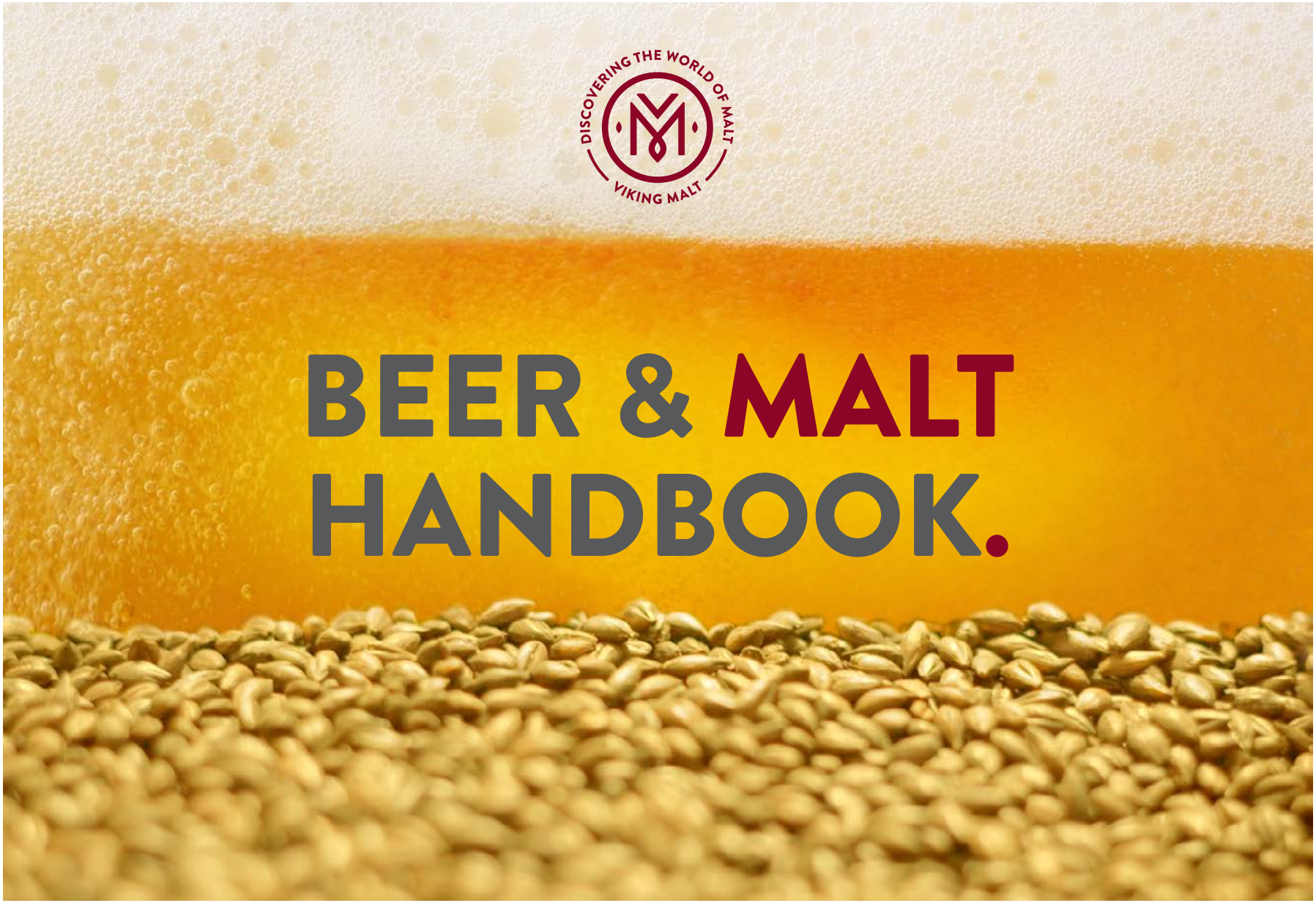

DISCOVERING THE WORLD OF MALT
VIKING MALT
BEER & MALT
HANDBOOK.

1. BEER TYPES

The world is full of different beers, divided into a vast array of different types. Many classifications and precise definitions of beers having been formulated over the years, ours are not the most rigid, since we seek simply to review some of the most important beer types. In addition, we present a few options for the malt used for each type - hints for brewers considering different choices of malt when planning a new beer.

The following beer types are given a short introduction and contain links to our Viking Malt malts.

TOP FERMENTED BEERS:

- Ales
- Stouts and Porters
- Wheat beers

BOTTOM FERMENTED BEERS:

- Lager
- Dark lager
- Pilsner
- Bocks
- Märzen

PILSNER

BACKGROUND

Known as the "mother" of all pale lagers, pilsner originated in Bohemia, in the city of Pilsen. Pilsner is said to have been the first golden, clear lager beer, and is well known for its very soft brewing water, which contributes to its smooth taste. Nowadays, for example, over half of the beer drunk in Germany is pilsner.

DESCRIPTION

Pilsner was originally famous for its fine hop aroma and strong bitterness. Its golden color and moderate alcohol content, and its slightly lower final attenuation, give it a smooth malty taste. Nowadays, the range of pilsner beers has extended in such a way that the less hopped and lighter versions are now considered ordinary lagers.

TYPICAL ANALYSIS OF PILSNER

Original gravity	11-12	°Plato
Alcohol content	4.5-5.2	% volume
Color	6-12	°EBC
Bitterness	25-40	BU

COMMON MALT BASIS

Pale Pilsner Malt is used according to the required specifications.

BREWING PRECAUTIONS

None in particular!

LAGERS

BACKGROUND

No doubt the most popular beer type in the world, but also one of the youngest, only the invention of refrigeration systems in the late 19th century making it possible to maintain the required low processing temperatures throughout the year. Since then, it has rapidly overtaken top fermented beers in terms of volume consumed. 'Lager' is sometimes used incorrectly to refer to all bottom fermented beers. Strong lagers are known as **exports** and lighter lagers simply as **light** beers.

DESCRIPTION

Lager is a bottom fermented beer, originally stored for long periods in the cold. It is pale in color and moderately hopped, with a flavor not usually characterised by any aroma in particular. It would be apposite to define this beer type as highly drinkable.

TYPICAL ANALYSIS OF PILSNER

Original gravity	10-11.5	°Plato
Alcohol content	4-5.5	% volume
Color	7-15	°EBC
Bitterness	15-25	BU

COMMON MALT BASIS

Pale Pilsner Malt, up to 100%. A less or more modified malt should be selected, depending on the particular beer characteristic sought (mouth feel, foam etc.). For flavor enrichment, a proportion of the grist can be replaced for example with Caramel Pale Malt or Vienna Malt. Adjuncts can also be used.

BREWING PRECAUTIONS

None in particular! If a very high proportion of malt with a low level of amylolytic activity is used, it should be taken into account during the mashing procedure. Active base malt in use is also recommended to be highly active in these cases.

MÄRZEN

BACKGROUND

The name, märzen, comes from the German word **märz**, meaning March. Before the development of efficient cooling systems, brewing was not always possible during the summer, leading to large quantities of strong beer being brewed in the early spring (around March) and its storage in cool cellars over the summer. In the autumn, these beer kegs were usually opened in **Oktoberfests**. Märzen also being known as **Vienna lager** or **Oktoberfest beer**. Nowadays, märzens are typical seasonal or festival beers in many countries.

DESCRIPTION

Märzens are bottom fermented beers, their color ranging from gold to copper or bronze. Taste is very malty and sweet. Hopping is focused on producing variety of aromas and these beers have a higher original gravity than pilsners or ordinary lagers.

TYPICAL ANALYSIS OF MÄRZEN

Original gravity	12-14	°Plato
Alcohol content	5-6.5	% volume
Color	10-40	°EBC
Bitterness	20-30	BU

COMMON MALT BASIS

Vienna Malt and Munich Light&Dark Malts are special malts developed for these beers. Malt taste can be rounded off using caramel malts or other dark brewing malts, such as Caramel Pale or Dark Ale Malt. However, most of the grist remains as Pilsner Malt.

BREWING PRECAUTIONS

When special malts are used, a longer mashing procedure is normally required.

BOCKS

BACKGROUND

A strong lager beer, originally from German with a long history starting from 14th century and the city of Einbeck. Later brewers from other cities also have learned to brew this great lager beer and it got more familiar with the name of Bock. Bock means **buck** in English, this horned animal usually decorating the label of bock beer bottles. Traditionally Bock is a seasonal beer for Christmas and springtime. Bocks are rarely sold throughout the year.

DESCRIPTION

The original bock beer style is strong copper-brown colored, moderately hopped beer with a malty taste. Nowadays there are several different styles. Dobbel bock, a stronger version of bock. Eisbock, even stronger version of Dobbel Bock. Maibock with lower color and a little more hops compared to original one. Similar versions with +50% wheat malt in a malt bill are also brewed.

