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International Symposium for Thin Layer Chromatography

HPTLC 2006, BERLIN - :- 9th-11th October 2006

tc{vguv

Radioactivity detection in HPTLC

raytest Isotopenmessgeraete GmbH
Benzstr.4
D-75334 Straubenhardt
Tel. +49(0)7082/9255-0
Fax. +49(0)7082/20813
www.raytest.com

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integrated Radio TLC detection systems based on:

25 years experience in Radio TLC detection
actual international regulations
own hardware development
own software development
own production & support
job-training on-site

Correct instrument selection

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Target (wish):

- **Reliable method**
- **Simple to perform**
- **Cheap chromatogaphy equipment**
- **Highest resolution**
- **High homogeneity**
- **Highest sensitivity**
- **Highest dynamic range & linearity**
- **Repeatable measurement**
- **Fast measurements**
- **One for everything**
- **Compliant to related regulations (GLP/GMP/21CFRpart11)**

Target (wish):

The golden key

=

perfect solution for everything

or in german the

“Eierlegende Wollmilchsau”

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Required resolution

Required LOD

Required dynamic

money

homogeneity

Used isotopes

Related regulations

Sample size

Number of samples

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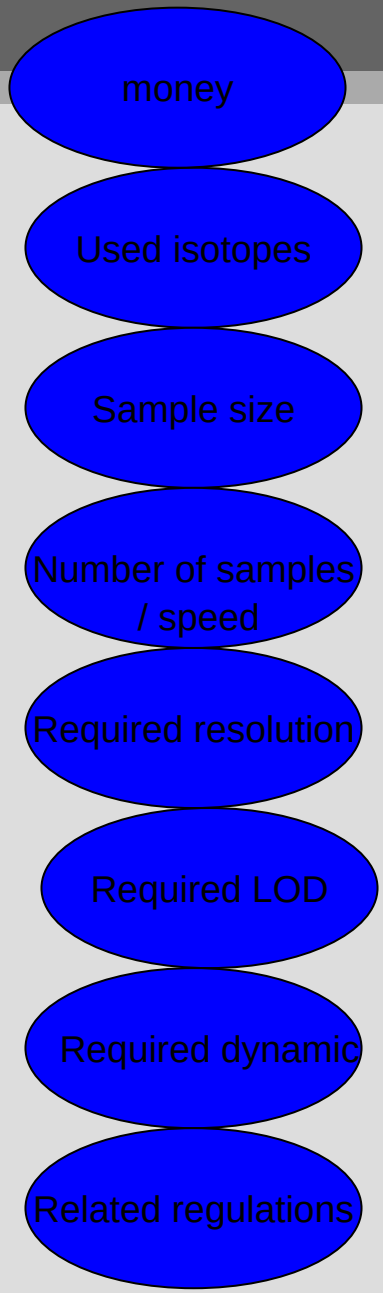

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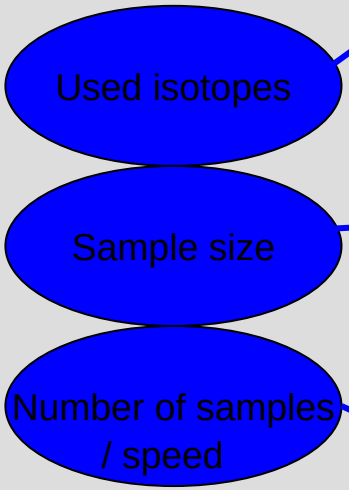
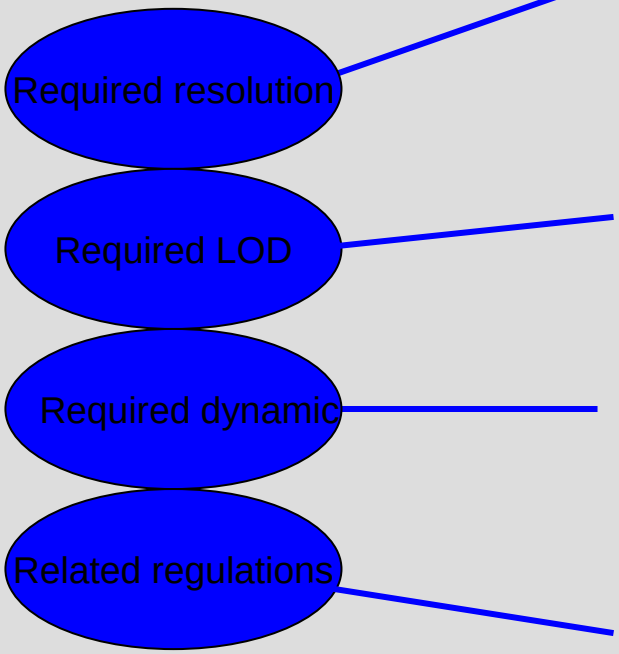


3H / 14C / I.... / Tc99m
F18 / C11 and many more

20x20cm ? / 10/10cm ?

Traces per plate ?
Plates per day ?



