



# Pure Polymers

Masterbatch & Compounding



Real Passion for Quality







## How it all started

The Innovation of plastic applications has enriched our life and increased its quality. Pure Polymers Factory ensures a reliable provision of high quality masterbatch for an efficient life.

Pure Polymers Factory was launched in Jan 2017 in Jeddah, Saudi Arabia as an independent manufacturer of white, colored and additive masterbatch equipped with international cutting-edge Italian twin-screw extruders to serve the top-quality plastic processing industry in the region.

We produce high quality white, colored and additive masterbatch, custom-made thermoplastic compounds, liquid based or paste colorants and custom compounding for Polymer manufacturing, Polymer converting, and petrochemical and plastics processing industries.

Pure Polymers produces masterbatch solutions that are either for general purposes or specific applications. Specific application includes masterbatch used for: Fibers, (PP, PET, PE), BOPP, Agricultural, Horticultural & Multi-layer films, PET Preform / sheet production & Specialist Pipe manufacture. Pure Polymers is also a source for customer specific additive pre-blends as it uses its proprietary technology to serve the growing number of customers in the Middle East region and beyond.

## WHITE MASTERBATCH



Our advanced performance white color concentrates containing up to %75  $\text{TiO}_2$  (in LLDPE), have been specifically designed to provide improved resistance to phenolic yellowing / pinking while optimizing whiteness and thermal stability. These products also provide high opacity with low letdown ratios.



Our white concentrates are available in a number of carrier resins and are designed for use in extrusion film, sheet, injection, and blow molding applications.

## BLACK MASTERBATCH



Our carbon black concentrates consist of a wide range of pigment systems varying from large to small particle sizes. This range of systems allows for tinting strengths of blue, jet black to brown. These products can be used in a wide variety of polymer systems from ABS, GPPS, HIPS, LDPE, LLDPE, HDPE, and PP homo and co-polymers.



Typical applications include film, compounding, pipe, fiber, and injection/blow molding. Industries served include agricultural, consumer products, industrial, and packaging.





# COLOR MASTERBATCH

## Colors and colorimetry

- The appearance of a manufactured product, assuming that it fulfills its principal function, is considered its most important attribute and it influences its marketability. Of all the visual aspects, color is perhaps the most important to the observer. A bad color or a lack of variation in color in a given batch of a product is perceived as being a sign of poor quality. The appearance and color therefore, constitutes the essential demonstration of the product. The three elements influencing this are:

1. The light Source.
2. The Object.
3. The Observer.



Colorimetry aims to translate the visual perception of the human observer into objective values. In color vision, the visual sensation interprets the impression of color on the basis of:

1. Its hue/chroma: This is the visual sensation which gives rise to color names such as, violet, blue, green, red, purple, etc.,
2. Its saturation or purity: This specifies the degree of the coloring feature of an object in contrast to white, which is achromatic.
3. Its lightness: This is the visual attribute by which an object appears to be more or less bright, or to transmit more or less light.



Hygienic properties



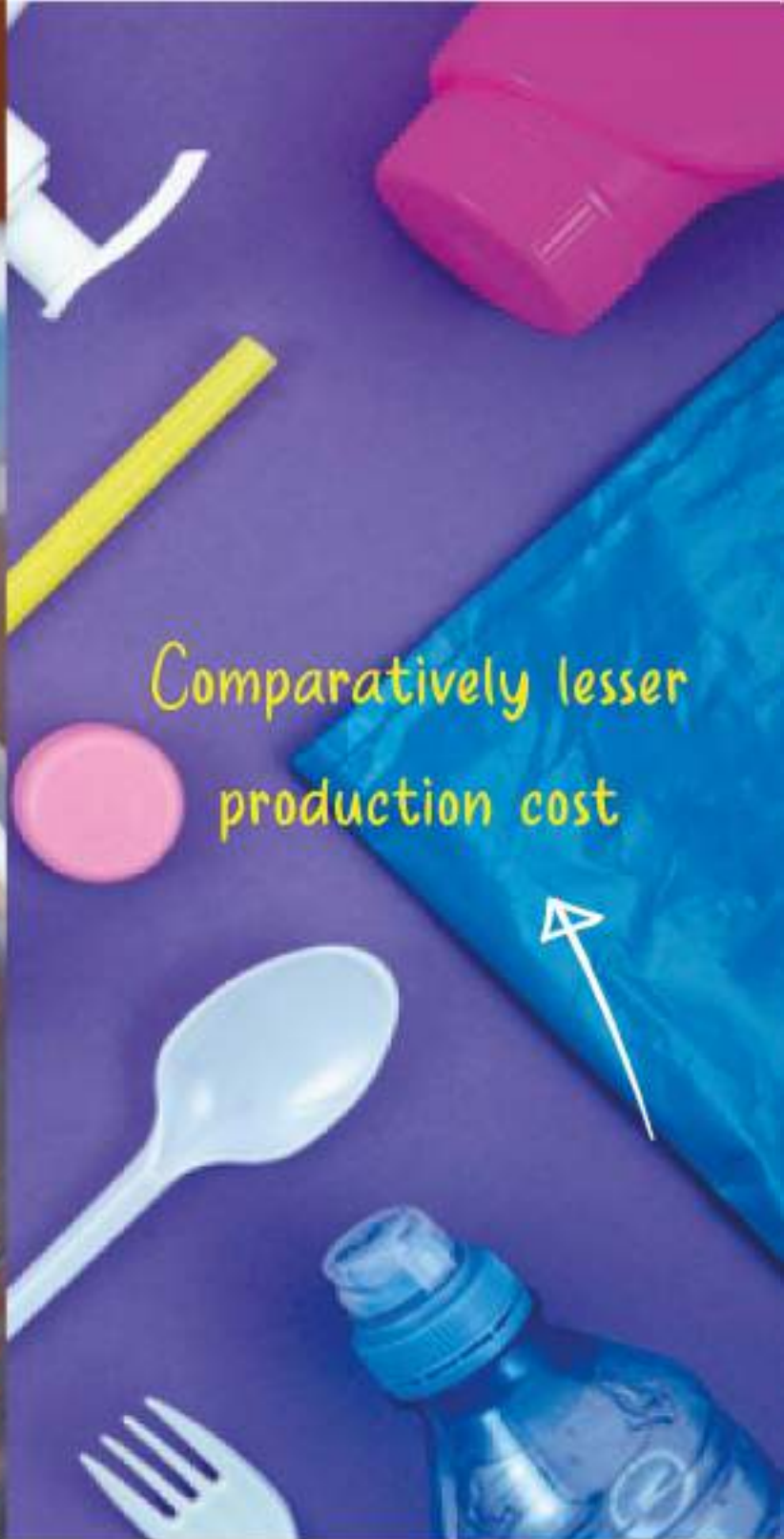
Request your Color

The material of choice - Human lifestyle and plastic inseparable.