TYPICAL ANALYSIS OF PALE BOCK BEER

Original gravity	16-18	°Plato
Alcohol content	6-8	% volume
Color (pale)	8-15	°EBC
Bitterness	15-25	BU

COMMON MALT BASIS

The malts you can find in bock beer mashing recipes are many as Bock is a very malty beer. For pale bocks, Pilsner Malt is brewed together with low color caramel malts and dark malts like Caramel Pale Malt and Munich Light&Dark Malts. For dark versions, about half of the grist can be formulated from Dark Ale Malt, Cookie Malt and Caramel Malt 100. If a very deep color is desired, it is reasonable to use a few per cent of Chocolate Light Malt or Chocolate Dark Malt or Black Malt. Wheat bock versions need of course Wheat Malt.

BREWING PRECAUTIONS

If high proportions of special malts are used, attention should be payed to amylolytic activity. Sometimes even Enzyme Malt is a reasonable option.

DARK LAGERS

BACKGROUND

Before pale bottom fermented beers became popular, almost all beers were dark in color. Dark lagers were strongly related to the different areas of central Europe, being brewed, for example, in the Bayer and Bohemia regions, and dark lager is now the common name for several bottom fermented dark beer types, including **Schwarzbier** and **Munchener dunkel**.

DESCRIPTION

The color varies, but is usually something between amber and near black, while the aroma tends to be dominated by compounds from dark malts: caramel, chocolate, toffee etc. Bitterness is not emphasised, the taste usually being sweet and full-bodied. Dark lagers are normally not very strong, rarely exceeding 6% alcohol by volume.

TYPICAL ANALYSIS OF DARK LAGER

Original gravity	10-15	°Plato
Alcohol content	3.5-6	% volume
Color	50-150	°EBC
Bitterness	15-30	BU

COMMON MALT BASIS

Many kinds of special malt can be used. Dark brewing malts like Munich Light&Dark Malt or Dark Ale Malt can be used as the base dark malt. Depending upon the required characteristics, caramel malts (for instance Caramel Malt 100) are normally added to the grist to emphasise roasted aromas or sweetness. If a very dark color is sought, a few percent of Black Malt is preferable.

BREWING PRECAUTIONS

It must be kept in mind that sufficient enzyme activity for proper saccharification is normally achieved only by using Pilsner Malt or in some cases even Enzyme Malt.

ALES

BACKGROUND

Treating ales as a single beer type lacks justification in some respect, since there are many different types of ale: bitter, mild, pale and barley wine, for example. Strictly speaking, ale is simply a top fermented beer. While most ales come from the British Isles, there are also famous Belgian and German versions.

DESCRIPTION

Ales are fruity and subtle in flavor, mainly due to higher fermentation temperatures. Their color range is wide starting from pale ales copper to bitter ales amber and even near black of some traditional ales. Post hopping is very common for ales and aroma varieties are created in the brew kettle. Normally dry in taste, there can be a great deal of variation in the original gravity.

TYPICAL ANALYSIS OF BITTER ALE

Original gravity	9-13	°Plato
Alcohol content	3.5-5.5	% volume
Color	15-30	°EBC
Bitterness	20-30	BU

COMMON MALT BASIS

Pale Ale Malt or well-modified Pilsner Malt as a basis. A stronger golden hue and taste can be taken from Golden Ale Malt. On top of that a wide variety of special malts can be used in accordance with the product type, e.g. Dark Ale, Pale Cookie Malt, Cookie Malt for bitter ales, Pale Caramel Malt for pale ales or dark Caramel Malts for brown ale.

BREWING PRECAUTIONS

When high final attenuation is sought, Enzyme Malt is worth to consider for strong enzyme performance.

STOUTS AND PORTERS

BACKGROUND

Stouts and porters trace their roots back to London, although since then they have been more strongly associated with Ireland. Porters, once the more common beer, were in many cases replaced by stouts. Their character is mainly determined by the roasted malts. Both stouts and porters are still brewed in the UK, USA and the Baltic countries, to name but a few.

DESCRIPTION

Porters and stouts are very dark, top fermented beers, their color in most cases being near black. Their taste is usually dominated by roasted compounds of dark malts, and the original gravity varies. They tend to be dry beers, tasting a little acrid or even harsh. Stout is generally considered stronger than porter.

TYPICAL ANALYSIS OF STOUT

Original gravity	13-18	°Plato
Alcohol content	5-8	% volume
Color	70-200	°EBC
Bitterness	25-50	BU

COMMON MALT BASIS

Well modified pale brewing malts like Pilsner Malt form a good basis for this type of beer. The very dark color is achieved using relatively high proportions (up to 10%) Chocolate Malt Light or Dark, Black Malt, Pearled Black Malt or Roasted Barley. Other dark malts, such as Caramel Malt 150, can also be used to emphasise sweetness or the fullness of the taste.

BREWING PRECAUTIONS

When relatively high proportions of dark malts are used, the decreased enzymatic activity of the grist must be taken into consideration. This usually means a longer mashing procedure or the supplementation of missing enzymes with highly active malt like Enzyme Malt.

WHEAT BEERS

BACKGROUND

Wheat has a long history as a raw material in brewing, due to having similar climatic requirements to barley. Usually regarded as southern German (Bayer) beers, where they are almost as popular as pilsner, famous wheat beers are also brewed in Belgium. Wheat beer has a refreshing taste and lively appearance, which is why a lot of wheat beer is drunk in the spring and summertime. Nowadays, wheat beers are brewed almost everywhere in the world.

DESCRIPTION

Wheat beers are top fermented beers with a relatively high carbon dioxide content (even up to 10 g/l). Their aroma is typically fruity and phenolic and they taste light and only slightly bitter. Some wheat beers are secondary fermented in the bottle. These beers are cloudy (due to yeast) and very lively (due to the carbon dioxide). Wheat beers are commonly pale in color, although many dark versions are also available.

TYPICAL ANALYSIS OF PALE WHEAT BEER

Original gravity	11-13	°Plato
Alcohol content	4-5.5	% volume
Color	8-15	°EBC
Bitterness	15-30	BU

COMMON MALT BASIS

The proportion of Wheat Malt is normally above 50% of the grist for pale versions brewed using Pilsner Malt. For dark versions, special malts such as Dark Ale Malt or Caramel Malt 100-150 are recommended.

BREWING PRECAUTIONS

Wheat Malt has low levels of amylolytic activity due to its lower natural content of α-amylase. That should be taken into account during the mashing procedure.

2. DIFFERENT BEERS WITH DIFFERENT MALTS

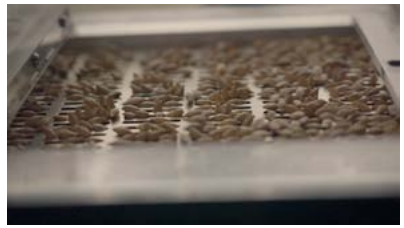
Brewing is a creative process. By varying recipes, mashing programmes, types of yeast and fermentation conditions, a brewer can create a variety of different beers. Further variations can be achieved by using different malts. The world of malts is rich, not only because of the wide variety of production methods used in manufacturing different types of malts, but also due to the possibility of using a variety of cereals for malting and brewing. Sometimes, these malts are called special malts, but due to the increased usage of these products in the production of so called standard lager beers, we would rather refer to them as different malts. This article describes the wide variety of malts from which today's brewers can choose when brewing high quality beers, not only for beer enthusiasts but also for brewing volume products.

RAW MATERIALS

The most common cereals used for malting and brewing are barley, wheat and rye. Wheat and rye mainly differ from barley with respect to the absence of the husk and their smaller kernel size.

The main requirements of malting are common across the range of different cereals: the use of pure varieties suitable for malting and brewing purposes, even kernel size, good germination, even modification and protein levels below 12%. Based on the variation in incoming raw materials, the maltster can control the usage of raw materials with different quality characteristics. Normally, barleys with a higher protein content are used in the production of dark brewing malts (because of their better color formation), while barleys which are low in protein are used in the roasting plant (since they have faster saccharification).



PRODUCTS

The production of different malts is presented in Figure 1.

