

Nucleating agent/Clarifying agent ZN-3S

- The most widely used world polypropylene (PP) transparent agent is the third generation of Sorbitol Nucleating Agent. Zhonghui ZN-3S, the same products are imported from the United States (MILLAD) 3988, It can provide the highest possible transparency for business applications. Applications include food and storage containers, bottles, packaging, medical equipment, as well as innovative products such as sheet.



1. Advantages of using polypropylene transparent agent

1. Best transparency

2. cost reduction

3. Weight reduction

4. Increase chemical resistance



2. ZN-3S is a polypropylene (PP) purification technology

- Zhonghui ZN-3S is a breakthrough in polypropylene (PP) purification technology, The formula is correct, and the grade of PP is relative, Using this additive can improve the transparency, increase the yield and yield, and improve the physical properties. Polypropylene with low cost and usability make it widely used. but in some cases its advantages are limited by its transparency. Now use the Zhonghui ZN-3S, polypropylene can be extremely clear and can be widely used in applications where the design is important. In terms of design, packaging and material selection, The purified polypropylene by ZN-3S provides great flexibility to the designer .

The advantages of polypropylene purified by ZN-3S:

- High transparency: transparency, high gloss, smooth surface of polypropylene;
- High yield: Polypropylene treated by ZN-3S, high yield and yield;
- High efficiency: Polypropylene cost-effective and low density, making it a very attractive alternative to other resins
- Wide use: the sink of ZN-3S purification in polypropylene, toughness, flexibility, rigidity, heat resistance, moisture resistance, chemical resistance and suitable for food contact and provide superior comprehensive performance;
- Performance improvement: compared with the UN purified polypropylene, the performance of the ZN-3S treated polypropylene was improved, especially with higher rigidity and thermal deformation temperature;
- Processability: ZN-3S will not be cooled out of polypropylene surface, will not produce odor;

3. Additive amount of nucleating agent

a. Add less

b. In general, the effect of ZN-3S addition on the 0.1 ~ 0.4% increase was significant

