



Alcohol Interlock Symposium 18.09.2023

EC - study: Prevention of DUI in Europe/EEC

- role of BTTF 116-2
- screening devices
- technologies for detection
- political resolves
- proactive versus reactive strategy
- common rules and standards
- EU legislation proposals



How to prevent DUI of alcohol and drugs ?



Prevention of driving under the influence of alcohol and drugs

Final Report

ECORYS

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1. Identifikation of the problem

- documenting the effect of alcohol and impaired driving
- prevalence, consequences, fatalities and injuries

2. Technology for alcohol enforcement and prevention

- detection, testing, evidencing, preventing
- accuracy, security, liability, functionality, trustworthiness

3. Public and political consensus and support for programs

- accuracy, security, liability, functionality, trustworthiness

4. Political decisions, legislation, sanctions

- technical operations, mandatory use, laws and regulations

EU: Type Approval Regulations: 2018/858, 2019/2144

Next: Legislation regulating use of alcohol interlocks



The problems – figures and facts

2018: Estimated share of road fatalities with alcohol involvement (Spit, Houwing, Hagenzieker, Mathijisen, Modijefsky)

(Table 3.12): Total number: % alcohol fatalities, (low rate) % alcohol fatalities, (high rate)

EU, 27: 23.366 18% 26%

30 EUR: 25.546 18% 25%

In total: 25% of all road fatalities related to alcohol.

2011 – 2018: Croatia, Latvia, Slovenia: Reduction. Norway, Lithuania; INCREASE.

Chapter 4: Drug use and road safety, different drugs and their effect

Prevalence of drugs in traffic: 1,9% illicit drugs, 1,4% medical drugs, 0,37% combination, drugs and alcohol

2019: Estimated share of drug related road fatalities

(Table 4.12): **Average: 6%. Examples:** 0,7% (Austria) 3,3% (Finland) 10,0% (Sweden) 10,6% (Denmark) 15,2% (France)

(Norway, Netherlands, Belgium, UK, Belgium, Croatia, Greece, Hungary, Ireland, Romania, Slovakia, Latvia: No data)

Challenge: Variety of drugs and narcotics – variety of effects – difficult to detect



Technologies for screening

History of infrared technology and electrochemical sensors

Alcohol Countermeasure System, ACS, developed from 1970 breath testing technology to prevent vehicle operation by impaired drivers

The Dräger Alcotest 7110 appeared in 1985 with an infrared sensor which responded especially selectively to alcohol.
The third generation can be combined with an electrochemical sensor.

*Alcotest 7110 Evidential MK III is a breath alcohol measuring device whose readings could be admissible as evidence in court.
Since all data used to calculate the final result are stored, it is possible, to later recalculate to verify the algorithms and the calculated result.
This is very valuable in statements to courts regarding DUI charges*

These instruments, Evidenzers, are operating in the same safety level as the alcohol interlocks, tested and approved in compliance with the CENELEC EN 50436 standard, developed and updated since 2005.

Technologies available for breath analyzers in screening devices and alcohol interlocks:

- *Electrochemical sensors (fuel cell) technology (compliance with EN 50436)*
- *Semiconductor sensor technology. (non-compliance with EN 50436)*
- *Infrared spectrometry without a mouthpiece (non-compliance with EN 50436)*

Some derivatives of these technologies have been tried, but so far without success, for example:

- *Toyota's attempt to install alcohol sensors in the steering wheel.*
- *Nissan's attempt to install the same type of instrument in the gear knob.*
- *Other attempts to develop automatic alcohol interlock devices*

Some other creative innovations are more in the anecdotic field



Technologies for detection 1

Invasive/intrusive technologies:

Analyzing samples of blood:

- Done by medical personnel in hospitals/medicare institutions
- Cost and time consuming – results after some time
- Detecting alcohol, drugs, narcotics, high reliability and accuracy

Blood testing has been present for the last 90 years, and is still the most accurate and most safe way of receiving an exact figure of blood alcohol concentration, BAC, and determining the level of impairment.