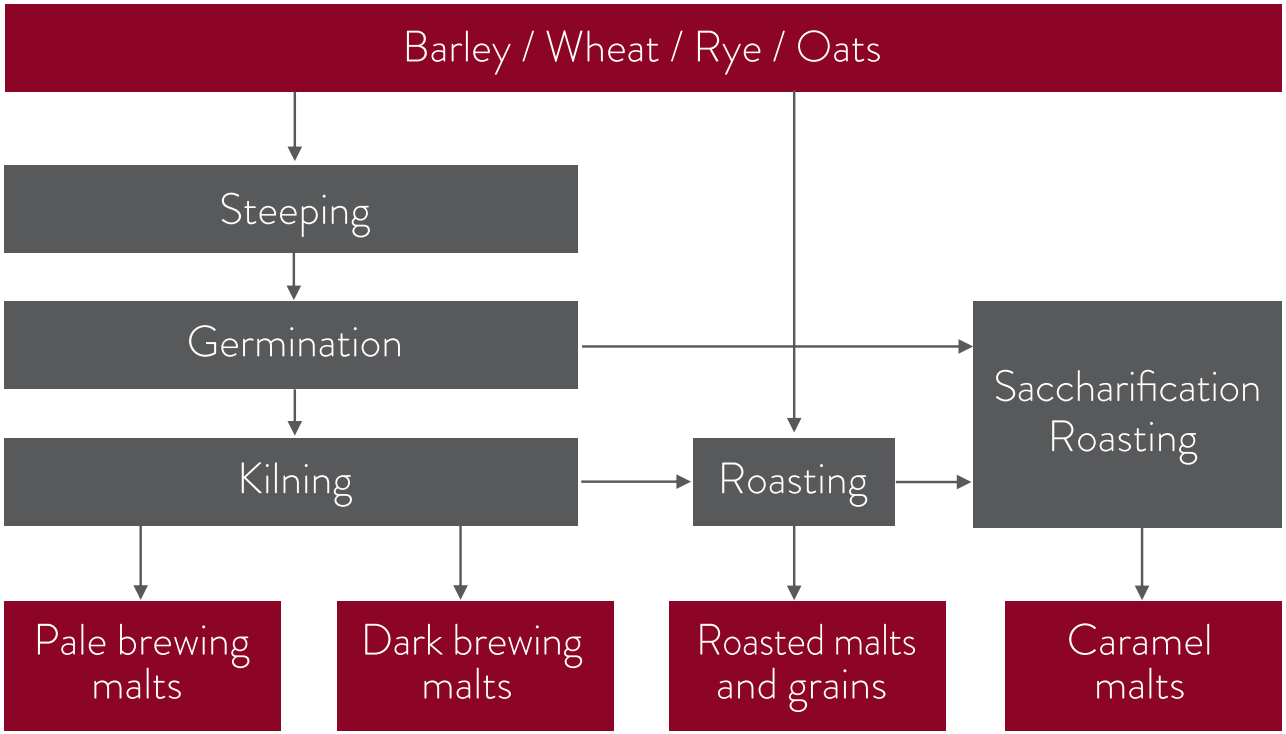


Figure 1. Manufacture of different malts.

DARK BREWING MALTS

Dark brewing malts are produced in a similar way to their pale equivalents, the kilning phase representing the only difference in most cases. Some maltsters also select the variety to be used and adjust the germination conditions in order to promote color formation. When compared to the production of pale brewing malt, the main differences are:

1) The circulation of air with a high moisture content during the early kilning phase (stewing)
2) Higher final kilning temperatures.

The higher the temperatures to which the malts are subjected during kilning, the more flavor and color compounds are formed. There are two main routes to color and flavor formation: the so-called Maillard and Strecker degradation reactions. Both reactions involve reducing sugar and amino acids reacting at elevated temperatures. The more the malt is stewed at the beginning of the kilning phase, the more sugars and amino acids are formed. The higher final temperature, the more color and flavor active compounds are formed. On the other hand, the higher the color is, lower is the residual enzyme activity. Dark brewing malts usually contain medium levels of enzyme activity, i.e. they can be used in relatively high portions for pale malts, or in some cases even alone.

Typical dark brewing malts include Vienna, Golden Ale, Dark Ale and Munich malts to mention few. Naturally, product names differ from producer to producer but, in general, the color of dark brewing malts varies from 5 to 50°EBC. Some maltsters have designed special kilning programmes to meet the specific requirements of their customers. Viking Dark Ale Malt is an example of this.

CARAMEL MALTS

Caramel malts can be produced in a roasting drum or specially equipped kiln. Raw material is well-modified green malt. The moisture content of the green malt should be quite high, preferably at a value higher than 45%. Due to the possibility of achieving higher temperatures in a roasting drum in comparison to conventional kilns, caramel malts have a broader color variation than kilned dark brewing malts. There are three main steps to producing caramel malts:

1) Heating to approx. 65°C and saccharification

2) Removal of excess moisture

3) Drying and cooling

Steps one and two are usually identical for all caramel malts, step three varying depending on the wanted color of the product. During saccharification, the interior part of the kernel reaches the temperatures required for gelatinisation to take place, which are also optimal for the activation of amylolytic enzymes. In other words, mashing takes place inside the kernel, with starch and proteins being broken down into sugars and amino acids.

Once modification of the endosperm has been achieved, the air flaps of the roasting drum are opened and the excess moisture removed. Following this, the malts are dried to reach a moisture content which is usually less than 8%. Since the sugar content is high, the color and flavor develop rapidly, and relatively high color values can be achieved. While the drying temperature normally varies between 80-140°C, the color values of different caramel malts vary from 5 to 600°EBC. Finally, the malts are cooled using cool fresh air, to temperatures of around 25°C.

Caramel malts have a glassy and hard structure, due to the crystallised sugars of the endosperm, and their level of amylolytic activity is negligible. This is also true for low color caramel malts.

When compared to dark malts of the same color, caramel malts are richer in flavor, mainly due to more intensive Maillard reactions during the drying stage. Caramel malts are typically mentioned to give sweet, caramel, toffee, nutty type flavors. Some roastiness is also always present but intensity is strongly varying with the color. Many investigations have shown that caramel malts improve foam retention, which could be due to the modification of the proteins during processing. Caramel malts can also contribute to the fullness and mouthfeel of the beer.




ROASTED PRODUCTS

There are two raw materials for the roasting process:

1) Dry pale brewing malt and
2) Barley or other native cereals

These products are exposed to very high temperatures in the roasting drum, the highest reaching more than 200°C. This results in very dark products with an array of harsh, bitter and even burnt flavors.

WHEAT MALTS

The total malting time for wheat is normally shorter than that of barley. Wheat has no husk, allowing a rapid uptake of water in steeping. Great care is needed not to produce over steeped wheat, which forms a sticky mess when it is turned and transferred. For pale wheat malts, kilning temperatures are usually around 72-80°C. In order to avoid kernel breakage and dust problems, a higher final moisture (5-6%) is allowed. Dark versions and caramel malts can also be produced from wheat in a similar way to the corresponding barley malts.

RYE MALTS

Rye is usually considered a bakery cereal, but brewery applications are not unknown. Due to their high concentration of gel forming pentosans, the use of rye malts in breweries is limited. With excess dosage of rye malts you easily get wort separation and or filtration problems. That is why rye malts can more or less be considered as a spice in beer production. However, in some home brews and low alcohol drinks, such as **kvass**, rye malt forms the main raw material. Rye has a malting characteristic quite similar to that of wheat. Light rye malts are probably most common, but also dark and caramel versions are produced. In addition to taste caramelised rye gives nice reddish hue.

MALT CHARACTERISTICS

Different raw materials and processing conditions produce remarkable differences in the brewing characteristics of malts and the nature of the final product. Typical malt and congress wort analyses of different malts are presented in Table 1. Due to the low enzyme activity of some malts, they cannot be mashed alone, even for analytical processes. Results in red color relate to mashes performed with pilsner malt on a 50/50 basis.

Table 1. Typical malt and congress malt analyses.

MALT	EXTRACT [% d.m.]	MOISTURE [%]	COLOR [EBC]	PROTEIN [% d.m.]	FAN [mg/l]	pH	VISCOSITY [mPas]	DIASTATIC POWER [WK d.m.]
Pilsner	81	4,5	3,5	10,5	160	6	1,45	350
Vienna	80	3,5	7	10,5	140	5,95	1,5	330
Munich Light	80	2,5	16	11,0	110	5,8	1,6	100
Caramel Pale Malt	79	7,5	8	11,0	150	5,9	1,5	0
Caramel Malt 100	77	4,5	100	11,0	110	5,5	1,55	0
Black Malt	65	1	1500	11,0	100	5,3	1,5	0
Wheat Malt	83	6	4	11,0	120	6,1	1,9	200
Pot Still Rye Malt	85	6,5	10	10,5	160	6,05	4,9	320

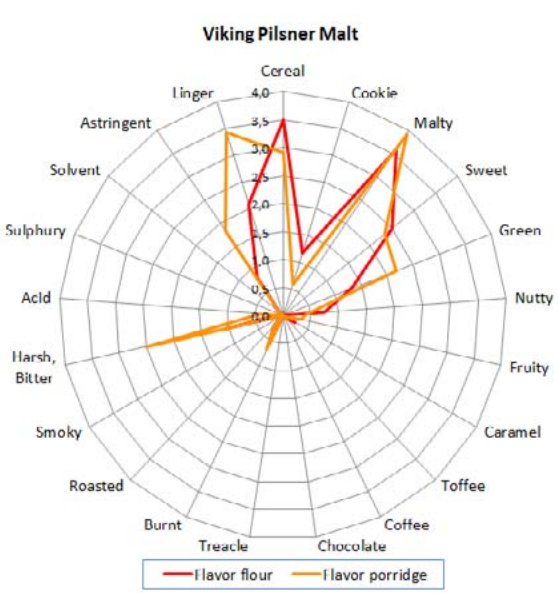
Note: Values in **red** refer to mashing with pilsner malt on a 50/50 basis.