Related to separation resolution
Related to used isotop

Related to application

Related to application

CLP/GMP/Pharmacopoia
21CFRpart11

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money

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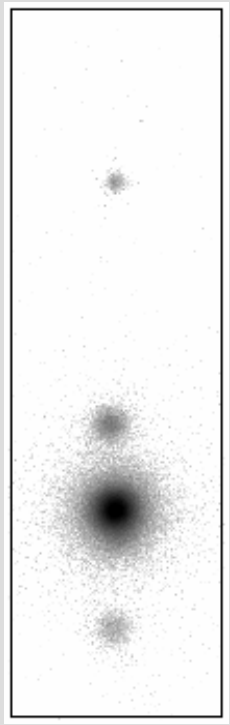
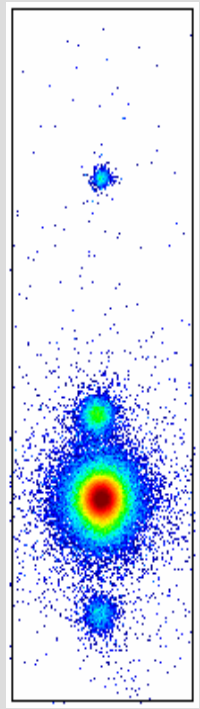
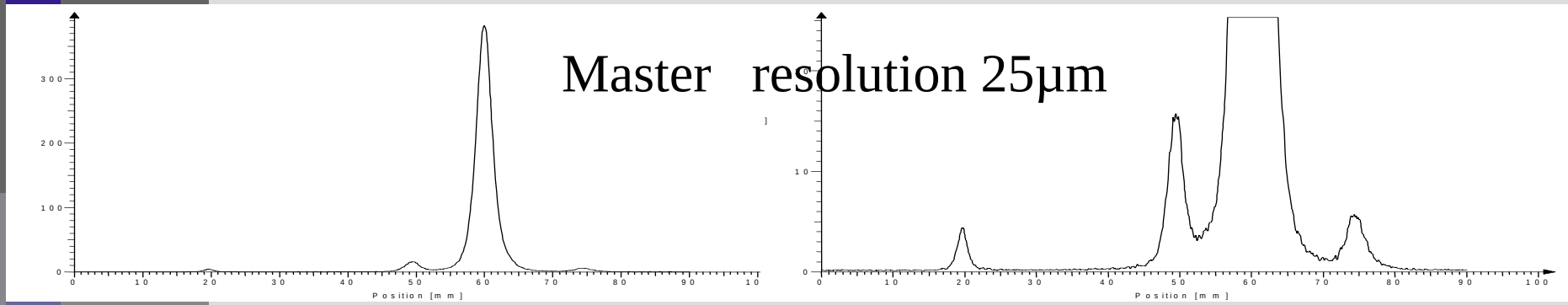
Fuji Bio-Imaging Plate 2D view (exposure time 2 min)

	18F-activity spotted	spot distance
start	1%	20 mm
impurity	5%	50 mm
product	100%	60 mm
impurity	3%	75 mm







Master resolution 25µm

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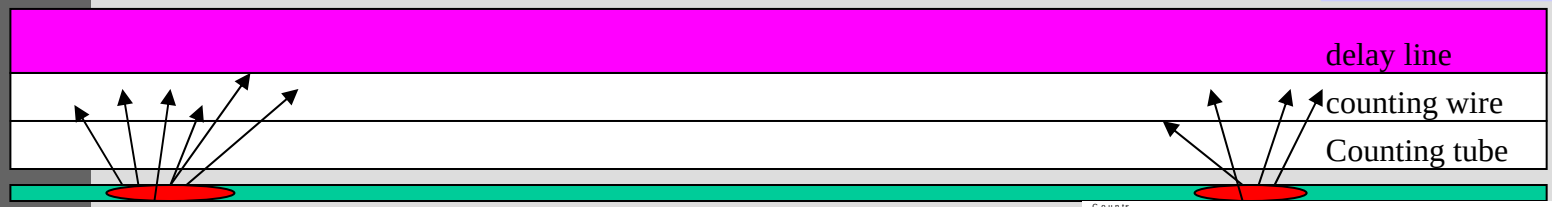
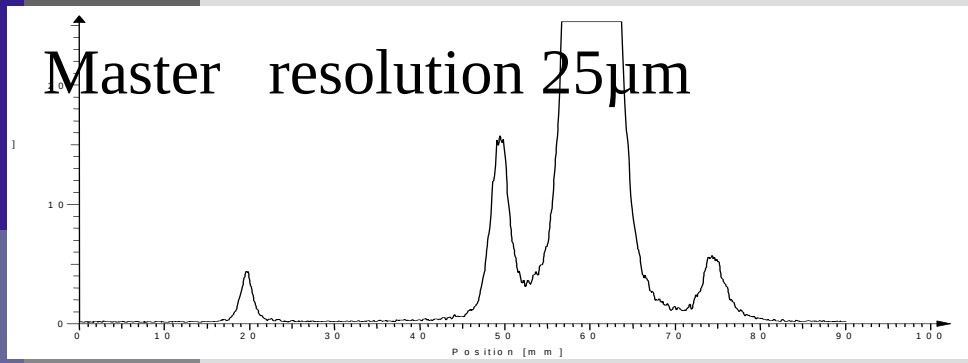
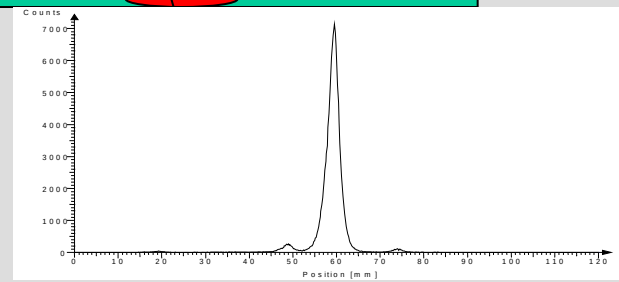
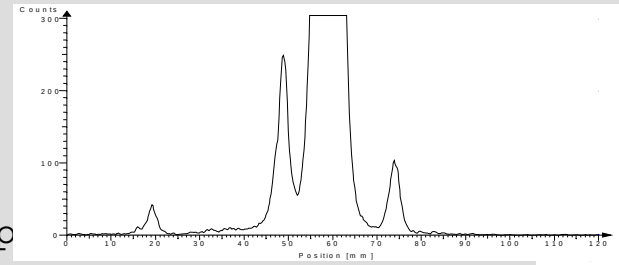
- position sensitive proportional counter
- fast measurement along the total trace
- high sensitive for beta- or beta+ radiation (3H 100dpm/peak 14C 10dpm/peak)
- low sensitive for gamma radiation
- Requires P10 gas
- Resolution 3H 0.5mm 14C 1mm
- Ultra high dynamic range 1 : 1 000 000
- Low BKG 0,1 cpm / mm
- Live display









