

# polyclar™ endure

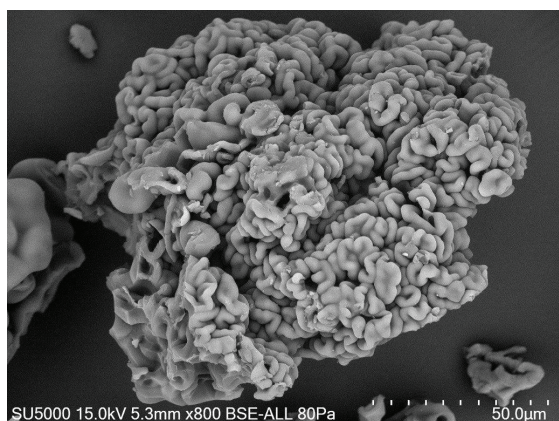
## regeneration-grade beer stabilizer

**The Ashland Polyclar™ line of beer stabilizers, the market leading beer stabilizers, just got even better. Introducing a new and improved version of Polyclar™ Super R: Polyclar™ Endure. This product is designed to be used in breweries with regenerative filter systems.**

Ashland scientists had the goal to improve particle strength, while maintaining favorable filter characteristics and adsorption efficiency. The result was creating a stronger particle that generates fewer fines while meeting all standard accepted regenerable polyvinylpyrrolidone (PVPP) specifications for absorbency and filter flow. The new particle has been in beta-test breweries in multiple countries and running on regenerative filtering systems from all major filter suppliers. To date, we have received positive feedback from all customers. New Polyclar Endure continues to show: reduced generation of fines; retention of filter flow characteristics; and reduced PVPP consumption. Polyclar™ Endure meets all existing sales specifications for Polyclar™ Super R.

### description

Polyclar™ Endure regeneration-grade beer stabilizer is a very effective 100% PVPP stabilizer. It is optimized for regeneration use, either on its own or in conjunction with other stabilizers, offering a highly effective means of preventing non-biological haze in all types of beer.



Polyclar™ Endure regeneration-grade beer stabilizer has a very large surface area for polyphenol adsorption making it an effective stabilizer.

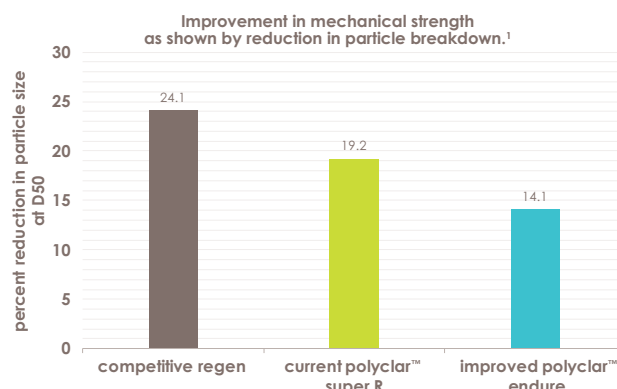
### key facts

Polyclar™ Endure regeneration-grade beer stabilizer represents a significant development in preserving the quality and character of beer after packaging.

It offers the following key benefits:

- regeneration-grade PVPP, requiring a dedicated secondary regeneration filter
- effective and highly selective removal of haze-producing polyphenols
- protection against chill haze and permanent haze development
- prevents oxidation of flavonoids, which contributes to harsh, astringent and stale flavors in beer
- no negative impact on foam, flavor or other quality parameters
- no PVPP labeling required on finished product
- excellent technical service from industry specialists
- compatible with all regenerative filter brands

### regen grade PVPP mechanical strength comparison



Improvement in mechanical strength results in fewer fines and less filter blockage.

<sup>1</sup>Percentage of particle breakdown measured after exposure to ultrasonic energy.

