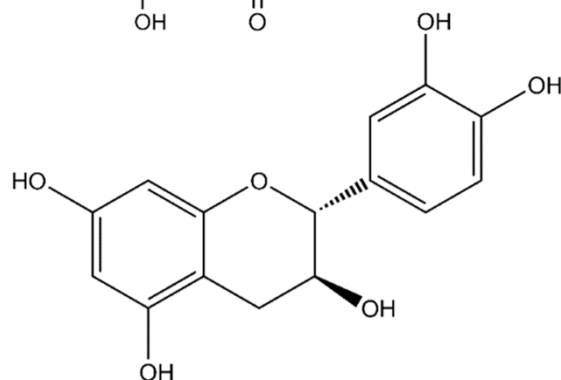
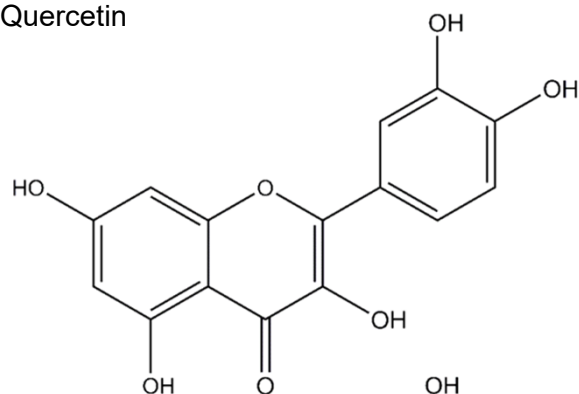


## Tannin Extract

### ❖ Overview

- The water-soluble fraction arising from the ethanol extraction process of leaf hops – **Tannin Extract** – contains low molecular weight polyphenols, which mainly contribute to flavor.
- Among others, the polyphenol fraction of the **Tannin Extract** contains the low molecular weight polyphenols catechin and epicatechin as well as glycosidically bound quercetin, kaempferol and multifidols.
- **Tannin Extract** enables the brewer to add polyphenols during wort boiling for the purpose of improving hot break formation.

Quercetin



Catechin

### ❖ Specifications

- |                      |                               |
|----------------------|-------------------------------|
| • Description:       | dark brown liquid             |
| • Water content:     | 40 – 50 %                     |
| • Sugars:            | typically around 20 %         |
| • Proteins:          | typically around 10 %         |
| • Polyphenols*:      | 2 – 6 %                       |
| • Bitter substances: | < 2 %                         |
| • pH:                | 5.4 (± 0.5)                   |
| • Viscosity:         | 5 – 10 mPas at 40 °C (104 °F) |
| • Density:           | 1.2 g/ml at 20 °C (68 °F)     |

\*dependent on variety and crop year

## ❖ Properties

### • Appearance

**Tannin Extract** is a dark brown liquid.

### • Utilization

The degree of utilization depends on the time of the addition. Very high yields can be achieved with **Tannin Extract** as it is readily soluble in water.

### • Flavor

The flavors and level of mouthfeel **Tannin Extract** imparts to beer depends on the quantity and the time of the addition. Late kettle additions can contribute to overall hop flavor.

### • Quality

All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

## ❖ Packaging

**Tannin Extract** can be packaged in cans, pails and drums according to customer requirements:

Cans: 0.5 to 4.2 kg  
Pails: 20 kg  
Drums: 50 and 200 kg

## ❖ Product Use

### • Dosage

**Tannin Extract** is typically added at a rate of 50 – 200 g/hl.

### • Application

**Tannin Extract** additions can take place at any stage of beer production; it is typically added to the wort kettle.

### • Storage

**Tannin Extract** should be stored in sealed containers at temperatures of 0 – 10 °C (32 – 50 °F). Opened containers should be used within a few days.

### • Best Before Date

**Tannin Extract** is stable for one year from the date it was produced / packaged if stored under the recommended conditions.

### • Safety

**Tannin Extract** is a natural product and may be safely handled using routine precautions to avoid contact with skin and, in particular, the eyes. Any product coming into contact with the skin should be immediately washed off with soap and water or an appropriate hand cleanser. If **Tannin Extract** gets into the eyes, flush with copious amounts of water until clear and seek medical attention. For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

## ❖ Analytical Methods

### • Total Polyphenols

Total polyphenols can be measured using the method EBC-Analytica 7.14.

### • Low Molecular Weight Polyphenols

Low molecular weight polyphenols are measured by HPLC using the relevant pure substances as external calibration standards.

## ❖ Technical Support

We are pleased to offer assistance and advice on the full range of Hopsteiner® products:

- copies of all relevant analytical procedures
- Safety Data Sheets (SDS)
- assistance with pilot or full-scale brewing trials
- special analytical services

Disclaimer: The information provided in this document is believed to be correct and valid. However, Hopsteiner® does not guarantee that the information provided here is complete or accurate and thus assumes no liability for any consequences resulting from its application.