Good safety  
for packaging



Comparatively lesser  
production cost

# TECHNICALLY ADVANCED MASTERBATCHES



Our objective and plan for the polymer sector are to continue to develop custom solutions and technically sophisticated masterbatches and compounds. We provide a complete sample service that is backed up by outstanding laboratory and technical support.



## TECHNOLOGICAL INNOVATION

Pure Polymers is a preferred partner for technological innovation by many leading plastic processing companies. In addition, Pure Polymers are often approached by forward thinking chemical producers launching new products into the plastics industry. Our fully equipped laboratory enables our technical staff to rapidly prototype new formulations, conduct extensive in-house testing and offer our customers a first-rate sampling service. Technically advanced masterbatches is our goal and strategy to continue to develop tailor made solutions and compounds for the polymer industry. We offer a comprehensive sampling service with excellent laboratory and back-up technical service.



## SPECIALIZED ADDITIVE MASTERBATCHES



Pure Polymers is a specialized additive masterbatches company located in the heart of the Middle East. Pure Polymers has an expertise in development and manufacturing in the plastics marketplace, and which provides a global supply.



## ADDITIVE SOLUTIONS FOR THE PLASTICS INDUSTRY

Pure Polymers has a wide range of masterbatches containing a variety of additives. These additive masterbatches provide the processor a means of measuring precise quantities of the active ingredients such as:

- Antimicrobial Masterbatch
- UV Stabilizer Masterbatch
- Anti-block Masterbatch
- Processing Masterbatch
- Anti-Slip Masterbatch
- Antioxidant Masterbatch
- Antistatic Masterbatch
- Anti-fog Masterbatch
- Clarifier Masterbatch
- Impact modifier Masterbatch
- Flame retardants Masterbatch
- Optical brightener Masterbatch
- Pre-colored resin Masterbatch
- Purging compound Masterbatch
- Desiccant Masterbatch
- Oxo biodegradables Masterbatch
- Blowing agent Masterbatch
- Cling agent Masterbatch





## Antimicrobials Masterbatch

Pure Polymers Antimicrobial masterbatches are special additives used by plastic manufacturers to control the growth of microbes on the surface of plastic products and textiles.

Adding antimicrobial additives offers a competitive edge and an economical means of increasing value and performance.

Pure Polymers has been a specialist in the field of antimicrobial additives for many years. The unsurpassed wealth of technical experience in this area combined with full in-house R&D and production facilities make Pure Polymers an ideal new product development partner.

Microbes, bacteria, fungi, moulds and mildews are all present in our everyday environment. These microscopic organisms have adapted to colonies and thrive in almost all places on earth. Residual levels of many bacterial strains are of no consequence to human health, in fact they can help build a general level of resistance in our immune system to infection and disease.



## So why use antibacterial additive?

Certain microbes are harmful to humans and if left unchecked will proliferate and cause infections and diseases. There is a necessity to control them in sensitive environments such as hospitals where acquired infections including MRSA can prove to be fatal.

Microbes can also be responsible for a wide range of undesirable effects such as product deuteriation, discoloration, and food contamination to name a few. Antimicrobial additives provide an extra layer of protection when combined with normal cleaning procedures.

## What does antimicrobial additives provide protection for?

- Plastics
- Fibers
- Films
- Moulding



## Key advantages & benefits of using Antimicrobials Masterbatches



**Before Antimicrobial**



**After Antimicrobial**

- Reduction in spread of acquired infections in the healthcare sector.
- Protection against cross contamination.
- Quick recovery through wound dressings.
- Reduction of odor formation in synthetic fibers and sportswear.
- Increase in product lifespan and durability.
- Resistance to unsightly and unwanted biofilm build up.

# UV Stabilizers & Absorbers

Protection against the detrimental effects of U.V. & I.R. radiation.

Ultra Violet radiation is destructive to polymeric materials so the choice of an appropriate and efficient UV package is critical to ensure good performance and longevity of the polymer. Pure Polymers produces highly concentrated formulations for the end applications. Polymer types include olefins, styrenics and ETPs. Careful selection of hindered amines and conjugated ring systems ensures the best possible performance and the co-inclusions of antioxidants further enhance the stabilization package. Application examples include: Tapes, Fibres, Geotextiles, Films, Extrusions and Injection Mouldings.

Increase product life



UV Protection includes the following:

- UV absorber and stabilizer masterbatches
- Tailored UV resistance to meet end-use requirements
- Complete range of UV technologies
- Fiber, film and moulding applications

## UV Absorber Masterbatch

The first UV protection of polymers was introduced through the use of UV absorbers. These are conjugated organic systems which "absorb" UV radiation due to the double bonds within the molecules that absorb light energy in the UV region and re-emits it in the IR region. Such compounds include benzophenones and benzotriazoles.





## UV Absorber Masterbatch

UV absorbers are only really effective in thicker sections as the thicker the section then the greater the chance of the light energy falling on an absorber molecule rather than a polymer molecule. Also, relatively large amounts of absorber have to be added to the polymer to ensure there is enough to scavenge all of the light energy that falls onto the polymer substrate. These systems have the advantage that they can be used to protect whatever is being covered or packaged by the treated polymer as well as the polymer itself. The most effective and important stabilizers are the hindered amine light stabilizers, the so-called HALS. Rather than simply absorbing the light energy, these work by interrupting the photodegradation process before it can get destructively underway.

Sunlight intensity and composition varies according to latitude, atmospheric effects etc. thus it is important that the additive (or more common the combination of additives) is selected to suit the exact application. It is therefore important to identify where in the world a final product will be used and the required life span. Other factors that affect the choice of UV stabilization package include product dimensions, type and color of pigments and application information such as food or pesticide contact.



# Antiblock Masterbatch

It is used in easy-open package, high-clarity mineral and polymeric types (bags, film ....)

Many types of Antiblock are available, ranging from synthetic silica formulations that gives high clarity, natural silica that offers high performance when cost is important and clarity can be compromised, to calcium carbonate when simple Anti-blocking without clarity is required.