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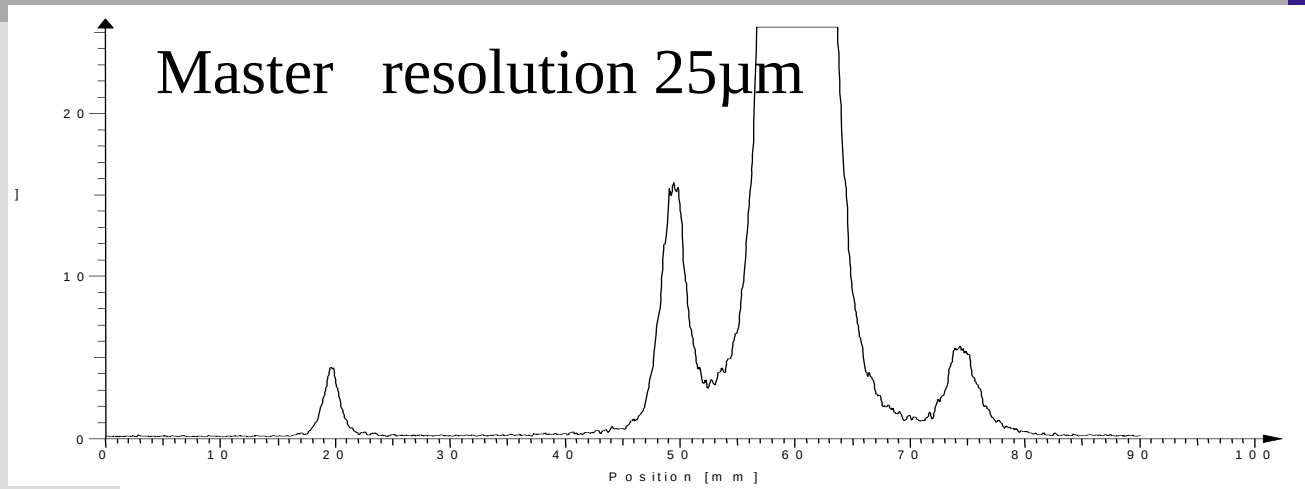
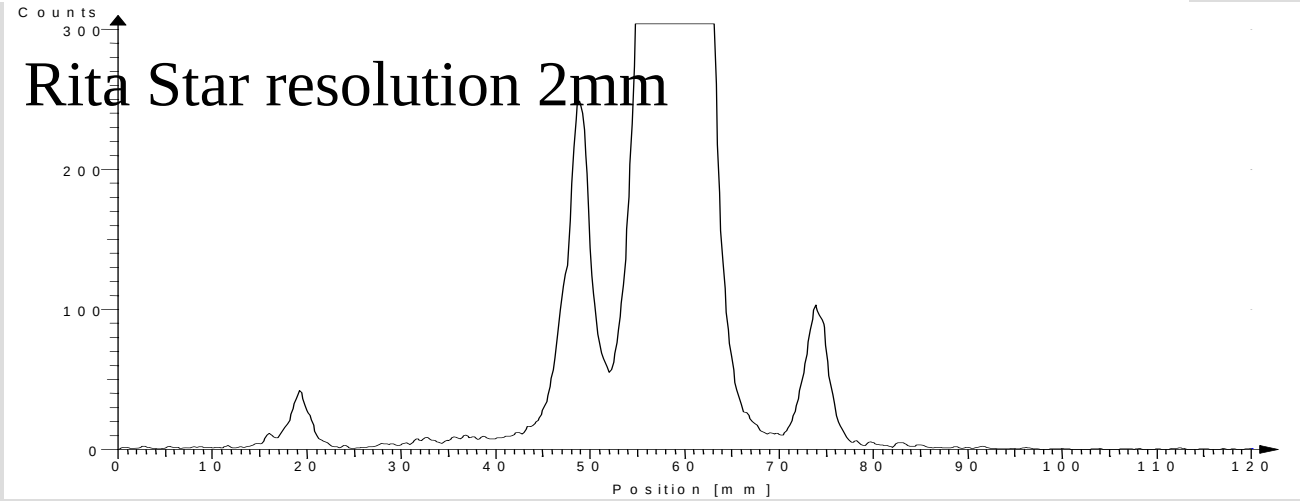
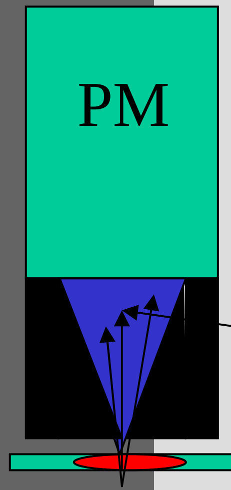
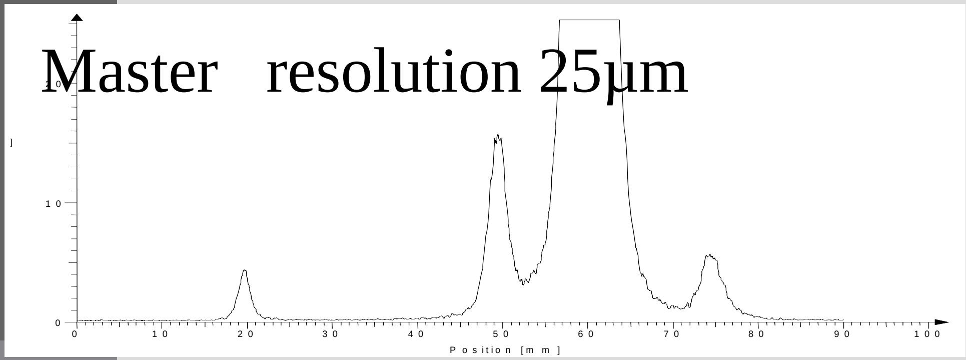
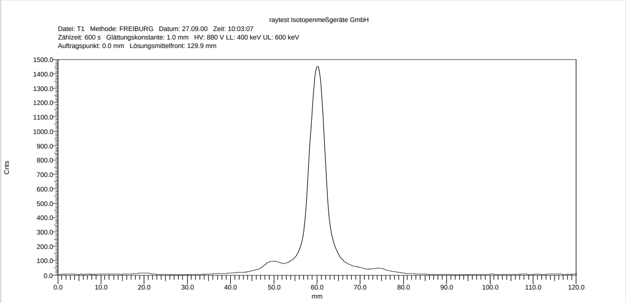

