

**We create
chemistry
that makes
builders love
plastics.**



Plastic additives for the building
and construction industry

 **BASF**
We create chemistry

Pushing back the boundaries of plastics

Success in plastics depends on having the right plastic additives. That is why it's important to choose a partner who not only has all the products you need, but can work with you to develop innovative new solutions: BASF.

BASF supplies the global plastics industry with an extensive range of plastic additives. Our long experience in stabilization and protection, comprehensive technical support, and strong innovation leadership help plastics producers come up with the right solutions throughout the building and construction value chains.

We pioneered the plastics industry in its earliest days and are dedicated to helping our customers achieve sustainable worldwide success into the future. Our vision is to continue to shape the future by enabling you to pursue entirely new building and construction applications for plastics.



We create chemistry that makes enablers love plastics.

Smart solutions to the challenges of the future

However the plastic processing industry develops in the coming years, you can rely on BASF to deliver the plastic additive solutions you need. Working with our customers to enable new plastics applications and support innovative solutions has been part of our DNA for many decades. No one is better positioned to enable you to successfully achieve your goals.



We create chemistry that makes pioneers love plastics.

Innovating the future together

Our pioneering spirit combined with your need for ever-more innovative solutions will drive the development of next-generation plastic additives for tomorrow's world. Together we can explore new possibilities and seek out more sustainable, high-performance solutions for the future.



We create chemistry that makes originals love plastics.

All the knowledge you need for your future success

Since the birth of the modern plastics industry back in the 1950s, BASF has been leading the way in plastic additives. Many of our innovations have gone on to become industry standards and benchmarks. Today, our long experience, expertise and unceasing passion for discovery mean you can rely on us to deliver the solutions you will need tomorrow.



We create chemistry that makes global challenges love plastics.

Your partner, across the globe

As globalization increases, new opportunities are certain to follow. But wherever your plastics business takes you and whatever additive solutions you need, you'll find BASF is already there. Waiting to support you with local knowledge and solutions customized to meet the needs of your new market.



We create chemistry that makes builders love plastics.

The power of curiosity, ambition and expertise

Tomorrow's plastics processing industry will need people with all of these qualities, builders who can deliver the cutting edge solutions that the future demands. With our global reach, innovation leadership, wide product portfolio and uncompromising commitment to product quality, BASF can help you make it happen.



We create chemistry that makes partners love plastics.

Together, we can achieve tomorrow's solutions

We in the Plastic Additives business have been working in close partnership with our customers for many decades: developing new ideas, responding to changing needs, and creating new solutions. So you can rest assured that we will be here to support your business by delivering the sustainable, innovative solutions you need to grow in the future.



We create chemistry that makes visionaries love plastics.

Working together to maximize sustainability

The future of plastics will rely on our shared vision to make the industry truly sustainable with plastic additives. Together, we can shape a bright future for plastics by continuously anticipating new market trends in the emerging economies and achieving best-in-class standards in resource conservation, production efficiency and environmental responsibility.



Plastics in buildings – the sky is the limit

Plastics are being used for an increasingly wide range of building and construction applications:

Plastic window profiles have better insulating properties than aluminum frames and require less maintenance than wooden ones.

Plastic decking and fencing require less maintenance than wooden alternatives and are more durable.

Plastic glazing is lower in weight than traditional glass, allowing for lighter building structures and more design freedom.

Plastic films enhance the properties of glass windows, making them safer or more energy efficient.



Plastic membranes offer great technical and aesthetic flexibility in applications requiring waterproofing, such as roofing, basements and swimming pools.

Plastic flooring provides a broad design scope and is more practical than other materials for demanding applications such as sports arenas.

Plastic pipes are easier to install and maintain than those made of other materials.

Rising to today's challenges

A wide variety of modern trends are affecting developments in the building and construction industry.



