



Particle number measurement in Europe

2nd Latin American Conference on Nanoparticle Emissions

November 26th, 2021

Pascal Buekenhoudt, Vice President – Technical Affairs

- WHO WE ARE -

We are a world-wide association of authorities and authorized companies active in the field of vehicle compliance

We gather more than 140 organizations in over 50 countries

- WHAT WE DO -

*We make roads safer and cleaner.
Every day. Everywhere. Impartially. Responsibly.*



We dedicate our daily efforts to **improving road safety** and **protecting the environment**.



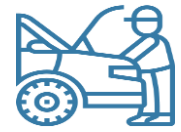
We provide a **global forum** for best practice exchange. Our members find a unique place to **share knowledge and participate in global activities** related to vehicle compliance.



We facilitate **best practice recommendations** and draft international standards. For our members, we coordinate **studies**, research and investigation.



We organise **conferences** and seminars on inspection methods, standards and equipment. We create **awareness** on quality control, assurance and accreditation.



We provide **training to stakeholders**, capacitate authorities and facilitate on information systems used to **improve inspection** consistency and effectiveness.

2009

SWITZERLAND

DPF retrofit on construction sites in Switzerland in 2002. PN measurement on tunnel construction machines with DPF starting 2009

**How it started
in EUROPE**

2013

THE NETHERLANDS

Lots of advertising for the removal of particulate filters on the internet and almost no rejections in PTI.

→ Assignment research project to TNO

23.11.2016

NPTI

Kick off by VERT and TNO

- **Device**
- **Procedure**
- **Limit value**

**How it started
in EUROPE**

NPTI

- **Representatives of some European governments,**
- **Metrology institutes,**
- **Universities,**
- **Research Institutes**
- **Equipment manufacturers**
- **Professional associations**

- WHERE ARE WE NOW -

3 countries are to start with PN measurement

The Netherlands and Belgium: 1·07·2022

Germany: 1·1·2023

PARTICLE NUMBER MEASUREMENT IN EUROPE



- SCOPE -

	The Netherlands	Belgium	Germany
Vehicle category	M1-M3, N1-N3	M1, N1	M1-M3, N1-N3
Fuel type	Diesel	Diesel	Diesel
Euro Norm	Euro 5 and higher (*)	Euro 5 and higher (**)	Euro 6 and higher
Threshold [cm ⁻³]	1.000.000	(250.000) – 1.000.000	250.000
Equipment specifications	NMi (NPTI)	NMi (NPTI)	PTB

PARTICLE NUMBER MEASUREMENT IN EUROPE



- SCOPE -

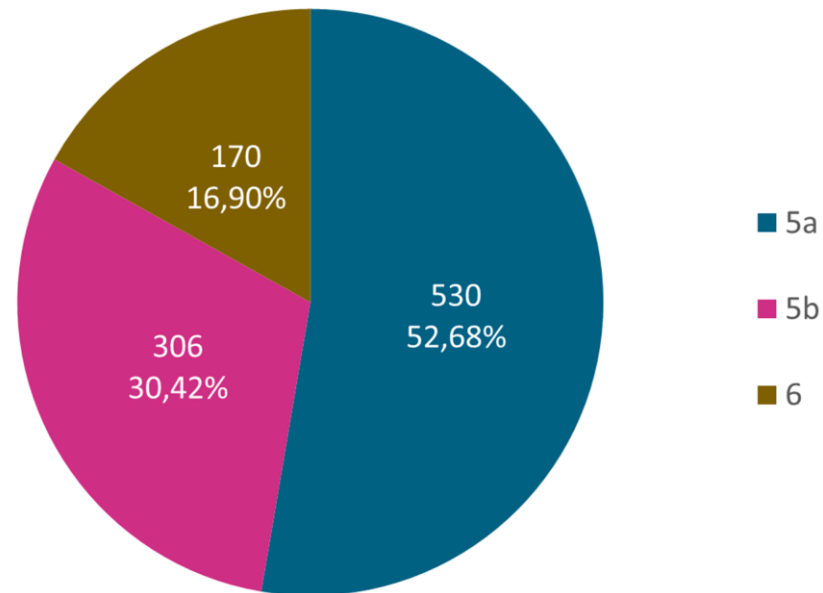
	The Netherlands	Belgium	Germany
Vehicle category	Low idle	Low idle	Snap acceleration + low idle
Test procedure	15s stabilization 15s measurement time	15s stabilization 15s measurement time	15s stabilization Snap acceleration 30s stabilization 3x30s measurement time
Fast Pass/Fast Fail	Fast Fail ($> 2.000.000 \text{ cm}^{-3}$)	no	Fast Pass ($\leq 50.000 \text{ cm}^{-3}$)

