

Position of the European Vending Association on the HFC gas R-134a

Summary of the European Vending Association's Position:

- *There are many limitations for CO2 usage in European vending machines, especially regarding waste treatment, energy and cost efficiency.*
 - *The main limitation for using HC gas in vending machines is that they are flammable and explosive.*
 - *We deal with the containment of the gas. The R-134a gas is kept in its cooling unit part hermetically sealed by brazing.*
 - *We do our share on climate change with our drastic reduction of energy consumption*
 - *To our knowledge today there is no vending machine in Europe operating with CO2 or other alternative refrigerants (if we exclude few tests).*
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About the European Vending Association:

The EVA represents the whole of the vending industry: machine and component manufacturers, suppliers of commodities (ingredients, cups, confectionery, soft drinks etc.) and operators (those companies, mostly SMEs, managing the machines on a daily basis: siting, cleaning, filling, maintaining and repairing the machines). Its membership is composed of National Associations and individual companies.

There are about 3.8 million vending machines in Europe, run by some 10,000 companies, mostly SMEs and family businesses. About 60% of vending machines in Europe serve hot drinks (up to 80% in some Western European countries), the remaining 40% vend anything from sandwiches to cold drinks, hot meals and snacks. Almost all machines are sited at the workplace (more than 80%). Hot drinks machines offer a broad range of products: coffee, cappuccino, latte macchiato, moccachino, hot chocolate, tea, herbal tea, etc.

The EVA also includes the EPDWA (European Point-of Use Drinking Water Assoc.) amongst its members. The EPDWA represents the interests of the water dispenser industry, both bottled water and Point-of-Use. There are approximately 3.1 million bottle and POU dispensers currently in use throughout Europe being serviced by over 1,000 distributors not including the growing number of vending operators also engaged in this industry. Furthermore, The Point of Use industry has manufacturing facilities employing significant numbers of people in EU member states such as United Kingdom, Italy, Spain, France, Ireland, Poland and Germany. For the purposes of this position paper the EPDWA would like its member's dispensers to be considered under the umbrella of vending machines.

About R-134a in vending machines in Europe

Snacks vending machines and bottled drinks vending machines in Europe use R-134a gas as refrigerant, plus the water point of use. This accounts for 4.6 million machines in Europe ¹ of which 100% use R-134a. The other machines are hot drinks machines without cooling unit.

The EVA wants to underline that vending machines can operate for 20 years which implies that there will be machines with R-134a until at least 2030.

The machine manufacturers are fully aware that they need to find alternatives to R-134a. They know that it is not only a question of responsibility towards the future generation but also a competitiveness issue amongst themselves. NGOs and public procurers are challenging the industry. Hence the manufacturers have been trying to introduce alternative gases in the machines. So far, there has been limited success:

To our knowledge **today there is no vending machine in Europe operating with CO2 or other alternative refrigerants** (with the exception of few tests). In Japan, less than 10% of the machines are operated with natural refrigerants, which means that more than 90% of the machines are still using R-134a². We want to emphasise that machines in Japan are generally bigger machines with a different design.

The main reasons for this situation are the following:

HC gas

The main limitation for using HC gas in vending machines is that they are flammable and explosive.

Vending machines are not simple coolers, vending machines are furnished with electronics, small motors to operate the spirals or other dispensing systems that deliver the products to the consumers.

¹ Datamonitor Research for the EVA - 2009

² Source : Takashi Kurosaki ; Director General ; Japan Vending Machine Manufactures Association

All these electronic/electric items are inside the machine body, in which the air flow is sent, so in case of a gas leakage, the machine components could ignite the gas and the machine could explode.

There are some technical devices that can avoid this problem but all certification schemes consider the “double error state” (i.e.: the pure theoretic instance in which all control systems would break down contemporarily) and in that case the machine security would be deficient.

The only way to solve the problem would be to change all components in to ATEX³ compliant ones, but some of them are not available (and the concerned industry is not interested in developing them in small numbers) and some other components are very expensive compared to the present ones. Furthermore a deep reengineering of the machines would be necessary, losing some of today’s features required by the market.

In addition, applicable standards to Vending Machines limit the amount of flammable gas to 150g, which in most cases would not be enough due to size and performance of the machines.

CO2 gas

There are many limitations for CO2 usage in European vending machines, especially regarding waste treatment, energy and cost efficiency.

With a CO2 cooling unit, you need a double system to cool the content of the machine: one refrigeration system to generate cold and a second one to cool the compressor of the first system so that it can work properly.

- Waste treatment: By increasing the size of the machines, the waste to be treated afterwards is boosted as well. As vending machines are covered by the WEEE Directive and as the vending industry is committed to limit waste, increasing the size of the machine for refrigeration purposes is completely counterproductive.
- Energy consumption: More energy is needed to operate the double system.
- Cost efficiency: The CO2 components are quite expensive because they need a high pressure to work properly. Additionally, a refrigeration unit

³ http://ec.europa.eu/enterprise/atex/index_en.htm

cannot be simply exchanged for another refrigeration unit. Changing gas means changing the refrigeration unit and reengineering the whole machine.

Taking this into account, the European Vending Association recommends **to be very cautious when considering measures on R-134a and vending machines**. CO2 is a promising gas but it needs a lot more development to be used by all machines and much more time to have vending machines operating without R-134a. The European Vending Association Members are fully committed to using less damaging gasses for the environment, are considering all Best Available Technologies but need for the moment R-134a. The vending industry is happy to quickly apply any alternative that would be available on the market, **as long as it is safe, economically and environmentally viable**.