**Antiblock masterbatches** can be produced in a wide range of polymers including polyethylene, polypropylene, ionomers, polyamides, thermoplastics polyurethanes and others. Combinations with antistatic and slip products offer cost effective products for use in the film industry. The application examples include: Films, sheets and others.







Pure Polymers's Antiblock Masterbatch Products include the following:

- Full range of products for the extrusion industry.
- Grades formulated for high transparency applications.
- Cost effective with high concentration.
- Combinations of masterbatches for complete solution.

## ANTIBLOCK MASTERBATCH

Polyolefin and other plastic films have a tendency to adhere together, often making it difficult to separate layers. This adhesion between film layers, called blocking, is an inherent property of some polymers. Antiblocking additives can be added to plastic to minimize this adhesion and as a result lower the blocking force between layers. Once compounded into plastic these additives create a microrough surface which reduces the adhesion between film layers and decreases the blocking tendency.



## Two factors determine the antilocking effect:

- Number of particles of antiblock at the film surface.
- Size of the antiblock particles

The greater the concentration of antiblock present then the rougher the film surface produced. However, it is important that the particles are well dispersed as agglomerates reduce antiblocking performance. Conversely the course the particles the further the two film layers are kept apart.





## Types of Antiblock Masterbatch

The choice of anti-block depends upon the polymer being used and the quality requirements of the end product.

### Synthetic Silica

This is an amorphous form of hydrous silicon dioxide with high micro porosity, a hydroxylated surface and a high surface area. Synthetic silica is used in high quality films and since it has a refractive index close to that of PE and PP it is possible to produce films with high transparency and clarity.

### Limestone

This is a naturally occurring mineral mainly consisting of calcium carbonate together sometimes with magnesium carbonate depending on the deposit. It tends to be used as an anti-block in lower quality film applications.

### Natural Silica

Natural silica is a sedimentary rock composed of the skeletons of single celled diatoms. The skeletons are made of amorphous silica and have a wide range of porous structures and shapes. Impurities such as water and organics can easily be removed, however the removal of quartz is more complex therefore, natural silicas tend to contain differing levels of quartz depending on the deposit.

### Talc

Talc is a magnesium hydro silicate. It has very low hardness and a refractive index close to that of PE and PP. Deposits are found around the world and although it contains certain levels of impurities, they can be minimized through refining.

### Organic Additives

Certain organic materials such as hard waxes and fatty acid amides show Antiblocking effects. Compared to inorganic additives they have low Antiblocking efficiency but excellent slip effect. Often slip and anti-block additives are used together to provide the optimum balance between slip and anti-block performance.



## Processing Aid Masterbatch - Output & product quality improvement.

### Why do we use Polymer Processing Aid Masterbatches?

Polymer Processing Aids (PPA) masterbatches are specifically designed to enhance extrusion ability of plastics (PE films, pipes, tubes...) leading to productivity and /or quality improvement. If you are not using polymer processing masterbatches today in your film or pipe extrusion processing, you are probably missing great opportunities in getting higher quality products at lower cost. The use of polymer processing aids has increased for polymer processors the quality and provided them with better finished products. Pure Polymers supplies an extensive range of polymer processing aid masterbatches to the extrusion and moulding markets. Specific formulations have been developed for polyolefins such as metallocene, styrenics and polyamides. Application examples include: Films, sheets, profile extrusion, injection moulding and others.





## Pure Polymer Processing Aid will:

- Enhance processability and reduce production costs
- Provide grades for commodity & engineering polymers
- Make polymers suitable for film, fiber, extrusion & injection moulding applications
- Offer combination products for complete solutions
- Eliminate the sharkskin effect
- Increase your production up to %15
- Reduce or eliminate Die Build Up
- Reduce or eliminate Gels and optical defects.
- Reduce Change over time

The term "processing aid" covers several types of materials that are used to improve the processability and handling of high molecular weight polymers.

## These products are used to:

- Eliminate melt fracture and improve surface finish.
- Reduce die-drool.
- Improve throughput & minimize energy consumption.
- Reduce gel formation
- Improve processability of recycled or regrind polymer



## Pure Polymer Processing Aid

They are used in a wide variety of applications such as blown film fiber, injection moulding, profile extrusion, pipe/tubing and cabling processes. Processing aids can be used with LLDPE, LDPE, HDPE, LLDPE, PP, polystyrene, polyamides, acrylics and others. They can be particularly effective when used with metallocene grades of polymer. Mode of Action Process aids are formulated to form a microscopic dispersed phase within the polymer carrier. During processing the applied shear-field causes the process aid to phase separate from the carrier polymer and migrate to the die wall gradually forming a continuous layer. Once the coating is complete, the backpressure of the extruder decreases to a minimum as the differential between the surface energies of the polymer and the coating allow for reduced friction during extrusion.

Other additives in the system, such as pigments and anti-blocks, as well as process conditions affect the coating and removal rates. A number of factors affect the coating equilibrium including concentration, dispersion, throughput, viscosity, shear gradient and temperature. To achieve the coating in a reasonable time the process aid masterbatch is typically added at %1 until the beneficial effects are seen. After this the addition rate can be reduced to %0.5 down to even %0.25 as long as the effect continues to be evident. A small addition must be maintained as the coating is dynamic, with the polymer melt both abrading the coating and depositing further process aid.



# Pure polymers Processing Aid Advantages:



## Reduction of melt fracture

Processing aids enable polymer to be extruded at higher shear rates without the melt fracture (surface roughness/shark skin effect) that may occur with untreated polymer melts. The addition of processing aids produces materials of high quality with greater productivity. Reduction of Die-drool & Gel formation During processing, deposits of low molecular weight polymer, additives and degradation products can build up on the die and extruder surfaces. Such deposits can create die lines and when/if they are released, defects on the extrudate. A processing aid is able to reduce die build up because as the coating layer develops any degraded material clinging to the die is displaced, and also stagnation in the extrusion process is minimized which decreases the production of thermal degradation products. The low energy surface provided by the coating reduces internal build up and subsequent degradation leading to crosslinked and oxidized gels. The reduction of unmelted/unmixed gels is believed to be related to the prevention of solid bed break-up. In addition, the processing aid may prevent premature melting in the feed section thus helping to maintain a coherent solid bed.



