

# Glyceryl triacetate

## Botanical Source

**Synonyms** Triacetin;  
Glycerol triacetate

## IUPAC Name

**CAS Reference** 102-76-1

**E Number** E1518

## Food Legislation

| Council of Europe (CoE) |         |
|-------------------------|---------|
| Number                  | Comment |
| -                       | -       |

| US Food and Drug Administration |                                             |
|---------------------------------|---------------------------------------------|
| Number                          | Comment                                     |
| 182.1901                        | Approved by the US FDA. FDA 21 CFR 182.1901 |

| Joint FAO/WHO Expert Committee on Food Additives (JECFA) |     |                                                                                                                                                                  |
|----------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number                                                   | ADI | Comment                                                                                                                                                          |
| 920                                                      | ND  | On the basis of the available data, the total daily intake arising from use levels necessary to achieve the desired effect does not represent a hazard to health |

| FEMA     |                                                                         |
|----------|-------------------------------------------------------------------------|
| FEMA No. | Comment                                                                 |
| 2007     | Generally recognised as safe as a flavour ingredient:GRAS List Number 3 |

## Natural Occurrence and Use in Food

Found in papaya; used in candy, baked goods, ice cream.

## Estimated Intake from Food and Drink

| Daily Intake mg/kg/day | FEMA Possible Average Daily Intake mg |
|------------------------|---------------------------------------|
| 1.6242                 | 0.083                                 |

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### Tobacco Product Related Chemical and Biological Studies for Ingredients Added in a Mixture

| Smoke Chemistry  |                |                                                                                                                                    |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------|
| Published Source | Level Tested % | Comment                                                                                                                            |
| BAT              | 0.12000        | At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke. |
| Philip Morris    | 0.00540        | An overall assessment of the data suggests that this ingredient did not add to the toxicity of smoke.                              |

| Ames Activity    |                |                                                                                                                                                               |
|------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Published Source | Level Tested % | Comment                                                                                                                                                       |
| BAT              | 0.12000        | Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke condensate was not increased by the addition of the ingredient. |
| Philip Morris    | 0.00540        | Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke was not increased by the addition of the ingredient.            |

| Micronucleus     |                |                                                                                                                                                               |
|------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Published Source | Level Tested % | Comment                                                                                                                                                       |
| BAT              | 0.12000        | Within the sensitivity of the in vitro micronucleus assay the activity of the cigarette smoke condensate was not increased by the addition of the ingredient. |

| Neutral Red      |                |                                                                                                                                                            |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Published Source | Level Tested % | Comment                                                                                                                                                    |
| BAT              | 0.12000        | Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke condensate was not increased by the addition of the ingredient. |
| Philip Morris    | 0.00540        | Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke was not increased by the addition of the ingredient.            |

| Inhalation       |                |                                                                                                                                                    |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Published Source | Level Tested % | Comment                                                                                                                                            |
| BAT              | 0.12000        | The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.                 |
| Lorillard        | 0.00300        | The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.                 |
| Philip Morris    | 0.00540        | The data indicate that the addition of the ingredient, when added with one of three groups, did not increase the inhalation toxicity of the smoke. |

| Mouse Skin Painting |                |                                                                                                                                                                                                                                                                                        |
|---------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Published Source    | Level Tested % | Comment                                                                                                                                                                                                                                                                                |
| Lorillard           | 0.00010        | None of the changes appeared to be substantial enough to conclude that the tumour promotion capacity of the condensate was discernibly different between condensate produced from cigarettes with the ingredient in comparison with condensate from cigarettes without the ingredient. |

| References                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baker RR, Pereira da Silva JR, Smith G. The effect of tobacco ingredients on smoke chemistry. Part I: Flavourings and additives. Food Chem Toxicol. 2004; 42 Suppl:S3-37.                                                                                    |
| Baker RR, Pereira da Silva JR, Smith G. The effect of tobacco ingredients on smoke chemistry. Part II: casing ingredients. Food Chem Toxicol. 2004; 42 Suppl:S39-52.                                                                                         |
| Baker RR, Massey ED, Smith G. An overview of the effects of tobacco ingredients on smoke chemistry and toxicity. Food Chem Toxicol. 2004; 42 Suppl:S53-83.                                                                                                   |
| Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 1: cigarette design, testing approach, and review of results. Food Chem Toxicol. 2002; 40(1): 77-91.                                                               |
| Rustemeier K, Stabbert R, Haussmann HJ, Roemer E, Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 2: chemical composition of mainstream smoke. Food Chem Toxicol. 2002; 40(1): 93-104.                             |
| Roemer E, Tewes FJ, Meisgen TJ, Veltel DJ, Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 3: in vitro genotoxicity and cytotoxicity. Food Chem Toxicol. 2002; 40(1): 105-111.                                     |
| Vanschewijck PM, Teredesai A, Terpstra PM, Verbeeck J, Kuhl P, Gerstenberg B, Gebel S, Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 4: subchronic inhalation toxicity. Food Chem Toxicol. 2002; 40(1): 113-131. |

