


# Additive and Colour Preparations

for Extruded Polystyrene Foams

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

 <p><b>GABRIEL-CHEMIE</b> GROUP</p>	<p>ADDITIVES for EXTRUDED POLYSTYRENE FOAM (XPS)</p>
<p>PS 78320/50 FR</p>	<p>Flame retardant masterbatch for PS-foam with high thermal stability and effectiveness. Also suitable for HIPS thick-walled articles to obtain flammability classification V2 according to UL94.</p>
<p>PS 791670 FR</p>	<p>Highly concentrated flame retardant masterbatch for PS foam with high thermal stability and effectiveness.</p>
<p>PS 7A1550 FR</p>	<p>Highly concentrated flame retardant masterbatch for PS foam with very high thermal stability and effectiveness and reduced HBCD content.</p>
<p>PS 78330 MOD</p>	<p>Processing aid for extruded polystyrene foam (XPS) based on styrene polymers, to obtain reduced shear, higher output, better temperature control of the melt and lower melt friction. No negative influence on flame retardancy.</p>
<p>SB 78690 NU</p>	<p>Inorganic nucleating masterbatch for obtaining a fine cell structure with reduced water absorption in XPS foamed sheet.</p>
<p>PS 790980 NU</p>	<p>Inorganic nucleating masterbatch to obtain a fine cell structure with a reduced water absorption in XPS foamed sheet. Food approved for XPS food packaging.</p>
<p>HP 781700 TR</p>	<p>Endothermic blowing agent masterbatch for the production of polyolefin and polystyrene foamed articles.</p>
<p>HP 78980/50 TR</p>	<p>Endothermic blowing agent masterbatch for the production of PS foamed sheet.</p>
<p>SB 71820 SF</p>	<p>Highly effective acid scavenger masterbatch, based on PS carrier, for the neutralisation of thermally overstressed flame retardant as well as for the occasional purging of XPS production and recycling lines.</p>

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

### PS-FOAMED SHEETS AND BOARDS

Gabriel-Chemie is one of the leading European suppliers of a whole package of additive and colour masterbatches for extruded foamed sheets and boards. Since 1983 we have been developing all our products directly with our customers, in order to optimise the properties of our products for the technology used.

Our aim is to offer a complete range of individual products for both the manufacture of conventional foam boards as well as for the development of new types of sheet and board. In addition to the above range of products we also specialise in the design of combination products which we have tailored to our customer's needs based on our long lasting practical experience.

The following must be considered in order to understand the interrelationships of the product's functions:

A high-grade PS foamed insulating board should contain:

- a) Colour masterbatch
- b) Organic nucleating agent masterbatch
- c) Inorganic nucleating agent masterbatch
- d) Flame retardant masterbatch
- e) Internal (polymeric) lubricant masterbatch
- f) Impact modifier, if required
- g) Thermal and processing stabilisers, if required

In the following we would like to highlight these product types:

#### A) COLOUR MASTERBATCH

It is important to consider the right colorant selection in order to avoid undesirable interactions with other additives. This we take into account when making specific formulations to suit individual applications.

#### B) ORGANIC NUCLEATING AGENT MASTERBATCH

These products are based on chemical blowing agents which thermally decompose very early, producing gas and forming fine cells within the melt. These cells act as nucleating spots where the injected gas can easily build up.

Chemical blowing agents are essential to obtain the lowest possible weight per volume.

#### C) INORGANIC NUCLEATING AGENT MASTERBATCH

This range of products contains selected inorganic fillers with a fine particle size, carefully dispersed in masterbatch, which quickly homogenises at the start of the melting process.

The fine, inorganic particles, having much better temperature conductivity than the polymer melt itself, form the so called „HOT SPOTS“, which act as nucleating centres where the injected gas (physical blowing agent) can easily build up.

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

Inorganic nucleating agents cause a higher weight per volume in comparison to chemical blowing agents (organic nucleation), but offer lower costs and the advantage of lower water absorption of the final board.

A useful compromise can be effected by using a combination of both systems. Recommended formulations will be illustrated later in this brochure.