# Process Efficiency Improvements



The use of a processing aid Masterbatches reduces resistance between the polymer melt and the die, resulting in the reduction of die and torque motor's pressure. If the process' temperature and outputs are kept constant, process aids can reduce motor energy consumption, while if process' temperature and extrusion pressures are kept constant, higher outputs can be achieved. As a result of processing aids reducing die build up, the extruder does not need to be stopped as frequently during production to clean deposits, thus limiting down time. Industrial trials have also found that the time in which color or resin changes occurred had been reduced.

## Recycling Plastics

Processing aids can help reduce extruder pressure when processing blends of polymers such as LLDPE with LDPE and LDPE with HDPE. While this does not solve incompatibility issues it can increase processing flexibility/options.





# Processing aid Applications

## Blown & Cast Film

Using a processing aid can enable LLDPE to be run on narrow die gaps resulting in improved impact strength without affecting other physical properties as caused by blending with LDPE. By reducing the stress and elongation of the polymer chains in the flow direction, the processing aid can improve the impact's balance. In cast film, the use of a processing aid has been shown to improve control over thickness. They are also used to reduce melt fracture, increase surface gloss and enable lower extrusion temperatures to be used resulting in higher melt strength.



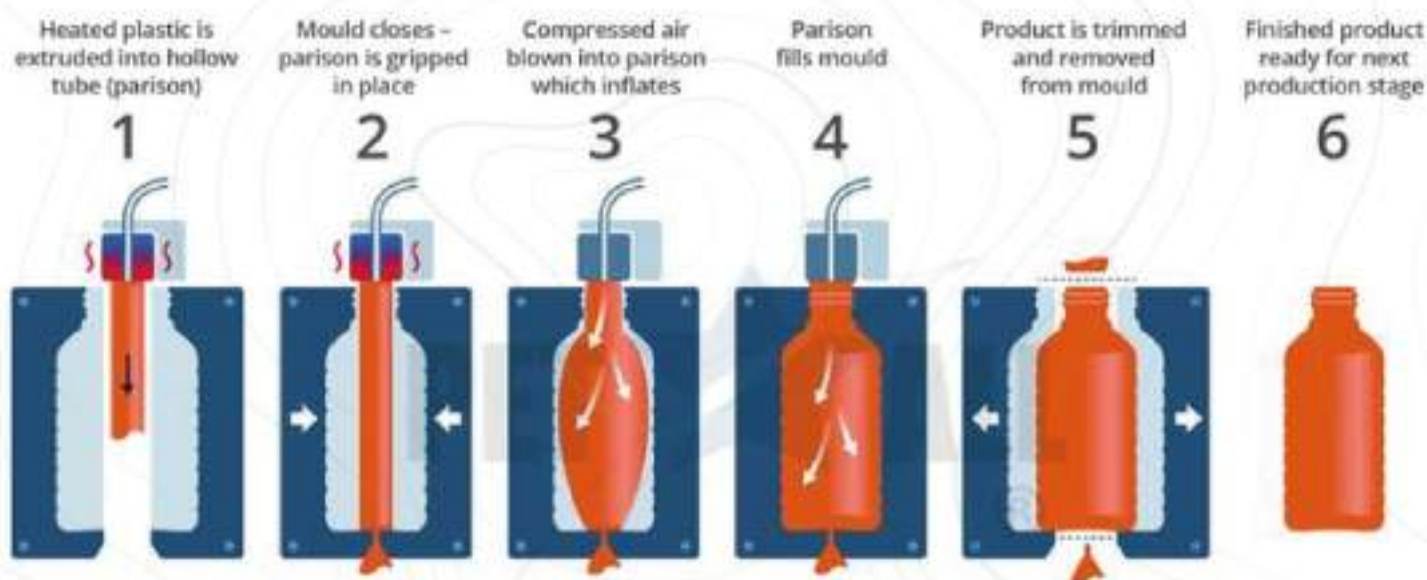
Excellent thermal and  
electrical insulation  
properties

## Processing aid Applications

### Cable & Tubing Extrusion

Here the processing aid can lower apparent viscosity of the polymer, reduce die build up or produce a smoother, glossier surface.