Gaworski CL, Dozier MM, Heck JD, Gerhart JM, Rajendran N, David RM, Brennecke LH, Morrissey R. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: 13 week inhalation exposures in rats. *Inhal. Toxicol.* 1998; 10:357-381

Gaworski CL, Heck JD, Bennett MB, Wenk ML. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: skin painting bioassay of cigarette smoke condensate in SENCAR mice. *Toxicology.* 1999; 139(1-2):1-17.

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### Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

| References                                                                                             |
|--------------------------------------------------------------------------------------------------------|
| Baker RR, Bishop LJ. The pyrolysis of tobacco ingredients. J. Anal. Appl. Pyrolysis 2004, 71, 223-311. |

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## Toxicological Data on the Unburnt Ingredient

[+ve, positive; -ve, negative; ?, equivocal  
with, with metabolic activation; without, without metabolic activation]

### In vivo

| Species                        | Test conditions                                                                                                                                                   | Endpoint | Results | Reference      |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|----------------|
| <i>Drosophila melanogaster</i> | Adult fruit flies were “dosed at 0.2-0.3 mg”.<br><br>An early, Eastern European study of unknown quality, with only very brief reporting in a review (CIR, 2003). | Mutation | -ve     | Efremova, 1962 |

### In vitro

| Test system                 | Test conditions                                                                                                                                                                      | Endpoint          | Activation status   | Results                                                                                                                                      | Reference            |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Hamster lung (CHL/IU) cells | Up to 5 mg/ml (although the minimum effective dose - not specified - was said to produce over 50% cytotoxicity). Cells incubated for 24 hr and examined for chromosomal aberrations. | Chromosome damage | With and without S9 | +ve (with S9 only)<br><br>[It was noted that the induction of chromosomal damage may have resulted due to the low pH of the culture medium.] | Kusakabe et al. 2002 |

|                                                                    |                                                                                        |          |                     |                               |                           |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------|---------------------|-------------------------------|---------------------------|
|                                                                    |                                                                                        |          |                     |                               |                           |
| <i>Salmonella typhimurium</i> strains TA97, TA98, TA100 and TA1535 | Ames test, using concentrations up to 10 mg/plate. A high quality study.               | Mutation | With and without S9 | -ve                           | NTP, 2004                 |
| <i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537  | Ames test, using concentrations up to 5 mg/plate.                                      | Mutation | With and without S9 | -ve<br>(a good quality study) | HRC, undated              |
| <i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537  | Ames test, using concentrations up to 5 mg/plate. Study performed to OECD guidelines.  | Mutation | With and without S9 | -ve                           | JETOC, 2000               |
| <i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537  | Ames test, using concentrations up to 5 mg/plate.                                      | Mutation | With and without S9 | -ve                           | Unichema Chemie BV, 1994. |
| <i>Salmonella typhimurium</i> strains TA1535, TA1537 and TA1538    | Ames test, using concentrations up to 0.0013% w/v. Limited study: insufficient strains | Mutation | With and without S9 | -ve                           | LBI, 1976                 |
| <i>Salmonella typhimurium</i> , various strains                    | 2 Ames tests (unpublished)                                                             | Mutation | With and without S9 | -ve                           | IUCLID, 2000              |
| <i>Salmonella typhimurium</i>                                      | Ames test. [Apparently a very brief                                                    | Mutation | With and without S9 | -ve                           | Wallat, 1982              |

|                                    |                                                                             |          |                     |     |             |
|------------------------------------|-----------------------------------------------------------------------------|----------|---------------------|-----|-------------|
|                                    | report of an unpublished study. No further details given in expert review.] |          |                     |     |             |
| <i>Escherichia coli</i> WP2uvrA    | Up to 5 mg/plate.                                                           | Mutation | With and without S9 | -ve | JETOC, 2000 |
| <i>Saccharomyces cerevisiae</i> D4 | Up to 5% w/v.                                                               | Mutation | With and without S9 | -ve | LBI, 1976   |

## References

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Unichema Chemie BV (1994). Unpublished data supplied to CTFA (Cosmetic, Toiletry and Fragrance Association) (cited in CIR, 2003).

Wallat S (1982). Unpublished data. Henkel KGaA, Report No. 292 (cited in Bibra, 1997).