TESTS IN BELGIUM in 2018 & 2021

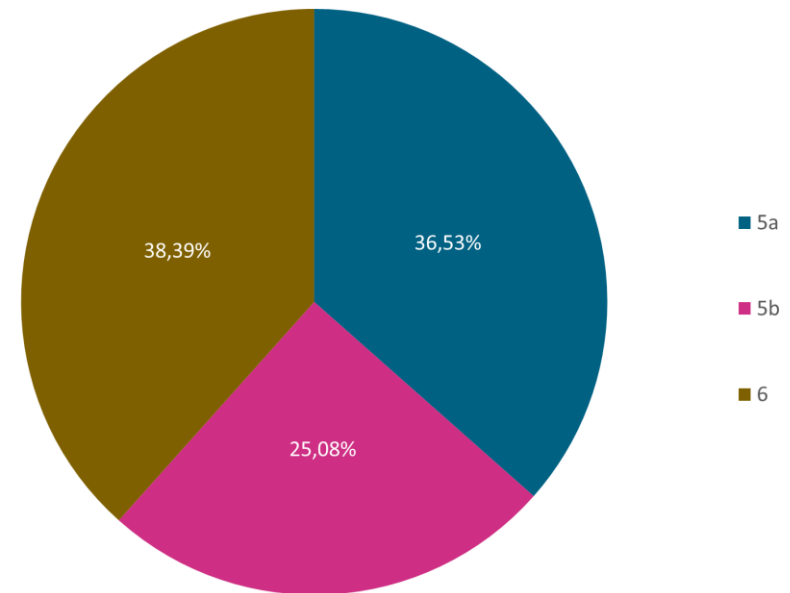


There is a shift towards Euro 6 vehicles

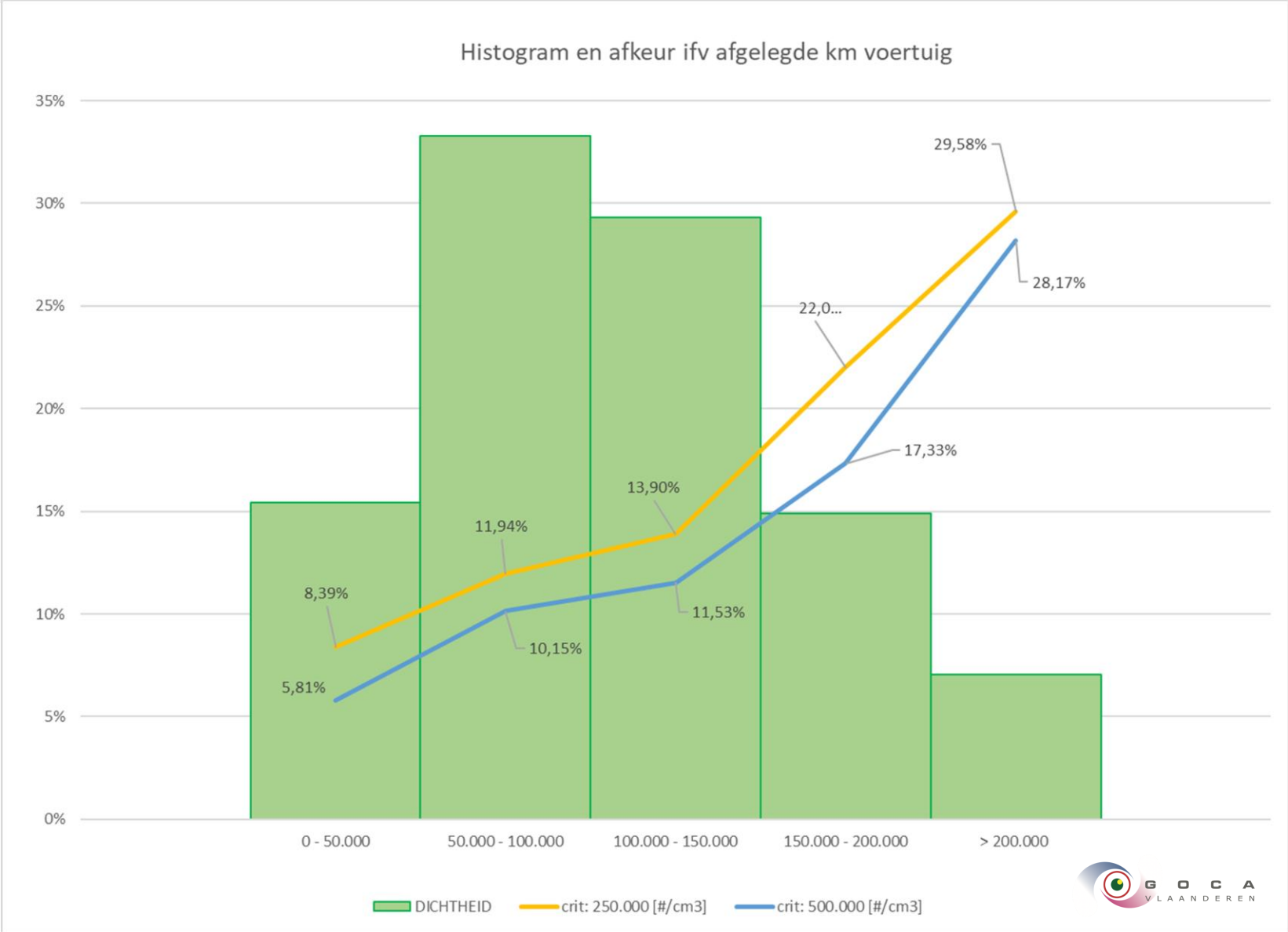
Distribution according Euro Norm
sample 2018