## methods of use

Polyclar™ Endure regeneration-grade beer stabilizer is added to beer after the diatomaceous earth (DE)/kieselguhr filter (primary filtration), using a separate PVPP filter. The optimized particle size allows for PVPP filtration/stabilization without the use of other filtration aids. The use of a trap filter after the DE filter is recommended.

Typically, Polyclar™ Endure regeneration-grade beer stabilizer is made up as an 8–12% (w/v) slurry in brewing/product water or as recommended by filter supplier on-site engineer. The slurry tank often has a permanent heating jacket or heat exchanger, before the injection point into the beer for microbial control.

A PVPP pre-coat is recommended for good initial polyphenol adsorption and beer filtration. The pre-coat can be made with either water or beer.

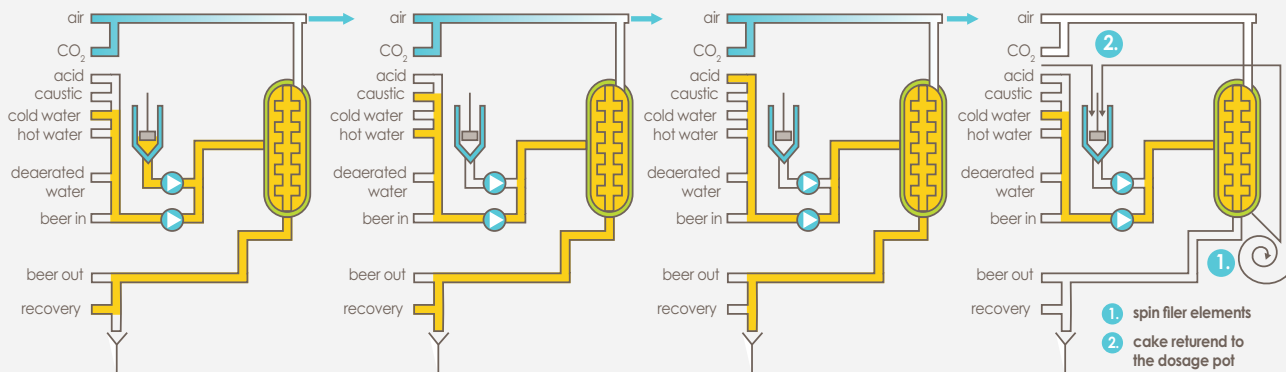
Polyclar™ Endure regeneration-grade beer stabilizer is effective with a contact time of a few minutes; however, a contact time of 10 minutes is recommended. It is regenerated using food grade caustic and acid washings *in-situ* — refer to the filter manufacturer's instructions.

The use of softened, brewing quality water is recommended, particularly for slurry preparation and neutralization.



PVPP regeneration filter — photo courtesy of Filtrox®.

### overview of regeneration



#### stage 1: end of beer treatment

Residual beer is returned to recovery tank and remaining Polyclar™ Endure regeneration-grade beer stabilizer is dosed into filter.

#### stage 2: caustic soda treatment

Polyclar™ Endure is regenerated *in situ* using a 1–2% (wt/wt) caustic soda wash at 60–80 °C, preferably for 30 minutes. After a pre-programmed time of recirculation, the caustic is flushed with hot water.

#### stage 3: neutralization/ acid washing

The Polyclar™ Endure filter cake is rinsed with dilute acid (nitric at 0.3% or phosphoric at 1% wt/wt; ambient to 50 °C, or as recommended by filter manufacturer) until the effluent from the filter reaches a pH of 4. Use of softened brewing water is recommended.

#### stage 4: rinsing and top-up

Cake is flushed with cold water and acid washed out. Regenerated Polyclar™ Endure is displaced from the filter. The solids in the dosing pot are checked and additional Polyclar™ Endure regeneration-grade beer stabilizer added as needed.

## PVPP in use

If regeneration-grade material is used for an extended length of time without decantation, accumulation of fines can occur. Monitoring and maintenance of the slurry is still required. In extreme cases, it may be necessary to replace a large proportion of the fill to re-establish an acceptable filter flow rate index.

