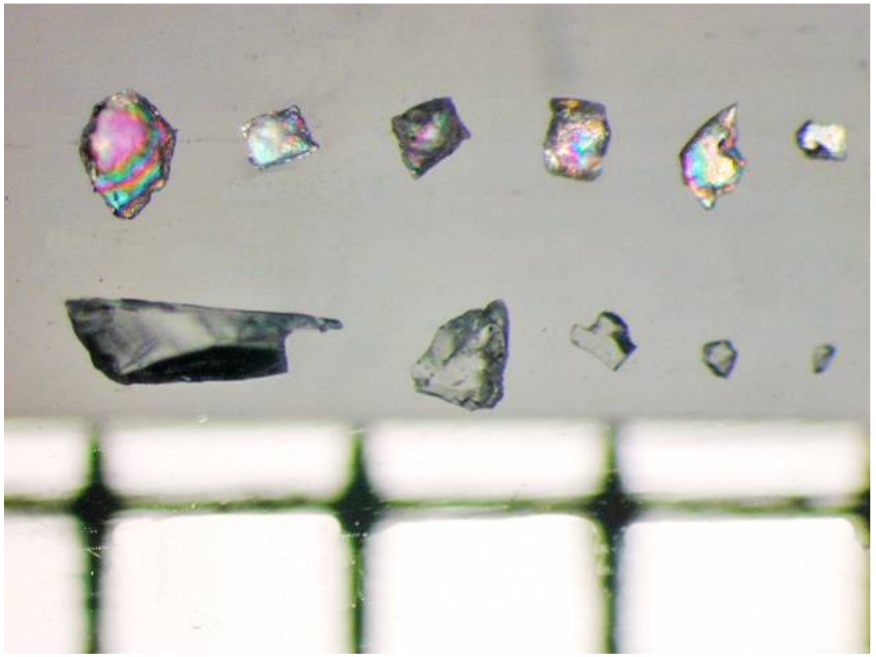
EPG materials of interest

Paint

Tape

Glass

Security Dyes



Refractive Index

- Harmonized method; “eleven laws” of RI measurement
- Common external std glass BKA-K5 with high homogeneity (Schott AG)
- Collection of RI data from German/ Switzerland FSI
- Organized/ hosted by federal state lab Stuttgart/ Germany

Lit: Design of a Glass Casework Database inheriting Quality Assurance Aspects; Becker et. al. Problems of For Sci. vol XLVII, 2001, 73-79

Refractive Index

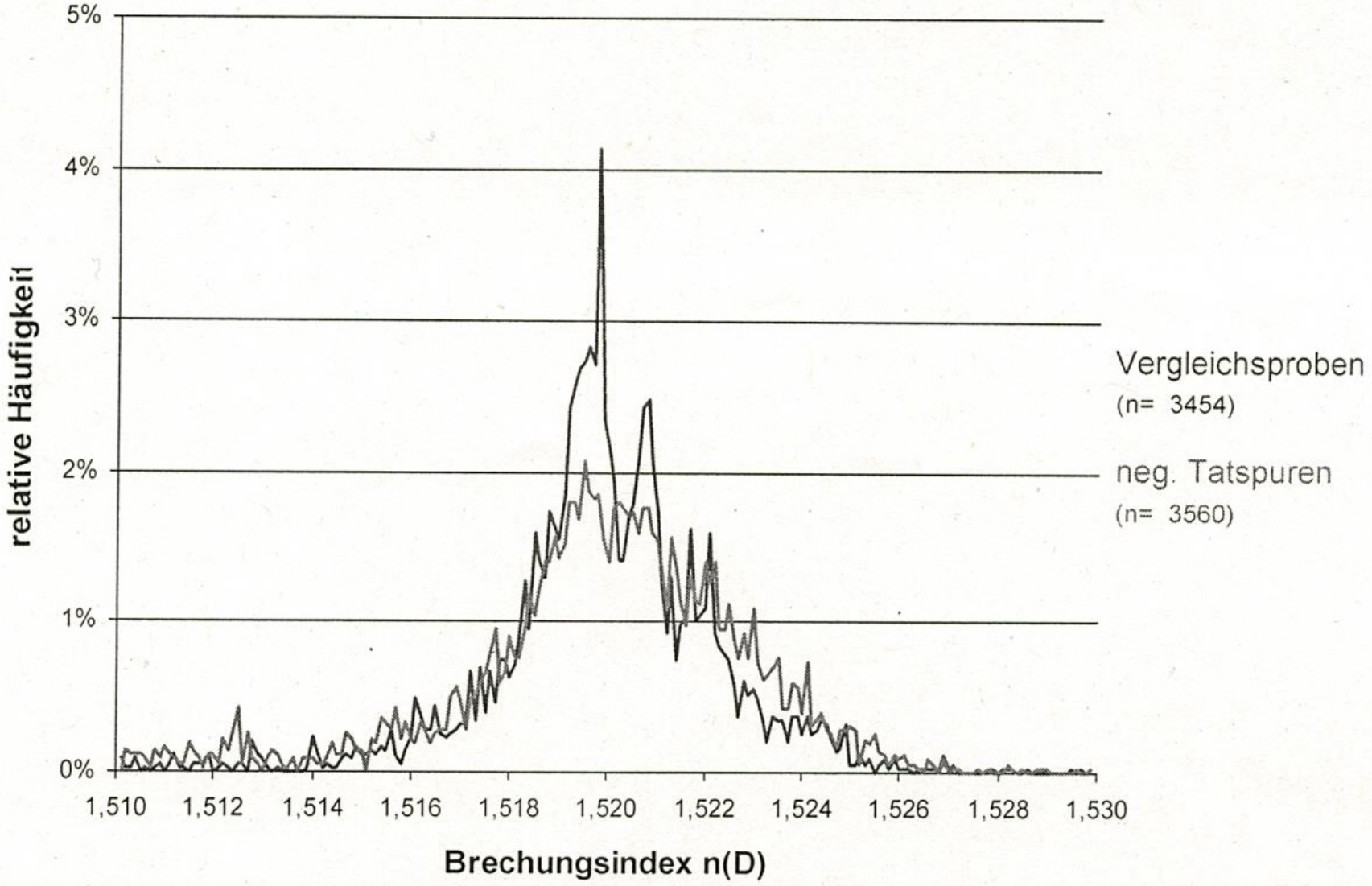
Regelkontrollmessungen am Referenzglas K5