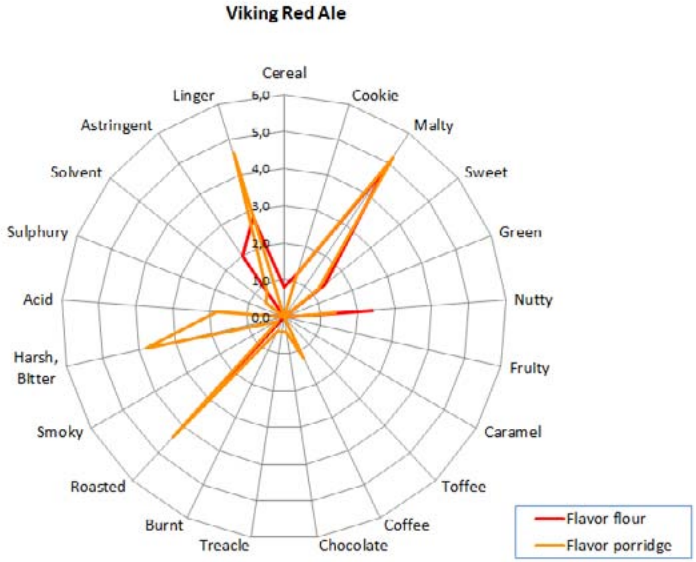
According to the results, the main conclusions are:

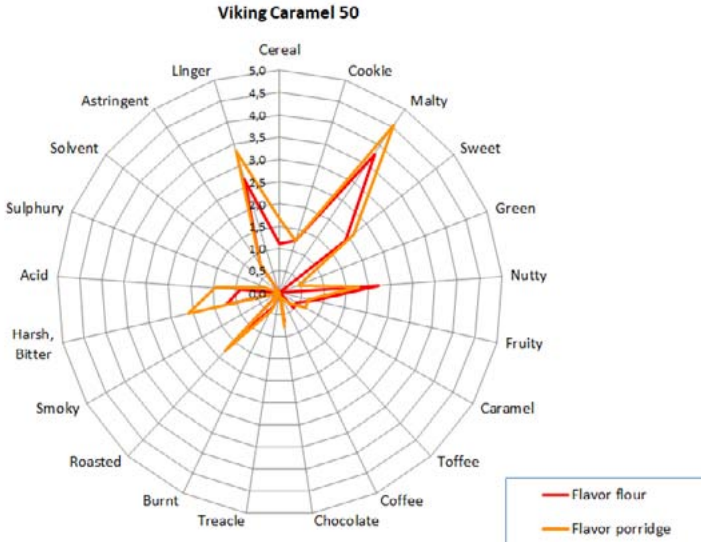
- Dark malts have a lower pH
- Enzyme activity decreases at higher kilning temperatures
- Extract content is lower in saccharified products
- Free amino nitrogen levels decrease as the temperature increases, in other words together with the color
- Wheat malt has high extract and viscosity
- Rye malts have very high viscosity

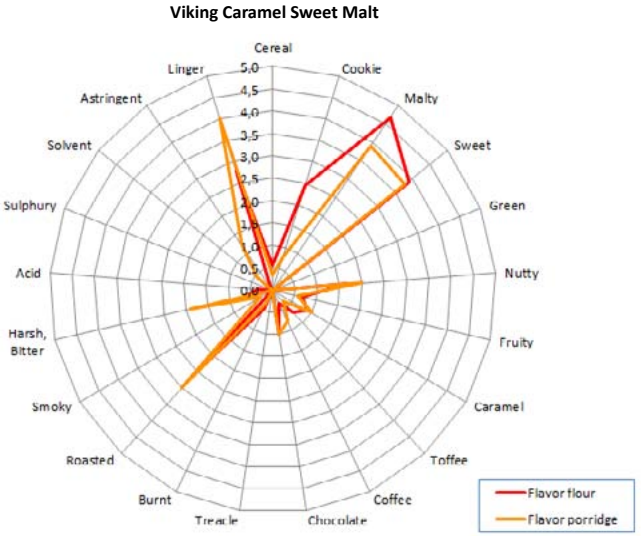
FLAVOR

In the past dark, caramel and roasted malts were mainly sold and used on the basis of their color value. On the other hand, as stated above, it is not only the color that is different, also flavor differs from special malt to another. The most common way of evaluating malts flavor is probably to taste and score the congress wort. However, due to the high sugar content of the wort, it is difficult to detect differences in flavor components. Therefore, we grind the malt and evaluate the flour. We have also adopted the "porridge method" developed by BRI. The malt flour is mixed with water, the porridge is evaluated as such. Flavor scores are given separately for malt flour and malt porridge.



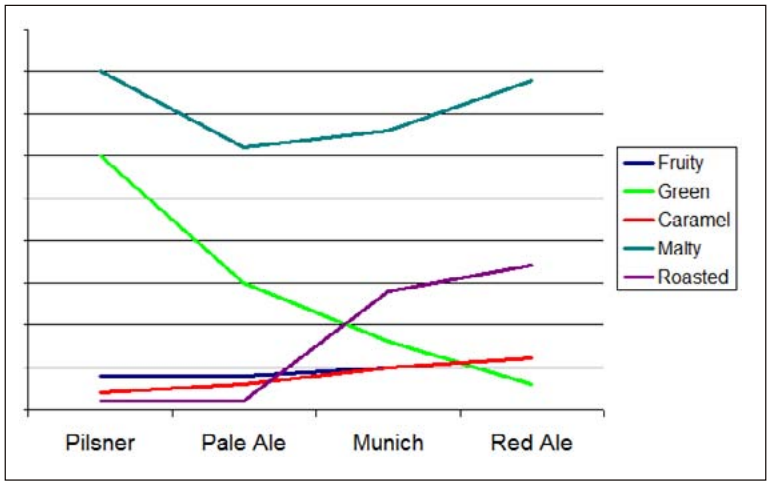






Figures 2-7. Examples of typical flavor profiles of different malts.

As described earlier, the formation of different flavor active compounds is dependent on temperature, moisture and time. As an example following figures demonstrate the differences between different malts when evaluated organoleptically.



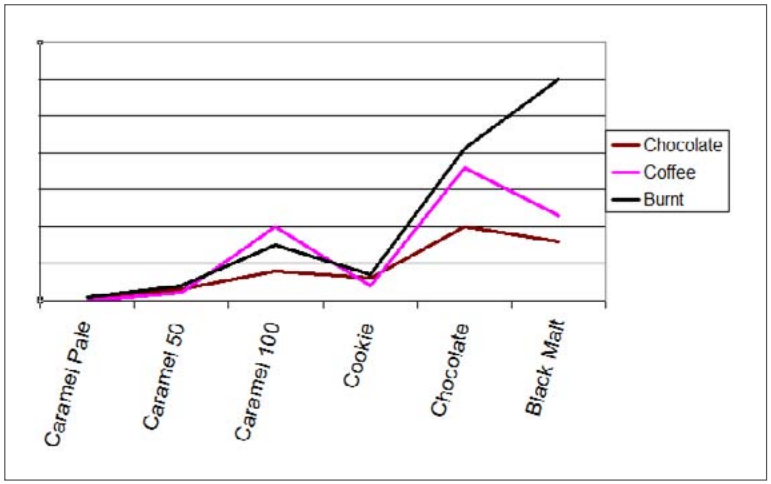


Figure 8. Malt aroma variations, by malt color, in some dark brewing malts and some caramel+roasted malts.

DIFFERENT BEERS WITH DIFFERENT MALTS

Wheat malt is the natural basis for wheat beers, and use in portions forming at least 50% of the grist is common. Sometimes, due to its higher soluble nitrogen content, wheat malt is used as a foam enhancer (2-5%), together with pale brewing malts.

Rye malt has some applications in commercial breweries, but its use is more common among home brewers and producers of other, beer-like, beverages like **sahti** in Finland or **kvass** in Russia.