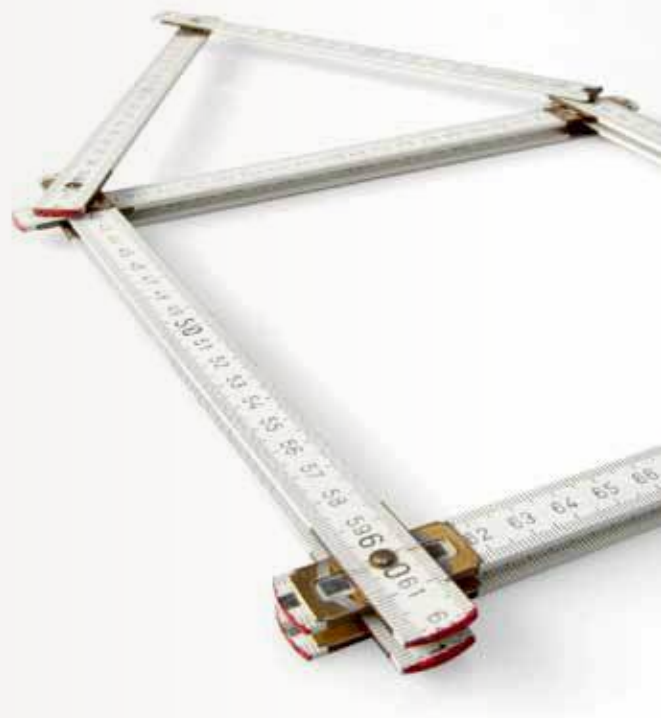
Energy saving

Buildings account for about 40 % of overall energy consumption and for 36 % of CO₂ emissions. Numerous countries are now developing plans for energy reduction in buildings.



Faster construction

Increasing cost pressure is leading to a demand for quicker reactions throughout the value chain and faster completion of construction.



Quality and durability

Replacing construction elements can be costly, time consuming and inconvenient. Construction materials are being made more durable to enable them to withstand severe conditions during production, installation and use.



Ease of maintenance

Defective areas or components of a building are not always easily accessible. To save time and money on maintenance, new construction should be designed to facilitate inspections and repair work.



Aesthetics and design

Increasing stress due to the demands of work and daily life is leading to a desire for greater comfort and luxury in buildings, including enhanced colors and textures that create a relaxed atmosphere.



Regulatory challenges

Increased regulatory challenges and related concerns have led to more stringent building specifications. As these issues become a top priority, demand is growing for recyclable and reusable materials.

Creating value through performance

As the leading supplier of plastic additives, BASF offers the products and know-how to support the building & construction industry.



Membranes

Membranes made from polymeric sheets or plastic coated textiles are widely used to prevent water penetration in a variety of building and construction applications from roofing to landfill liners. With the increasing use of membranes in regions with exceptionally high amounts of sunlight, meeting the associated ultraviolet (UV) radiation, the ability to meet the ever increasing demands for life expectancy can be a challenge.

Besides light exposure, many other elements affect durability. For example, in applications such as swimming pools, membranes are exposed to various water treatment chemicals. In other applications, the presence of halogenated flame retardants may be detrimental.

Special consideration should be given to the materials of construction used for membranes. While thermoplastic polyolefin (TPO) membranes require process, thermal and light stabilizers to protect them during manufacture and use, polyvinyl chloride (PVC) membranes are typically stabilized with high loadings of titanium dioxide (TiO₂). Membrane fabricators can often reduce the wear-and-tear on their processing equipment by substituting some portion of the TiO₂ with BASF light stabilizers.

BASF's technical experts, with their deep understanding of industry performance requirements and test methods, are prepared to make stabilization recommendations for your specific membrane application.

Application	Antioxidants	Light stabilizers
TPO membrane	Irganox® B 225, Irgastab® FS 301	Chimassorb® 2020, Tinuvin® XT 847**
TPO membrane with halogenated flame retardant	Irganox® B 225, Irgastab® FS 301	Flamestab® NOR® 116, Tinuvin® XT 850 Chimassorb® 2020
PVC membrane	Irganox® 1010, Irganox® 1076	Tinuvin® XT 835**, Chimassorb® 81, Tinuvin® P
PE geomembrane	Irganox® 1010, Irganox® 225, Irgastab® FS 301	Chimassorb® 2020, Tinuvin® 111
PVC coated fabrics	Irganox® 1010, Irganox® 1076	Tinuvin® XT 835**, Chimassorb® 81, Tinuvin® P

** Check for regional availability



Window and Door Profiles

The desire for an increased level of daylight in buildings has resulted in larger windows, which require stronger frames. Window and door frames, shutters and other ornamental profiles made from plastics need to maintain their functionality and appearance over their anticipated lifetime. Suitable stabilization solutions are therefore crucial.

As building design becomes more imaginative, greater use is made of color. Pigments contribute to aesthetics and durability. Bright and dark shades, however, can distort profiles exposed to light by retaining radiant heat, making it important to select colors that will minimize heat buildup.

Most polyvinyl chloride (PVC) profiles contain white pigments based on titanium dioxide (TiO₂), which can provide protection against the detrimental effects of light. However, for specific colored applications or those applications unsuitable for high loadings of TiO₂, light stabilizers must be added to the PVC polymer.

