

INLAND TRANSPORT COMMITTEE

**Working Party on the Transport of
Dangerous Goods**

**(Seventy-first session,
Geneva, 5-9 November 2001)
item 3 d) of the agenda**

**CLASSIFICATION OF VINEGAR AND ACETIC ACID FOOD GRADE
(TRANS/WP.15/AC.1/2001/40)**

Note by the Secretariat

The secretariat has received the following request from CEFIC.

The CEFIC/CPIV proposal to the Joint Meeting (TRANS/WP.15/AC.1/2001/40) related to the classification of vinegar and acetic acid food grade was not discussed at the September meeting due to the lack of time.

This absence of decision is a problem for the industry sectors concerned. The proposal however concerns only the road transport even if an harmonisation with rail was welcome.

Therefore CEFIC proposed that this document be considered by WP.15 at its present 71st session.



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INLAND TRANSPORT COMMITTEE

Working Party on the Transport of Dangerous Goods

**Joint Meeting of the RID Safety Committee and the
Working Party on the Transport of Dangerous Goods**
(Geneva, 10-14 September 2001)

SPECIAL PROVISION APPLICABLE TO UN 2790, PACKING GROUP III

**Proposal transmitted by the European Chemical Industry Council (CEFIC)
and the Comité Permanent International du Vinaigre (CPIV) */**

Analytical Summary:	Special provision applicable to "UN 2790 solutions of acetic acid PG III" reducing the RID/ADR requirements for fermentation vinegar and acetic acid food grade with up to 25 % acetic acid by mass
Action to be taken:	Add in Part 3 of RID/ADR a new special provision "xyz" applicable to UN 2790 Packing group III .

Introduction

The concentration limit for the classification of acetic acid solution (UN 2790) as a dangerous good in the RID/ADR was reduced in 1999 from 25 % to 10 %. The amendment was adopted in the frame of a global proposal aiming at harmonising RID/ADR with the UN-Model regulation (TRANS/WP.15/AC.1/1997/51)

This affects the manufacturers of vinegar and acetic acid food grade.

*/ Circulated by the Central Office for International Carriage by Rail (OCTI) under the symbol OCTI/RID/GT/III/2001/40.

Acetic acid of vinegar and acetic acid food grade are chemically identical products for the same uses. Their only difference is in the production process.

Both products are used as food ingredients in the production of foodstuffs.

To protect the health of the consumer these products have to meet cleanness specifications/purity criteria which do not allow any chemical reaction between vinegar / acetic acid food grade and the packaging material.

The EC-Directives and Council of Europe documents which have been implemented into the national laws in that respect are as follow :

Council Directive 82/711/EEC, O.J. L 297/26

(This Directive lays down the basic rules necessary for testing migration of the constituents of plastic materials and articles intended to come into contact with foodstuffs)

Council Directive 90/128/EEC, O.J. L 75/90

(Specific Directive on plastic materials and articles in contact with foodstuffs)

Directive 89/109/EC, O.J. L 40/89

(Framework Directive which paves the way for the adoption of specific Directives on particular types of materials and articles in contact with foodstuffs)

Policy statement of the Council of Europe concerning metals and alloys: Guidelines for stainless steel used as food contact material.

The transport of vinegar and acetic acid food grade is already regulated in National provisions for foodstuffs and has up to that date, without fulfilling the RID/ADR requirements, never resulted in any safety problem.

Specific multilateral agreements were already adopted by several European Member States to limit the unnecessary transport burden resulting from such a change of classification.

The following proposal aim at resolving this problem on a longer term basis.

Proposal

Add in Part 3 Chapter 3.3 a new special provision “xyz” applicable exclusively to “UN 2790, ACETIC ACID SOLUTION, not less than 10 % but not more than 50 % acid, by mass” as follows:

“The transport for vinegar and acetic acid food grade up to 25 % pure acid, by mass will have to comply only with the following requirements:

- a) Packagings, intermediate bulk containers (IBCs) and tanks shall be manufactured from stainless steel or plastic material which is permanently resistant to corrosion of vinegar/acetic acid food grade.
- b) Packagings, IBCs and tanks shall at regular intervals be subjected to a visual inspection by the owner. The results of the inspections shall be recorded and the records kept for at least one year. Damaged packagings , IBCs and tanks shall not be filled.
- c) Packagings, IBCs and tanks shall be filled in a way that no product is spilled or adheres to the outer surface.