Dark brewing malts are widely used when seeking a dark color in the final beer, and different malts are selected in accordance with the favored characteristics of the end product. Dark brewing malts are preferred for festival beer, while strong stouts and porters require substantial amounts of roasted malt or barley. Blends of different malts are usually chosen, in order to obtain a versatile and balanced beer flavor.

Caramel malts are used when a sweet taste, full mouth feel and fruity flavor are desired. These malts are widely used, for example in **bocks**, seasonal beers like **märzens** and even in some **ales**.

When used in reasonable portions in a grist, the flavor and appearance of ordinary lager type beers can be improved significantly through the use of different malts, without significant deleterious effects on a brewery's finances. Such improvements include the color, foam, flavor and mouth feel of any beer.

3. VIKING MALT'S PRODUCT PORTFOLIO

Viking Malt produces full range of malts. Below you can find a list of our malts available at the moment. As we develop our services according customer wishes malt portfolio may change as time passes. Please visit www.vikingmalt.com/what-we-offer to find accurate list of our malts under following topics.

BREWER'S CLASSIC:

- Viking Pilsner Malt
- Viking Pale Ale Malt
- Viking Pilsner Zero Malt
- Viking Vienna Malt
- Viking Wheat Malt

BREWER'S SPECIAL:

- Viking Munich Light Malt
- Viking Munich Dark Malt
- Viking Caramel Wheat
- Viking Caramel Malts
- Viking Caramel Pale
- Viking Cookie Malt
- Viking Pale Cookie Malt
- Viking Chocolate Light Malt
- Viking Chocolate Dark Malt
- Viking Dark Ale Malt
- Viking Red Ale Malt
- Viking Golden Ale Malt
- Viking Caramel Sweet Malt
- Viking Caramel Aromatic Malt
- Viking Sahti Malt
- Viking Rye Malt
- Viking Black Malt
- Viking Pearled Black Malt
- Viking Roasted Barley
- Viking Dextrin Malt

BREWER'S ORGANIC:

- Viking Pilsner Malt Organic
- Viking Pale Ale Malt Organic
- Viking Munich Light Organic
- Viking Caramel Malt 100 Organic
- Viking Black Malt Organic
- Viking Wheat Malt Organic

SMOKED SPECIAL:

- Viking Smoked Wheat Malt
- Viking Smoked Malt
- Viking Lightly Peated Malt

(smoke originating from apple, beech, cherry, sweet cherry and pear wood delivered from ecological, clean areas)

DISTILLER'S CHOICE:

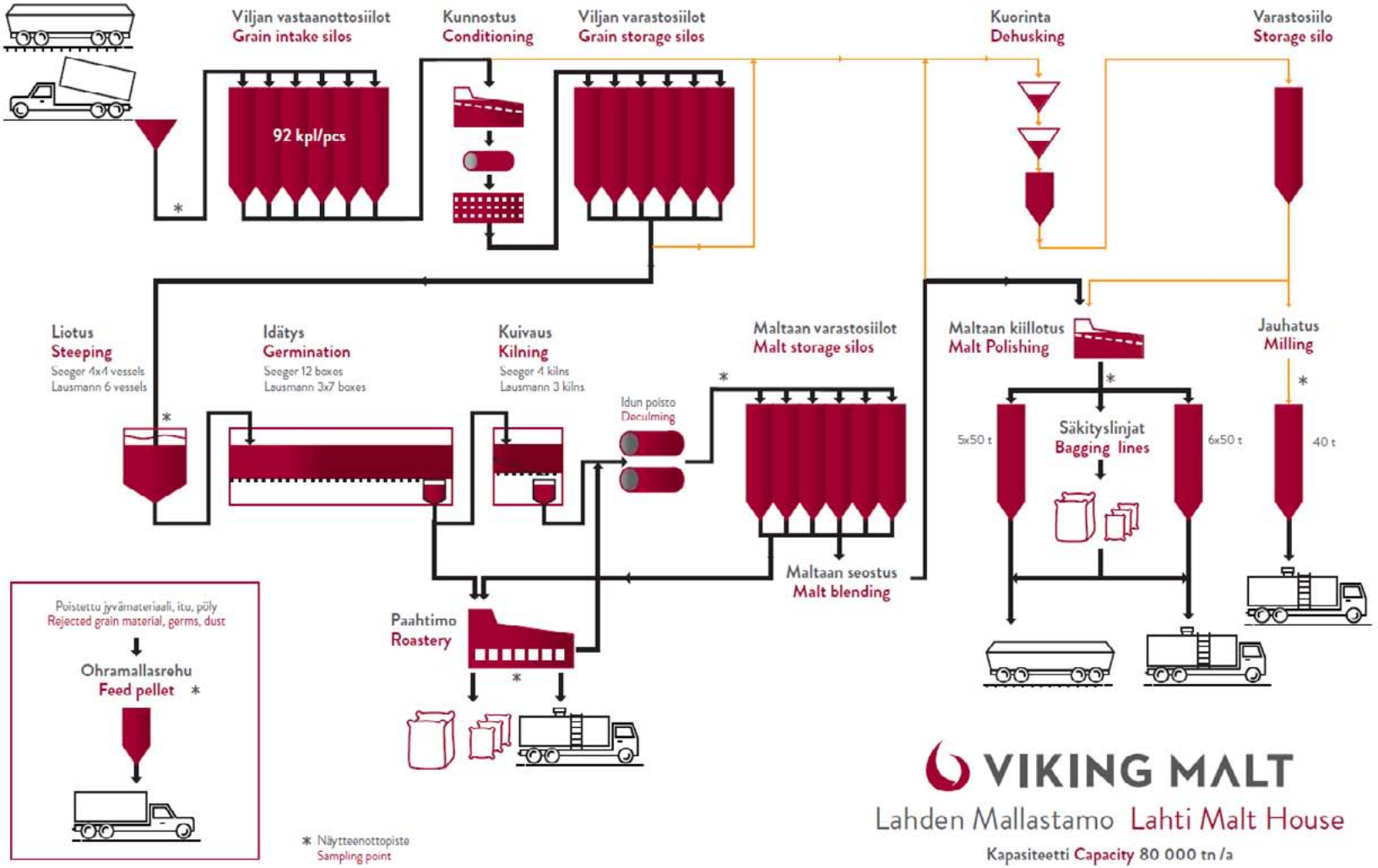
- Viking Pot Still Rye Malt
- Viking Enzyme Malt

MALTSTER'S SIGNATURE:

Would you like to have malting done according to your wishes? Or do you wish to have your own malt blend? We malt the raw material of your choice and make blends in accordance with your recipes. If we can match the production tonnage and your needs we have good basis for discussions. This service possibility is used more often than many brewers would think.

ARCTIC MALT CONCEPT:

Like maltster's signature but with your own raw material. We just do the malting for you. Many of our clients have used this possibility.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Grain intake silos
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Kunnostus
Conditioning
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Grain storage silos
Kuorinta
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Varastosiilo
Storage silo
Liotus
Steeping
Seeger 4x4 vessels
Lausmann 6 vessels
Idätys
Germination
Seeger 12 boxes
Lausmann 3x7 boxes
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Maltaan varastosiilot
Malt storage silos
Maltaan kiillotus
Malt Polishing
Jauhatus
Milling
5x50 t
Säkityslinjat
Bagging lines
6x50 t
40 t
Maltaan seostus
Malt blending
Paahtimo
Roastery
Poistettu jyvämateriaali, itu, pöly
Rejected grain material, germs, dust
Ohramallasrehu
Feed pellet *
* Näytteenottopiste
Sampling point
VIKING MALT
Lahden Mallastamo Lahti Malt House
Kapasiteetti Capacity 80 000 tn /a

4.
BEER RECIPES

4MALT ALE

4Malt Ale is redhued all malt beer brewed with selected malts. The flavor of this Ale is full and malty but due to that it is pressurized with gas mix N 70%/CO2 30%. This beer is very smooth and easy going with nice creamy foam. Nice citric note may be noticed originating from cascade hop. Alcohol content promotes the overall taste experience giving a little warming effect in after taste. The flavor and odor of this beer can be said to be full, balanced and pleasant.

RAW MATERIALS:

75%	Viking Pilsner Malt
10%	Viking Caramel Malt 50
10%	Viking Cookie Malt
5%	Viking Red Ale Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
66°C 60 min./78°C 1 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 64%/36%
Bitter hops: Northern Brewer, 9,4% alpha, dosing beginning of boiling.
Aroma hops: Cascade 6,9% alpha. Dosing 50 min. from beginning of boiling

FERMENTATION:

OG/FG 14,0/4,4
Mangrove Jacks Burton Union M79;
4 days +20°C/3 days + 16°C/7 days +10°C/3 days -1°C.
From day 4 pressure +0,5 bar

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	5,0 vol.-%
Color	17°EBC
Bitterness	15 BU
pH	4,2
Turbidity	0,7°EBC-F.U.