Zusammenstellung

Untersuchungsstelle	*Anzahl der Messtage*	*Mittelwert*	*Standardabweichung*
Federal state lab A	943	1,52242	1,50E-05
BKA	165	1,52242	2,42E-05
Federal state lab B	322	1,52241	2,03E-05
Federal state lab C	287	1,52240	2,88E-05
Federal state lab D	63	1,52241	2,44E-05
CH state lab	267	1,52241	2,03E-05

Klassenhäufigkeiten Brechungsindex

Refractive Index



Glass – elemental analysis

1995-97	Collection of float glasses of intl. sources
1997	Solution ICP-MS data of 64 glasses, chemo-metrics to determine discriminating element
2001/02	SCHOTT AG production of BKA FGS 1 &2
2001-03	Development of a protocol for glass analysis
2005	Optimized method: JFS, vol. 50(6) 1327-41
2009-13	EAWG activities
2011	Match criterion: JAAS, 26, 1273
2013	ASTM E2927 – 13 (ASTM E2926-13)

NITE CRIME Network

LA-ICP-MS dataset in forensic casework

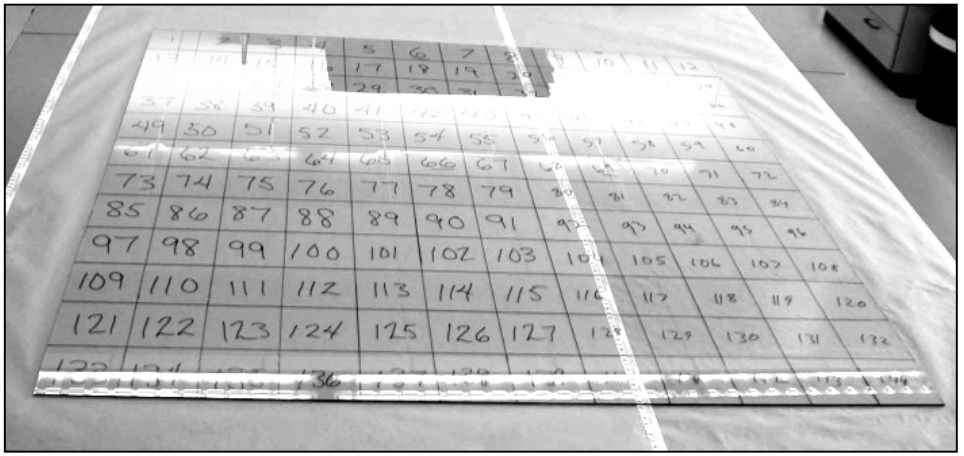
LA-ICP-MS measurements on 62 different float glasses from the BKA glass collection

