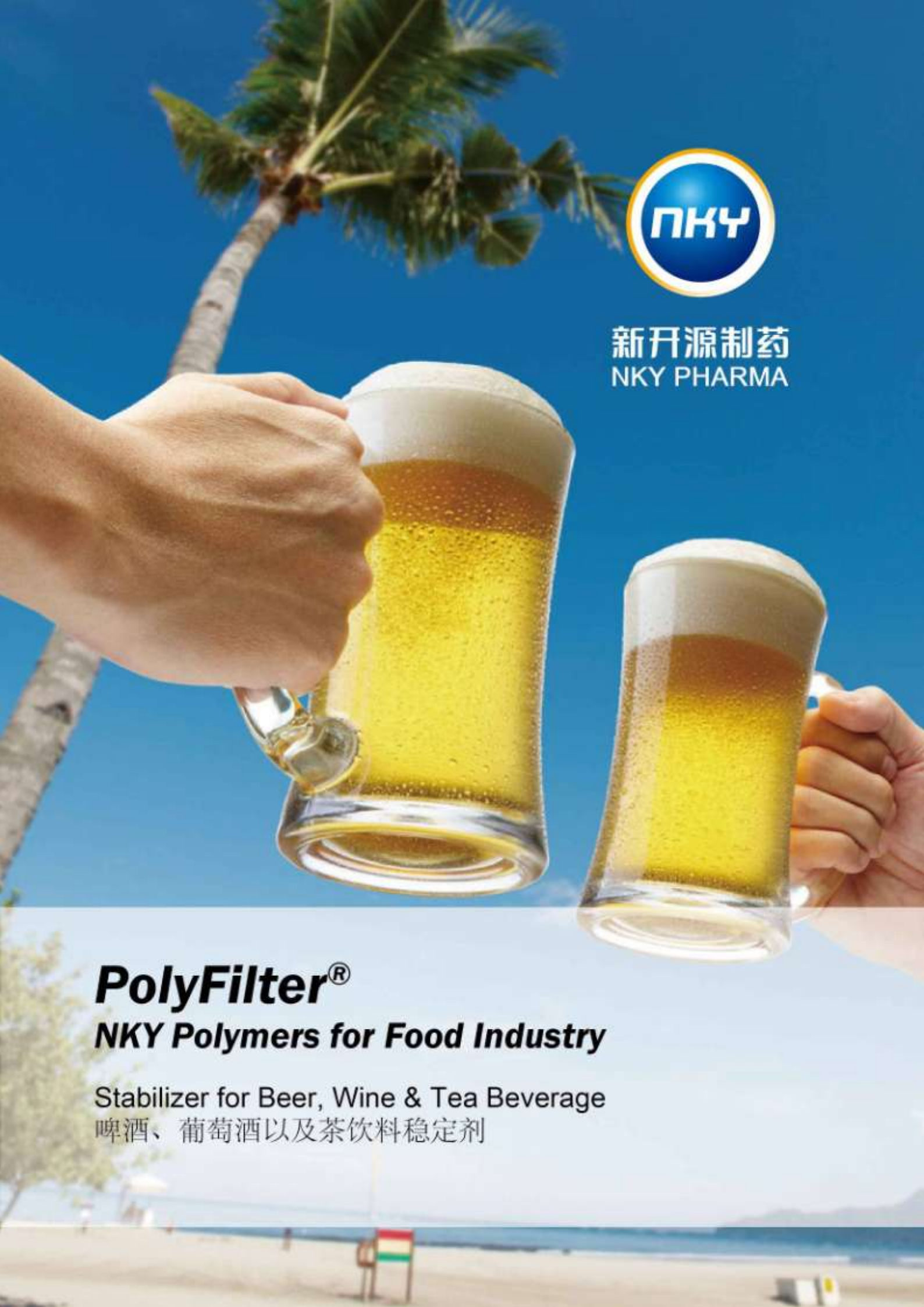


新开源制药
NKY PHARMA

PolyFilter®

NKY Polymers for Food Industry

Stabilizer for Beer, Wine & Tea Beverage
啤酒、葡萄酒以及茶饮料稳定剂

About NKY

Boai NKY Pharmaceuticals Ltd (NKY, stock code: 300109) was the first domestic company to develop and manufacture polyvinylpyrrolidone (PVP) series products in China. With more than 26 year's experience in PVP production coupled to a dedicated commitment to quality improvement and management, NKY has become the largest Chinese producer of PVP's and third largest globally.

