

## Press Release No. 43/2010

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## Federal Environment Agency favours carbon dioxide in air conditioning systems

### Tetrafluoropropene more damaging to climate and environment

**After findings of the latest technical tests the Federal Environment Agency (UBA) now recommends the use of carbon dioxide in mobile air conditioning systems. The refrigerant tetrafluoropropene, or HFO-1234yf, favoured by the automobile industry may well comply with the new EU guidelines, but it has greater global warming potential than the refrigerant CO<sub>2</sub>.**

After 1 January 2011 car makers must reduce vehicle emissions from mobile air conditioning systems. In order to comply with the guidelines in EU Directive 2006/40/EC, the international automobile industry plans to use the chemical refrigerant tetrafluoropropene in future. This substance will replace the HFC-134a used as a refrigerant up to now. German manufacturers announced at the end of May 2010 to do the same, thereby rejecting the considerably more ecological refrigerant carbon dioxide (CO<sub>2</sub>). As a refrigerant, carbon dioxide has both a lower global warming potential than tetrafluoropropene as well as other advantages: it is inflammable, available at low cost worldwide, and has good cooling capacity. Moreover, CO<sub>2</sub> does not produce any of the degradation products fluorinated refrigerants do.

New tests commissioned by UBA to the Federal Institute for Materials Research and Testing (BAM) corroborate the risks of tetrafluoropropene use. In the event of a vehicle fire hydrofluoric acid, which is toxic and highly corrosive can form. Tetrafluoropropene itself is highly flammable and has one more critical property: even before the chemical ignites, high concentrations of hydrofluoric acid can form on hot metal surfaces of 350°C, a temperature that can be reached in an operating vehicle, for instance in the exhaust manifold and at the catalytic converter.

UBA President Jochen Flasbarth comments, "Tetrafluoropropene may well be the easy and obvious solution as far as air conditioning and the global market is concerned. It certainly is not the best choice in terms of climate protection. Environmental and technological considerations speak for carbon dioxide."

One car in the UBA fleet has operated for over a year with a CO<sub>2</sub> air conditioning unit.

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The test report *Ignition behavior of HFO 1234y* (English) by the Federal Institute for Materials Research and Testing (BAM) is here:

[http://www.umweltbundesamt.de/produkte/dokumente/test\\_report\\_hfo1234yf\\_2010\\_06.pdf](http://www.umweltbundesamt.de/produkte/dokumente/test_report_hfo1234yf_2010_06.pdf)

For more information on the BAM test results see:

<http://www.umweltbundesamt.de/produkte/fckw/automobilklimaanlagen.htm>

General information on passenger car air conditioning systems:

<http://www.umweltbundesamt.de/produkte/fckw/touran.htm>

Dessau-Roßlau, 26 August 2010