- d) Seals and closures shall be resistant to vinegar/acetic acid food grade. Packagings, IBCs and tanks shall be hermetically sealed by the person in charge of packaging and/or filling so that under normal conditions of transport there will be no leakage.
- e) Combined packaging with inner packaging made of glass or plastic (Subsection 4.1.4.1 "P001") which fulfil the general packing requirements of sub sections 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.5, 4.1.1.6, 4.1.1.7 and 4.1.1.8 may be used.

The other provisions of RID/ADR do not apply.“

Justification

Acetic acid of vinegar and acetic acid food grade in concentrations up to 25 %, by mass don't meet the RID/ADR Class 8 classification criteria for corrosion to the skin (see. attached 2 letters from the German federal institute for health protection and veterinary medicine - BGVV).

Concerning corrosion to metal the transport of these products by road or railroad is not regarded dangerous if the restricted requirements mentioned in the new SP "xyz" are fulfilled. It is not necessary from a safety point of view to fulfil the other requirements of RID/ADR (see attached letter from the German federal institute for material research and testing – BAM).

The validity of this statement is confirmed by the fact that no transport safety problems related to corrosive properties have been encountered so far when these products in concentrations up to 25 % were transported not being subject to the provisions of RID/ADR.

Since there is no safety improvement, the additional burden resulting from the new classification limits for the food industry is not justified.

Annexe 1

Translation / Original: German

Please note that the following terminology has been used:

Essigsäure - acetic acid

Essigessenz - vinegar essence

Gärungsessig/Essig - vinegar

Letter from the Federal Institute for Health Protection of Consumers and Veterinary Medicine (Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin - BgVV) to the German Federal Ministry of Transport, Building and Housing (Bundesministerium für Verkehr, Bau und Wohnungswesen)

Date: 27 January 1999

**Re: Classification of > 10% acid as dangerous good pursuant to the ADR;
Letter from the Association of the German Vinegar Industry (Verband der deutschen Essigindustrie e. V.) to the BgVV, reference Rd/Ro of 6 January 1999**

In the above-mentioned letter the BgVV was asked to give an expert opinion on the corrosive effect of vinegar on the external skin with a view to substantiating the application for an exemption from the regular transport pursuant to the GGVS/ADR to be made to the German Federal Ministry of Transport, Building and Housing. (GGVS = Gefahrgutverordnung Straße; German regulation on the transport of dangerous goods by road)

We confirm that, judging by its impact on living skin tissue, vinegar is not deemed a dangerous good in the meaning of class 8. Consequently it is not justifiably included under item 32c of this class.

The test reports of March and April 1993 submitted by LEBERCO TESTING/INC refer to the testing of vinegar (Gärungsessig) in various acidic strengths and its topical effect on the skin of rabbits in the Draize test. This is a standard test whose implementation corresponds to OECD method 404.

We have evaluated the test results obtained in a 4-hour exposure, as this duration reflects the most prolonged strain and thus meets the criteria of class 8 packing group III. The following situation is depicted in the table:

Vinegar acid causes reddening that sets in fast and tends to blister with higher acid contents (Bl = blister). A distinct swelling of the exposed area occurs only with 30% vinegar. (The maximum reaction with reddening and swelling is assessed with '4' in the Draize test.)

The tendency to subside of reddening and swelling is clear enough within two days so that no delayed reactions should be expected.

One case of cutaneous necrosis occurred with 12% acid content. As stronger concentrations did not cause necrosis, this case can be deemed atypical. Considering the entire test series as one study, a corrosive effect in the meaning of class 8/III was observed in 1 animal out of altogether 24 animals. Consequently there is no reason to classify vinegar as corrosive.