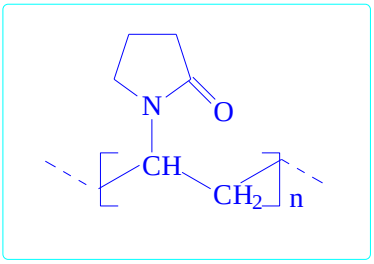
With the establishment of the R&D Center in Boai and the Technical Research Center in Tianjin, NKY is committed to R&D and the development of new products and technologies to bring new solutions and value to their customers. We are continuously striving to become the most trusted partner to our customers by providing materials that meet their quality requirements and enhance their finished product's performance.

The company continues to develop new technologies and capabilities to better serve its market as can be attested by the many company patents and distinctions. Recently, NKY has been awarded the distinction as National Torch Plan high-tech company, qualifying the company as a State-level high-tech enterprise. On a provincial level, our technical R&D center has been qualified as a Jiaozuo innovation center and our company as an environmentally responsible enterprise.

We provide high quality medicinal excipient for our customers in more than 60 countries world-wide.

What is PolyFilter®

PolyFilter® is the brand name of PVPP which produced by Boai NKY pharmaceuticals Ltd., and acted as Wine, Beer&other beverage's stabilizer. It's cross-linked homopolymer of 1-vingylpyrrolidine-2-one, and well know as polyvinylpyrrolidone and PVPP. It's odorless or with characteristic odor, insoluble in water, alkali, acid and all other common solvents, hygroscopic, swells rapidly in water but without forming a gel.



Application: PolyFilter® used as stabilizer in beer, wine, tea beverage, juice & other beverage industry.

Chemical name Cross-linked homopolymer of polyvinylpyrrolidone, PVPP

INCI/CTFA Insoluble PVP

CAS No. 25249-54-1; 9003-39-8

Appearence white or creamy white granular free flowing powder

Specifications

Product	PolyFilter® Single-use				PolyFilter® Recycling
Specifications	10	V	VT	F	R
Appearance	White to off - white,hygroscopic, free flowing powder				
Identification(FCCV method)	No blue color appears				
Water-soluble substances % max	0.5				
Acid /ethanol soluble substances % max	1.0				
pH(1%water suspension)	5.0-8.0				
Moisture % max	5.0				
Residue on Ignition % max	0.4				
Assay of nitrogen %	11.0-12.8				
Vinylpyrrolidone ppm max	10				
Lead ppm max	2				
Arsenic ppm max	2				
Heavy metal ppm max	10				
Peroxides (Expressed as H_2O_2) ppm max	400				

Adsorptive capacity % min	**45**	**45**	**40**	**40**	**40**
Particle Size >80% μm	5-50	50-50	5-200	100-300	80-180
Typical Average Particle Size μm	25	30	140	180	90
Swell Volume ml/g max					6

PVPP stabilizer for beer

Introduction

Even through the beer are filtrated,stored some time later, the turbidity & sedimentation will be formed also, then the shelf-life will not be long. This phenomenon mainly caused by the polyphenols in the beer, such polyphenols have a particularly high haze-forming potential which will be caused the beer cloudy. PolyFilter® can avoid premature turbidity by the removal of polyphenols brings clear appearance & advantages in taste, also prolongs the shelf-life.

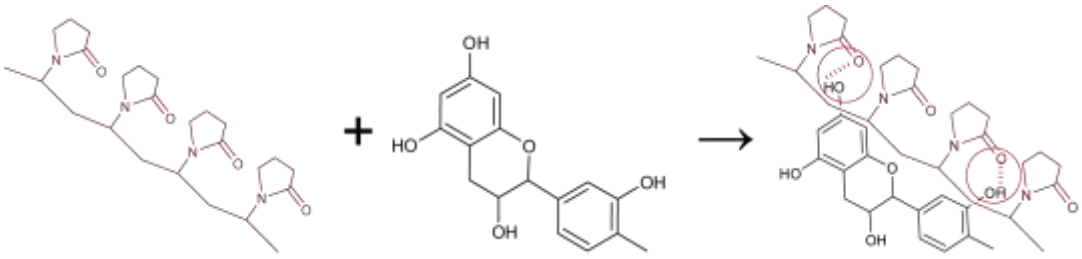
Mechanism of Haze Development

Fresh beer contains simple flavanoid polyphenols and kind of proteins, such polyphenols and proteins are easy to form weak hydrogen bonds, thereby form some compounds, and these compounds are invisible due to their low molecular weight.. 3 to 6 weeks later, the flavanoids oxidized and polymerized, and every 3-4 bonds formed one new unit substance-called “tannoids”. Tannoids can produce visible colloidal particles by naked eyes. The effect of hydrogen bonds which connect the polyphenols together are weak, when the temperature rise they are broken, then the turbidity disappeared. We call this “chill Haze”.