AMERICAN DREAM – AMERICAN IPA

American IPA is pale hoppy beer with rich maltiness covered by hop bitterness and new wave hop aroma – citrusy, fruity, floral etc. One of the best selling beer styles in craft beer industry. The key are well stored new hop varieties, neutral yeast low in esters and of course pale malts with a hint of wheat and special malt to balance the bitterness.

RAW MATERIALS:

80%	Viking Pilsner Malt
10%	Viking Wheat Malt
7%	Viking Munich Malt
2%	Viking Caramel Malt 100
1%	Viking Caramel Malt 150

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,3
64°C 60 min./71°C 15 min./76°C 5 min.

BOILING:

80 min., normal pressure
pH set with lactic acid to 5,0, calcium chloride
Bitter hops: Magnum, 14,5% alpha, dosing 60 minutes before the end of boiling.
Aroma hops: Columbus, 15,9% alpha, dosing 15 minutes before the end of boiling, Centennial 10% alpha, dosing 10 minutes before the end of boiling, Simcoe 11,9% alpha, dosing 5 minutes before the end of boiling, Citra 12,7% alpha, dosing 1 minute before the end of boiling.

FERMENTATION:

OG/FG 15,4/3,6
Wyeast 1056 American Ale yeast. 11 days (18 to 21°C, growing) + 5 days 12-16°C

BEER ANALYSIS:

Alcohol	6,4 vol.-%
Color	14°EBC
Bitterness	64 BU

SWEET HOME – AMERICAN PALE ALE

American Pale Ale is lighter, a little less bitter and hopped version of American India Pale Ale. This beer build on Viking Special Malts, slightly orange, refreshing beer with nice sweet maltiness interacting with new wave hop aroma – piney, citrusy, fruity, floral etc. Well balanced and crazy drinkable.

RAW MATERIALS:

73%	Viking Pale Ale Malt
16%	Viking Caramel Malt 30
11%	Viking Dextrin Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,3
62°C 30 min./72°C 30 min./76°C 5 min.

BOILING:

65 min., normal pressure
pH set with lactic acid to 5,0, calcium chloride
Bitter hops: 10%
Aroma hops: 90% added just before the end of the boil, in Whirlpool and dry hopped.

FERMENTATION:

OG/FG 12/2,8
Wyeast 1056 American Ale yeast. 7 days 19°C+14 days 14°C

BEER ANALYSIS:

Alcohol	4,9 vol.-%
Color	14°EBC
Bitterness	40 BU

THE CATCHER IN THE WHEAT – AMERICAN WHEAT

American Wheat is a simple, but enjoyable wheat beer. Refreshing and hoppy. Slightly hazy from wheat malt addition, but has no hefeweizen cloves and banana aroma, but complex fruity aroma of American hops. Slightly bready, moderately full with high, thick white head.

RAW MATERIALS:

49%	Viking Pilsner Malt
49%	Viking Wheat Malt
2%	Viking Caramel Malt 30

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,3
68°C 60 min./76°C 5 min.

BOILING:

65 min., normal pressure
pH set with lactic acid to 5,0, calcium chloride
Bitter hops (30%): American – Chinook is recommended, dosing 60 minutes before the end of boiling.
Aroma hops (70%): Amarillo added 15 minutes before the end of the boil and Citra added 5 minutes before the end of the boil.

FERMENTATION:

OG/FG 12/2,8
Wyeast 1010 American Wheat yeast. 7 days 17°C+14 days 14°C

BEER ANALYSIS:

Alcohol	4,9 vol.-%
Color	10°EBC
Bitterness	20 BU

WARSAW BALTIC PORTER – BALTIC PORTER

The recipe is based on non-existing Baltic Porter brewed for many years in Poland. It is a very complex, rich malty beer with high alcohol content. Smooth and clean lager character is full of malty aromas of toffee, molasses, coffee and chocolate. This beer needs longer conditioning (half a year minimum) that helps to create dried red fruit aroma. Dark brown beer with little colored head, bitter from hops, alcohol and roasted malts, it's a fantastic beer preferred for a colder months.

RAW MATERIALS:

67%	Viking Pilsner Malt
15%	Viking Munich Dark Malt
9%	Viking Caramel Malt (600 EBC)
9%	Viking Dark Chocolate Malt (900 EBC)

MASHING:

Malt/Water ratio: 1/3
pH set with lactic acid to 5,3
52°C 20 min./62°C 20 min./72°C 30 min./76°C 1 min.

BOIL ING:

Boil until reaching OG 22 but no longer than 120 minutes, normal pressure
pH set with lactic acid to 5,0
Hops: 80% from aromatic hops at the start of the boil, 20% 5 minutes before the end of the boil (aromatic varieties from Middle Europe like Polish Marynka, Czech Zatec, etc.)

FERMENTATION:

OG/FG 22/5,2
Lager yeast slurry. 10-20 days 7°C (until it reaches 9,6 gravity) + 60-90 days 0°C

BEER ANALYSIS:

Alcohol	9,8 vol.-%
Color	130°EBC
Bitterness	40 BU

BASIC LAGER BEER

Basic Lager Beer is a yellow-gold hued all malt beer brewed with just using Viking Pilsner Malt as a malt base. This lager beer has malty character with refreshing taste. A slight citric note may be noticed originating from hops.

The color, flavor and odor of this beer can be said to be balanced and pleasant.

RAW MATERIALS:

100% Viking Pilsner Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
52°C 10 min./65°C 30 min./72°C 15 min./80°C 1 min.

BOILING:

90 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 80%/20%
Bitter hops: Magnum, 11,9% alpha, dosing beginning of boiling
Aroma hops: Cascade 6,9% alpha. dosing 80 minutes from beginning of boiling

FERMENTATION:

OG/FG 10,1/1,5
Lager Yeast slurry. 14 days +12-14°C 0,25 bar + 1 day -2°C

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	4,5 vol.-%
Color	10°EBC
Bitterness	26 BU
pH	4,3
Turbidity	0,3°EBC-F.U.

AMERICAN MONK – BELGIAN IPA

Belgian IPA is a marriage between traditional Belgian Tripel and recently popular IPA's. Fresh maltiness, high bitterness and complex, citrusy and piney New World hops are typical for famous American beer, while Belgian tradition brings in high alcohol content and spicy, clove-like phenol originating from Belgian yeast as well as pleasant and sweet fruity esters. High carbonation builds high, dense, white head.

RAW MATERIALS:

50%	Viking Pilsner Malt
38%	Viking Munich Light Malt
8%	Table sugar
4%	Viking Caramel Malt 50

MASHING:

Malt/Water ratio: 1/3,5
pH set with lactic acid to 5,3
65°C 30 min./72°C 20 min./76°C 5 min.

BOILING:

Boil 90 minutes, normal pressure
pH set with lactic acid to 5,0
Hops: 60% from bitter hops 60 minutes after start of the boil, 30% 5 minutes before the end of the boil (New Wave American hops), it can be as well richly dry hopped or hopped in Whirlpool with American Hops. Sugar added 5 minutes before the end of the boil

FERMENTATION:

OG/FG 18,3/2,1
Wyeast Belgian Ale Yeast (1214). 14 days at 18-24°C
(temperature is raised steadily) + 28 days at 14°C

BEER ANALYSIS:

Alcohol	8,9 vol.-%
Color	18°EBC
Bitterness	65 BU

BLACK CITRUS – IPA

Black Citrus – IPA, an all malt beer brewed with punch of special malts from Viking Malt portfolio. Strong taste of chocolate supported with dark color and intensive citric odor from hops is a target and may be over the edge for some one. Fruitiness is strongly present arising from dry hopping. This Black beer is crystal clear.

RAW MATERIALS:

59%	Viking Pilsner Malt
15%	Viking Wheat Malt
10%	Viking Caramel Malt 100
8%	Viking Munich Light Malt
5%	Viking Chocolate Light Malt
2%	Viking Chocolate Dark Malt (fine milling, dosed during last 10 min. of boiling)
1%	Viking Chocolate Light Malt (fine milling, dosed during last 10 min of boiling)

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,5
53°C/30 min./63°C 45 min./76°C 10 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 4,7
Bitterness units from bitter/aroma hops: 86%/14%
Bitter hops: Herkules, 13,5% alpha, dosing beginning of boiling.
bitter/aroma hop: Citra 13,4% alpha dosing into Whirlpool

FERMENTATION:

OG/FG 13,2/2,6
Wyeast Lab #1056, American Ale. 6 days 20°C + 7 days 18°C (0,1 bar counter pressure) + 2days -1°C.

FILTRATION: optional

Dry Hopping: Cascade 6,8% alpha, dosing 1,2 g/litre, 6h before filtration.
Beco SD 30

BEER ANALYSIS:

Alcohol	5,8 vol.-%
Color	75°EBC
Bitterness	40 BU
pH	4,2
Turbidity	1,1°EBC-F.U.