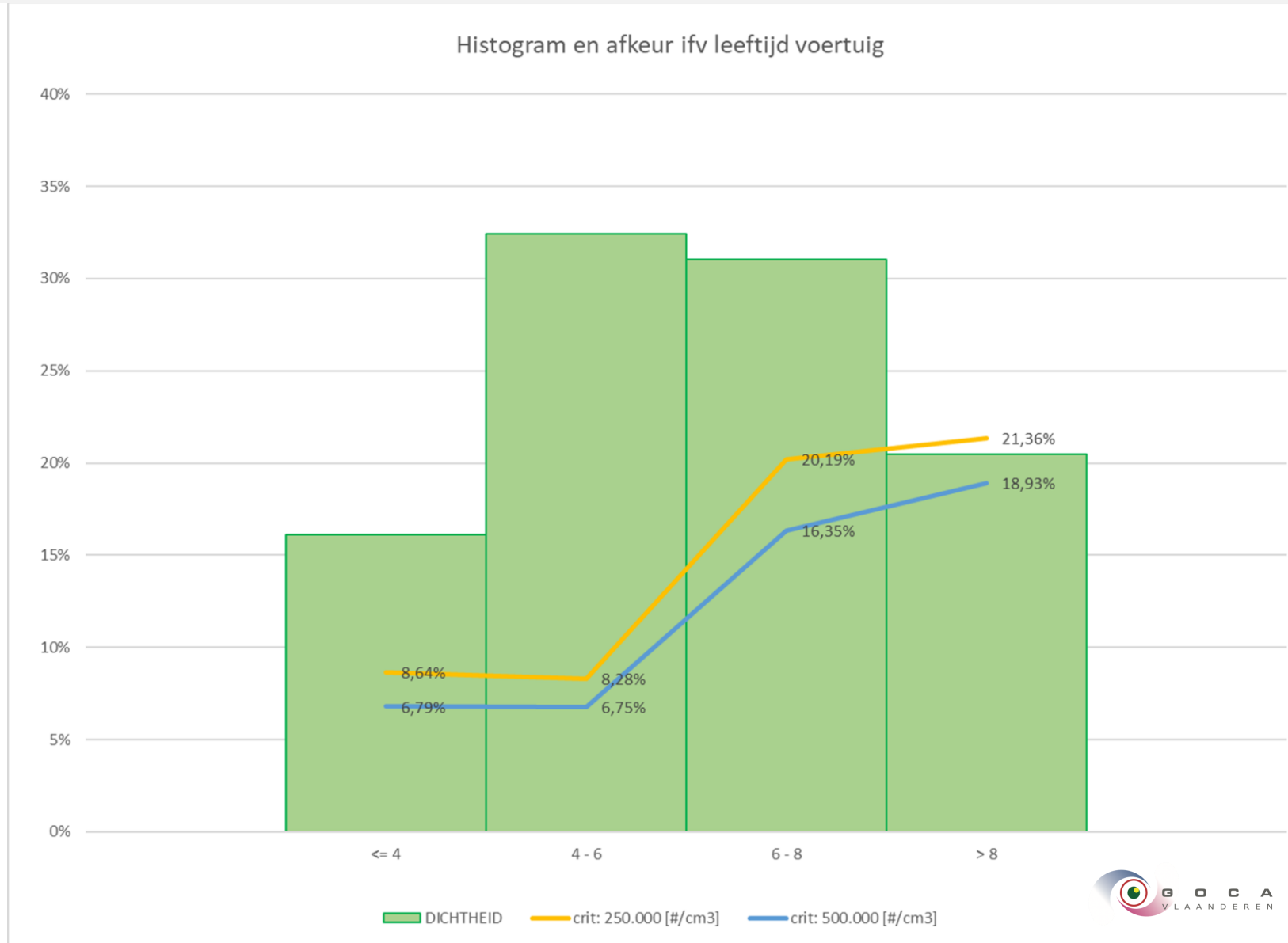
Distribution according Euro Norm
sample 2021