c. Suggested adding amount of 0.2 ~ 0.4%,

d. Processing temperature: 190~270°C

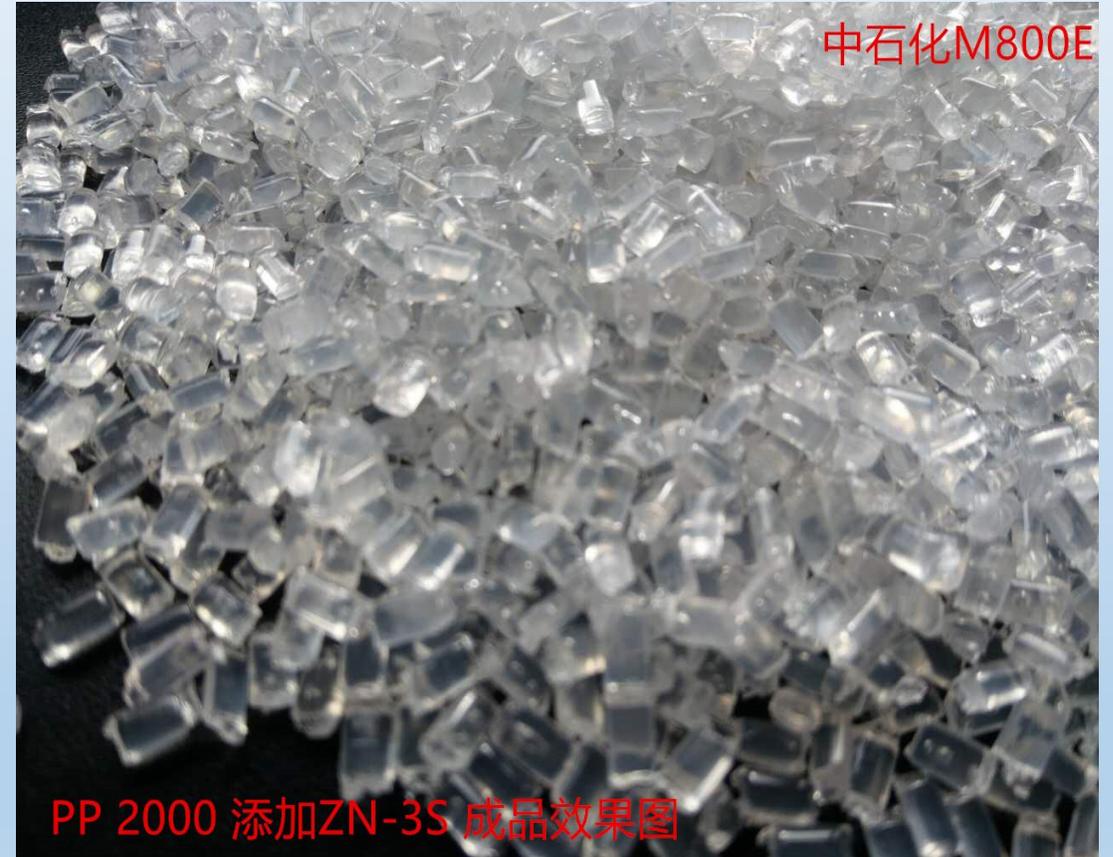
4. Zhonghui ZN-3S how to take effect

Usually polypropylene is slowly crystallized into relatively large crystals called grains. As the crystal is larger than the visible wavelength, the incident light is scattered by the crystal, thereby reducing the transparency and increasing the ambiguity. When polypropylene was purified by ZN-3S, the crystallization rate of the polymer increased exponentially. Because of the increase in the number of crystals grown in the same volume and the decrease of the crystal size, the result is that the crystal is smaller than the wavelength of light, and the transparency is enhanced after the light is allowed to pass.



5. To obtain purified polypropylene by Zhonghui ZN-3S

- One of the easiest ways to get the purified polypropylene from ZN-3S is to obtain the resin from your polypropylene supplier. The cleaning agent is usually added to the resin during the molding process.



6. Comparison between polypropylene purified by ZN-3S and other materials

Compared with other materials, **polypropylene purified by ZN-3S** has many advantages. Example: light weight, high strength, good cost performance. Some properties of polypropylene after use of ZN-3S are summarized as follows. The following table compares polypropylene containing ZN-3S with the following materials: Poly ethylene terephthalate (PET), polystyrene (PS), polyvinyl chloride (PVC), high density polyethylene (HDPE), polycarbonate (PC) and glass (GLS):

Identification project	Selection of other materials					
performance	PET	PS	PVC	HDPE	PC	GLS
Transparency and gloss	O	O	O	++	O	O
Cost per unit volume	++	+	+	O	++	+
Hot filled capacity	++	++	++	++	O	O
Wet / steam barrier	+	++	+	O	++	-
low density	++	+	++	O	++	++
Propagation properties of taste and odor	+	O	+	+	O	-
Drop strength	+	++	-	-	-	++
flexibility	O	++	O	O	O	++
hardness	-	-	-	+	-	-
Chemical resistance	+	+	++	O	O	++
Oxygen barrier property	-	O	-	-	O	-

Symbol : Polypropylene containing ZN-3S is : Far superior (++) ; Be better than (+) ; Amount to (0) ; Inferior to (-)

7. The process of resin containing ZN-3S

- Resin containing ZN-3S can be used in all manufacturing processes- Mold, blow mold (EBM, IBM, ISBM, SBM) , Sheet extrusion, thermoforming, film and fiber extrusion. In general, polypropylene containing ZN-3S in the process of processing conditions are not harsh-- It has a rather large processing temperature compared with the traditional purified polypropylene.
- Because ZN-3S is both effective nucleating agent and purifying agent, The curing process of resin is much faster than that of standard resin, The result is a higher yield than most of the untreated polypropylene in most of the process reactions. As a result, the equipment parameters usually need to be adjusted to take advantage of this improvement and to ensure the smooth progress of the process.