### D) FLAME RETARDANT MASTERBATCH

This group of masterbatches works by suppressing the potential fire hazard relevant to the final application. The dosage depends on the standards required.

The most important property of any FR masterbatch is its heat stability. Since its thermal decomposition creates acidic conditions which can cause serious corrosion within the equipment, it is essential to use products with the highest heat stability. The FR masterbatch must have similar melt viscosity to the polymer in order not to disturb the sheet calibration or the surface finish.

While the pure flame retardant powder shows very low melt viscosity at 180°C, the masterbatch allows a melt viscosity much closer to the polymer in order to balance the conditions in the extruder barrel independently of the different behaviour of the basic components.

This ensures the board's high quality surface and a more constant flow of the melt. Usually brominated flame retardants are rather heat sensitive and therefore need very specific stabilisation and protection against decomposition. This is another very strong argument for avoiding that the pure flame retardant makes any direct contact with the hot inner metal surface of the extruder barrel, especially in the melting zone. In our unique manufacturing process the flame retardant masterbatch is produced at a significantly lower temperature range than is usual for foam extrusion. Our masterbatches' polymer carrier acts as a „heat shield“, protecting the incorporated flame retardant components from temperature influences. A highly sophisticated thermal stabiliser system protects against corrosion.

This explains why masterbatches lead to better results than pure powder components.

### E) INTERNAL LUBRICANT

One of the most difficult steps in manufacturing high quality foamed boards – with a thickness above 5 cm - is the cooling of the melt before leaving the die. Lowering the temperature causes increased shear force, leading again to an increased temperature which is the exact opposite of the intention to cool. This controversial effect requires a well balanced compromise between melt temperature, melt friction and shear, throughput, foam structure, dimension stability after the calibration, surface quality etc.

The task is to apply lubricants which do not cause any adverse effects on the board's properties (e.g. reduction of flame retardancy when using primary plasticisers as a lubricant - even at low dosage rates).

We have developed an internal lubricant concentrate based on polymeric substances only, which acts by lowering the adhesion of the melt against the hot metal surfaces thereby lowering the melt shear (at constant temperatures). This makes cooling easier and reduces power consumption, as well as allowing an increase in output by some 5% to 7%.

Experience shows that such a modification is not necessarily required in boards from 2 to 5 cm, but is essential from 6 cm upwards - particular in the case of older equipment.

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

### F) IMPACT MODIFIER

For some very specific applications it might be necessary to improve the impact due to the brittleness of the standard polystyrene without influencing major process parameters. We keep a number of useful modifier concentrates available. For further details please contact our Technical Department.

### G) THERMAL AND PROCESSING STABILISERS

All our products contain a sufficient quantity of stabilisers so that additional thermal/processing stabilisation is usually not required.

In a few very special cases such additional additives may be beneficial. For further details please contact our Technical Department.

At this point we should draw your attention to our so called „**neutralising masterbatch**“ which is not a process additive required in daily manufacturing, but acts as an emergency purging concentrate in the case of any unusual overheating which has caused the flame retardant to start decomposition. These free acids, acting as catalysts, may create further decomposition resulting in long-lasting discoloration. At this stage normal purging will fail. The reason for this is that rinsing with virgin polymer can not totally remove all acidic residuals from the metal surfaces of the extruder.

Therefore, after conventional purging (mechanical / physical), the extruder barrel should be "neutralised" (chemical purging) to ensure a trouble-free restart.

### The MAXITHEN® Product Range

#### 1. FLAME RETARDANT MASTERBATCHES-STANDARD TYPES

- 1.1 **MAXITHEN® PS 78320/50 FR:** Flame retardant masterbatch based on a PS carrier with high heat stability and efficiency.
- 1.2 **MAXITHEN® PS 791670 FR:** Flame retardant masterbatch based on a PS carrier with high heat stability and efficiency, containing a high concentration of active substances for a more cost efficient FR stabilisation of foam boards.
- 1.3 **MAXITHEN® PS 7A1550 FR:** Flame retardant masterbatch based on a PS carrier with very high heat stability and efficiency, containing a high concentration of active substances, but reduced HBCD content. This meets the requirements of being both a more cost efficient and a more ecological FR stabilisation.

