

# STARTER-KIT

CONTAINS THE MOST  
COMMON OFF-FLAVOURS  
FOR THE „BASICS OF  
SENSORY ANALYSIS“

Doemens flavour standards  
allow targeted and efficient  
application in the brewery  
and are the basis for efficient  
sensory quality control.



09

## DIACETYL

**Butter-like, sweet,  
creamy caramel**

Metabolic product of yeast,  
formed at the beginning of fer-  
mentation, remains in the finished  
product if maturation is incom-  
plete; contamination with lactic  
acid bacteria (*Pediococcus*)



01

## ACETALDEHYDE

**Green apple, pungent**

Metabolic product of yeast,  
formed during alcoholic  
fermentation as precursor of  
ethanol (green beer aroma);  
contamination with acetic acid  
bacteria



08

## DMS (DIMETHYLSULFID)

**Sweet corn, cabbage or celery**

Formed from malt-derived  
precursors, remaining in the  
finished product if wort boiling is  
insufficient; contamination with  
wort bacteria in the brewhouse



23

## PAPERY

**Cardboard-like**

Fatty acid oxidation caused by  
oxygen input, forced by high  
temperature



53

## MENTHANTHOLONE

**Blackcurrant, catty, cat urine**

Formed as a result of oxidation  
reactions in the beginning of  
beer ageing



20

## LIGHT STRUCK

**Skunk, cannabis-like**

Caused by exposure to light;  
degradation of light-reactive  
isohumulones (especially in  
green glass bottles)

# FLAVOUR-KIT

## „FERMENTATION ERRORS“

### ORIGIN

Metabolic products of yeast

### MEANING

Typical green beer substances,  
atypical varietal aromas

### POSSIBLE CAUSES

Fermentation management,  
temperature, yeast cell count,  
yeast vitality



09

### DIACETYL

**Butter-like, sweet,  
creamy caramel**

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formed at the beginning of fer-  
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product if maturation is incom-  
plete; contamination with lactic  
acid bacteria (*Pediococcus*)



01

### ACETALDEHYDE

**Green apple, pungent**

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formed during alcoholic  
fermentation as precursor of  
ethanol (green beer aroma);  
contamination with acetic acid  
bacteria



45

### H<sub>2</sub>S (HYDROGEN SULPHIDE)

**Boiled or rotten eggs, stink bomb**

Metabolic product of yeast  
depending on yeast strain and  
fermentation process; insufficient  
CO<sub>2</sub> scrubbing; contamination  
with H<sub>2</sub>S forming bacteria



55

### 4-VG (4-VINYLGUAJACOL)

**Phenolic, clove-like**

Undesirable in bottom-fermented  
beers; caused by contamination  
with wild yeasts



17

### ISOAMYLACETATE

**Estery, banana-like**

Excessive increase of esters  
due to high gravity; depending  
on yeast strain



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### ETHYLACETATE

**Glue, solvent-like,  
nail varnish remover**

Excessive increase of esters  
due to high gravity; depending  
on yeast strain

# FLAVOUR-KIT

## „AGING / OXIDATION“

### ORIGIN

Oxidation and degradation of amino acids and other precursors

### MEANING

Typical off-flavours occurring during ageing beer

### POSSIBLE CAUSES

High oxygen input; light and temperature exposure after leaving the brewery



### MENTHANTHOLONE

53

**Blackcurrant, catty, cat urine**

Formed as a result of oxidation reactions in the beginning of beer ageing



### PAPERY

23

**Cardboard-like**

Fatty acid oxidation caused by oxygen input, forced by high temperature



### DAMASCENONE

38

**Floral, fruity, cooked apple, plum, berries**

Formed from the oxidative breakdown of precursors from raw materials



### ALMOND (BENZALDEHYDE)

03

**Bitter almond, marzipan**

Benzaldehyde is formed in beer during ageing (strecker degradation)



### ETHYLPHENYLACETATE

56

**Honey, floral, rose**

Occurs in beer during ageing from precursors formed during fermentation



### LIGHT STRUCK

20

**Skunk, cannabis-like**

Caused by exposure to light; degradation of light-reactive isohumulones (especially in green glass bottles)

# FLAVOUR-KIT

## „CONTAMINATION“

### ORIGIN

Contamination with various bacteria and yeast strains

### MEANING

Typical off-flavours in a variety of beer styles

### POSSIBLE CAUSES

Inadequate industrial hygiene



09

### DIACETYL

**Butter-like, sweet, creamy caramel**

Metabolic product of yeast, formed at the beginning of fermentation, remains in the finished product if maturation is incomplete; contamination with lactic acid bacteria (*Pediococcus*)



01

### ACETALDEHYDE

**Green apple, pungent**

Metabolic product of yeast, formed during alcoholic fermentation as precursor of ethanol (green beer aroma); contamination with acetic acid bacteria



45

### H<sub>2</sub>S (HYDROGEN SULPHIDE)

**Boiled or rotten eggs, stink bomb**

Metabolic product of yeast depending on yeast strain and fermentation process; insufficient CO<sub>2</sub> scrubbing; contamination with H<sub>2</sub>S forming bacteria



55

### 4-VG (4-VINYLGUAJACOL)

**Phenolic, clove-like**

Undesirable in bottom-fermented beers; caused by contamination with wild yeasts



08

### DMS (DIMETHYLSULFID)

**Sweet corn, cabbage or celery**

Formed from malt-derived precursors, remaining in the finished product if wort boiling is insufficient; contamination with wort bacteria in the brewhouse



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### LACTIC ACID

**Acidic, sour milk, yoghurt**

Contamination with lactic acid bacteria



## INSTRUCTIONS FOR USE



### SHAKE THE AMPULE

Before opening the ampule, please shake thoroughly to mix the contents. In some cases, some of the liquid may remain in the top of the ampule. Should this occur, lightly tap or flick the top of the ampule with your fingers until the liquid flows to the bottom.



### OPEN THE AMPULE

Wrap a piece of paper towel or facial tissue around the ampule. Hold the ampule upright and snap the upper portion off at the neck. This will make an audible noise, indicating that ampule is open.



### PREPARE THE BEVERAGE

Each ampule can be used to treat the following volumes: beer: 1 liter; water and beverages primarily composed of water: 1 liter. If other concentrations are desired, the amount of beverage must be adjusted accordingly!



### POUR THE FLAVOUR STANDARD INTO THE LIQUID

Pour half of the beverage into a container. After opening, hold the ampule over the container and allow the contents to flow into the liquid. Lightly tap the bottom to empty the ampule. Add the rest of the beverage to the container to achieve a uniform mixture.

### INTENDED USE:

These ampules are intended to aid in the identification of sensory characteristics. They are only to be used for analysis and educational purposes.

Further information on using the flavour standards as well as individual descriptions and datasheets/online order forms can be found at [www.doemens.org](http://www.doemens.org)