Blurred vision: Just a small amount of alcohol can alter perception.
All the crumple zones, airbags, and ABS systems cannot reduce the danger of traffic fatalities if people drive while drunk. That’s why more and more countries around the world are requiring individuals convicted of drunk driving offenses to install **BREATH ALCOHOL CONTROLLED VEHICLE IMMOBILIZERS** in their vehicles. Sweden even plans to eliminate all alcohol related traffic fatalities with the help of such alcohol interlocks.

The effects of alcohol are well known: Reactive ability usually becomes impaired at a blood-alcohol concentration (BAC) of 0.03 percent, while the willingness to take risks rises. Equilibrium and speech disturbances occur at a BAC of 0.08 percent, and consciousness begins to fade at a BAC of 0.2 percent. Individuals with a BAC of 0.3 percent often lapse into a coma, and some even die. Only those who are in good physical condition manage to survive such intoxication. More than anything else, their fellow citizens need to keep out of the way of drunk drivers, as the latest road safety report issued by the European Union confirms. “Excessive speed, alcohol, and driving without seatbelts are still the three most common causes of deadly traffic accidents,” says Siim Kallas, Vice President of the European Commission in charge of transport.

**Alcohol is involved in 10 percent of all traffic fatalities**

Statistics show that the severity of an accident increases in line with BAC. Drunk drivers are almost twice as likely to be killed in a traffic accident than sober motorists. Last year, 4,152 people died in Germany in a total of 310,806 registered accidents that resulted in injuries. Although alcohol was involved in only 5.5 percent of these accidents, the 440 deaths they led to amounted to 10.6 percent of total fatalities. Moreover, those convicted of driving while under the influence (DUI) tend to repeat their mistake. Studies in the U.S. have shown that DUI offenders who cause a fatal accident are eight times as likely to do the same thing again as sober drivers whose actions lead to fatalities. Measures such as license suspensions seem to have only a minor effect on habitual drinkers; punishment alone is apparently not enough. What’s needed is monitoring and therapy—the same methods that are used to treat anyone with an addiction problem.

People have known that alcohol poses a mortal danger to anyone on the road ever since the automobile was invented. As early as 1872, the United Kingdom passed a law forbidding anyone to be “drunk while in charge on any highway or other public place of any carriage, horse, cattle, or steam engine.” In 1904, *The Quarterly Journal of Inebriety* (No. 26, p. 308) reported that 23 people had died in automobile accidents and that 19 of them, or over 80 percent, had consumed alcohol before getting behind the wheel.

Despite this knowledge, alcohol played no role in traffic safety policies for many years. In the first half of the 20th century, policymakers focused on bringing order to the streets by keeping pedestrians, coaches, bicycles, and automobiles away from one another. This led to the installation of the world’s first traffic light in Detroit in 1914, with Hamburg and Paris following eight years later. Europe’s first crossing signal for pedestrians went into operation in Copenhagen in 1933. Two years prior to that, the League of Nations adopted an agreement in Geneva called the “Convention Concerning the Unification of Road Signals.” The agreement was ratified by 18 countries but contained no stipulations on road markings. It wasn’t until after the end of World War II that pedestrian crosswalks and the like began to appear on the world’s streets.

**Technology leads to (more) safety**

As more and more cars began to fill up the roads, attention shifted in the early 1950s to occupant protection. Safety pioneer Hugh de Havne, who as a pilot had survived a plane crash, compared driving a car at that time to “shipping fragile valuable objects loose inside a steel container.” The years that followed saw the development of safety features like the three-point seatbelt, the crumple zone, and the collapsible steering column. The latter replaced columns that had previously penetrated vehicle interiors—and drivers—like a spear in crashes. Despite these measures, the number of traffic fatalities in Germany continued to increase, and by the end of the 1960s, the fatality figure had reached a record high of more than 22,000.