Vinegar (Gärungsssig)
 Outcome of the Draize test; primary skin irritation in rabbits

Acid contents	8 %	12 %	20 %	30 %
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		Time of examination after the end of a 4-hour exposure											
(hours)	0	24	48	0	24	48	0	24	48	0	24	48	
Erythema	2	2	1	2	1	1	1B1	1B1	1B1	2	1	0	
	2	1	0	2	2	1	2B1	2B1	1B1	2B1	2B1	1	
	2	1	0	2	1	1	1B1	2B1	1B1	2	2	1	
	2	2	1	2	1	0	2	2	1	2B1	2B1	2B1	
	0	0	0	2B1	1B1	1B1	1B1	1B1	1B1	2B1	2B1	1	
	0	0	0	2B1	2B1	1B1	1	1	1	2B1	2B1	2	
Oedema	0	0	0	1	0	0	0	0	0	0	0	0	
	1	0	0	1	0	0	1	1	0	2	1	0	
	0	0	0	1	0	0	0	1	0	1	1	0	
	0	0	0	0	0	0	0	0	0	1	1	0	
	0	0	0	1	0	0	0	0	0	2	1	0	
	0	0	0	1	1	0	0	0	0	3	2	1	
Necrosis	No	No	No	No	No	No	No	No	No	No	No	No	
	No	No	No	No	No	No	No	No	No	No	No	No	
	No	No	No	No	No	No	No	No	No	No	No	No	
	No	No	No	No	No	No	No	No	No	No	No	No	
	No	No	No	No	No	No	No	No	No	No	No	No	
	No	No	No	No	Yes	Yes	No	No	No	No	No	No	

signed by order:
 Dr M Kunde

Annexe 2

Translation / Original: German

Please note that the following terminology has been used:

Essigsäure - acetic acid

Essigessenz - vinegar essence

Gärungsessig/Essig - vinegar

Letter from the Federal Institute for Health Protection of Consumers and Veterinary Medicine (Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin - BgVV) to the German Federal Ministry of Transport, Building and Housing (Bundesministerium für Verkehr, Bau und Wohnungswesen)

Date: 31 March 1999

**Re: Classification of acetic acid with more than 10% acid as dangerous good pursuant to the ADR;
Our letter of 27 January 1999 - FB 8-2822-6/99 -**

Since our above-mentioned letter we have further pursued this matter and are now able to reply in more detail to your correspondence of 2 February 1999.

Meanwhile test reports from BASF on the topical effect of up to 50% acetic acid on rabbit skin have come in our possession. The test substance is an aqueous solution of technical acetic acid (technische Essigsäure), i.e. no vinegar (Gärungsessig). These are the only tests where the test substance is exactly designated in the IUCLID data set and exposure times were chosen according to the OECD method.

The results correspond well with those described in our above-mentioned letter. Therefore no differentiation is necessary between vinegar and technical acetic acid.

We concur with the internal evaluation by BASF's laboratory according to which 35% and 50% acetic acid are irritant to skin. Remarkable is the long duration of skin reddening and swelling. Also, in some cases surface layers of skin die off. In the post observation phase they either flake off or peel off as crusts. But this process seems to be rather a maceration of the cornified squamous epithelium, because underneath the cast off skin parties an intact, newly formed skin surface emerges. This process is by no means comparable with the deep skin destruction as defined with the term *necrosis* in the criteria of class 8. A corrosive effect in this meaning was observed with 90% acetic acid.

The question arises if, for the sake of consistency in the EU classification in the transport sector, a lower limit of 25% for the classification as *corrosive* should be striven for. This solution would be practice-oriented and could be justified in terms of toxicology.

Regarding the corrosive effect on steel or aluminium as a criterion for the classification of a substance in class 8 PG III, we would make the following basic observation:

We agree that a cargo with a corrosive effect can endanger the integrity of a means of transport in case of package failure. This is generally accepted for aircrafts and ships. A good example among transported dangerous goods is metallic mercury. By contrast, when limiting considerations to the interaction between packagings and their contents, the general principle applies that they must be compatible with each other. There is a multitude of possible combinations so that the right choice must be made in the individual case. The right choice is not primarily determined by the aspect of averting

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danger to public safety and order but it is, first all part, part of quality management in the transport chain. If a loaded good constitutes *per definitionem* no danger to humans, animals or objects after release from its enclosure, it is not evident why this good should be classified - ignoring this point - as a dangerous good only because a release seems possible due to the incompatibility of materials.