8.加工



Injection molding and blow molding(EBM和IBM)

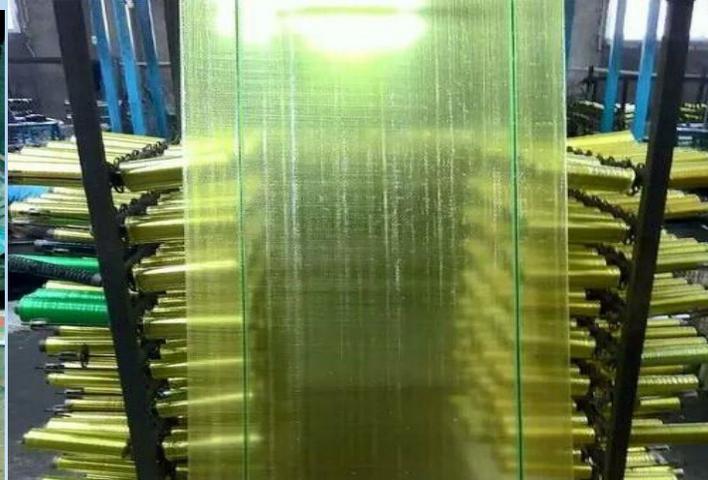


- Resins containing ZN-3S can be formed in a wide temperature range, You can use the melting point of 200-270°C. Usually when the mold temperature is 20-40 °C and surface smooth (Widely discussed with SPI1-2 finish, SPI3 finish can also) , Maximum transparency can be obtained. Compared with polypropylene containing a previous generation of purifying agent or as a nucleating polypropylene, Processing of polypropylene containing ZN-3S nucleating agents may be encountered in the following table

problem	Reason	Solution
Injection mold is not complete, there are holes, bubbles	Resin filling speed may cause incomplete injection and exhaust incomplete	Increase the melting temperature; Increasing the mold temperature; To ensure the smooth mold hole
streamline	<ol style="list-style-type: none"> 1. The relative mold, the equipment is too small 2. Mixed difference and (or) short dwell time 3. Uneven melting 4. Note: the line is due to polymer band than the polymer solidification around quickly, and was forced to move in to fill the mold. This produces a blurred line along the direction of flow in the mold. 	<ol style="list-style-type: none"> 1、 Increase the back pressure to increase the melting temperature and improve the uniformity of the melting temperature with a longer period of time; 2. Increase the injection tube temperature and (or) so that you can quickly fill the mold mold temperature in polymer before solidification; 3. Improving the uniformity of melt using a mixing nozzle or a high efficiency screw machine;
Reduce processing time	Rapid solidification to reduce time	If the whole cycle is not restricted by the screw mechanism or other parameters, the cooling cycle can be reduced
Transparency is not enough	Fuzzy flocculent due to excessive filling of injection molding caused	Reduced injection pressure

Blow molding

There are several types of ISBM and SBM machines available for use in the production of polypropylene bottles with high transparency. This equipment is used to regulate the purification of polypropylene, which has the same transparency as glass. The introduction of the use of processing conditions depends on the type of equipment and the specific use of the resin.