About R-134a containment in vending machines in Europe

No leakage

The charge for the refrigerant for vending machines is very tiny. The cooling unit is kept in a box and not embedded in the machine like it is for fridges. **The gas is kept in its part hermetically sealed by brazing**. Consequently there is no leakage of gas from vending machines. However we want to stress that the probability of leakage is extremely low but it is not zero and in case of leakage the machine could explode if the HC is used (one single case would be enough).

Furthermore, end of life machines are dealt with by professional scrapping companies which deal with the gas in special degassing points.

Insulation foam

Some vending machines are still built with insulation foam based on HFC gas. More and more machines use foam based on water for insulation.

Foams are dealt with at special shredding points where the gas of the foam is collected.

In the past the vending industry used CFC and was committed to work for the planet as we are fully aware this is a one planet business. Vending machine manufacturers invested money and manpower to change the cooling systems and use R-134a.

Conclusion

We want to emphasise that energy consumption is a very important point that people should bear in mind. The European vending industry has developed its Energy Measurement Protocol (EMP)⁴ scale to improve the energy efficiency of machines by peer pressure and economic competition. We believe like Mr Shende, Head of the OzonAction Branch of UNEP DTIE that energy is the “fifth fuel”⁵. Consequently our industry is working long and hard to save this fifth fuel. We want to be able to continue working with R-134a as long as we do not have any serious and marketable alternatives. We do our part on climate change with our drastic reduction of energy consumption; It is important that we can continue to work with R-134a while we are developing and researching on workable alternatives.

⁴ <http://www.vending-europe.eu/standards/EVA-EMP.html>

⁵ **Rajendra Shende, XIII European Conference, Latest Technologies in Air Conditioning and Refrigeration Industry, Milan, Italy June 2009**, “Energy Efficiency is really a fifth fuel after coal, oil, natural gas, and nuclear{...}.employing this fifth energy resource, it can contribute to solve the climate change {...}The global effort to boost energy efficiency with existing technologies could cut more than 20% of world energy demand by 2020. The peer reviewed study by McKinsey published recently estimates that GHG emissions could be cut by 40% by 2030 over 1990 levels by using the existing available technology options-many of them by making appliances more energy efficient and by making efficient use of appliances.

Annex 1

The European Vending machines manufacturing

Most of the vending machines that are present in Europe are manufactured in Europe. The EVA members represent over 80% of all machine manufacturers in Europe. The EVA manages also the secretariat of EVMMA representing all machine manufacturers in Europe.

Most vending machine manufacturers are small and medium enterprises, the largest company employs around 1,200 people.

The European manufacturers are notably based and have factories in:

- Italy : www.NWglobalvending.com ; www.bianchivending.com ; www.fas.it ; www.saeco.com ; www.rheavendors.com
- Germany : www.sielaff.de www.gerhardt-automaten.de www.wurlitzer.de
- Spain : www.jofemar.com www.azkoyen.com
- The Netherlands www.bravilor.com www.etna-vt.com
- The United Kingdom : www.westomatic.com
- Denmark : <http://www.wittenborg.dk/>
- and other European countries (Sweden, Hungary etc)

These companies directly or indirectly distribute their machines in other European countries and are therefore strong supporters of the European internal market and contributors to the European economy. Being SMEs, the EVA manufacturers prefer uniform procedures and laws across Europe to avoid administrative burden, as they do not necessarily have the financial resources to hire an extra person for that purpose.



(FAS Company assembly line, Italy)



(N&W Company assembly line, Italy)



(Azkoyen factory, Spain)

Annex 2

The market

Over 30% of vending machines in Europe serve hot drinks, the remaining ones vend anything from sandwiches to cold drinks, hot meals and snacks. The machines are a convenient point of sale equivalent in size to a shop of 1m². Most machines are located in companies and the rest are placed in public locations like train stations or airports.

The benefits for consumers

- "Convenience", speed
- 24h/7 availability
- "Versatility": machines can sell almost any product
- A wide range of payment options
- Clean, hygienic, safe, always at the right temperature
- Quality of food and drinks, household brands
- Offers a place to meet with colleagues
- Machine branding adaptable to the clients requirements (schools, banks etc)
- Hydration & energy - for a competitive workforce
- Flexible placing options (sell, lease or rent)

The players

The machines are managed by operators. They run the machines as their core business. They conclude commercial agreements with companies or public institutions for the placing of the machines, invest funds into the hardware, and are responsible for cleaning and filling the machines with products (be it cups, snacks, coffee beans, cans, etc...).

There were 10,000 vending machine operators present in Europe in 2008. Of those 69% were small enterprises operating under 100 machines each; 30% were medium size business operating between 101 and 1,000 machines and 2% were large companies operating over 1,000 machines. The operators employ around 85,500 people. About 69% are unskilled workers who is responsible for filling, cleaning and handling the cash generated by a vending machine.

The operators get their machines and suppliers from different actors, located in Europe and generating jobs and revenues in Europe.

The machine manufacturers produce the machines used by the operators. They employ blue collar workers, as well as a significant number of low skilled female employees. Vending manufacturers have not been massively delocalising.

Annex 3

Typical Japanese vending machine (twice as large as the European ones)