This trend only began to reverse itself with the systematic development of automobile safety standards. By the 1980s, vehicle seats, safety belts, belt tensioners, and airbags had joined together to form a protective unit. Anti-lock brake systems (ABS) and electronic stability control systems also served to make driving safer and more comfortable. In 1995, the “European New Car Assessment Program” (Euro NCAP) provided consumers with a Europe-wide basis for comparing vehicle safety. Euro NCAP issues five stars to the safest vehicles, which are designed to ensure that occupants exposed >
Regional disagreements continue to be a problem within the EU

Dräger Interlock XT

Dräger is a leading manufacturer of breath-controlled alcohol interlocks. The Interlock XT marks the introduction of the second generation of Dräger interlock devices, whose development is based on the company’s 50 years of experience in measuring breath-alcohol concentrations. Interlock XT uses an electrochemical sensor like the one employed in police measuring devices. This determines the alcohol concentration in a breath sample at a high level of precision. The overall system stands out through its robust mechanical components and its outstanding reliability even at low temperatures and high humidity. It also meets all the approval requirements for alcohol interlocks around the world.

This vehicle can only be started after a driver blows a clean breath sample.

> to a side impact at a speed of 64 kilometers per hour (km/h) remain uninjured. However, technology alone cannot exhaust the full potential for making driving safer; motorists must do their part as well. Sometimes drivers have to be forced to act properly, which is why Germany introduced a speed limit of 100 km/h on state roads in 1972, and followed this by instituting a recommended speed of 130 km/h for highways in 1974 and a seatbelt requirement in 1984. The German government also began cracking down on alcohol consumption by reducing the legal BAC limit of 0.08 percent introduced in 1973 to 0.05 percent in 1998. In 2007, the government also completely banned alcohol for new drivers still in their probationary period and all drivers under 21. All of these measures paid off, as the number of alcohol-related traffic deaths in Germany has declined by nearly 88 percent since 1975 – despite the fact that the number of vehicles on the road in the country has almost doubled during the same period.

Sweden leads the way

New concepts are being developed to continue this success. The EU, for example, is seeking to cut the number of traffic fatalities in the union in half over the next ten years. Individual countries, and above all Sweden, are planning to do everything they can to ensure that no one is ever again severely injured, or even killed, on their roads in the future. “We don’t have an actual date as to when we have to achieve this goal,” says Claes Tingvall, Director of Traffic Safety for the Swedish National Road Administration. Nevertheless, the country’s commitment to ‘Vision Zero’ alone has led to a traffic safety breakthrough on an international scale, he says. Such a breakthrough is urgently needed because disagreements between countries concerning alcohol and driving continue to be a problem even within the EU. For one thing, there is no agreement on how much alcohol a person should be allowed to consume before getting behind the wheel. Whereas the UK, Ireland, and Malta let their citizens drive with a BAC of 0.08 percent, Estonia, Romania, Slovakia, the Czech Republic, and Hungary have retained the complete ban on alcohol instituted by the former communist regimes. The BAC limits in other EU member states fall somewhere in between.

The Swedes, for their part, have already had an extremely unpleasant experience with the “EU and alcohol” issue. When the country’s borders were opened after its entry into the EU in 1995, Swedes began bringing in huge amounts of wine, beer, and liquor from neighboring countries instead of purchasing them in Systembolaget – the state-controlled alcohol monopoly, which also charges very high prices. Within just a few years, the number of alcohol-related traffic fatalities had doubled as a result. “If per capita alcohol consumption rises by one liter of pure alcohol each year, the number of fatal accidents rises by eight percent,” says Swedish traffic safety expert Hans Laurell.

Nevertheless, Sweden remains a role model for traffic safety, as alcohol consumption accounts for only around four of every 100 traffic fatalities in the country. The figure for Germany is slightly over
A quick blow is all it takes to quickly and reliably measure breath alcohol concentration.

Alcohol interlocks

The devices can be retrofitted to existing vehicles. Dräger also manufactures such a unit—the Interlock XT, which requires drivers to blow into a breathalyzer, after which the device determines whether they should be allowed to drive off. If the driver fails the test, the unit blocks current to the vehicle’s starter solenoid (see page 36). All of the data are recorded for subsequent evaluation.

Sweden offers a program that allows motorists convicted of DUI offenses to use an alcohol ignition interlock as a condition of probation. In this manner, first-time and repeat offenders are given the chance to avoid punishments such as a license suspension or even a jail sentence. Those who opt for the program must install an alcohol ignition interlock in their vehicle, pay for the unit and its installation, undergo periodic medical monitoring, and stay out of trouble during the probation period. Sweden has been monitoring the impact of the program since 1999, and the results of the government’s studies will soon be incorporated into new legislation.