Window and door profiles may also be constructed with PVC or acrylic film laminates. BASF's wide range of light stabilizers allows customers to tailor their formulations to ensure that profiles laminated with such films fulfill their life expectancy requirements.

BASF's technical experts can help you in all formulation considerations for plastic profiles.

Application	Antioxidants	Light stabilizer
Flexible PVC film or profile	Irganox® 1010, Irganox® 1076	Tinuvin® XT 835**, Tinuvin® P, Chimassorb® 81
Rigid PVC film or profile	Irganox® B 1010, Irganox® 1076	Tinuvin® P, Uvinul® 3035, Chimassorb® 81, Tinuvin® 312, Tinuvin® 326
Acrylic film	Irganox® B 900, Irganox® 1076	Tinuvin® 1600, Tinuvin® 1577, Tinuvin® 770, Tinuvin® P

** Check for regional availability



Decking and Fencing

Wood-plastic composites made from polyvinyl chloride (PVC), polyethylene (PE) and polypropylene (PP) are gaining in popularity as the material of choice for decking applications. There are numerous advantages of using wood-plastic composites over wood, including,

- Freedom from warping, ensuring shape retention
- Resistance to rotting and splintering
- No moisture absorbance
- Resistance to insect attack
- Low maintenance as periodic painting is not required

Meanwhile, PVC has emerged as the predominant material for plastic fencing.

For outdoor applications, wood-plastic composites and PVC must be properly stabilized against the harmful effects of sun exposure, which cause chalking and other detrimental changes in appearance. Fortunately, BASF offers additive solutions that can significantly prolong the life of your plastic decking and fencing.

Application	Antioxidants	Light stabilizers
PVC-based wood plastic composites	Irganox® 1010, Irganox® 1076	Tinuvin® XT 835, Tinuvin® 326, Tinuvin® P, Chimassorb® 81
PE-based wood plastic composites	Irganox® B 225	Tinuvin® 783 + Tinuvin® 326, Chimassorb® 2020 + Tinuvin® XT 326
PP-based wood plastic composites	Irganox® B 225	Tinuvin® XT 855 + Tinuvin® 326; Tinuvin® 770 + Chimassorb® 2020; Tinuvin® 770 + Tinuvin® 326

** Check for regional availability



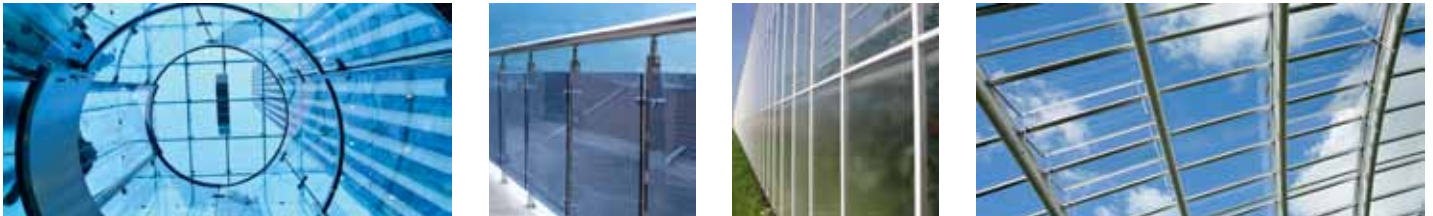
Pipes and Fittings

Traditional materials used in manufacturing pipes and conduits, such as ceramics, concrete and metals, are being increasingly replaced by plastics, which are lighter in weight, less expensive and easier to use.

During their lifetime, pipes may be exposed to environmental factors that can affect their durability and cause premature failure, including excessive heat and light, high pressures during use, and high soil acidity. The specific needs of each type of pipe, from the simplest to the most complex, can be addressed with tailor-made systems based on BASF's broad range of stabilizers.