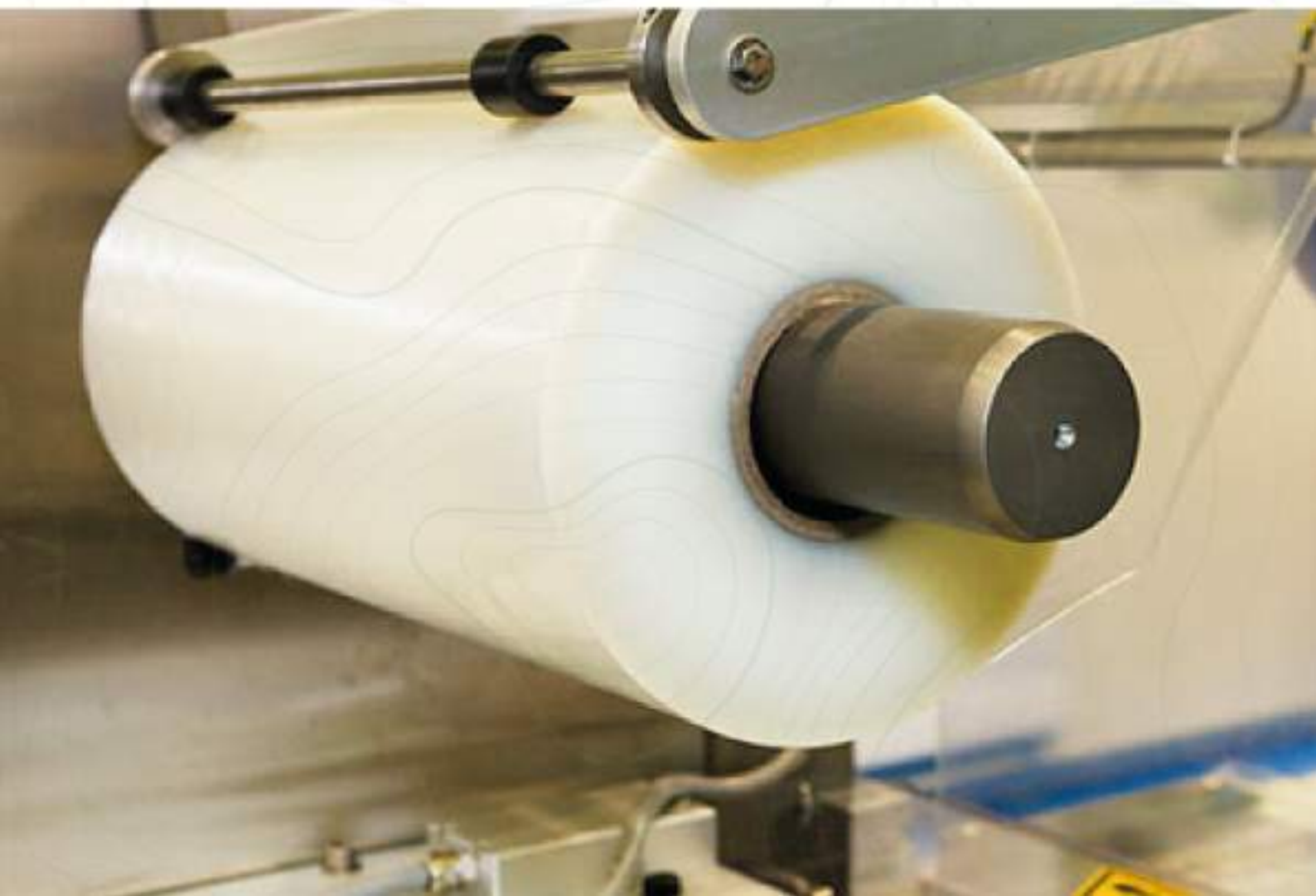
### Blow Moulding & Injection Moulding





# Anti-Slip Masterbatch

Polyolefin films tend to adhere to themselves and metal surfaces due to their high coefficient of friction (COF). For processing ease, films need a COF near 0.2. Slip additives can modify the surface properties of a film and thus lower the friction between film layers and other surfaces. To be effective the slip needs to migrate out of the polymer to the surface and therefore it must have a degree of incompatibility with the polymer. Fatty acid amides are often used as slip additives. During processing they are solubilized in the amorphous melt, but as the polymer cools and crystallizes the fatty acid amide is "squeezed" out forming a lubricating layer at the polymer surface. The addition of a slip additive can prevent film sticking and pulling helping to increase throughput.





High slip performance

## Types of Slip Additives

The most commonly used slip additives are erucamide (C22-) and oleamide (C18-). Oleamide migrates quicker than erucamide and is often called "fast blooming". However, after a certain time the slower erucamide provides films with a lower (COF) than oleamide. Erucamide, with its lower vapor pressure and volatility, is used in higher temperature processing applications and it also stays at the surface longer, not venting off as smoke. Oleamide is used when a low (COF) is needed in a short period of time, while the slower migration of erucamide can be advantageous in roll stock applications and on-line corona treatment. Another fatty acid amide is Stearamide. This is often used together with erucamide or oleamide to provide an anti-blocking effect when film transparency is very important.

The concentration of slip affects performance. Initially the (COF) is sensitive to small variations in concentration until a critical level of slip is reached, after which more slip has little effect on the COF. The amount of slip required depends upon film thickness, the slip additive being used and the presence of other additives such as anti-blocks.



# Antislip Masterbatch For Packaging & stackable items

This product is used to increase the coefficient of friction between films or sheets of polyethylene.

## Slip Masterbatch

The reduction of coefficient of friction (COF) in films also provides anti-block & mold release improvement. Slip additives are used to improve either processing or end applications by lowering the surface coefficient of friction of polymers. High- and low-level slip additives are available, and masterbatch performance can be designed to be instant or slow-acting. Grades that have been certified for food contact are available. For usage in the film industry, combinations with anti-static and anti-block chemicals provide cost-effective, multi-use masterbatches. Film, sheet, injection molding, and other applications are examples.

## Slip & Antiblock Products include the following:

- Full range of products for the extrusion industry
- Grades formulated for high transparency applications
- Cost effective with high concentration.



## Antioxidant Masterbatch

The use of antioxidants in polymer processing can offer better stabilization of the polymer during processing and also prolong its life in the end application. Pure Polymers has an extensive range of products which can be used as standalone masterbatches offering gel reductions or die lip build up control in polyethylene film extrusion, or process stabilization in the case of polypropylene fiber production in which careful control of the MFI is essential to ensure high-quality and trouble-free production.

Long term colour and thermal stability can be enhanced by selecting the correct package of antioxidants.

In addition to stand alone masterbatches this system can be used in multifunctional masterbatches such as in conjunction with UV Stabilizers and Processing Aids Masterbatches to offer both enhanced properties and cost effectiveness.

Application examples include: Tapes, Fibers, Geotextiles, Films, Injection mouldings.



# Antioxidant Masterbatch include:

- Primary phenolic & secondary phosphate stabilizer packages.
- Products specifically designed for film and fiber manufacturers.
- Process stabilizers to improve outputs.
- Finished product stabilizers to enhance lifetime performance.

## Polymer Oxidation

The degradation of polymers can occur during various stages of the polymer lifecycle from initial manufacture, through fabrication and then subsequent exposure to the environment. Oxygen is the major cause of polymer degradation and its effect can be accelerated by other factors such as sunlight, heat, mechanical stress and metal ion contaminants.

Polymer degradation during thermal processing and weathering occurs through an autoxidative free radical chain reaction process. This involves the generation of free radicals, then propagation reactions leading to the formation of hydroperoxides and finally termination reactions where radicals are consumed. Hydroperoxides are inherently unstable to heat, light and metal ions, readily decomposing to yield further radicals and thus continuing the chain reaction.

The prior thermal-oxidative history of polymers significantly influences their photo-oxidative behavior in service. Inhibition of this oxidative process is therefore very important and almost all synthetic polymers require stabilization.

## Types of Antioxidant

Antioxidants are compounds that can interfere with the oxidative cycle thus inhibiting or slowing the oxidative degradation of polymers. There are two main classes of antioxidant depending on the way they act to interrupt the oxidative process.

## Primary Antioxidant:

These antioxidants interrupt the primary oxidation cycle by removing the propagating radicals. Such compounds are also called Chain Breaking Antioxidants and examples include the hindered phenols and aromatic amines. Aromatic amines tend to discolor the end product and hence their use in plastics is limited. The phenolic antioxidants, however, are widely used in polymers. Careful selection of the phenolic antioxidant is required as the oxidation of phenols in some products may discolor the polymer. The formation of chromophores is directly related to the structure of the phenol and discoloration can therefore be minimized by choosing a phenolic with a specific structure together with the use of suitable co-stabilizers.