Master resolution 25µm
20
10
0
0 10 20 30 40 50 60 70 80 90 100
Position [mm]

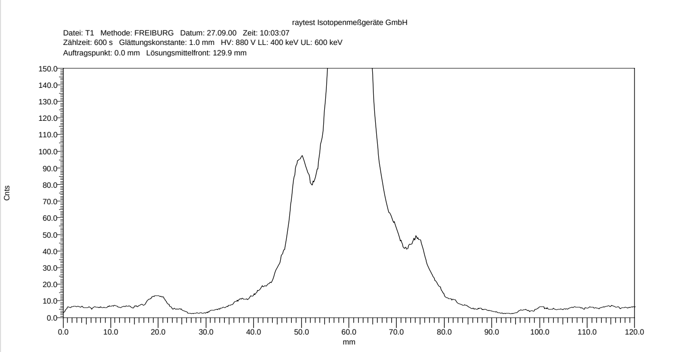

Counts
Rita Star resolution 2mm
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120
Position [mm]



Scintillation probe
BGO crystal
V-shape
high sensitivity (gamma)
high resolution
Tungsten shielding







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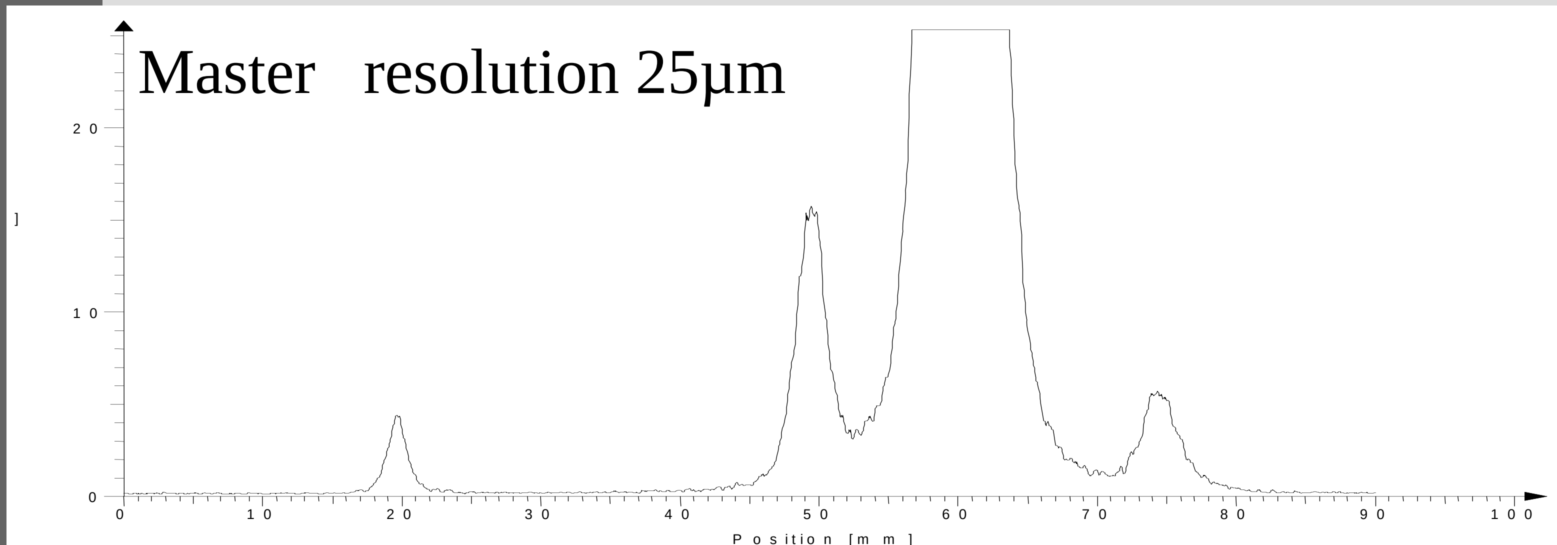
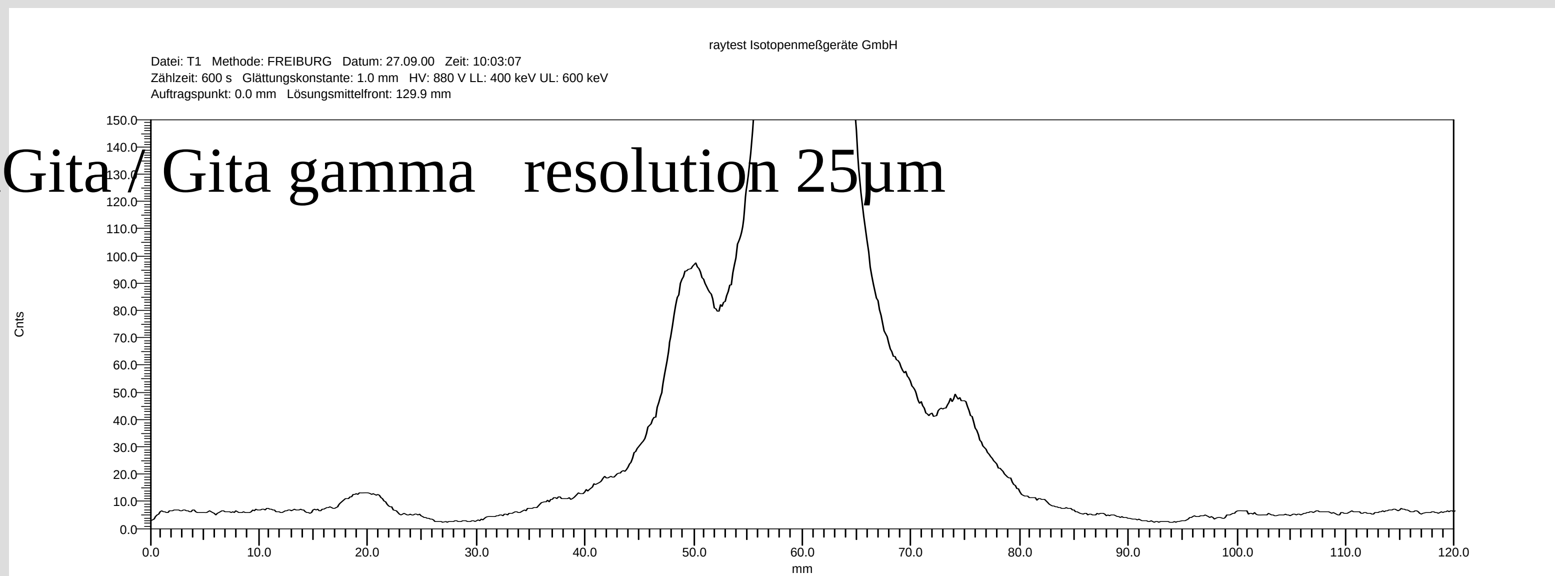
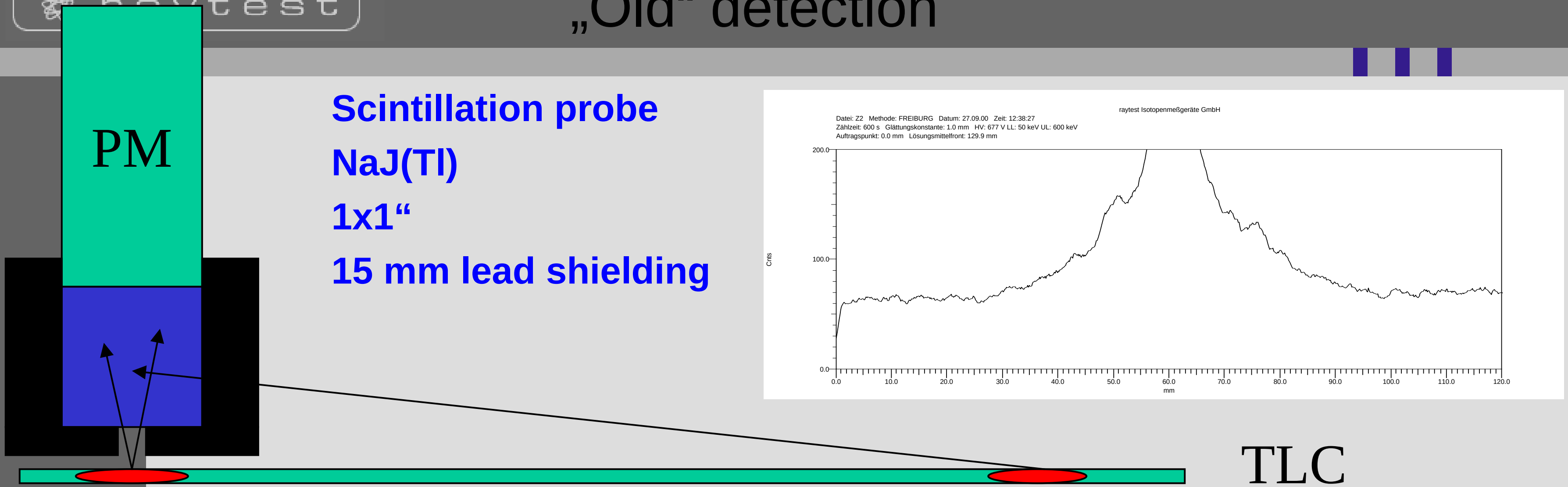
Master resolution 25µm