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

### 2. NUCLEATING MASTERBATCHES

#### 2.1 ORGANIC NUCLEATING MASTERBATCHES (CHEMICAL BLOWING AGENTS)

- 2.1.1 **MAXITHEN® HP 78980/50 TR:** Endothermic blowing agent masterbatch for standard cell structure. Most often used for insulating sheets with a thickness between 2 and 10 cm. Often used in combination with MAXITHEN® SB 78690 NU.
- 2.1.2 **MAXITHEN® HP 781700 TR:** Endothermic blowing agent masterbatch for standard cell structure, good price performance.
- 2.1.3 **MAXITHEN® HP 78810/40 TR:** Endothermic blowing agent masterbatch for very fine cell structure and special applications. Often used in combination with MAXITHEN® SB 78690 NU.

#### 2.2 INORGANIC NUCLEATING MASTERBATCHES

- 2.2.1 **MAXITHEN® SB 78690 NU:** Inorganic nucleating masterbatch for very fine cell structure, significantly reducing water absorption but causing the sheet to have a slightly higher density.
- 2.2.2 **MAXITHEN® PS 790980 NU:** Inorganic nucleating masterbatch for very fine cell structure, significantly reducing water absorption but causing the sheet to have a slightly higher density. Food approved for use in vacuum thermoformed XPS food trays.

### 3. INTERNAL LUBRICANT MASTERBATCH (MODIFIER)

- 3.1 **MAXITHEN® PS 78330 Modifier:** Processing-aid masterbatch based on polystyrene and containing a polymer based lubricant. Developed to achieve lower power consumption, better temperature control of the melt and lower melt friction without adversely influencing flame retardancy.

### 4. NEUTRALISING MASTERBATCH

- 4.1 **MAXITHEN® SB 71820 SF:** To bind any free acid which may arise as a result of several extrusion processes containing flame retardant formulations (process interruptions/unintended machinery stops, overheating, recycling).

### 5. COLOUR MASTERBATCHES

We match every colour shade based on the individual wishes of our customers. We consider the particular requirements of the XPS process when choosing the colour and other components for our formulations. Combined additive/colour masterbatches can be developed on request. A broad range of standard colours is also available "off the shelf".

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

### GENERAL INFORMATION

Due to our many years of technical experience we are able to advise and assist in many questions associated with the manufacture of extruded PS foamed sheets and boards. We can even help in changing the gas-type or modifying any other property or process.

### START FORMULATIONS

**Minimum formulation** to start with is:

4,5% (to 5,5%) MAXITHEN® PS 78320/50 FR  
or 3,2% MAXITHEN® PS 791670 FR  
+ 0,7% (to 1,0%) MAXITHEN® HP 78980/50 TR or HP 781700 TR

Of course the dosage of FR depends on national regulations. The above mentioned quantities are average recommendations based on experience in Europe to fulfil DIN 4102/B1, ÖNORM B 3800/B1, AFNOR NF P 92.504/505/M 1 etc.

Please consider that FR tests must not be carried out immediately after manufacturing. The test boards should be stored for at least 3 to 6 weeks before evaluation.

### THE MOST UNIVERSAL START FORMULATION IS:

4,5% (to 5,5%) MAXITHEN® PS 78320/50 FR  
or 3,2% MAXITHEN® PS 791670 FR  
+ 0,5% MAXITHEN® HP 78980/50 TR  
+ 0,7% (to 1,0%) MAXITHEN® SB 78690 NU

and for **thick boards** 0,7 to 1,5% MAXITHEN® PS 78330

For lowest possible **water absorption**, without considering weight per volume

4,5% MAXITHEN® PS 78320/50 FR  
or 3,2% MAXITHEN® PS 791670 FR  
+ approx. 1,0% MAXITHEN® SB 78690 NU (according to requirement)

# Additive and Colour Preparations

## ADDITIVE AND COLOUR PREPARATION FOR EXTRUDED POLYSTYRENE FOAMS

This information is a basic summary. For further details feel free to contact us:

E-mail: [polymerfoam@gabriel-chemie.com](mailto:polymerfoam@gabriel-chemie.com)

All our information is given to our best knowledge to inform and assist our customers, but should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.