After a longer storage period, ionic and covalent bonds formed between the flavanoids and the proteins. They are stronger that can not be broken by an increasing temperature, so permanent haze would develop in beer.

Mode of Action

Polyphenols are adsorbed by PolyFilter through forming hydrogen bonds, and then removed by filter.



Advantages of PolyFilter®

- High effective at relative low dosage rates and with short contact times
- No residue
- Consistently achieve and make the maximum for beer shelf-life and constant quality.
- Colloidal stability of the beer even under extreme climatic condition
- No impact on foam, flavor or other beer quality parameters
- Easy to use
- Environmental friendly

PVPP stabilizer for beer

Safe to use

PolyFilter® is dissoluble in water，so can be removed though filter.

PVPP used as beer clarifying agent was applied in food field in 1973,and registered in Gerengy. The relatied laws and regulations can be found in current edition of food chemistry index, EU rules, Japan Register authority, and food and drug union regulation index. These systems also can be applied in supervise the application of PVPP in other beverage industries.

Single-use process

Preparing 5-15% PolyFilter® suspension with deoxidation water, continue to stirring mor than 60 minutes, making particles with beer to contact sufficiently. PolyFilter® is added uniformly accompanied by the process of kieselgur added continuously

Adsorption time & dosage

A few minutes of adsorption can get obvious effect.But in order to give full play to the PolyFilter® effect, it's recommended that the adsorption time more better lasts 10 minutes.it can't influence on beer if extending the adsorption time.The dosage of PolyFilter® is controlled in the range of 10-45g/hl.

Recycling process

Preparing 10% PolyFilter® suspension with deaerated water in dosing vessel, continue to stir. After the beer filtered by kieselgur, PolyFilter® suspension is uniformly added to the beer filtration through measurement .

Adsorption time & dosage

At least more than three minutes of the adsorption time can get obvious effect. Dosage is controlled in the range of 20 to 50 g/hl

Regeneration

Regeneration function--under alkaline condition, the hydrogen bond can open, polyphenols are dissolved clean, PolyFilter® is regenerated..

Wastage

Each regeneration process loss about 0.5 to 1%. Suggested that the concentration of PolyFilter® suspension should be checked at regular intervals, and adjusted properly

PVPP stabilizer for wine

To judge the quality of wine looking is great important because the eye participates in the wine experience. The color and transparency of wine are often compared to rubies or gold. Enjoyment, especially of white wines, is diminished by brown or pink discoloration. The bitter tastes and discoloration are caused in part by so-called polyphenols

Discoloration and bitter taster are caused in such ways

The following reactions of the polyphenols lead to discoloration in white wine:

- Flavanoids and other polyphenols are converted through oxidization to unpleasant or mast ringent flavors.
- Browning and changes in color(pinking) are caused by oxidation of leuco-/pro- anthocyanidin.
- The reaction of tannins and albumen or iron leads to clouding.

How to solve the problem? Purify the polyphenols is necessary

PolyFilter® wine stabilizers are based on polyvinylpolypyrrolidone(PVPP) technology. This provides effective and highly selective reduction of polyphenols causing oxidative discoloration,haze, or loss of fresh aroma and flavor characteristics, and,

- ✧ Prevent the pinking and browning reactions in white and sparkling wines.
- ✧ Improve the wine clarity in bottle
- ✧ Enhance the aroma and flavor in red wine-preserving more of the highly desirable fresh, fruity character.

PolyFilter® preferential forms very strong bonds with the more problematic polyphenols that can cause visual and flavor problems in wine, it is insoluble in water,alcohol,acid and almost any solvent,so can removed completely form the wine by filtration.

PolyFilter® is a good choice!

- ✓ Easy to disperse-can be added either directly as powder or as slurry to the must.
- ✓ Can be used in all wines
- ✓ Helps prevent oxidative color defects such as pinking and browning.
- ✓ Brightens the wine.
- ✓ Enhances the aroma and taste character of the wine by removing polyphenols.
- ✓ Highly effective at relatively low dosage.

NKY Polymers for Food Industry

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