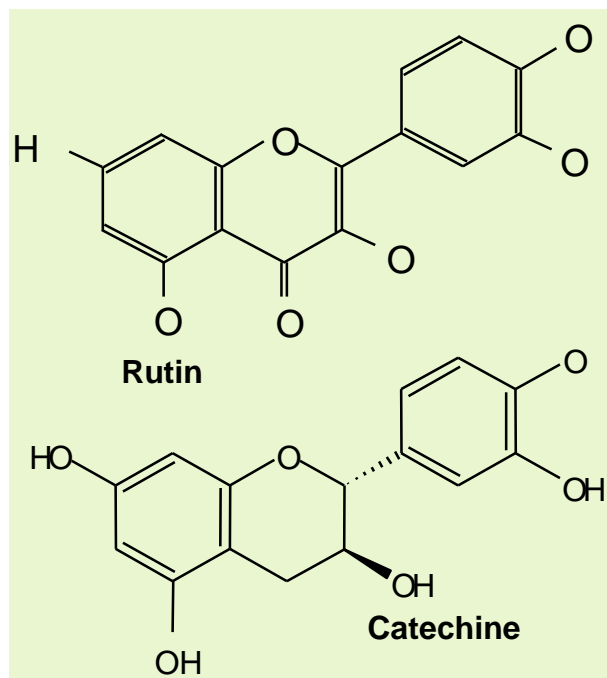


## Tannin Extract

### ❖ Overview

- The water-soluble fraction from the ethanol extraction process – the **Tannin Extract** – contains low molecular weight polyphenols, which have anti-oxidative properties.
- Amongst others, the polyphenol fraction of the **Tannin Extract** contains the low molecular polyphenols Catechin, 2-MPPG (1-[(2-Methylpropionyl)-phlorogluciny]- $\beta$ -D-glucopyranoside), Rutin, Astragalin and Epicatechin.
- **Tannin Extract** enables the brewer to add polyphenols, during wort boiling, which can act as anti-oxidants.



### ❖ Specifications

- **Description:** Dark-brown liquid
- **Water content:** Approx. 45 – 50 %
- **Sugar:** 20 %
- **Protein:** 10 %
- **Polyphenols:** Approx. 2 – 6 % (depending on variety)
- **Bitter substances:** < 2 %
- **Density:** 1.2 g/ml

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## ❖ Properties

### □ Appearance

Dark-brown liquid.

### □ Flavor

When added during wort boiling, **Tannin Extract** has no negative impact on beer flavor.

### □ Quality

All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards.

## ❖ Packaging

**Tannin Extract** can be packed in various container sizes up to 200 kg-drums.

## ❖ Product Use

**Tannin Extract** should be added during wort boiling. Recommended time of addition is 15 min. before the end of boiling. Because of its good solubility in water it is not necessary to warm the **Tannin Extract** before addition.

### □ Dosage

#### **Example:**

A dosage of 100 g / hl **Tannin Extract** with 6 % total polyphenols is comparable to a hop dosage of 8 g alpha / hl (based on leaf hops).

Time of addition is preferably 15 to 20 min. before the end of the boil. Because of subtle differences in the type of equipment used in each brewery, the final dosage will need to be established empirically.

### □ Addition

**Tannin Extract** can be added to the wort in the same way as normal hop extract.

### □ Storage

**Tannin Extract** should be stored cool (< 10°C).

### □ Safety

**Tannin Extract** should be handled like normal hop extract. If **Tannin Extract** gets into the eyes, irrigate thoroughly with water and seek medical attention.

For full safety information please see the relevant Steiner material safety data sheet.

## ❖ Analytical Methods

The following methods are used in the analysis of **Tannin Extract**:

- Total polyphenols are measured by the method EBC (Harris und Ricketts).
- Low molecular polyphenols by HPLC using the relevant pure substances as external calibration standards.

## ❖ Technical Support

We will be pleased to offer help and advice on the full range of Hopsteiner® products:

- Copies of all relevant analytical procedures
- Material Safety Data Sheets (MSDS)
- Assistance with pilot or full brewery trials
- Specialist analytical services

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