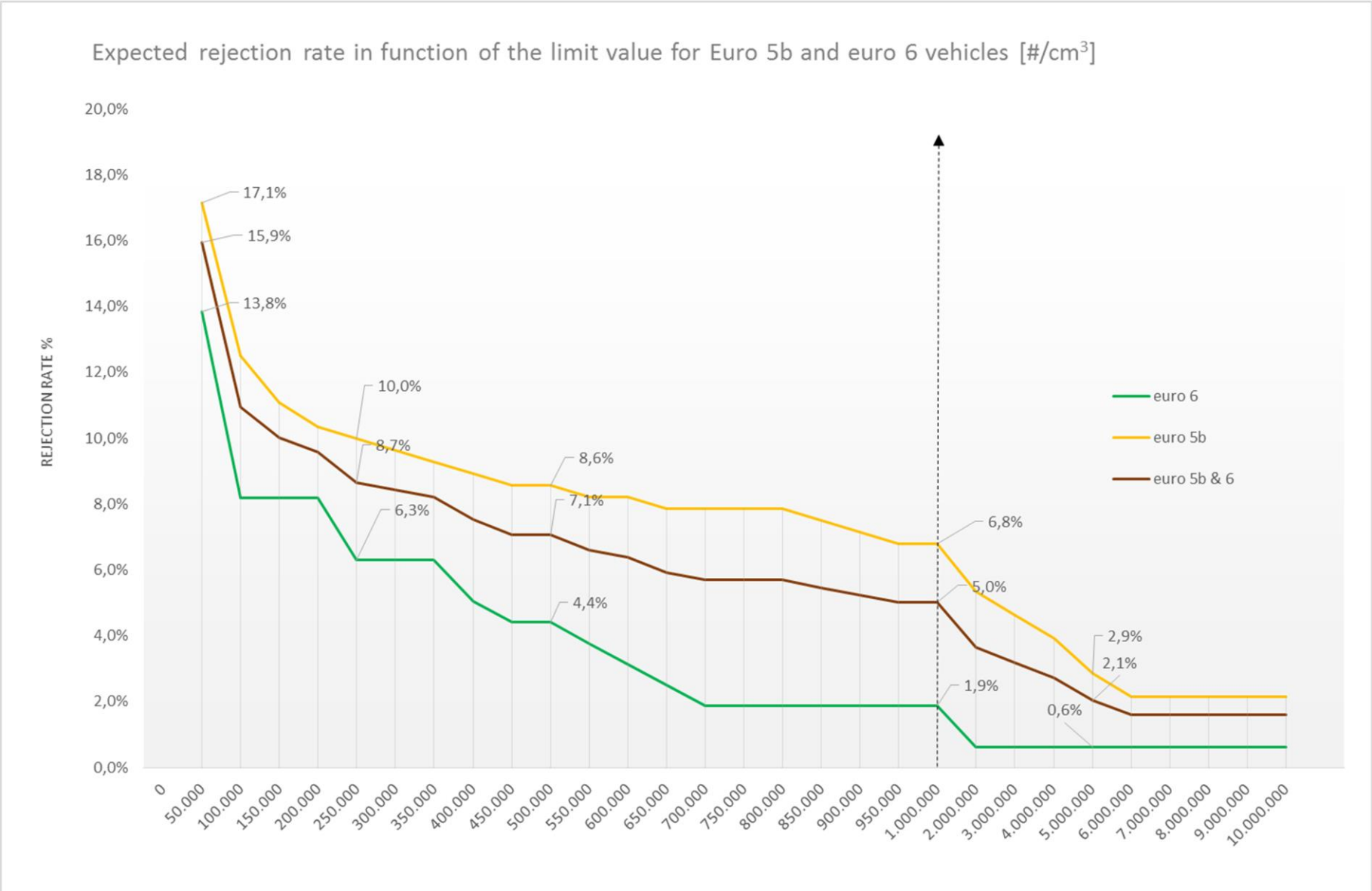
SAMPLE 2018 - Distribution per mileages



SAMPLE 2018 - Distribution by age



SAMPLE 2018 – Expected rejection rate



SAMPLE 2021 - Distribution of sample

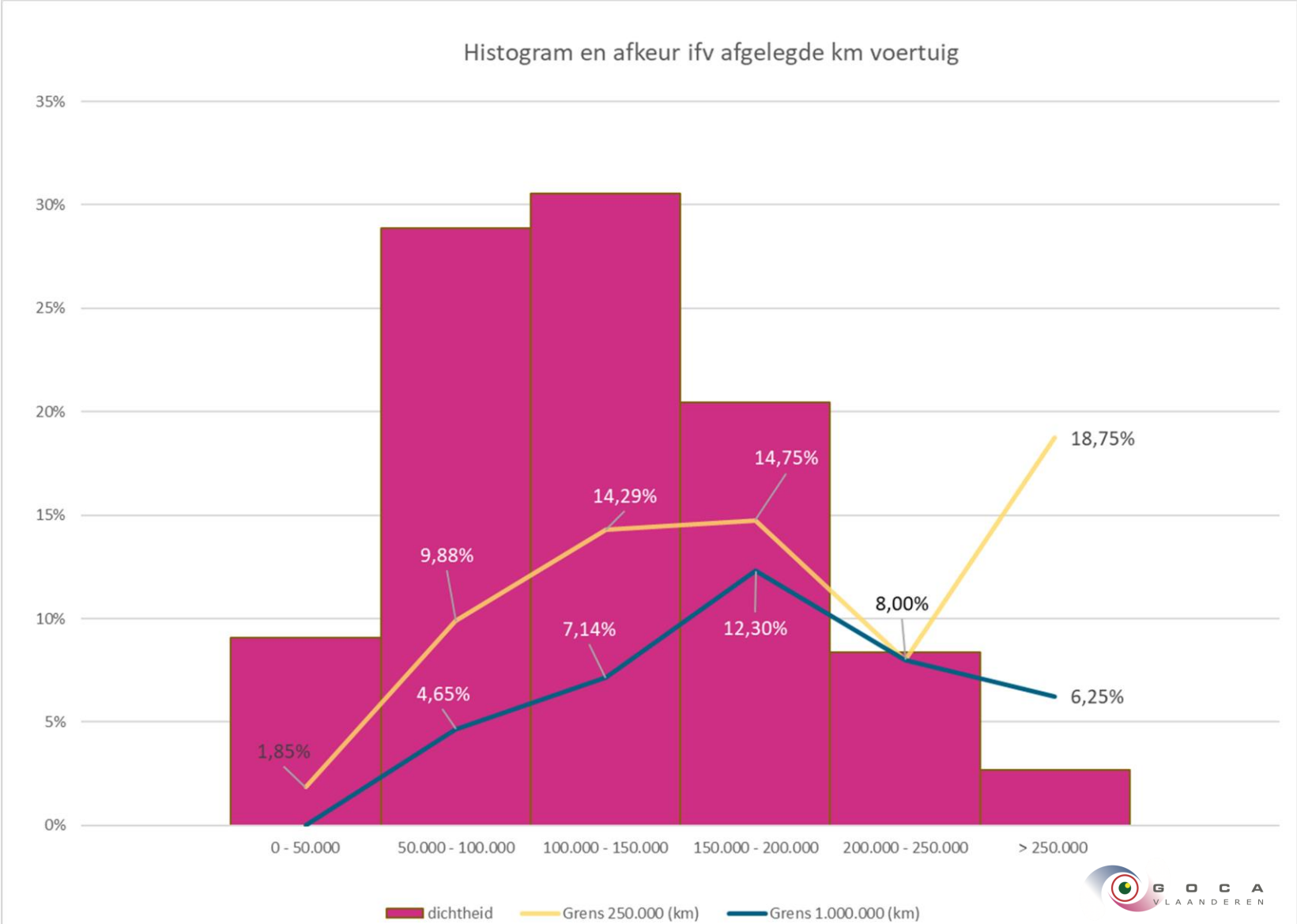


		afgelegde afstand [1.000 km]						Totaal
		0 - 50	50 - 100	100 - 150	150 - 200	200 - 250	> 250	
Leeftijd	<4	32	24	7	5	2	0	70
	4-6	19	76	45	13	2	0	155
	6-8	6	46	50	40	9	5	156
	8-10	3	31	59	46	23	6	168
	>10	0	14	44	35	19	6	118
Totaal		60	191	205	139	55	17	667

