



Application Notes | TURBIDI.T™

Testing the turbidity of several types of beer with TURBIDI.T™

This study was performed in collaboration with the microbrewery EtOH (Montreal, QC) which brewed and provided the different tested beers.

SUMMARY

- Turbidity or haze is a crucial parameter in the beer industry since it indicates the brewing quality and influences the flavor profile and the shelf life of the product.
- TURBIDI.T™ successfully characterized the turbidity of different types of beers.
- Pilsner showed the lowest turbidity level, followed by amber, wheat, and NEIPA.

INTRODUCTION

Turbidity provides the consumer's first visual impression of beer quality. Beer turbidity, technically known as haze, can be a desired or an undesired effect. Industrial beer companies normally choose to filter their beer and follow a precise quality control analysis with the aim of reducing the haze. Consumers expect a filtered beer to be a clear, bright and non-hazy product that remains so during its shelf life. On the other hand, artisanal beers normally have higher haze to maintain their unique flavor and appearance, specially for some types of beers such as New-England Indian Pale Ale (NEIPA). Haze results primarily from proteins, polyphenols and sometimes carbohydrates in colloidal form [1].

In this application note, the TURBIDI.T™ was used to measure the haze in various types of beers provided by EtOH, a local microbrewery located in Montreal, QC.

MATERIALS AND METHODS

Four different beer styles have been collected from the microbrewery EtOH (Montreal, QC): pilsner, amber, wheat and NEIPA (**Figure 1**). Beer samples have been stored at 4°C. Previous to testing, the TURBIDI.T™ equipment was calibrated with formazin standards (FTU). Beers have been tempered at 25°C and 3 samples of each type were prepared in 10 mL vials for testing in TURBIDI.T™ (n=3). Average results are expressed as mean ± standard deviation.

RESULTS AND DISCUSSION

Turbidity, or haze, is a characteristic that can vary greatly among different types of beer. Based on a series of turbidity analysis conducted on several beer styles, it was observed that pilsner had the lowest turbidity levels (1.4 ± 0.34 FTU), followed by amber (38.53 ± 6.5 FTU), wheat (234.2 ± 3.1 FTU), and finally NEIPA (370.3 ± 4.7 FTU), which had the highest turbidity level (**Figure 2**). The visual appearance of the haze was in coherence with the turbidity results measured with TURBIDI.T™ (**Figure 1**). Pilsners are known for their crisp, clear appearance, while amber beers typically have a slight haze. Wheat



TIME
MEASUREMENTS



TESTING
CONFIGURATION

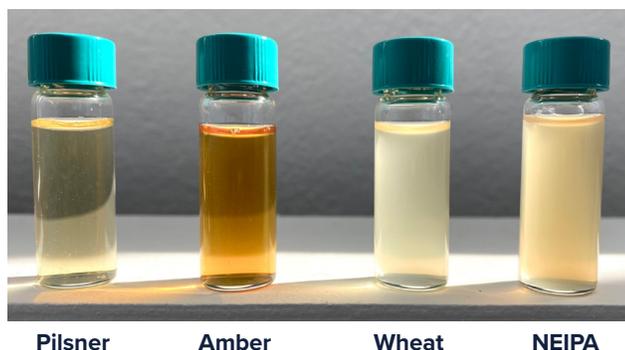


Figure 1. Different types of beer tested.

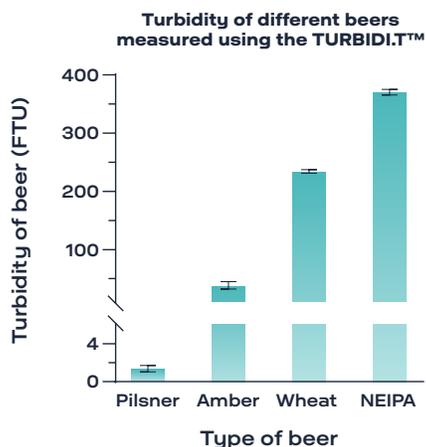


Figure 2: Turbidity (in FTU) of different types of beer obtained from the TURBIDI.T™.

beers often have a hazy, opaque appearance due to the presence of wheat proteins, while NEIPAs are famous for their turbid, hazy appearance caused by high levels of hop oils and proteins. These results indicate that turbidity can be used as a characteristic to distinguish between different beer styles.

The varying turbidity levels of different beer styles provide insight into the unique brewing processes and ingredients used for each style. This information can be valuable to brewers seeking to improve their techniques and achieve specific appearance and flavor profiles. For example, achieving a lower turbidity level in a pilsner may involve longer conditioning times, whereas achieving a higher turbidity level in a NEIPA may involve using specific hop varieties and dry-hopping techniques.

Additionally, for consumers, the turbidity of a beer can be an indicator of its freshness and quality. Hazy beers, such as NEIPAs, are often best consumed fresh, as the hop flavors and aromas can diminish over time. Clearer beers, such as pilsners, generally have a longer shelf life and are more consistent in flavor over time.

CONCLUSIONS

TURBIDI.T™ successfully measured the turbidity of different types of beer. Pilsner beer has the lowest turbidity levels, followed by amber, wheat, and NEIPA style. Turbidity analysis is crucial in the beer industry as it measures clarity and identifies the presence of suspended particles that can affect flavor, aroma, and shelf life. It helps ensure quality, compliance and efficiency of the brewing process as well as to distinguish between different beer styles.

Therefore, this study showed that:

- The turbidity of beers can be easily measured with the user-friendly TURBIDI.T™ instrument.
- Turbidity data can be collected into a tablet via the Soft Matter Analytics™ App and exported as needed.
- Multiple TURBIDI.T™ units can be connected to the same operating tablet to create a scalable testing platform.

REFERENCES

[1] "A Healthy Shade", Josh Weikert, 2017. Beer and brewing: <https://beerandbrewing.com/a-hazy-shade/>