



European Commission

Enterprise and Industry  
Directorate-General

# Update on Legal Situation on Greenhouse Gas Emissions of MACs

VDA Alternative Refrigerant Winter Meeting 2007

Saalfelden, 14 February 2007

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# Why EC Directive on MACs?

## Climate Change

- The greatest environmental and economic challenge facing humanity
- Global problem – global action needed

## Response to climate change

- Kyoto Protocol (*the EU is committed to reduce greenhouse gas emissions by 8% from 1990 levels by 2008-2012*)
- The key priority in the 6<sup>th</sup> Environment Action Programme (2001-2010)
- Major priority of EU's Sustainable Development Strategy
- European Climate Change Programme (ECCP)

# Regulatory steps

## Directive on MACs

### Legislative process:

- **Codecision**

Legal act, prepared by the Commission, is adopted by the European Parliament and the Council (Directive 2006/40/EC)

- **Comitology**

Legal act with technical requirements is adopted through the CATP (Committee for Adaptation to Technical Progress) (Regulation XXXX/2007)

# Regulatory steps

## Directive on MACs

**Directive 2006/40/ EC of the European Parliament and of the Council relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC**

- Based on Article 95 EC Treaty
- Published in the Official Journal of the European Union L 161, 14.06.2006, p. 12

# The main objectives of MACs Directive

- The **control of leakage** of certain fluorinated greenhouse gases with a global warming potential (GWP) higher than 150 in MACs
- The **prohibition** of MACs using those gases from a certain date

# MACs Directive

## SUBJECT MATTER – (*Art. 1*)

- Type - approval of vehicles as regards emissions from, and the safe functioning of, air conditioning systems fitted to vehicles
- Retrofitting and refilling of such systems

## SCOPE – (*Art. 2*)

- passenger cars - M1
- certain commercial vehicles - N1 class I

# MACs Directive

## CONTROL OF LEAKAGE – (*Art. 5.2 and 5.3*)

### Leakage rate of F-gases with GWP>150

- not exceeding 40 grams/year for single evaporator system
- not exceeding 60 grams/year for dual evaporator system

### From the date

- 12 months after the test procedure has been adopted (or 1 January 2007) for **new types of vehicles**
- 24 months after the test procedure has been adopted (or 1 January 2008) for **all new vehicles**

# MACs Directive

## PHASE - OUT OF MACs DESIGNED TO USE F-GASES WITH GWP>150 - (*Art. 5.4 and 5.5*)

- From 1 January 2011 for **new types of vehicles**
- From 1 January 2017 for **all new vehicles**

## RETROFITTING AND REFILLING - (*Art. 6*)

- Retrofitting with certain MACs not allowed from 2011 / 2017
- MACs refilling with F-gases with GWP > 150 not allowed from 2011/2017  
*Exception for systems fitted before that date*
- Provision for service providers (abnormal leak)



## Next steps

### ADOPTION OF IMPLEMENTING MEASURES

*when*

by 12 months after the date of entry into force of the Directive

*in particular*

administrative provisions for the EC type approval

a harmonised leakage detection test to measure the leakage rate of F-gases with GWP>150 from air conditioning systems

*how* comitology procedure



## Next steps

In future (if appropriate) following measures may be adopted

- measures needed to ensure the safe functioning and proper servicing of refrigerants in MACs
- measures relating to retrofitting and refilling of in-use vehicles and systems
- the adaptation of the method for determining the relevant GWP of preparations

# Review clause

## REVIEW – (*Art. 8.1*)

The Commission shall examine whether

- to extend the legislation to other categories of vehicles ( $M_2$  and  $M_3$ ,  $N_1$  classes II and III)
- to amend provisions concerning GWP of F-gases, changes should take account of technological and scientific developments with respect to industrial product planning timescales

It shall publish a report by 5 years after the entry into force

# Implementing measures (under preparation)

## GENERAL REQUIREMENTS

- testing of single components, systems or vehicles
- the individual results of the components are added to get the system value
- use of a sealed chamber
- correlation to real driving conditions
- calibration of the enclosure and analyser is necessary

# Implementing measures (under preparation)

The draft proposal introduces measures on:

- EC component type-approval (leak components/ air-conditioning systems)
- EC type-approval of a vehicle with regard to emissions from an air conditioning system

# Implementing measures (under preparation)

Type of:

- vehicle with regard to emissions from air-conditioning system,
- air-conditioning system,
- leak component,

is defined

# Leak components

The list of leak components is specified

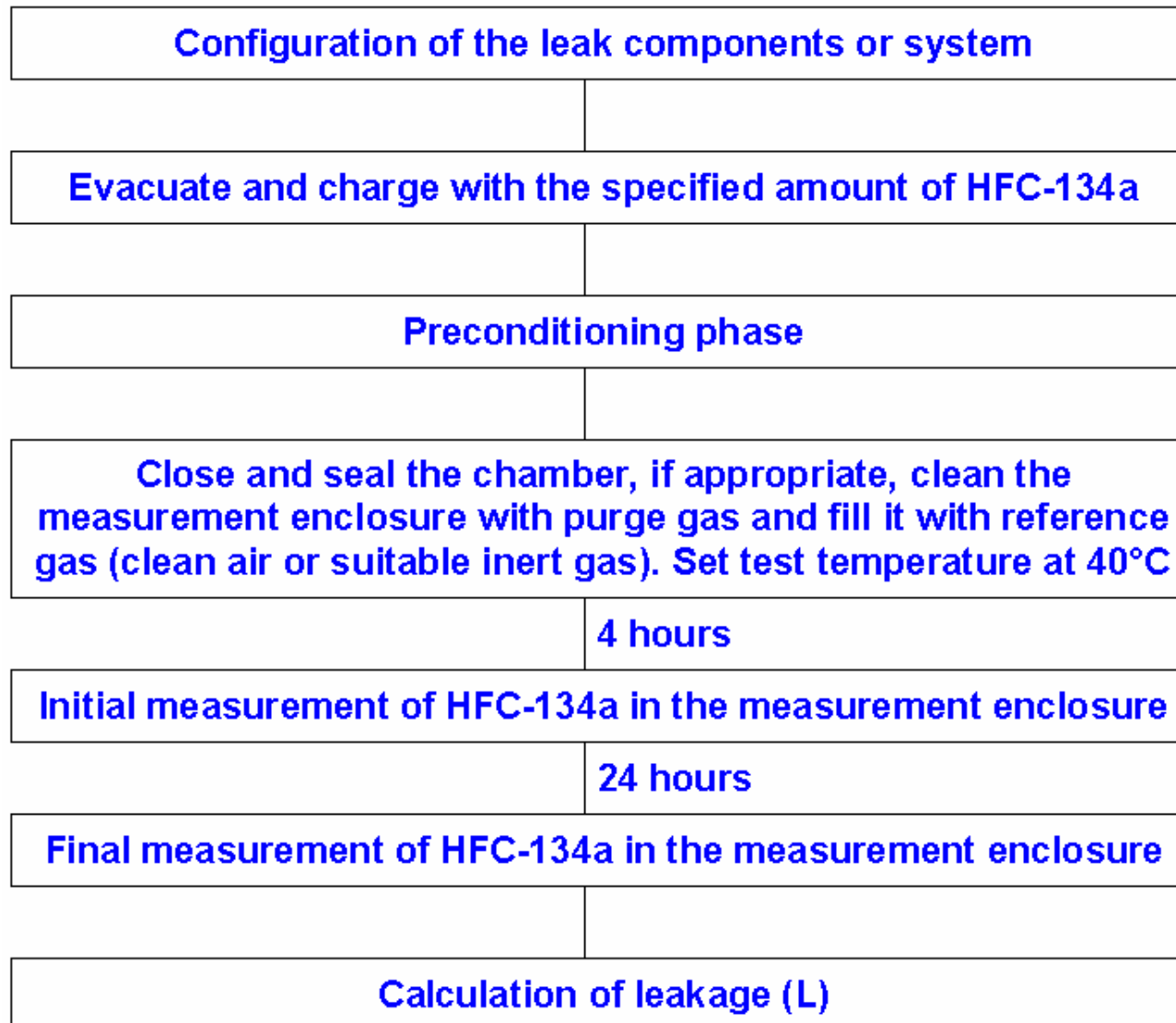
- Hose including crimping
- Individual connections (male/female)
- Valves, switches and sensors
- Thermal expansion valves with connections
- Evaporator with external connections
- Compressor with connections
- Condenser with integrated serviceable dryer
- Receiver/dryer with connections
- Accumulator with connections

# Leakage test

Technical provisions for the determination of the leakages, in particular:

- Equipment requirements
- Test conditions
- Test procedure and data requirements

# Leakage test - test sequence



# Leakage test – test results

## Overall results of tests

- final result of the test to refer to real driving conditions
- taking into account the ARMINES study for ACEA, a correlation factor has been calculated:

$$CF = 0.277$$

# Questions for future

## New refrigerants

- as announced last year
- still under development

# Questions for future

## US STANDARD SAE J2727

- provides a R134a MACs Leakage Chart and defines a system rating based upon the technology used
- in principle not intended to measure the refrigerant emissions
- if harmonisation is sought, SAE standards J2763 and J2764 (introducing a test procedure for determining the leakage rate of HFC-134a from MAC systems and components) could perhaps be considered

## Questions for future

### Setting minimum efficiency requirements for air-conditioning systems

Communications from the Commission (7.02.2007):

- on the review of the Community Strategy to reduce CO<sub>2</sub> emissions from cars
- on CARS 21



Thank you!

Thank you for your attention!

[http://ec.europa.eu/enterprise/automotive/pagesbackgroud/pollutant\\_emission/index.htm#macs](http://ec.europa.eu/enterprise/automotive/pagesbackgroud/pollutant_emission/index.htm#macs)