## Secondary Antioxidant:

These compounds are also called Preventative Antioxidants as they interrupt the oxidative cycle by preventing or inhibiting the formation of free radicals. The most important preventive mechanism is the hydroperoxide decomposition in which the hydroperoxides are transformed into non-radical, nonreactive and thermally stable products. Phosphites or phosphonites, organic Sulphur containing compounds and thiophosphates are widely used to achieve this, acting as peroxide decomposers.



## Choosing the correct system

The choice of antioxidant varies depending on a number of factors, including the base polymer, the extrusion temperature and the performance targets of the end-use application. Efficiency of an antioxidant upon processing is dependent on its ability to reach the polymer's attacked sites by diffusing through the viscous melt. The compatibility with and the solubility of the additive in the solid polymer, its low volatility and its resistance to extraction into the environment are also clearly important.

Synergism, where a co-operative interaction between antioxidants leads to a greater overall effect, can occur. It may arise from using two chemically similar antioxidants or when two different antioxidant functions are present in the same molecule, or when mechanistically

## Outdoor Exposure

The choice of antioxidant varies depending on a number of factors, including the base polymer, the extrusion temperature and the performance targets of the end-use application. The efficiency of an antioxidant upon processing is dependent on its ability to reach the polymers attacked sites by diffusing through the viscous melt. The compatibility with and the solubility of the additive in the solid polymer, its low volatility and its resistance to extraction into the environment are also clearly important. Synergism, where a co-operative interaction between antioxidants leads to a greater overall effect, can occur. It may arise from using two chemically similar antioxidants or when two different antioxidant functions are present in the same molecule.

This information is correct to the best of our knowledge, but we would recommend that users make their own assessment to ensure that the material meets their requirements. We accept no liability for any damage, loss or injury resulting from using this information. Freedom from patent rights must not be assumed.



# Antistatic Masterbatch

## Dissipation of static build-up and dust control.

The choice of a suitable antistatic is crucial and is determined by a wide range of factors such as the polymer's type, processing conditions and end application. By careful selection of the proper blend of antistatic ingredients, Pure Polymers has developed a dynamic range of products to cover the whole spectrum of requirements.

Masterbatches can be fast acting to reduce dust attraction in food packaging and display applications and can be formulated to give longer-term effects in demanding applications such as flooring.

Combinations with antiblock and slip products for use in the film industry are cost effective and provide high performance for polyethylene and polypropylene film extruders.

**Application examples include:** Sheets, Films, Fibers, Injection moulding and others.

## Antistatic Additive Packages include the following:

- Experience with antistatic technologies
- Products for films, fibers, sheets, and moldings
- Products tailored for specific performance applications
- Combination of masterbatches for a complete solution set



# Antistatic Additive Masterbatch



Internal antistatic additives are substances which are added to polymers/plastic articles during thermoforming or compounding in order to minimize the natural tendency of most plastics to accumulate static charge.

Generally, these additives work by migrating to the surface of the polymer, usually in a molecular or multi-molecular layer, and attracting water molecules from the atmosphere. The water lowers the surface resistivity from the approximate value of  $10^{15}$  -  $10^{14}$  ohms for most polymers (including styrenics and polyolefins) to  $10^8$  -  $10^{11}$  ohms.

The additive molecule normally consists of a hydrophobic part, which confers a level of compatibility with the polymer and a hydrophilic part which attracts the water that forms the surface's conductive path. The type of additive used depends on the needed compatibility with the polymer in question, an appropriate rate of migration, an appropriate persistence of effect and the ability to undergo the manufacturing process, whether regarding the additive concentration level or the subsequent conversion into the finished product.

The speed of antistatic effect and its duration can be optimized through the careful choice of the additive. The migration rate is determined by a number of factors including the relative compatibility of the additive and the polymer, polymer crystallinity, total additive formulation, concentration of antistatic and temperature.

# Antifog Masterbatch



based in LLDPE, LDPE resin. Active additive contain rapidly migrates to film surface, reducing the contact angle of condensed water droplets, giving anti-fogging effect to finale product, condensation of water vapor is created by a temperature gradient up to and across a film.

The appearance of condensation is also affected by the difference in surface tension between condensed water vapor and the film's surface. Pure Polymers Additives offering Antifog MB are use in food packaging to improve the aesthetics by reducing the beaded appearance of fogged sheet or film.

**Pure Polymers** film Additives are use a high performance property and blend of ingredients additives in Antifog MB that migrate to the surface of the film or sheet and reduce the surface tension of the water droplets that may form. Internal additives must maintain a balance of incompatibility that allows them to migrate while not easily washing' off and out of the polymer matrix. They must also comply with durability criteria that will give them a time period of effectiveness that is suitable to the application.

Polyolefin's such as PE and PP have a surface that is particularly hydrophobic and the intent of the Antifog is to increase the surface energy. When the surface tension is decreased water beads tend to 'wet out' meaning the contact angle is reduced. The reduced contact angle improves transparency and negative aesthetic qualities are reduced.





Food quality does  
not deteriorate for  
longer time

When prescribing an Antifog masterbatch, the film's thickness, process conditions, service conditions, processing methods, and regulatory requirements are taken into account. All of our masterbatches are pelletized, dry, and free flowing making them suitable for film or sheet packaging in cold and hot food contact applications. They also provide excellent clarity and thermal stability.

## Mode of Action

Antifog Masterbatch is the result of combining two chemical elements, which prevent the formation of water droplets and it includes the following:

- Prevents water droplet turbidity, and achieves heat stability and low volatility.
- Prevents vapour (pressure of water) formation during film production without causing a yellowing effect or any negative influence over transparency or the odor of the films.



## Benefits of Antifog masterbatch:

- It allows perfect transparency of food packaging.
- It improves visual attractiveness of content.
- Food quality lasts for a longer time.
- Useful in eliminating Hot and Cold fog formation.
- Improves the light transmission in agriculture films resulting in higher plant growth.
- Reduces the burning of plants and crop spoilage.
- True universal compatibility in LDPE, LLDPEPP, PVC, PVDC, and EVA films.

## Material Characteristics:

- Excellent improvement in decreasing degradation & surface staining.
- Excellent improved processing speed & higher production rates.
- Easy processing without affecting the mechanical properties of the end products

## Antifogging Masterbatch recommendations for the films and Thermoforming food packaging.

Mono - layer : %03 TO %8

Multi - layer : %02 TO %06 in skin contact layer





## Clarifier Masterbatch

For haze reduction or to improve clarity, third generation sorbitol derivative are used in PP Homopolymer as well as in PP Random Copolymer.