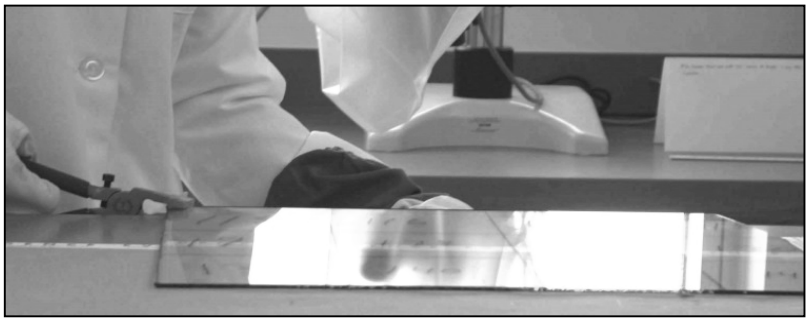
04_36		Asahi Glass Co.	Aichi 2	Japan	Asien	Asahi Glass Co.	clear	3,50
04_38		Asahi Glass Co.	Kashima 1	Japan	Asien	Asahi Glass Co.	clear	3,00
05_01	Planilux klar	Vegla	Stolberg	Germany	Europa	Saint Gobain	clear	3,13
05_02	Parsol grün N	Vegla	Herzogenrath	Germany	Europa	Saint Gobain	green	4,11
05_03	Parsol grün plus	Vegla	Herzogenrath	Germany	Europa	Saint Gobain	green	4,06
05_05	VSG besch.	Vegla	Stolberg	Germany	Europa	Saint Gobain	clear	4,68
05_09	V_PORZ Plalux	Vegla	Porz 2	Germany	Europa	Saint Gobain	clear	5,84
06_02	Triplex grün	Triplex	St. Helens	Kingdom	Europa	Pilkington Bros Ltd	green	2,15
07_01	Lahti 10.02.1995	Lahden Lasitehdas	Lahti L-1	Finland	Europa	Pilkington	clear	2,15
07_03	Lahti 15.02.1995	Lahden Lasitehdas	Lahti L-1	Finland	Europa	Pilkington	clear	1,15
08_02	Green Float	S.I.V.	San Salvo	Italy	Europa	Pilkington	green	3,17
08_03	Climaglass	S.I.V.	San Salvo	Italy	Europa	Pilkington	green	3,15
09_02	Optiwhite	Flachglas	Weiherhammer 2	Germany	Europa	Pilkington	clear	3,85
10_01	Optifloat	Flachglas	Gladbeck 1	Germany	Europa	Pilkington	clear	3,84
11_01	Optifloat	Flachglas	Gladbeck 1	Germany	Europa	Pilkington	clear	3,84
12_01	Optigrün 90	Flachglas	Gladbeck 2	Germany	Europa	Pilkington	green	3,15
12_02	Optigrün 58	Flachglas	Gladbeck 2	Germany	Europa	Pilkington	green	2,15
13_01	Optifloat	Flachglas	Weiherhammer 1	Germany	Europa	Pilkington	clear	5,88
13_02	Optifloat	Flachglas	Weiherhammer 1	Germany	Europa	Pilkington	clear	3,83
14_02	Optifloat	Flachglas	Weiherhammer 2	Germany	Europa	Pilkington	clear	1,87
15_02	AFG	AFG (Asahi)	Greenland 1 oder 2	USA	Amerika	AFG (Asahi)	clear	3,00
16_01	AFG	AFG (Asahi)	Cinnaminson	USA	Amerika	AFG (Asahi)	clear	5,70

Match criterion
within sample variability

Commercial window pane (FBI glass group)

FBI: sample prep., GRIM, ICP-OES BKA: LA-ICP-MS

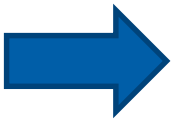




Glass case data collection

- Started in 2007
- Each data set consisting of 18 elemental concentrations
- Non matching traces and control samples from casework
- 362 samples (May 2016)
  65341 pairwise comparisons
  16 random matches

Recent activities within the EPG

Paint 

Tape 

Glass 

Security Dyes 

General remarks

Challenges with Common Databases

- Readiness of key companies to support databases by procuring samples and information is required
- Sufficient resources (staff, money, time) for continual database updating/ maintenance is needed
- Participants have to show a disciplined approach by complying with rules for building up databases
- The more participants, the more coordination is required

Suggestion for Common Databases

- The possible benefit of a database must be evaluated and proved in advance
- An agreement about the rules for building up the databases should be formulated by the experts and signed by the directors of the participating institutes
- Continuous availability of sufficient resources (staff, money, time) for the updating/ maintenance process must be guaranteed
- The more complex a database the more a central coordinating lab should be in charge for the updating/ maintenance process – samples and info can be delivered by the database users
- A validation process, regular tests and surveys should be done to evaluate the benefit of the database

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