miniGita / Gita gamma resolution 25µm



„Old“ detection

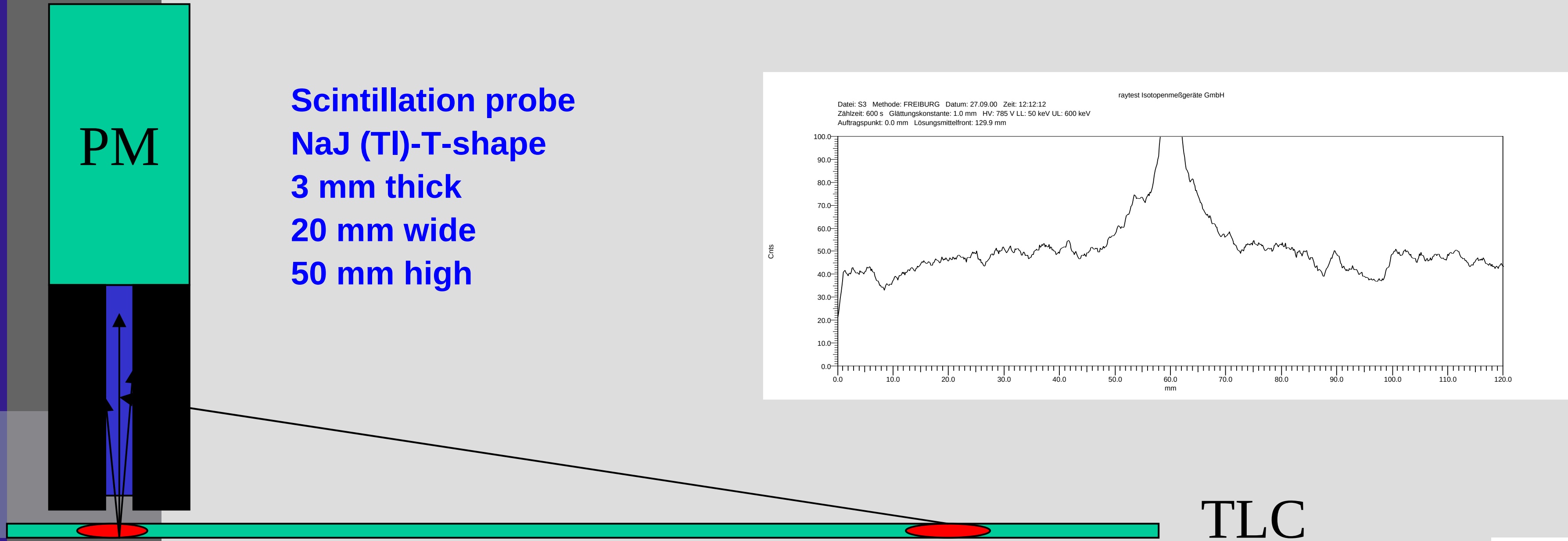


Scintillation probe

NaJ(Tl)