- Clarifiers Promote Nucleation in the Polymer Melt as a result, the Spherulites created are Small enough to allow Light waves to pass without scattering them and bringing transparency in PP.
- Clarifier Masterbatches improve the time cycle, has a higher temperature, flexural modulus, stiffness and impact strength in PP. It also promotes faster crystallization.
- Pure Polymers Clarifier masterbatches have a %10 of active content and are consistent with Food Safety Regulation acts. They are used at let down ratio of %3-%1.5 depending on thickness and the process implemented.
- Clarifier Masterbatches are used for PP films used in packaging, PP Food and storage Containers, blow moulded bottles & Injection moulded items.



## Impact Modifier Masterbatch

Impact modifier is an ethylene-acrylic ester copolymer. It improves splitting, stress cracking- resistance, low temperature and impact resistance, weldability and processability. It can be processed by injection molding, extrusion and compounding. Our Impact Modifier is compatible with polypropylene, polystyrene, polybutylene terephthalate, ABS, polyethylene, polyamide, polyethylene terephthalate, and polycarbonate. It improves easy processing in standard processing equipment, reduces hardness, increases flexibility, and impacts strength at low temperatures. It also provides good adhesion to many substrates, as well as high utilization temperatures, good organoleptic, environmentally sound, good compatibility, filler acceptance, and thermal stability to the polymer. Pure Polymers' impact modifier can be used in cables, masterbatches, construction, bags and for rigid polymers.





## Flame Retardant Masterbatch

Wherever the heat is on, effective flame retardation is a necessity; In fields such as electronic and electrical engineering, construction and transport as well as in the textile sector and in many applications using films or sheets, flame retardant and additives are needed in plastics processing to comply with national and international flammability regulations such as Halogenated flame retardants. The energy-rich H- and OH-radicals produced in the event of a fire are neutralized and thus are made unavailable for further reactions. act in the gaseous phase by interrupting the radical reaction mechanism for best result's .

Brominated flame-retardants are the most effective in terms of performance and costs and can be used for a broad variety of applications. Their high level of efficacy and relatively low addition rate means that the properties of the polymers with this flame-resistant finish are less adversely affected than in other systems, the large number of available additives with their different properties and interactions with polymers demand a high degree of expertise in order to achieve the optimum flame-resistant finish for the plastic components.

Our team supplies the experience gained from many years of developing and producing flame-retardant masterbatches and compounds together with expert advice on the best solution for your application



## Optical Brightener

It is also called fluorescent whitening agents.

These Masterbatches are added in polymers to reduce yellowing, improve whiteness, and enhance the brightness of products. These Masterbatches work via a fluorescent mechanism which absorbs light in the UV spectrum and emits light in the blue region of visible spectrum to yield a brighter and fresher appearance.

Optical Brightener Masterbatch is specifically used for imparting whiteness and brightness to the plastic products without any blue tones. With an excellent composition of bis-benzoxazole organic derivative and poly-olefin polymer, this type of masterbatch is also responsible for minimizing the yellowing of the end product. It also has the capability of re-emitting blue light and absorbing ultraviolet radiation.

It supplies a full line of optical brighteners for both water soluble and solvent soluble applications. Optical brighteners have a unique characteristic of being clear under normal conditions and visible when under the UV range. Optical Brightener Masterbatch are often used to enhance the whiteness of plastics. We have developed our Optical Brightener Masterbatches specifically for a multitude of polymer and resin systems to ensure you of the best possible performance. We also Manufacture Optical Brighteners including Invisible Fluorescents for use in security and special effects.



# Optical Brightener benefits:

We have developed our Optical Brightener Masterbatches specifically for a multitude of polymer and resin systems to ensure you of the best possible performance. we also Manufacture Optical Brighteners including Invisible Fluorescents for use in security and special effects.

- Improves initial color
- Adds brightness to colored items
- Contains highly concentrated Brightener chemicals
- Gives smooth & glossy surface to films
- Improves optical properties
- Brings bright appearance for finished materials
- Creates a Smooth surface
- Achieves neutralization to reprocess plastic granules
- Imparts bluish - purple tint
- Improve the whiteness of recycled polymer
- Composed of bis-benzoxazole
- Reduces the yellowing of plastic products
- Enhances the whiteness and brightness
- Absorbs UV radiation
- Re- emits blue light
- eliminates blue tones in the product v
- Improves optical properties

## Applications:

- Agriculture: Blown Film / Cast Film / Raffia
- Consumer Products :Injection molding, Blow molding
- Flexible Packaging :Extrusion process,
- Healthcare & Hygiene: Extrusion process/ Injection molding/ Blow molding
- Fibers: Moulding process / Articles
- Molded thermoplastic :Moulding process / Articles
- Extruded Products :Films, Net, all extrusion process
- Rotomoulding :all applications of rotomoulding



## Precolored Resins & Compounds Masterbatch

- Coloring of tradename resins or specialty compounds
- Custom or standard colors are available
- Production orders and samples are shipped in 7 days

In addition to our extensive specialty product portfolio, Pure Polymers can color any resin you select with the exact color you request.

Unparalleled experience that comes from routinely working with over 60 different polymers types in combination with hundreds of performance additives – coupled with corresponding process quality control necessary to produce specialty materials – guarantees that the color you choose will match your approved standard during every production run.

Pre-colored products range from custom compounds to specific tradename resins from any resin manufacturer – whether you need a specific polymer or let Pure Polymers choose the resin based on your specifications, we maintain the same precise color tolerances.

Delivered when you need it, Precolored samples and production orders are shipped within 7 business days – always with the highest quality, commitment to service, and attention to detail that only experience can provide.



# Compounds

Our Compounds are suitable for PE, PP, PS and ABS Base Resin. Typical product applications include: Furniture, Electrical Appliances and Industrial Components.



Pure Polymers is specialized in formulating and compounding all kinds of resins. Our ability to do so gives product designers a great amount of flexibility in designing moulds without worrying about processing and flow issues. Sometimes an application requires a material that has some properties of one polymer, and some of another. Instead of synthesizing a completely new polymer with all the properties you want, we modify and blend polymers and additives together to get the desired properties you are looking for. We can even add a colorant, additive, flame retardant, UV resistance, durability or wear resistance package to the compound developed for you. In recent years, compounds have been increasingly recognized by the Automotive, Electrical and Electronic sectors in addition to other industries as a replacement to metal.