CITRIC WHEAT BEER

Filtered Wheat beer brewed with Viking Pale Ale Malt together with Viking Dextrin and Wheat Malts. This Wheat beer can be said to have well balanced and refreshing taste. Process pH adjustments done with citric acid. Peeled bitter orange and coriander seeds added during boiling giving nice citric nuances into taste supported by Cascade hop. Acidity of citrus is nicely smoothened with sweetness originating from Dextrin Malt.

RAW MATERIALS:

60%	Viking Wheat Malt
20%	Viking Dextrin Malt
20%	Viking Pale Ale Malt

MASHING:

Malt – water ratio in mashing 1:4
pH set to 5,6 with 100% citric juice concentrate
58°C/63°C/72°C/76°C

BOILING:

70 min., normal pressure
pH set with citric acid to 5,0
Bitterness units from bitter/aroma hops 47%/53%
Bitter hops: Magnum 11,9% alpha, dosing beginning of boiling
Aroma hops: Hallertau Hersbrucker 2,9% alpha 60 min. from boiling, Cascade 5,9% alpha last minute of boiling.
Same time add also Peeled bitter orange 0,23 mass-%
and Coriander seeds 0,45 mass-% from mass of malts

FERMENTATION:

OG 13,7°Plato
FG 4,6°Plato
4 days 20°C no counter pressure, 4 days 16°C + 13 days 13°C pressure 0,25 bar
Yeast: Mangrove Jack's Bavarian Wheat Yeast M20

FILTRATION:

Beco KDS12

BEER ANALYSIS:

Alcohol	4,7 vol.-%
Color	8°EBC
Bitterness	14 BU
pH	4,5
Turbidity	0,9°EBC-F.U.

MOONLESS NIGHT – COFFEE AMERICAN PORTER

Dark beer witch rich malt character and aroma topped with roasted coffee note. Oats and dark malts are responsible for thickness and coffee adds drinkability. Aroma is very complex: coffee notes, chocolate, roasted malt, dark fruits, molasses, toffee, caramel, toastiness. Same with taste – complex maltiness is responsible for sweetness, bitterness is derived from hops, roasted malts and coffee that are responsible for bit sour, dry finish.

RAW MATERIALS:

19%	Viking Pale Ale Malt
69%	Viking Pilsner Zero Malt
5%	Viking Caramel Malt 300
3%	Flaked Oats
2%	Viking Chocolate Dark Malt
2%	Viking Roasted Barley

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,3
Gelatinize oat flakes prior to adding to the bath
52°C 10 min./62°C 30 min./72°C 30 min./76°C 5 min.

BOILING:

Boil 80 minutes, normal pressure
pH set with lactic acid to 5,0
Hops: 50% from bitter hops 20 minutes after start of the boil, 50% 5 minutes before the end of the boil (aromatic New World varieties like Cascade or Chinook)
Thickly crushed coffee: in a bag (or smaller bags) after the boil for 5 minutes. The amount depends on amount of beer

FERMENTATION:

OG/FG 15/3,5
Safale S-04 dried yeast. 6 days at 19°C + ~20 days at 14°C

BEER ANALYSIS:

Alcohol	6,3 vol.-%
Color	60°EBC
Bitterness	30 BU

VIKING DARK BOCK

Viking Dark Bock is a beer containing punch of our special malts. The color is dark brown with copper hue while foam is long lasting and refreshing light in color. The taste can be said to be full, with some toasty and caramel notes. Bitterness level nicely supporting the caramel-malty taste.

RAW MATERIALS:

42%	Viking Munich Dark Malt
41%	Viking Pilsner Malt
10%	Viking Caramel Malt 100
5%	Viking Caramel Aromatic Malt
2%	Viking Chocolate Light Malt

MASHING:

Malt/Water ratio: 1/3
pH set with lactic acid to 5,6
57°C 15 min./65°C 30 min./73°C 10 min./77°C 1 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 4,7
Bitter hops: Hallertau Hersbrucker 2,1%, dosing beginning of boiling

FERMENTATION:

OG/FG 16.6/4,0
German Bock Lager yeast, White Labs #WLP833
12 days +11°C/4 days + 13°C/7 days + 1°C,
pressure 0,25 bar

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	6,9 vol.-%
Color	67°EBC
Bitterness	25 BU
pH	4,5
Turbidity	0,2°EBC-F.U.

GRODZISKIE / GRÄTZER

Unique traditional Polish beer style, recently gaining more and more popularity around the world. Low-gravity, highly-carbonated pale ale brewed with 100% of oak-smoked wheat malt. Crisp and refreshing, distinctive smoke aroma is fulfilled by low esters from yeast. Slightly higher acidity and bitterness are also present.

RAW MATERIALS:

100% Viking Smoked Wheat Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,3
53°C 30 min./70°C 30 min./75°C 5 min.

BOILING:

120 min., normal pressure
pH set with lactic acid to 5,0, calcium sulfate
Hops: aromatic varieties from Middle Europe like Polish Nowotomyski, Czech Zatec, Polish Lublin, German Hallertauer Mittelfrüh or Tettnanger. Most of them having ~5% alpha acid. It doesn't have to be fresh. Two additions: 80% of hops 15 minutes after start of the boiling and 20% 30 minutes before the end.

FERMENTATION:

OG/FG 7,8/1,8
Wyeast 1056 American Ale yeast. 11 days (18°C to 21°C, growing) + 5 days 12°C-16°C

BEER ANALYSIS:

Alcohol	3,1 vol.-%
Color	9°EBC
Bitterness	22 BU

MALTY ALE

Malty Ale is an all malt beer brewed with malts from Viking Ale Malt family, spiced with Viking Caramel Malt 50. The flavor of this Ale beer is strong and malty, but also lots of fruitiness can be found. The alcohol content, though not very high, promotes the overall taste experience giving a little warming effect in general taste. The flavor and odor of this beer can be said to be full, balanced and pleasant.

RAW MATERIALS:

43%	Viking Pale Ale Malt
26%	Viking Golden Ale Malt
16%	Viking Caramel Sweet Malt
11%	Viking Red Ale Malt
4%	Viking Dark Ale Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
63°C 60 min./75°C 10 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 79%/21%
Bitter hops: Magnum, 11,9% alpha, dosing beginning of boiling.
Bitter/aroma hop: East Kent Goldings 6,2% alpha dosing after 30 min.
Aroma Hop: Saaz 2,2% alpha dosing after 55 min.

FERMENTATION:

OG/FG 14,4/3,9
Wyeast Lab #1214, Belgian Abbey. 4 days 19°C + 21 days 19°C (0,1 bar counter pressure)
Notice: #1214 yeast is quite often a very slow starter

FILTRATION: optional

Beco K2 (not totally clear end result, some yeast will go through)

BEER ANALYSIS:

Alcohol	5,6 vol.-%
Color	44°EBC
Bitterness	25 BU
pH	4,4
Turbidity	5,8°EBC-F.U.

PILSNER ROSE' SINGLE HOP

Filtered Pilsner Beer with good body together with nice foam and head retention supported by Viking special malts. Reddish color and good body originating from Caramel 50 Malt, bisquit type nuances from Cookie Malt and Vienna adding some malty and nutty tastes. Strong but not overwhelming hoppy taste is coming from Saaz.

RAW MATERIALS:

70%	Viking Pilsner Malt
24%	Viking Caramel Sweet Malt
3%	Viking Cookie Malt
3%	Viking Vienna Malt

MASHING:

Malt – water ratio in mashing 1:3
Infusion mashing 58°C/63°C/73°C/78°C

BOILING:

60 min., normal pressure
Hops: Saaz
Additions: 70% in the beginning of boiling 30% to Whirlpool

FERMENTATION:

OG 13,2°Plato
FG 3,3°Plato
Fermentation 14 days + 10°C counter pressure 0,5 bar, 3 days -2°C

YEAST:

Urquell lager 2001. Notice: start of fermentation might be slow with this yeast. After fermentation slight notes of diacetyl are wanted for this beer. If diacetyl is not wanted raise the last 3 fermentation day temp. up to 18°C.

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	5,3 vol.-%
Color	23°EBC
Bitterness	43 BU
pH	4,6
Turbidity	0,2°EBC-F.U.

RED LAGER

Red lager is a gold-red hued all malt beer brewed with punch of special malts. The flavor of this lager beer has strong malty character but also lots of fruitiness can be found. A special citric note may be noticed originating from cascade hop. The rather high alcohol content promotes the overall taste experience giving a little warming effect in after taste.
The flavor and odor of this beer can be said to be full, balanced and pleasant.