Analyzing samples of saliva

- Instruments for roadside testing - detecting drugs and narcotics
- Fairly accurate reading – blood testing necessary for evidence in court of law

*The perpetrator must give away some of his saliva, which processed, marks for drugs and narcotics.
Blood testing to decide type of drug and level*

Analyzing breath samples

- Requires exhalation of air into a specific device
- Police roadside test instruments – reading BAC through breath testing
- Highly accurate reading – accepted as evidence in court of law

- **Breath Analyzers are alcohol screening devices, capable of detecting alcohol impairment.**
- **The tested person must blow in a constant stream through a mouthpiece.**
- **The routine in use by the police at random roadside testing, is usually a two-step procedure in which the first step is performed by means of handheld alcometers.**



Technologies for detection 2

Electrochemical sensors (fuel-cell, in compliance with EN 50436)

- *The dominating sensor technology in present alcohol interlocks is based on catalytic combustion, either in fuel cells or in heated metal oxide mixtures.*
- *Reliability and long-term stability are issues with both sensor types, due to degradation and possible contamination of the catalytic surfaces.*
- *The devices require periodic recalibration and occasional replacement of degraded sensor elements.*

Semiconductors, (non-compliance with EN 50436)

- *Solid-state devices composed of sintered metal oxides which detect gas through an increase in electrical conductivity when reducing gases are adsorbed on the sensor surface.*
- *Their sensitivity and accuracy is dependent upon ambient conditions of temperature and humidity.*
- *Their long term stability may be limited.*

Infrared transmission spectroscopy without a mouthpiece, (Non-compliance with EN 50436)

- *Samples mixed with ambient air*
- *Necessary to correct the breath alcohol concentration for the dilution*
- *Developed, but so far not reached commercial use*

CENELEC EN 50436 standard for alcohol interlocks, developed and updated since 2005, gives detailed and comprehensive demands for functionality and security for alcohol interlocks



Technologies for detection 3

Non invasive/non-intrusive technologies:

- *Transdermal (skin-contact) systems – detect alcohol through skin perspiration*

The lag of 30-60 minutes between the consumption of an alcoholic drink and the translation of alcohol into sweat, means that this measure may not be appropriate to govern vehicle ignition

- *Tissue spectroscopy – reads BAC by measuring light absorption in a tissue*

Detection of light absorption at a particular wavelength from a beam of Near-Infrared (NIR) reflected from within the subject's tissue, require skin contact

- *Distance spectroscopy – a “sniffer” to detect alcohol in the vehicle*

Multiple sensors in steering-wheel, gearknob, similar to Tissue Spectrometry, but no skin contact

- *Behavioral Systems – detect impaired driver through behavioral measures*

Ocular indices such as gaze and eye movement, driving performance measures

- *Optical sensors – sensor in car detect alcohol in the air*

Drawing exhaled breath into a sensor, measurement of the concentrations of alcohol and carbon dioxide.

- *Intelligent Fingerprinting (combination alcohol and drugs/narcotics) – screening cartridge*

Test of fingerprint sweat samples by a small drug screening cartridge.

No operational instrument detecting drugs, narcotics and alcohol is available – yet

