What is FAN?
FAN is extracted from the malt during the mash process. The age and quality of the malt will influence the amount of FAN that is present in the wort.

FAN is an important nutrient to the brewer and is vital to maintain healthy yeast cells during fermentation.

Benefits of Measuring FAN
When mashing, a brewer should get amino nitrogen from the grain. The benefit of measuring FAN levels is that it allows the brewer to make a decision on whether or not the brewer needs to add more nutrients to the wort prior to fermentation.

This measurement means that brewers can avoid losing product and reduce costs. If the necessary nutrients are not added, then the mash may not completely ferment (this is known as stuck fermentation) and the yeast cells don’t survive due to the lack of FAN. The stuck fermentation is then thrown away, causing the brewer to lose product and production time.

Why is FAN Measurement Important to a Brewer?
FAN is regarded as a good index for predicting healthy yeast growth, viability, vitality, and fermentation efficiency which leads to beer quality and stability. If a brewery tests for VDK and they keep having issues, testing for FAN could be useful as this could be the root cause of their VDK problem.

Low Levels of FAN
Low FAN levels may indicate slow or incomplete fermentation. Worts low in FAN can have high diacetyl. Basically, if a brewer feeds their yeast cells, the yeast will try to make their own amino acids (valine) which will produce more diacetyl.

Usually malted barley supplies all the FAN needed. However if a brewer uses corn, rice, unmalted wheat or barley, honey, or refined sugars then the wort won’t have enough nutrients necessary for the yeast to build strong cells. Extracts are sometimes thinned with corn sugar and will cause low FANs. So, nutrients would need to be added to the wort.
High Levels of FAN

Measurement of FAN allows the brewer to reduce the risk of high levels of FAN, which can lead to problems both in the taste and in the microbiological stability of the beer. If there is too much nutrient, the beer gets infected by microbes; spoiling the finished beer and costing the brewer time and money as they will have to throw the beer away.

When and Where Should FAN be Measured?

Samples should be taken before fermentation at the brew kettle. Samples can also be measured in beer.

How to Test?

Tests can be performed using relatively simple and inexpensive UV-visible spectroscopy methods.

The DR6000™ UV-VIS Spectrophotometer supports many of the analytical measurements necessary for monitoring throughout the entire brewing process from raw materials to final product.

The DR6000 brewing-specific software has been expanded to include the most important parameters from both MEBAK and the American Society of Brewing Chemists (ASBC). This means that the DR6000 can be used to measure beer quality around the globe.

In the DR6000, programs for the measurement of FAN are available in accordance with both MEBAK and ASBC.

- FAN, light beer program 2008 0 - 400 mg/L FAN
- FAN, light wort program 2007 0 - 400 mg/L FAN
- FAN, dark beer program 2016 0 - 400 mg/L FAN
- FAN, dark wort Program 2015 0 - 400 mg/L FAN
- ASBC FAN, beer Program 2024 0 - 400 mg/L FAN
- ASBC FAN, wort Program 2025 0 - 400 mg/L FAN

FAN MEBAK and ASBC Methods

The methods for both MEBAK and ASBC are identical. The prepared beer or wort is mixed with a color reagent (based on ninhydrin) and the absorbance is measured at a wavelength of 570 nm in a 10 mm cuvette.

ASBC method — Wort-12 0 - 400 mg/L and Beer-31 0 - 400 mg/L
MEBAK, Wort, Beer, Beer-Based Beverages, 1st Edition 2012, page 84 ff