RAW MATERIALS:

75%	Viking Pilsner Malt
15%	Viking Caramel Sweet Malt
8%	Viking Red Ale Malt
2%	Viking Munich Light Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
54°C 10 min./63°C 30 min./ 72°C 20 min./ 76°C 1 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 50%/50%
Bitter hops: Northern Brewer, 7,5% alpha, dosing beginning of boiling.
Aroma hops: Cascade 6,3% alpha. Dosing 50% after 50 min., 50% to Whirlpool

FERMENTATION:

OG/FG 15,9/2,7
Lager yeast slurry. 4 days + 9 days 12°C + 2days -2°C

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	7,4 vol.-%
Color	20°EBC
Bitterness	18 BU
pH	4,50
Turbidity	0,5°EBC-F.U.

MALT MANDALA – RUSSIAN IMPERIAL

Black as a moonless night. Thick as chocolate syrup with rich, brown head. Dominating the taste on every field. Burned, roasted malt, chocolate, coffee, molasses, toffee, oatmeal cookies. Whole symphony of flavors completed with top-fermenting yeast and New World hops. Deep, warming, bitter-sweet finish. Beer for tasting on a cold, winter nights.

RAW MATERIALS:

50%	Viking Pilsner Zero Malt
20%	Viking Munich Light Malt
4%	Table sugar
5%	Viking Wheat Malt
4%	Viking Chocolate Dark Malt
4%	Viking Smoked Beech Malt
5%	Viking Caramel Malt 150
2%	Brown sugar
2%	Viking Caramel Malt 600
2%	Viking Roasted Barley
2%	Viking Rye Malt

MASHING:

Malt/Water ratio: 1/3,5
pH set with lactic acid to 5,3
65°C 45 min./71°C 15 min./76°C 5 min.

BOILING:

Boil 120 minutes, normal pressure
pH set with lactic acid to 5,0.
Hops: 60% from bitter hops 60 minutes after start of the boil, 30% 5 minutes before the end of the boil (New Wave American hops). Sugar added 5 minutes before the end of the boil.

FERMENTATION:

OG/FG 23/4,3
WLP004 Irish Ale. 21 days at 15°C + 21 days at 14°C

BEER ANALYSIS:

Alcohol	10,8 vol.-%
Color	100°EBC
Bitterness	100 BU

SINGLE MALT JUNIPER LAGER

This lager beer is a yellow-gold hued all malt beer brewed with just a single top quality Viking Pilsner malt and tuned with Juniper Chips during whirlpool operations. The flavor of this lager beer has malty character with refreshing fruity flavor and a strong punch of Juniper in taste and odor. A slight citric note may also be noticed originating from cascade hop.
The color, flavor and odor of this beer can be said to be balanced and pleasant. Juniper brings something special into this beer.

RAW MATERIALS:

100%	Viking Pilsner Malt
+2%	Juniper chips, calculated from mass of the malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
52°C -10 min./65°C 30 min./72°C 15 min./80°C 1 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 70%/30%
Bitter hops: Magnum, 11,9% alpha, dosing beginning of boiling
Aroma hops: Cascade 6,9% alpha. Dosing 50 min. beginning of boiling

WHIRLPOOL:

Juniper chips dosed on the bottom of whirlpool before entering of boiling hot wort.

FERMENTATION:

OG/FG 10,0/1,4
Lager Yeast slurry. 13 days + 12°C-14°C 0, 4 bar + 1 day -2°C

FILTRATION:

Beco SD30

BEER ANALYSIS:

Alcohol	4,3 vol.-%
Color	6°EBC
Bitterness	19 BU
pH	4,2
Turbidity	0,7°EBC-F.U.

SMOKED LAGER

Smoked Lager is a yellow-gold hued all malt beer. The flavor has strong malty character with nice, not too overlapping smoky character originating from Pear wood. Slight citric note may also be noticed originating from cascade aroma hop, giving some fresh extra for this beer.
The flavor and odor can be said to be smoky, balanced and pleasant.

RAW MATERIALS:

50%	Viking Pilsner Malt
50%	Viking Smoked Malt

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,6
48°C 15 min./52°C 10 min./67°C 40 min./72°C 15 min./80°C 1 min.

BOILING:

60 min., normal pressure
pH set with lactic acid to 5,0
Bitterness units from bitter/aroma hops: 75%/25%
Bitter hops: Magnum pellets 11,9% alpha, dosing beginning of boiling
Aroma hops: Cascade pellets 7,8% alpha. Dosing 50 minutes from start of boiling

FERMENTATION:

OG/FG 10/1,5
Commercial Lager yeast slurry. 4 days 14°C + 10 days 12°C + 1 day -2°C

FILTRATION:

Beco SD30. Can also be unfiltered

BEER ANALYSIS:

Alcohol	4,7 vol.-%
Color	6°EBC
Bitterness	25 BU
pH	4,5

BELGIAN GOLD – BELGIAN DUBBEL

It is a strong, malty beer of deep copper color and rich, thick white head. Perfect marriage of complex malts, Belgian yeast aromas, alcohol and delicate earthy noble hop notes. High carbonation makes it drinkable despite high extract. The aroma covers many esters (stone fruits like peaches and plums, dried red fruits remaining of prunes and raisins), malt toffee, cookie-like aroma, slight soft alcohol and clove-like, spicy phenol from Belgian yeast. Produced and drunk in Belgian for years and now popular all over the world.

RAW MATERIALS:

39%	Viking Pilsner Malt
32%	Viking Pale Ale Malt
10%	Viking Wheat Malt
6%	Candied syrup
6%	Viking Munich Light Malt
4%	Viking Caramel Malt 100
3%	Viking Caramel Malt 200

MASHING:

Malt/Water ratio: 1/3,5
pH set with lactic acid to 5,3
65°C 45 min./71°C 15 min./76°C 5 min.

BOILING:

Boil 90 min., normal pressure
pH set with lactic acid to 5,0
Hops: 70% from bitter hops 30 minutes after start of the boil, 30% 10 minutes before the end of the boil (Belgian aromatic hops). Candied syrup added 5 minutes before the end of the boil

FERMENTATION:

OG/FG 18/3,3
Wyeast 3538. 14 days at 16°C-24°C (temperature is raised steadily) + 21 days at 14°C

BEER ANALYSIS:

Alcohol	8,1 vol.-%
Color	25°EBC
Bitterness	40 BU

MANNEKEN PIS – BELGIAN TRIPEL

Tripel is strong, light malty beer that despite his high alcoholic content is refreshing and drinkable. Simple grist results in pleasant maltiness that is nicely balanced by phenol (clove-like, papery, spicy) and fruit (stone fruits, banana, pear) aromas from Belgian yeast. Slight alcohol might be present. The beer should be richly gassed with white, thick head. Malt bitterness is intensive to balance sweetness from the aroma. It can be dangerously complex and easy-drinking beer.

RAW MATERIALS:

90%	Viking Pilsner Malt
10%	Table sugar

MASHING:

Malt/Water ratio: 1/3
pH set with lactic acid to 5,3
65°C 30 min./72°C 20 min./76°C 5 min.

BOILING:

Boil 90 min., normal pressure
pH set with lactic acid to 5,0
Hops: 70% from bitter hops 30 minutes after start of the boil, 30% 10 minutes before the end of the boil (Belgian aromatic hops). Sugar added 5 minutes before the end of the boil

FERMENTATION:

OG/FG 19/3
Wyeast 1214 Belgian Abbey. 14 days at 18°C-24°C (temperature is raised steadily) + 28 days at 14°C

BEER ANALYSIS:

Alcohol	8,9 vol.-%
Color	12°EBC
Bitterness	40 BU

VIKING APA

Viking APA is a non-filtered beer made with our selection of special malts. A moderate hop aroma together with strong enough malty taste makes this beer balanced and drinkable. Hazy appearance of this beer supports the taste sensation.

RAW MATERIALS:

72%	Viking Pale Ale Malt
16%	Viking Dextrin Malt
12%	Viking Caramel Pale

MASHING:

Malt/Water ratio: 1/4
pH set with lactic acid to 5,5
62°C 30 min./72°C 10 min./76°C 5 min.

BOILING:

60 min., normal pressure
pH set with lactid acid to 4,8
Bitterness unit from bitter/aroma hops: 70%/30%
Bitter hops: Chinook 14,6% dosing beginning of boiling,
Aroma hops: Saaz 3,8% dosing 45 min. from beginning
Chinook 14,6% dosing 55 min. from beginning
Centennial 8,5% dosing into Whirlpool

FERMENTATION:

OG/FG 12,2/1,7
Yeast: Safale US-05 14 days 19°C + 2 days 5°C

FILTRATION:

No filtration

BEER ANALYSIS:

Alcohol	5,1 vol.-%
Color	12°EBC
Bitterness	29 BU

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