### mandatory requirements for proper use of regenerable PVPP

It is imperative that all breweries implement these best practice procedures:

- Ensure that the beer in-feed to the regen filter is less than 0.6 EBC (European Brewing Convention) haze units. This practice will minimize residual organic matter contamination of the PVPP.
- Ensure that a security/trap filter is installed between the primary DE filter and the regen filter. This will prevent the DE contamination of PVPP.
- Ensure that the regen filter is provided with separate and dedicated holding tanks for storage of "food grade" caustic solution and acid solution. This practice will maintain the integrity of these solutions and thus prevent any chance of PVPP contamination by undesirable residues.
- CIP cleaning caustic solution and/or regeneration caustic available in the brewery sometimes contain surfactants and other additives. These inclusions might leave a residue on the candle surface, screens or in the PVPP resulting in compromised regeneration operation. Preferably, the caustic solution used in regeneration should be made from "food grade" caustic, which has no surfactants or additives. This will ensure a trouble-free regeneration process
- Every PVPP regen filter unit has a stated holding capacity for PVPP. To ensure that the capacity is not exceeded, overcharging or overloading of first fill PVPP quantity and the concentration of the PVPP slurry must be monitored to ensure excess PVPP is not delivered to the filter.
- Overcharging or overloading the filter can potentially cause major damage to filter candles and screens. A regeneration PVPP filter is an expensive piece of equipment. In view of this, it is imperative that the practices recommended here are followed to avoid damage to the filter.
- Regular high-pressure cleaning of filter elements is necessary to keep effective performance of PVPP filter; 1–2 times per year.

## summary of regeneration filter procedure checks

parameter	frequency	procedure
slurry composition 10% or as recommended	each occasion	drying at 108 °C, or via swell volume calculation
filter differential pressure ( $\Delta p$ ) < 1.0 bar	each occasion	monitor filter $\Delta P$
inspection of filter elements	each occasion	visual inspection

Ashland offers a Polyclar™ Endure health check that encompasses additional testing and can be done every six months free of charge. Health check procedures are listed in the table.

### Ashland Polyclar™ Endure health checks—every 6 months

parameter	procedure
slurry composition (%)	drying at 108 °C
catechin adsorption capacity (%)	Ashland test method No. MP-496-W
filter flow rate	Ashland test method No. MP-456-W
particle size distribution	Ashland test method No. MP-1202-W
ash	Ashland test method No. MP-1381-W
swell volume (ml)	Ashland test method No. MP-557-W

## dosage rates

The exact amount of Polyclar™ Endure regeneration-grade beer stabilizer required will be dependent upon the brewing raw materials used, process conditions, shelf life requirement and contact time. The following table shows some examples:

### dosage rates

stabilizer	shelf life	addition rate (g/hl)
Polyclar™ Endure regeneration-grade beer stabilizer	6 months	15–30
Polyclar™ Endure regeneration-grade beer stabilizer	>6 months	20–50
Polyclar™ Endure regeneration-grade beer stabilizer + silica gel	6 months	10–20
Polyclar™ Endure regeneration-grade beer stabilizer + silica gel	>6 months	15–40



## quality, safety and service

### quality

Polyclar™ stabilizer products are manufactured to internationally recognized quality standards. Details are available upon request.

### regulatory

PVPP is permitted for use in beverages in all countries with regulations covering the use of additives and process aids. Always seek guidance from your local regulatory authorities.

### safety

Safety Data Sheets are available upon request.

### technical support

Technical support for Ashland's beverage product portfolio is provided by a team of dedicated industry specialists, from locations in Europe, the U.S. and Asia. For further information on the use of our products, please contact your local Ashland representative or authorized distributor.

Ashland also supplies products and services to the wine, brewing and wider food and beverage industries. We are always solving stability and clarifying challenges to introduce innovative new products to better serve our increasing number of customers in these markets.

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