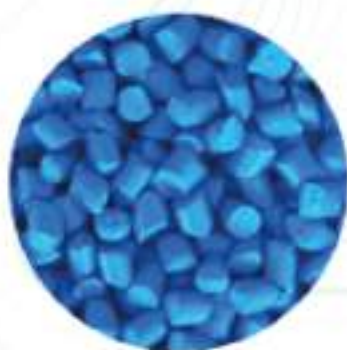


## Pure Polymers Compounds and Blends we offer:

- Pre-Colored Compounds
- Pearl Compounds
- Purging Compounds

## BOPP Masterbatch

BOPP (Biaxially Orientated Polypropylene) is a thin, clear, flexible film used mainly for, biscuits, snacks and confectionary packaging. It can be produced with special sealing layers and with a wide variety of surface finishes to enhance consumer interest and appeal.







## Purging Compound Masterbatch

It helps to manage the manufacturing time effectively and enhances productivity. This masterbatch is basically used to clean barrel properly which reduces the cleaning timing.

It is basically designed to clean all primary machine (such as extruder, injection molding, blow molding machine) when changing color or removing contamination.

There are several advantages of Pure Polymer Purge Compound masterbatch:

1. Reduces cleaning time
2. Enhances productivity
3. Removes contamination

# Desiccant Masterbatch

High performance desiccant masterbatches are designed to eliminate humidity and enhance extrusion and injection processes.

Pure Polymers' moisture absorber masterbatches are provided in pellet form with a high concentration of active agents and excellent dispersion in the end product.

## Benefits of using this product include:

- The removal of residual moisture
- Solves and avoids problems during the processing such as: fisheyes, holes and grooves

Pure Polymers' defoaming masterbatch also known as desiccant masterbatch or suction masterbatch, is off-white granules which is a new kind of functional masterbatch that solves the moisture problem. It can strongly absorb the moisture in the plastic, eliminating the bubbles, cracks, speckles and other issues caused by moisture. Defoaming masterbatch is not harmful for physical and mechanical properties, on the contrary, it ensures the products quality, increase yields, and reduces consumption.

## Pure Polymers desiccant masterbatch is characterized as follows:

- The drying process is not needed for the plastic raw material
- It can absorb an amount of water equivalent to %20 of its own weight
- You can use the ordinary equipment and no need to change the processing technique
- It is non-toxic, tasteless, non-corrosive and harmless to humans
- It can highly improve the mechanical properties and appearance of plastic products
- It helps to reduce the costs and increase profits. products





## Oxo Biodegradable Masterbatch

This masterbatch is made by blending a pro-degradant additive into the plastic during the extrusion process. The additive causes the molecular structure of plastic to break down when exposed to heat or sunlight. The plastic will eventually be in a state where it can be digested by microorganisms.

Due to the lack of enforcement, and the pace at which the bioplastics industry is growing, you may encounter products misleadingly marketed as compostable or biodegradable.

In both film extrusion and injection molding applications, there are additive technologies in which bio-additives (such as starch) are added to traditional plastic (such as PP, PE, PS, etc.) and falsely marketed as compostable and biodegradable. These oxo-degradable products are often more damaging to the environment than traditional plastic.

Misleading marketing of non-compostable products include "Oxo"-degradable, "oxo"-biodegradable, etc. Bio-additives, such as starch that is added to polyethylene (PE). Oxo-film is often falsely marketed as being biodegradable, when it is only degradable. "Degradable" cutlery is made from a blend of bio-additives, such as starch (PSM - Plant Starch Material, for example), and traditional plastics such as polypropylene (PP) and polystyrene (PS). These blends often consist of %70 plastic! This cutlery is NOT compostable nor biodegradable.





## Blowing Agents Masterbatch

### Get more out of your plastics.

Chemical blowing agents are reactive additives that release gases during the processing of thermoplastics. Thus, they enable the production of foamed plastic for various applications. Gases develop by means of a thermally activated decomposition reaction that occurs during the processing of the masterbatch, generating a stable and defined plastic foam. With chemical blowing agents, a general distinction is made between endothermal and exothermal systems, each of which have different characteristics. Our experts will conduct a thorough consultation to determine which solution is the right one for your application.

Pure Polymers' blowing agent masterbatch for controlled reaction when exposed to heat and shear, they decompose and release non-toxic gases. In many cases these gases are carbon dioxide and water vapor and the most common active agents are carbonates and carboxylic acids. Since externally supplied heat is consumed during the reaction, these products are called endothermal blowing agents. The advantage of these products is that gas formation stops any time when the energy supply is interrupted and can be restarted in a controlled manner.

### Pure Polymers blowing agent masterbatch properties: -

- Gas yield is estimated approx. 130 - 100 ml/g
- Higher dosing quantities compared to exothermal blowing agents
- Possible blooming effects
- Controlled foaming process
- Very fine cell structure
- Shorter time cycle
- Reduced streaking
- Prevention of post-expansion
- Approved for food packaging





## Cling Masterbatch

is a concentrate of high molecular weight Polyisobutylene tackifier in linear low density polyethylene. It is used as a cling agent to make stretch wrap films from LLDPE or LDPE. It is a dry free-flowing pellet

Pure Polymers Cling masterbatch is designed to produce stretch film from LLDPE, LDPE or other polyolefins for the applications of pallet wrap, silage wrap and food wrap. It can be used in both blown or cast film process. Polymers used with Pure Polymers Cling MB must not contain any slip or antiblock additives or have a density higher than 0.923 as this will prevent the migration of the cling additive. Migration time for good cling properties is 72-24 hours.

### Recommended Addition Rates:

- For monolayer blown films 8 % by weight should be added to LLDPE (or resin mix).
- For monolayer cast films 3 and 4 %.
- On multilayer film lines, is often added to the skin layers only.

Addition rate depends on which layer is used and the layer thickness.

Pure Polymers Cling MB masterbatch range is based on Polyisobutylene technology and It can be used in both blown and cast film processes with mono & multi layers structures. It delivers cling strengths such as Peel cling Strength, Lap cling Strength or Retack ability.





We have continuously grown and developed our offering and production capacity to provide our customers with all they need and become truly close to the market.

When you work with Pure Polymers, you work with a partner. We will be part of your team in order to create the most efficient solutions.



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