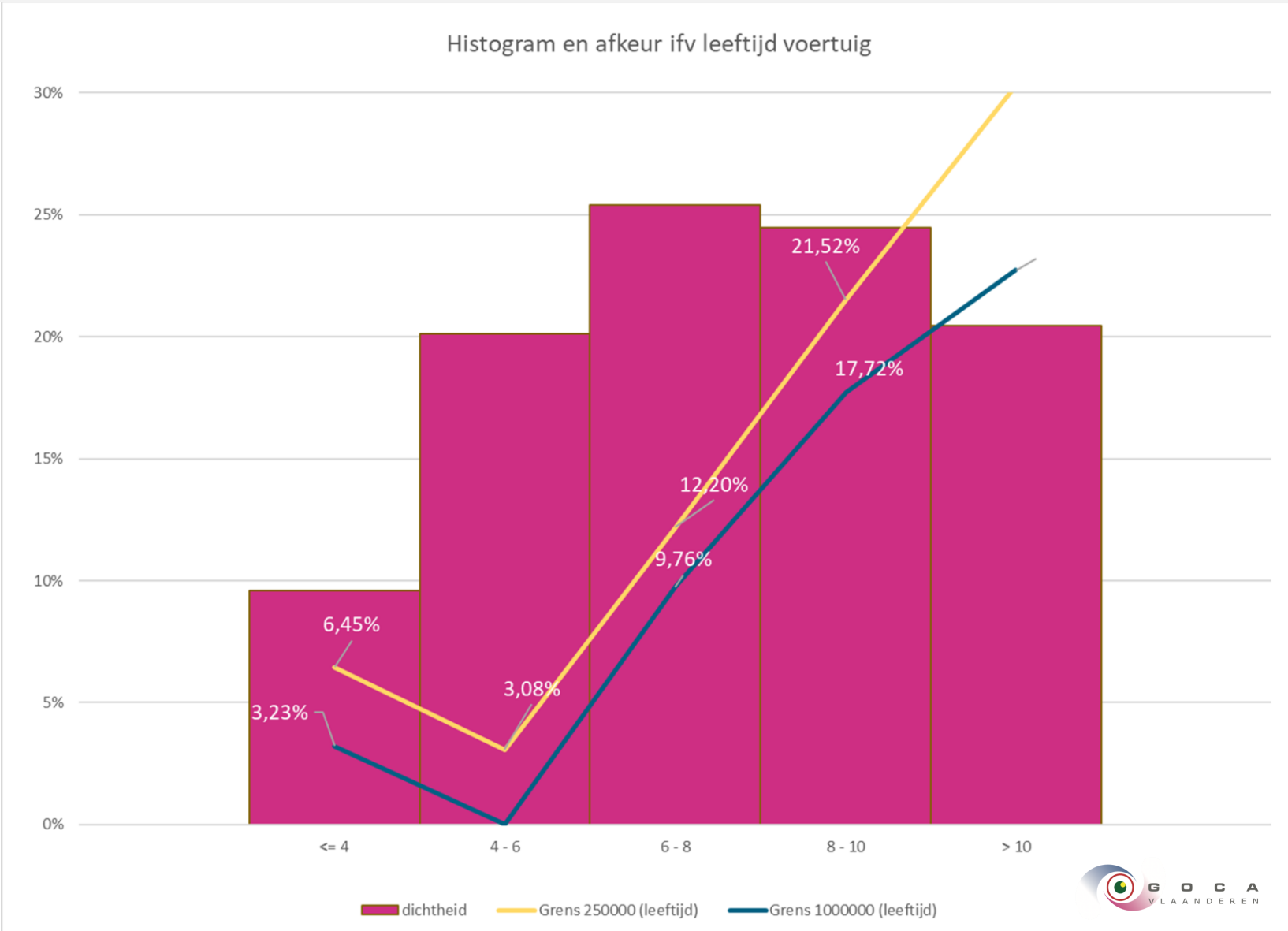


		afgelegde afstand [1.000 km]						Totaal
		0 - 50	50 - 100	100 - 150	150 - 200	200 - 250	> 250	
Leeftijd	<4	4,80%	3,60%	1,05%	0,75%	0,30%	0,00%	10,49%
	4-6	2,85%	11,39%	6,75%	1,95%	0,30%	0,00%	23,24%
	6-8	0,90%	6,90%	7,50%	6,00%	1,35%	0,75%	23,39%
	8-10	0,45%	4,65%	8,85%	6,90%	3,45%	0,90%	25,19%
	>10	0,00%	2,10%	6,60%	5,25%	2,85%	0,90%	17,69%
Totaal		9,00%	28,64%	30,73%	20,84%	8,25%	2,55%	100,00%