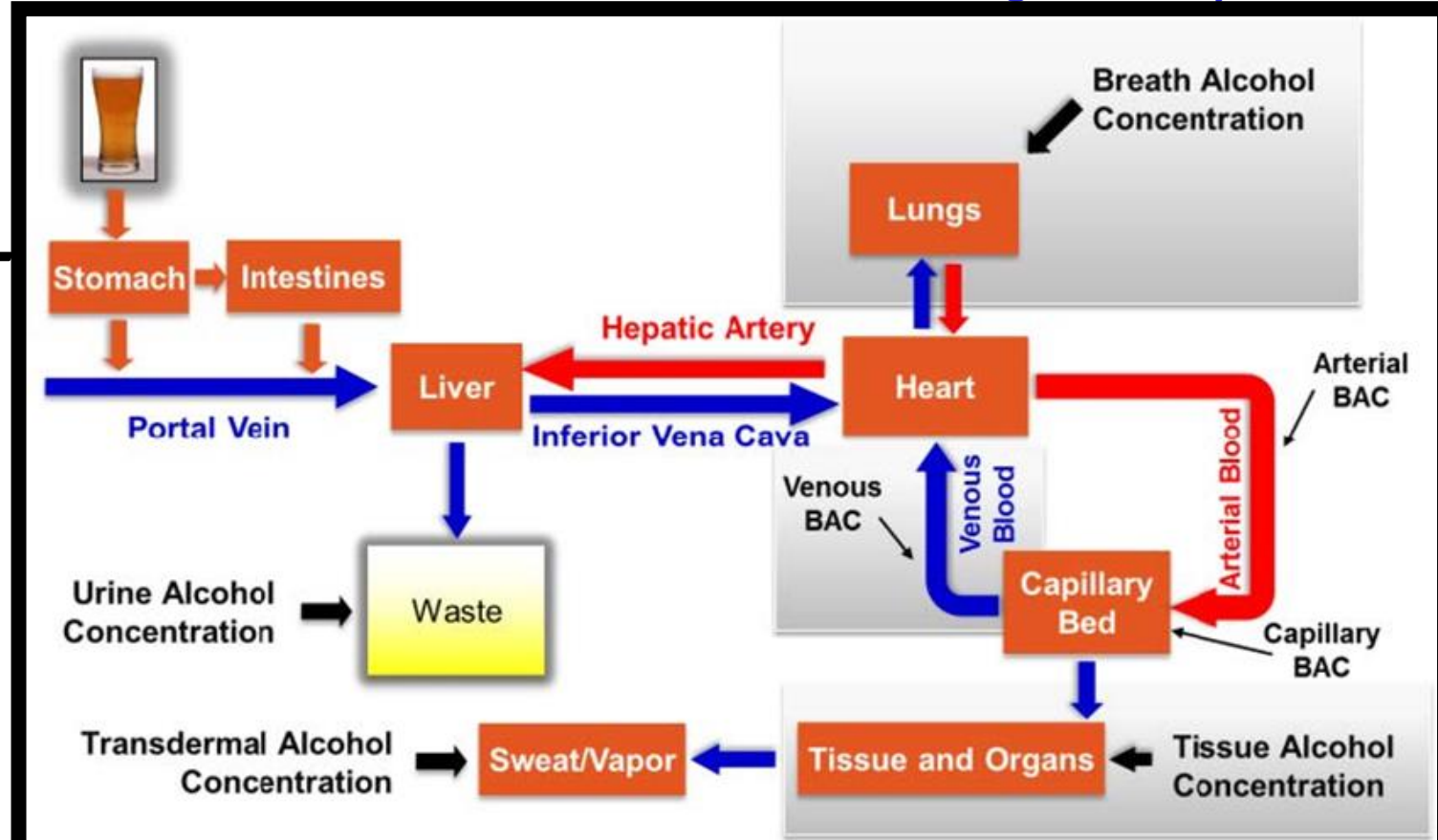


Alcohol Interlocks, sophisticated technology

NHTSA criteria 2010 for acceptable widespread use of alcohol interlocks:

- *Non-invasive*
- *Quick to use (determines breath alcohol concentration in <0.5 seconds from activation and recycle)*
- *Highly accurate*
- *Require no or low maintenance*
- *Virtually invisible to sober drivers*
- *Small*
- *Highly reliable*
- *Repeatable*
- *Durable, robust*
- *Low cost*

Alcohol absorption, distribution and elimination through the body



Challenges to be Overcome by the alcohol interlock in temperatures ranging from -45 - + 85 under all weather conditions



Proactive versus reactive use

Reactive: Offender programs for perpetrators, commercial or private

Offenders receive prosecution, suspended driving licences, by court order confined to rehabilitation and cars with alcohol interlock installed for a period of time

- Offence followed by rehabilitation programs and new licence test
- Offence has been committed – high risk of accidents
- Cost paid by perpetrators

Offender programs helps most offenders being prosecuted for DUI the option to resume a normal life with work and family, to catch up with their alcohol problems in a more permanent way following rehabilitation process, and afterwards having license valid only for cars with alcohol interlocks

Proactive: Mandatory/compulsary use of alcohol interlocks

Installation and use of alcohol interlocks made mandatory or compulsory by law or regulations for specific groups of vehicles for generally prevention purposes, f. ex. vehicles offering transport services.

- Use of alcohol interlocks as precaution similar to the use of safety belts
- Impaired are halted by blocking of the vehicle – low risk of accidents
- Cost paid by owner of the vehicle

CLC EN 50435, part 3, chapt. 6. Alcohol Interlocks, a way to assure quality:

“The expanded and proactive use of alcohol interlocks may benefit the employers, the employees and also the societies, as it may reduce the fear of being encountered by drunk drivers. With the right use of alcohol interlock registry data, combined with company HR-policies, it may also be possible to make an early engagement with people at an early stage of a potential alcohol problem”.