These considerations aim at a change of the criteria of class 8, and we intend to put them up for discussion in the ASV (Ausschuß Stoffe/Verpackungen, committee for substances/packagings).

In the subject of this letter, we are awaiting a decree by the German Federal Ministry of Transport, Building and Housing (BMVBW) to finalise this matter after evaluation of all positions received.

signed by order:

Dr M Kunde

Annexe 3

Translation / Original: German

Please note that the following terminology has been used:

Essigsäure - acetic acid

Essigessenz - vinegar essence

Gärungsessig/Essig - vinegar

Letter from the German Federal Institute for Material Research and Testing
(Bundesanstalt für Materialforschung und -prüfung - BAM) to the
German Federal Ministry of Transport, Building and Housing
(Bundesministerium für Verkehr, Bau und Wohnungswesen), Mr Oberreuter

Date: 18 August 2000

**Re: Classification and transport of acetic acid food grade
(vinegar essence with not more than 25% acetic acid)
Your letter: Transport of dangerous goods; - Classification of acetic acid
(vinegar) of 5 November 1999 (A44/26.00.70-03-1/99-14 SH 99)
Your letter of 24 February 2000 (A 44/26.00.70-03-1/99-19 Ver 00)**

Dear Mr Oberreuter

The German Chemical Industry Association (VCI, Mr Scholz) addressed BAM, asking to clarify the classification and transport of acetic acid food grade (vinegar essence with not more than 25% acetic acid) and in particular regarding statements on the corrosion behaviour of the above-mentioned acetic acid in connection with metallic materials. You were previously advised by letter of 27 January 2000 that VCI's sector group 'Acetic Acid Food Grade' would like to achieve - analogously to the Association of the German Vinegar Industry (Verband der deutschen Essigindustrie) - an exemption within a multilateral agreement for the transport of acetic acid (vinegar essence with not more than 25% acetic acid). The reason underlying this request is the change in the concentration limit for acetic acid in class 8 item 32 c) of the ADR RID from 25% to 10% as from 1 January 1999; you are aware of this change.

In the meeting of 22 October 1999 in your offices, the participants noted after a full discussion that there is no danger of corrosion - fear of corrosion is the reason for the classification of acetic acid in the concentration range from 10% to 25% as a dangerous good of class 8, packing group III - in the transport of vinegar by road and rail and that any danger of corrosion can be avoided by way of simple conditions and measures.

Exclusively containers made of austenitic CrNi steels or plastics are used in the transport of vinegar and vinegar essence. The corrosion rate for surface corrosion of high-grade steels under the impact of acetic acid in the mentioned concentration range at test temperatures of 100 °C is under 0.1 mm/annum. According to foodstuffs legislation, vinegar that contains in 100 g more than 11 g of acetic acid free from water may be transported only in closed containers which will reliably resist the expected strain and are made of materials that are not susceptible to corrosion due to acetic acid and do not react with acetic acid in a dangerous way. Consequently containers made of aluminium and unalloyed steels are not used for the handling of these products. Since the food industry is the only customer of the acetic acid industry, a high degree of purity is essential for acetic acid. According to Mr Scholz of VCI, the same requirements to purity apply to vinegar essence and vinegar alike.

In the above-mentioned meeting we pointed out that statements on corrosion behaviour and the conclusions drawn can currently apply only to vinegar used in the food sector. Technically manufactured acetic acid is largely transported in higher concentrations and does not occur in transport as a pure aqueous solution in concentrations between 10% and 25%. Products in this concentration range contain not only acetic acid but also other substances (e.g. detergents, products for technical applications).

BAM can state that the corrosion behaviours of vinegar and vinegar essence in the concentration range of 10% to 25% with the same requirements to purity are almost identical. In view of these points we are in favour of a multilateral agreement analogously to vinegar.

Yours sincerely
signed: Dipl.-Chem. M. Weltschev
etc