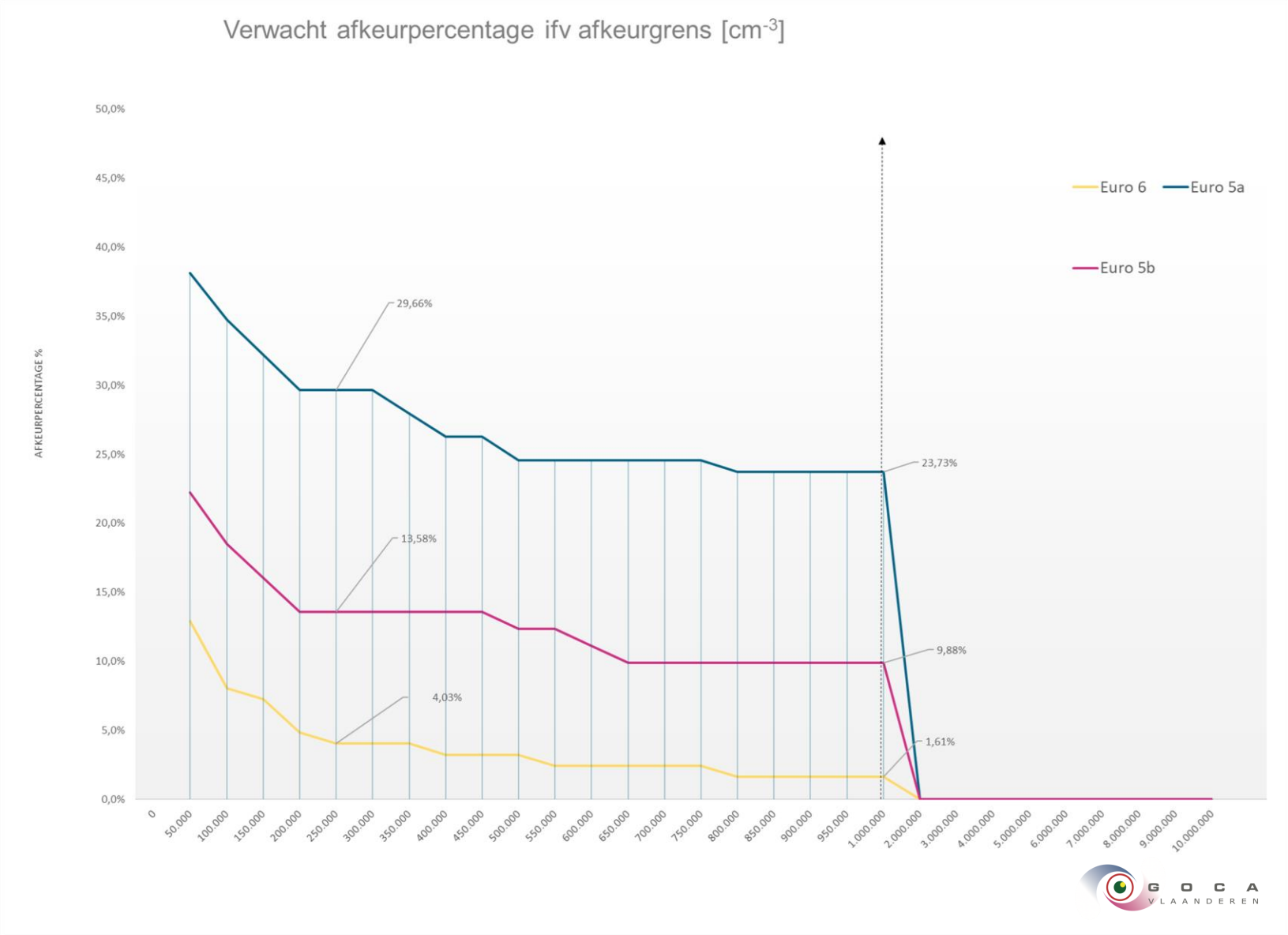
SAMPLE 2021 - Distribution per mileages



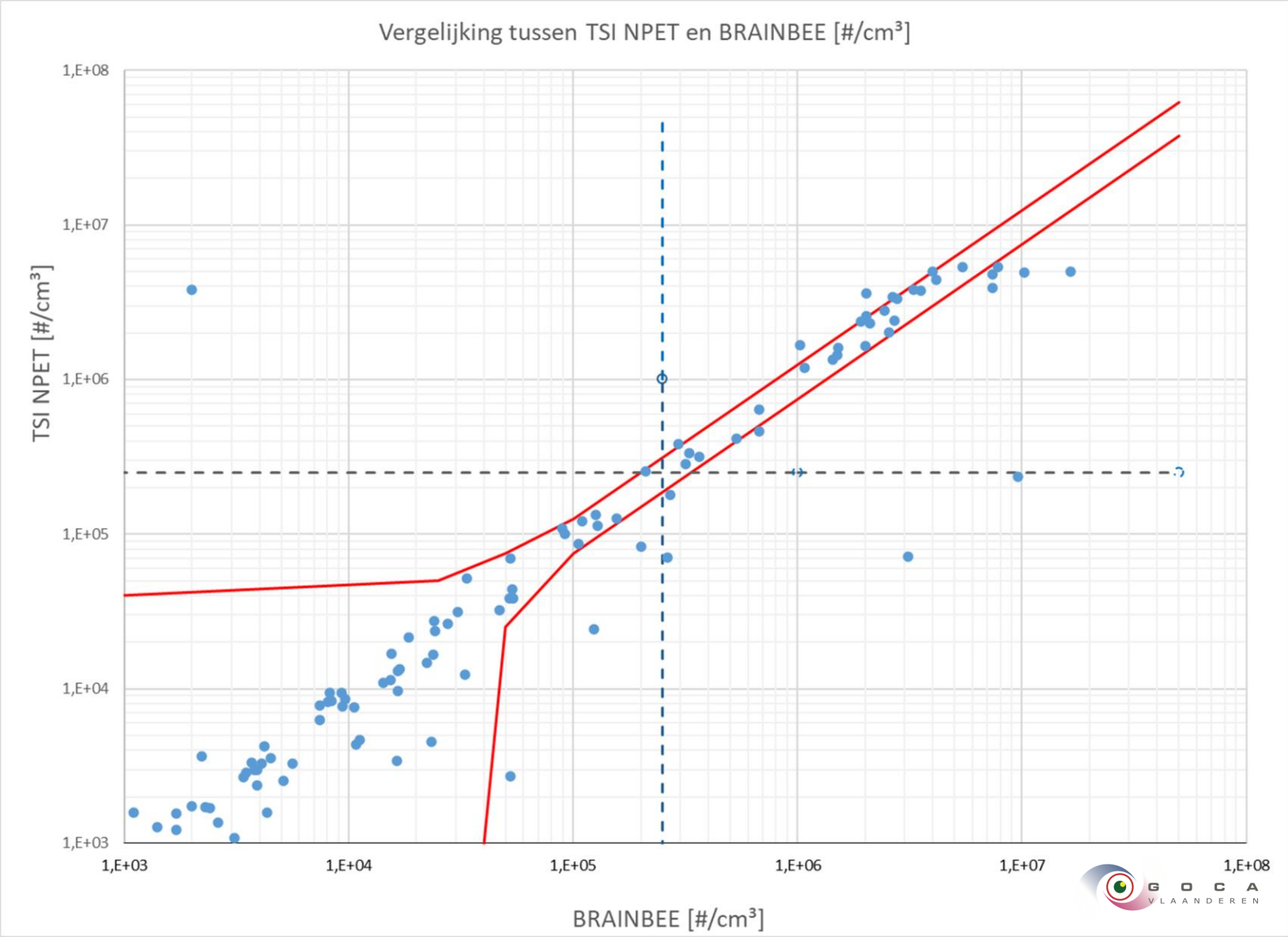
SAMPLE 2021 - Distribution by age



SAMPLE 2021 – Expected rejection rate



SAMPLE 2021 – Comparison between equipment





Conferencia Virtual Centro y Sudamérica

<https://citainsp.org/event/rag-central-south-america-web-conference/>

2 de diciembre de 2021:

- 8 am México / Guatemala / San Salvador / Tegucigalpa / Managua
- 9 am Lima / Quito / Bogotá
- 10 am La Paz / Caracas
- 11 am Buenos Aires / Santiago de Chile

Interpretación castellano ↔ inglés



Thank you for your attention!

www.citainsp.org

Rue du Commerce 123 - 1000 Brussels, Belgium

+32 (0)2 469 06 70

secretariat@citainsp.org