Recommendations for new legislation

Two main options for EU/EEC to end carnage on roads

- Mandatory use of alcohol interlocks for transport vehicles
- Offender programs with alcohol interlocks for all driving under influence of alcohol

*All new motor vehicles are to be prepared for installation of alcohol interlocks ((EU) 2019/2144) from 2022/24
It is a question about courage and clout in political decisions to make it happen*

Harmonized EU-legislation to provide equal rights

- Common Public Road Laws with standard BAC limits Of 0,2 g/l (promille) for all EU/EEC countries
- Common regulations for perpetrators – equal reactions for impairment in traffic
- Common standards for alcohol interlocks – safety of installation, use and maintenance
- Equal terms of competitions for transport companies

As transport and travels are trans-national, common standards are necessary within the EU/EEC

Program for prevention and rehabilitation

- EU/EEC uniform legislation and agreements for employers, employees and authorities
- Common set of rules and agreements for how to deal with professional drivers failing tests.

*Encourage companies to introduce programs of prevention and cure of emerging alcohol problems,
Employees offered rehabilitation instead of rejection for the benefit of both persons, companies and society*



Role of CLC BTTF 116-2 – 2003 -

CENELEC BTTF 116-2, «Alcohol Interlocks», 2003/04. developing European Standard.

At the time, no technical requirements for alcohol interlocks existed.

Over the years, BTTF 116-2 served as a forum, meetingplace and workshop for technical and political development

Providers, authorities, NGOs and others from Europe and North America, have contributed directly or indirectly in the work.

Requirements for the development of alcohol interlocks are now captured in the CENELEC 50436 part 1 - 7 standards, considered to be among the most comprehensive in the world:

1. **Technical requirements for alcohol interlocks with a mouthpiece,**
2. **Technical requirements for alcohol interlocks with a mouthpiece for preventive use** (Part 1 and 2 now amalgamated into 1, ready for publishing)
3. **Guidelines for authorities, governments, political decision makers, transport companies, purchasers, unions and users.**
4. **Specification of interface between vehicles and alcohol interlocks**
5. **Technical requirements for alcohol interlocks without a mouthpiece (not finished)**
6. **Specification for security requirements for protection and handling of records stored in the data registry of alcohol interlocks**
7. **Defines the content of installation documents providing necessary information for installation of alcohol interlocks in vehicles.**

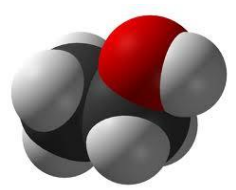
Providers of alcohol interlocks are entitled to certify their alcohol interlocks in compliance with the requirements CLC EN 50436

Users find guidelines for installation and use presented in part 3.

EN 50436 referred in EU Regulations 2018/858 (type approval for vehicles) and 2019/2144 (type approval for safety equipment)

Next: Dialogue with Automotive Industry for improved installation facilities in all types of vehicles

EU legislation for enhanced use of alcohol interlocks to prevent driving under influence of alcohol and drugs



Consensus and implementation

Strategy and Consensus for enhanced use of alcohol interlocks

- The Norwegian Alcohol Interlock Committee, served as meeting arena for unions, employers, politicians, providers and organizations.
- Winding down political opposition against alcohol interlocks, by some regarded as intrusion into freedom of life
- Consensus was reached for promoting use of alcohol interlocks in commercial vehicles.
- From 2012 this consensus included all political parties in Stortinget.
- January 1st 2019, alcohol interlocks mandatory for busses and minibuses in Norway.
- 2024: Considerations for expanding the mandatory use of alcohol interlocks to other group of vehicles.
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Priority list:

- School buses in particular and busses in general
- Taxi and other vehicles transporting people
- Transport Fleet Sector – cities and public services
- Heavy transport sector
- Construction enterprises machinery
- General Preventive installation in passenger cars

Results:

Alcohol interlocks in busses and minibusses mandatory by Law

Taxi and other vehicles for transport of people – significant implementation on voluntary basis

Transport Fleet sector – implementation following requests from transport buyers

Heavy Transport Sector – implementation following requests from transport buyers

Construction enterprises – implementation by owner to protect expensive machinery