Application	Antioxidants	Light stabilizers
PE black pipes	Irganox® 1010 + Irgafos® 168	Chimassorb® 2020, Chimassorb® 2020 + Tinuvin® 622
PE water pipes	Irganox® 1010 + Irgafos® 168, Irganox® 1330 + Irgafos® 168	Chimassorb® 2020 + Tinuvin® 326
PE gas pipes	Irganox® 1010 + Irgafos® 168	Chimassorb® 2020 + Tinuvin® 326, Chimassorb® 2020 + Chimassorb® 81
PP pressure pipes	Irganox® 1010 + Irganox® 1330 + Irgafos® 168 + Irganox® PS 802	Tinuvin® 326, Chimassorb® 81
PP pipes & conduits	Irganox® 1010 + Irganox® 1330 + Irgafos® 168 + Irganox® PS 802	Tinuvin® 791 + Tinuvin® 326, Tinuvin® 791 + Chimassorb® 81
PE-RT pipes	Irganox® 1010 + Irganox® 1330 + Irgafos® 168	Chimassorb® 2020
PEX pipes	Irganox® 1010, Irganox® 1076, Irganox® 1330 + Irgafos® 168	Tinuvin® 111, Tinuvin® 326, Chimassorb® 2020 + Tinuvin® 326, Chimassorb® 2020
PVC pipes	Irganox® 1010, Irganox® 1076	Tinuvin® P, Chimassorb® 81, Tinuvin® 312
PE corrugated pipes	Irganox® 1010, Irgafos® 168	Chimassorb® 2020 + Tinuvin® 326 Chimassorb® 2020 + Chimassorb® 81

If in direct contact with metal we recommend the use of Irganox® MD 1024.



Glazing

Thanks to advantages such as weight reduction, impact resistance and design flexibility, optically clear plastics are being adopted for a wide variety of glazing applications.



Constant exposure to light causes clear plastics, such as polycarbonate (PC), to degrade resulting in yellowing and loss of transparency. To prolong the life of plastic glazing sheet, appropriate light stabilization is essential. BASF's standard stabilizers for plastic glazing help prevent plastic degradation and maintain glass-like appearance.

For applications requiring still higher durability, BASF has developed Tinuvin® 1600 a novel high-performance technology.

Application	Antioxidants	Light stabilizers
PC glazing	Irganox® B 900, Irgafos® 168	Tinuvin® 360, Uvinul® 3030, Tinuvin® 1577, Tinuvin® 1600
PMMA glazing	Irganox® B 900, Irganox® 1076	Tinuvin® 1600, Tinuvin® 1577, Tinuvin® 770 + Tinuvin® 1577, Tinuvin® 770 + Tinuvin® P
PET glazing films	Irganox® B 1010, Irgafos® 168	Tinuvin® 1600, Tinuvin® 1577, Tinuvin® 360



Tinuvin® 1600 – A Breakthrough Technology

BASF's Tinuvin® 1600 provides extremely long-lasting ultraviolet (UV) protection for high-performance thermoplastics. It exhibits outstanding UV absorption capacity, resulting in minimal loss of optical properties under even the toughest weathering conditions. Its very low volatility allows for outstanding processing characteristics and ultra-high durability not achievable with standard UV stabilizing technologies.

- Specifically developed for long-lasting protection of thin-layer exterior applications
- Retains mechanical properties, color, and transparency for extended periods of time
- Very low volatility, excellent thermal stability and good substrate compatibility
- Superior durability compared to traditional UV absorbers
- Ease of processing







Flooring

Polyvinyl chloride (PVC), often referred to as 'vinyl', is used extensively for hard surface flooring. Not only is it versatile and cost-effective, but it is also durable, hygienic and easy to install and maintain.

Although vinyl flooring is mainly installed on the inside of buildings, it may still be exposed to sunlight. If vinyl is colored and not adequately stabilized, it will discolor in irregular patches depending on exposure levels.

Most vinyl flooring contains titanium dioxide (TiO₂) based white pigments that provide protection against the detrimental effects of light. But for specific colored applications or in regions with high amounts of sunlight, additional light stabilizers should be added to the PVC to improve the longevity of the flooring.

BASF can support you in finding suitable additive solutions to meet all of the performance requirements of your polymer-based flooring, whether it is made from PVC, polypropylene (PP), or synthetic rubber.



Application	Antioxidants	Light stabilizers
PVC flooring	Irganox® 1076	Tinuvin® XT 835**, Chimassorb® 81
PP modular flooring	Irganox® B 215	Tinuvin® 770 + Tinuvin® 326

** Check for regional availability





BASF competencies

Additive	Brand	Benefit
Light stabilizers	Chimassorb® Tinuvin® Uvinul®	Extend the lifetime of plastics in UV sensitive applications. Maintain appearance and physical properties to preserve aesthetics and functionality.
Thermal & processing stabilizers	Irganox® Irgafos® Irgastab®	Provide thermal protection and long-term durability. Maintain integrity of polymer properties during processing.

For more information on BASF plastic additives for building and construction applications, please contact your account manager or visit www.plasticadditives.basf.com.



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