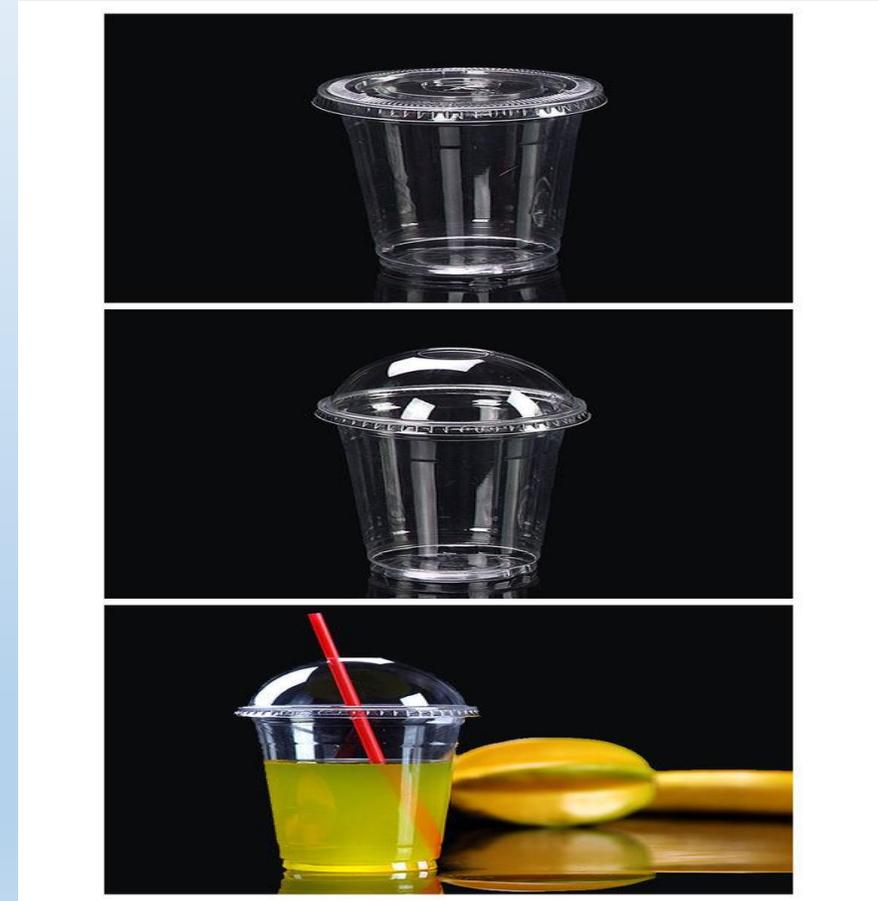
Extrusion molding

- For sheet and film extrusion, Extrusion molding containing ZN-3S polypropylene at a high temperature of 270 °C under processing must be filled evenly mixing intact. Factory conditions allow pre granulation. Due to the rapid increase of crystallization rate, The processing of polypropylene containing ZN-3S will be different from the processing of non nucleated polypropylene, If the resin is too fast, There will not be a smooth surface, and the finished product may have stress deformation, It is generally recommended that the temperature above normal cold rolling be suitable, The addition of a mild cooling surface and a faster resin extrusion speed can increase productivity, Can also produce a more transparent, smooth and high rigidity of the film. The exact and general mold cooling surface humidity depends on the resin, film thickness and device type.



9. Application of polypropylene purified by Zhong Hui ZN-3S

- Polypropylene containing ZN-3S has many uses. In most manufacturing situations, new product designers can flexibly select polypropylene without or without ZN-3S purification. The removal of other materials and the use of purified polypropylene will reduce costs and improve efficiency in most potential applications. The following table gives an overview of the possible applications that may be achieved through a variety of machining processes.



Injection mold:	1. room 2, electronic components; and the video box; 3, the joint storage box; 4, protective packaging; storage box 5, 6, 7; China plate; medical instrument; 8, equipment parts
Blow molding:	1. Tomato sauce seasoning bottle; 2, water bottle; 3, detergent bottle; 4, baby bottle
Blow molding:	1. Bottle; 2, etc. exudation and sports drink bottles, medicine bottles; 3; 4, 5, baby bottles; detergent bottles; 6, dry food and seasoning cans; 7, room 8, parts; liquid soap and detergent bottles
Sheet extrusion:	1. The video box set; 2 floor plates; 3, assembly or lunch box; 4, health products
Hot forming:	1. Foam packaging materials; 2, beverage cup; 3, 4, a medical tray; fruit juice box; 5, one-time Deli plate; 6, box 7, dairy packaging; microwave fast food box; 8, the plate of cookies
Thin wall injection mould	1. Dairy packaging box; 2, disposable beverage cups; 3, 4, cooked food containers; storage containers
Cast film:	1. Photo protection layer; 2, candy wrappers, health supplies; 3; 4, medical film
Nucleation of various processes:	1. Biaxially oriented film; 2, block copolymer and thermoplastic olefin polymers; 3, non woven fabric; processing cycle 4, faster or more durable products

10. Quality standards: ZN-3S quality and quality of the United States and (MILLAD) 3988 consistent quality, the price is the United States (MILLAD).

Item	Standard
Appearance	White Powder
Identification	Conforms
Purity(HPLC)	≥99.0%
Melting Point	255—270°C
Loss on Drying	≤0.5%
(95% of the size)	≤30μm
(Average particle size)	≤10μm
Ash	≤0.5%

11. Packing

5Kg and 10kg composite paper bag, can also be customized according to user needs packaging specifications; should be kept in a cool, dry place. In the unopened condition can be kept for three years, if not used this product should tie the bag.

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