Considerations and proposals

European Parliament, June 3rd 2015



Alcohol interlocks are key elements of a prevention policy against driving under influence of alcohol and drugs:

Harmonizing of legislation within EU/EEC

- Common BAC levels – adoption of 0,2 g/l (promille)
- Equal conditions for transport and commerce
- Common rules for perpetrators

Mandatory use of alcohol interlocks:

- High cost-efficiency: All types of transport and public vehicles
- Low cost-efficiency: All types of private owned vehicles

Extended use of offender programs for perpetrators

- Subjected to offender programs/rehabilitation
- Driving licence restricted to vehicles with alcohol interlocks
- Residivists – long term alcohol interlocks restrained driving licenses
- Focus on proactive measurements – early detection of alcohol problems

Based on the study, EC may consider any legal measures for alcohol interlock requirements in groups of vehicles



Political resolutions

European Parliament Resolution 27.09.2011

47. Calls on the Commission to support, as a first step, the development of techniques for apprehending drivers under the influence of drugs and medicines which influence their fitness to drive and to propose as a second step EU legislation to prohibit driving whilst under the influence of drugs or the above mentioned medicines, with effective enforcement.

73. Recommends that fitting of alcohol interlocks – with a small, scientifically-based range of tolerance for measurement – to all new types of commercial passenger and goods transport vehicles be made compulsory; calls on the Commission to prepare by 2013 a proposal for a Directive for the fitting of alcolocks, including the relevant specifications for its technical implementation.



Nordic Council Resolution, 30.10.2012:

Report A-1566 recommends the Member Countries to:

- *implement alcohol interlocks for commercial and professional drivers in the Nordic Countries, Faeroe Island, Greenland and Åland*
- *implement alcohol interlocks for persons convicted for driving under influence of alcohol*
- *do research of alcohol interlocks in all types of motor vehicles for General Prevention Purpose*

Norwegian Political Consensus – votes in Stortinget

June 2nd 2015: *Request for legislation for alcohol interlocks in vehicles transporting people.*

March 2018: *Alcohol Interlock paragraph (18) Norwegian Public Road Traffic Law*

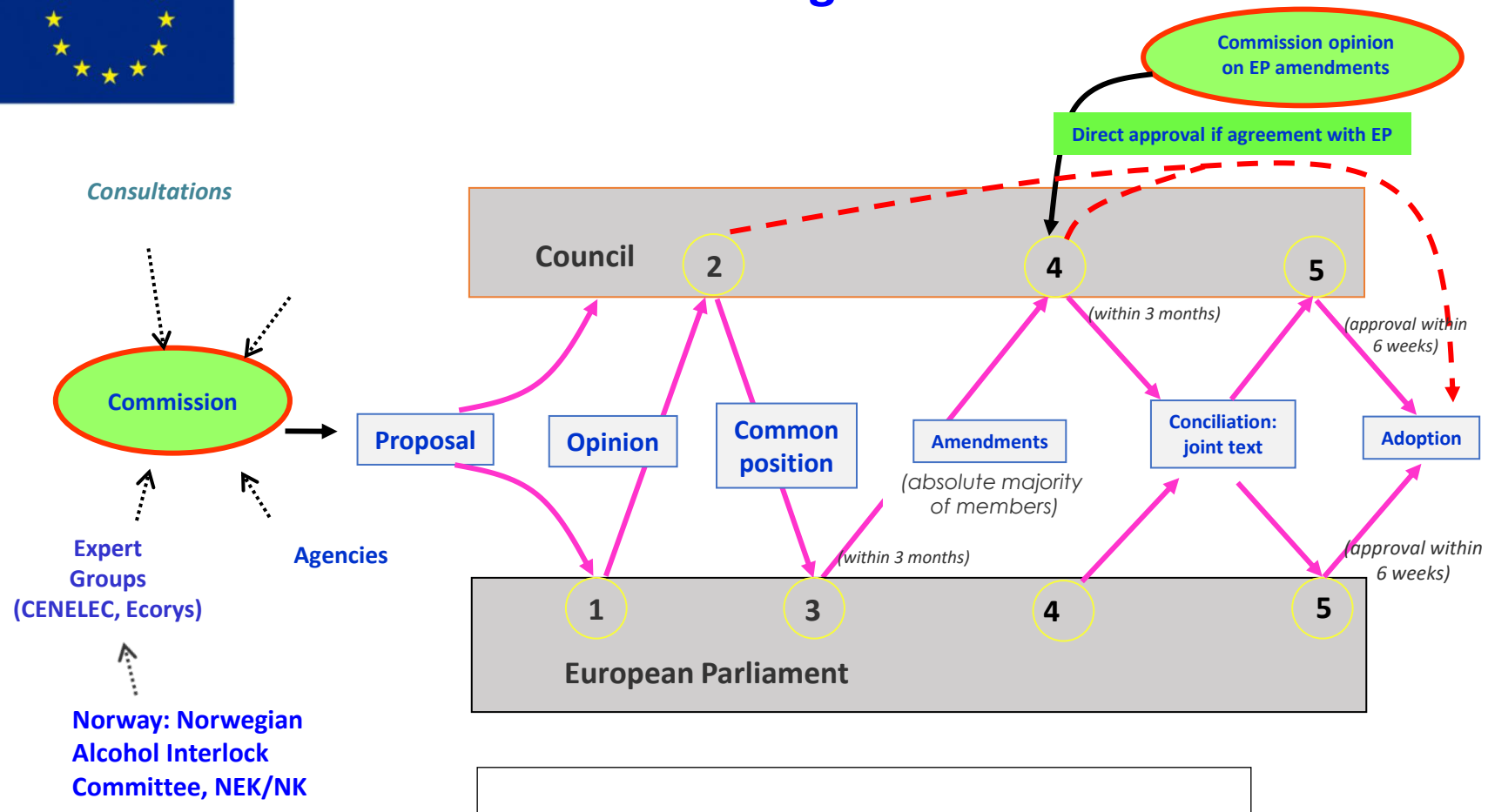
January 1st 2019: *Alcohol interlocks are by law made compulsory for busses and mini-busses*