The U.S. has the most extensive experience with interlock programs, which ten out of 100; in the U.S. it’s as high as 30. One of the reasons for Sweden’s success is the “Vision Zero” package of road construction and technical and regulatory measures adopted by the government in 1997. One of the most important measures has been the introduction of alcohol interlocks—vehicle immobilizers that require motorists to “blow before they go,” or not go anywhere if they’ve been drinking.
Alcohol interlocks are an effective way to make driving safer

> have been in effect in one form or another in the country since the 1980s and are now being used in 47 of the 50 states. The programs are mandatory for offenders in 29 of these states and voluntary in the other 18. However, only a fraction of convicted offenders in the latter actually take part in the programs. “Every year some 1.4 million people are arrested for drunk driving - but only 180,000 alcohol interlocks were in use in 2009,” says U.S. traffic safety expert Dr. Richard Roth. This low number is in no way due to a lack of effectiveness on the part of the devices, since several studies in the U.S. have shown that they dramatically reduce the recidivist rate among both first-time and repeat offenders. Those who install an interlock after an initial DUI conviction are considerably less likely to repeat the offense than someone who chooses not to use such a device.

**Offender programs on the rise**

More countries around the world are now paying attention to such findings. Offender programs have been under way in the Australian states of Victoria, New South Wales, and South Australia for several years, and the Northern Territory introduced a program one year ago. Because success seems to increase when such programs are mandatory, South Australia now also requires offenders to participate. The use of interlocks is on the rise in Europe as well. France has a (still) voluntary program, and DUI offenders in the Netherlands and Belgium will likely be forced to install interlocks beginning next year. The legislation process for interlocks is under way in the UK and Norway, and Austria is examining possibilities for introducing interlock programs. Finland has made the most progress in this area after Sweden. The country has been testing alcohol interlocks on a voluntary basis since 2005, and plans call for mandatory participation in interlock programs to be gradually phased in. Finland wants to mandate interlocks not only for drivers but also for vehicles as a preventive measure. “We’re going to start with school buses in 2011,” says Janne Mänttäri from the Finnish Ministry of Transport, “but ultimately we will require all vehicles to install the devices.”

This would not only save lives but also a lot of money, as Finland holds the record in Europe for the most roadside breath checks - some two million a year in a country where only 3.5 million people have a driver’s license. Germany is also looking more closely at alcohol interlocks. Although the country has no firm plans for legislation or programs, it is now “planning a research project on drivers under the influence,” according to Dr. Simone Klipp of the Federal Highway Research Institute. One reason for the growing interest is related to the medical-psychological assessment that repeat DUI offenders are required to undergo in Germany. There is no up-to-date proof that the measure is effective. The country’s citizens don’t take the test seriously: For years they’ve been denouncing it as the “Idiot Test.”

Alcohol interlocks could help out here. After all, they not only determine whether a driver may start the vehicle but also record a lot of data on the actual or attempted starts. This data could be used to evaluate the progress of participants and the success of rehabilitation measures. Key questions here include: How often did the driver fail to start the car? When did he or she attempt to start it? Studies conducted with DUI offenders in therapy have found that in the beginning they also have difficulty starting their vehicles in the morning. However, this is usually not due to an early morning drink. Instead, it’s because they still have alcohol in their system from the night before, but don’t realize it. A study in Finland has shown that installation of alcohol interlocks has prevented about 10,000 trips by drivers under the influence over the last five years.

**People are the problem**

Because conclusions can now for the first time be drawn precisely timed with the help of alcohol interlocks, traffic experts are also using the devices. Berlin traffic psychologist Dr. Ronald Kosellek has already rehabilitated several DUI offenders with the help of the devices. Says Kosellek, “Although the potential for the units in Germany is still being developed, they could form part of a traffic safety concept aimed at preventing DUI accidents.” This would be just one of several components, Kosellek adds, because ultimately “alcohol interlocks will never be in a position to solve people’s personal problems.”

Further information online, including: How Australia uses a “Booze Bus” to catch drunk and drugged drivers

www.draeger.com/101/alcohol
Experts predict that road traffic accidents will rise to become the 5th leading cause of death by 2030. AIDS, lung cancer, and diabetes will be less lethal.

Car accidents are the Number 1 killer for 15 to 29-year-olds.

Almost 50% of those who die in traffic accidents are cyclists, pedestrians, and motorcyclists.

Over 1.2 million die in road accidents every year.

A further 50 million are injured.

62% of all accidents occur in just ten countries.