1x1“

15 mm lead shielding



Scintillation probe

NaJ (Tl)-T-shape

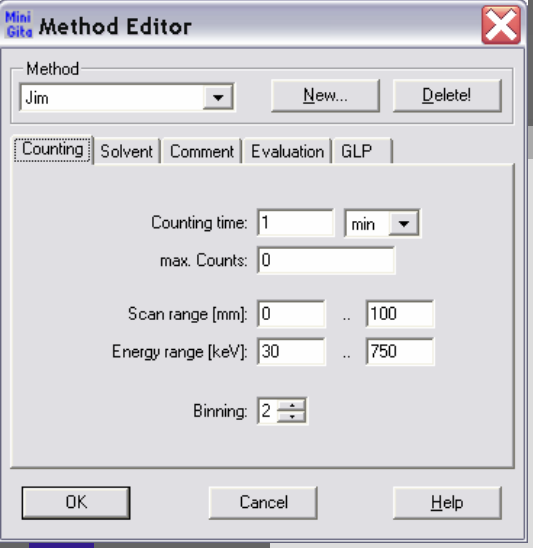
3 mm thick

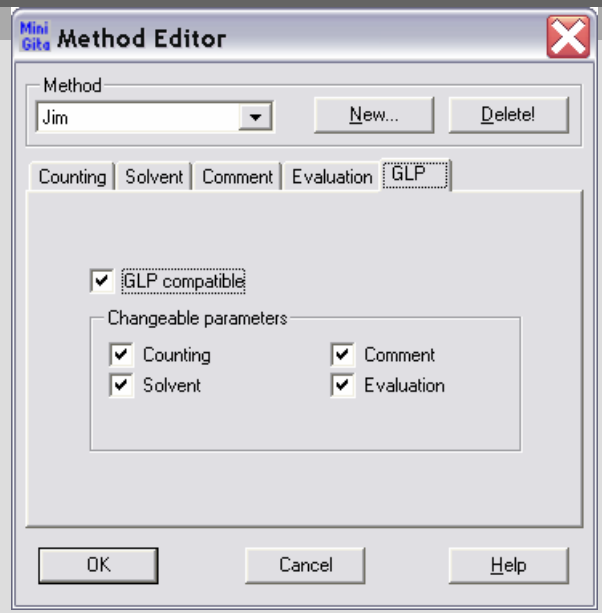
20 mm wide

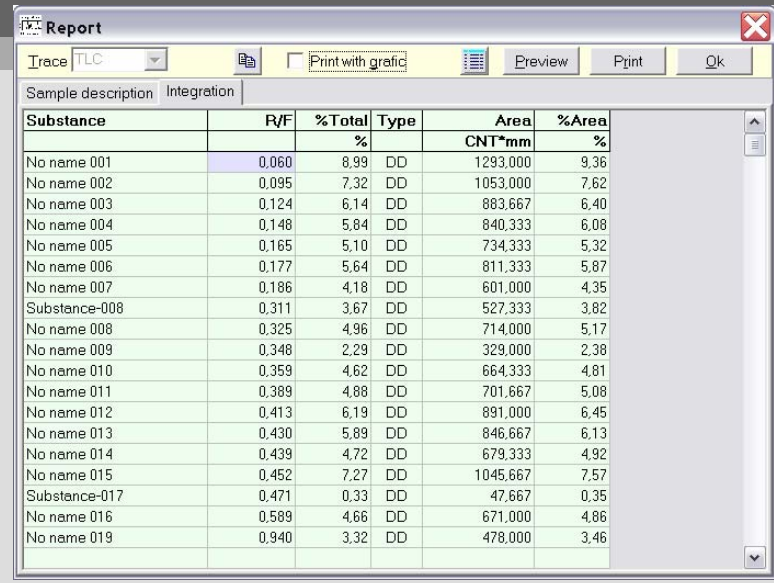
50 mm high

Regulations

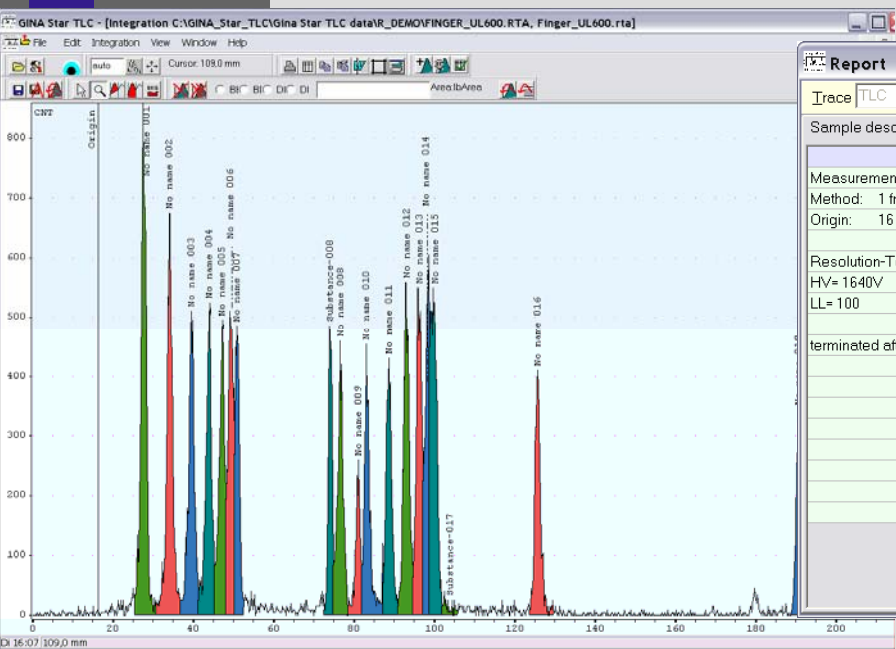
- GLP
- GMP
- Pharmacopoia
- 21CFRpart11

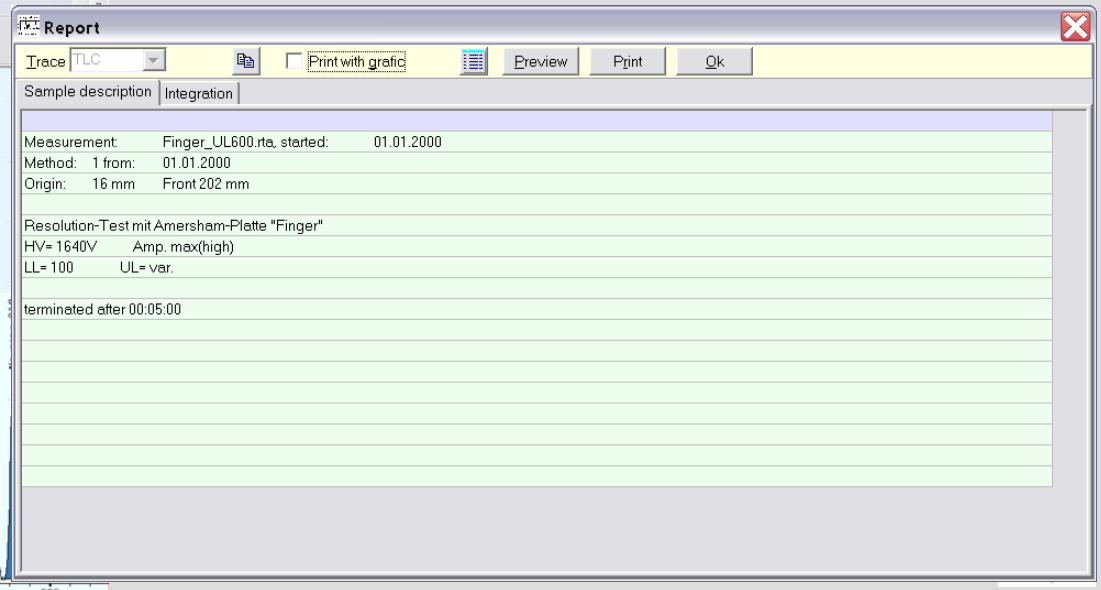






Substance	R/F	%Total	Type	Area	%Area
		%		CNT*mm	%
No name 001	0,060	8,99	DD	1293,000	9,36
No name 002	0,095	7,32	DD	1053,000	7,62
No name 003	0,124	6,14	DD	883,667	6,40
No name 004	0,148	5,84	DD	840,333	6,08
No name 005	0,165	5,10	DD	734,333	5,32
No name 006	0,177	5,64	DD	811,333	5,87
No name 007	0,186	4,18	DD	601,000	4,35
Substance-008	0,311	3,67	DD	527,333	3,82
No name 008	0,325	4,96	DD	714,000	5,17
No name 009	0,348	2,29	DD	329,000	2,38
No name 010	0,359	4,62	DD	664,333	4,81
No name 011	0,389	4,88	DD	701,667	5,08
No name 012	0,413	6,19	DD	891,000	6,45
No name 013	0,430	5,89	DD	846,667	6,13
No name 014	0,439	4,72	DD	679,333	4,92
No name 015	0,452	7,27	DD	1045,667	7,57
Substance-017	0,471	0,33	DD	47,667	0,35
No name 016	0,589	4,66	DD	671,000	4,86
No name 019	0,940	3,32	DD	478,000	3,46





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There is no golden key (one for everything)

But there is a best solution for a specific application

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Thank you for your attention!