EU - process of legislation development



EU: Decision Making Process





EU: Type Approval Regulations

EU preparation for extended use of alcohol interlocks

In preparation

“Article 6 of Regulation (EU) 2019/2144 of the European Parliament and of the Council requires motor vehicles of categories M and N to be equipped with certain advanced vehicle systems, including alcohol interlock installation facilitation. It lays down in its Annex II basic requirements for the type-approval of motor vehicles with regard to the alcohol interlock installation facilitation in those”

Draft act

Feedback period

03 February 2021 - 03 March

2021

FEEDBACK: OPEN

EC: Draft delegated regulation - Ares(2021)931801, 11.02.2021:

UPCOMING

“Alcohol interlocks improve traffic safety by preventing drivers from driving with alcohol concentrations above certain limits”.

Commission adoption

Planned for

First quarter 2021

“To make it easy to do this, vehicle manufacturers will be required to provide either a standardised connector or a clear document giving the necessary guidance on how to install them.”

Deadline:
July 6th, 2022

“The requirements in this initiative are based on the existing standard EN 50436”



Enhanced implementation and use

Dialogue with stakeholders to find common ground (EN50436 part 3)

- Transport customers
- Transport companies
- Transport workers
- ITF - International Transport Workers Federations
- ETF - European Transport Workers Federation
- IRU - International Road transport Union
- Public and political authorities.

Confidence and motivation for users:

- Comprehensive communication and understanding between management, unions, users and authorities
- Agreements to take care of the users civil and lawbinding rights – avoid circumstansialities.
- Reliable and easyhandling technologi – professional drivers work, income and life situation at stake
- Well developed and provided service network
- Companies to develop a clear drug-handling policy
- Strong protection of sensitive information – only authorized person have access.

Europe: EU/EEC standardization – equal terms for all users

- Equal BAC levels in EU/EEC
- Equality in competition for transport companies, most of them operating in a cross-border market,
- Standardized laws, regulations, standards, guidelines and definitions in all EU and EEA-countries.

**YOU can provide people in traffic more freedom from alcohol, narcotics
and drugs with alcohol interlocks**

Just DO it!

Not because it is easy, but because it is right!

Thank you for your attention

Bjarne Eikefjord

Leader: Norwegian Alcohol Interlock Committee

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**Norwegian Alcohol
Interlock
Committee
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