# MAXITHEN<sup>®</sup> PS 78320/50 FR

Flame Retardant Masterbatch for Styrene Polymers

- FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN<sup>®</sup> colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.
- COLOUR:** Milky white or, on special request, coloured with a combination of pigments in order to additionally colour the final article.
- ACTIVE AGENT:** Brominated flame retardant, specially thermally stabilised. Under conventional processing conditions the preparation can be used at temperatures up to 220°C. During injection moulding the residence time should be kept as low as possible and injection should be done gently. Higher stabilised grades are available upon request.
- CARRIER MATERIAL:** Styrene polymers
- APPLICATION:** MAXITHEN<sup>®</sup> PS 78320 FR is designed as a flame retardant for styrene polymer, especially for foamed polystyrene articles (e.g. insulation boards and sheets) but also for rigid products.
- DOSAGE RATE:** Usually between 4,0% and 7,0%, depending on the required flame retardancy of the final article.
- GENERAL NOTES:** The dosage rate and homogenisation of the flame retardant influence the efficiency of flame retardants, as do the basic polymer and recycling material. In foamed articles the foam structure (cell size, wall thickness of the cells), the blowing gas and further additives in use have additional influence.
- NOTE:** In general, brominated organic compounds are thermally unstable and should be protected as far as possible against excessive heat. Serious corrosion of the machinery will occur if the decomposition temperature is exceeded.  
In our experience there will be no problems if handled correctly. During stoppages no melt containing flame retardant, should remain in the machine.  
If the machine is to be switched off we recommend purging and cleaning with natural polymer.  
In the case of acid split off caused by incorrect processing conditions (excessive temperature, friction and/or residence time), the whole equipment must be purged with virgin resin and cleaned, preferably with suitable neutralising agents (e.g. with MAXITHEN<sup>®</sup> SB 71820 SF which has been especially developed for this purpose).  
Please note that remaining acid and/or acid forming or acid containing compositions may cause autocatalytic decomposition even if all other conditions are perfect.

# MAXITHEN® PS 78320/50 FR

Flame Retardant Masterbatch for Styrene Polymers

**PRECAUTIONS:** If there is a discolouration towards brown the machine must be emptied and purged. Ensure good ventilation – vapours should not be inhaled.

**STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, April 1997

# MAXITHEN® PS 791670 FR

Flame Retardant Masterbatch for XPS-Products

**FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.

**COLOUR:** Milky white

**ACTIVE AGENT:** Bromine organic flame retardant with heat stabiliser. Under conventional processing conditions the preparation can be used at temperatures up to max. 220°C.

**CARRIER MATERIAL:** Styrene polymers

**APPLICATION:** Flame resistant preparation of styrene polymers. MAXITHEN® PS 791670 FR acts as a flame retardant for foamed PS-products (thermal insulation sheets and films).

**DOSAGE RATE:** The dosage rate depends on the flame resistance required of the final product. The typical dosage rate is between 3 and 5%.

**INFLUENCES:** The effectiveness of the flame retardant is influenced by the dispersion, dosage rate, the polymers and the percentage of regrind used. In the case of foamed articles, the foam structure (cell size, cell wall-thickness), blowing gas and other additives exert additional influences.

**NOTE:** Bromine organic compounds are generally thermally unstable and should be protected against overheating as far as possible. Serious corrosion of the machinery is possible if the decomposition temperature is exceeded.  
It should be noted that thermal stability is time-dependent. According to our experience, there will be no problems when handled correctly. Avoid leaving any melt containing flame retardants in the machine when the production is stopped. Before switching off the extruder we recommend purging with natural polymer.  
If even minor acid separation starts due to improper handling (too high temperature, shear and/or dwell time), the whole machine must be purged immediately with natural polymer and preferably cleaned with an appropriate neutralising batch (e.g. our MAXITHEN® SB 71820 SF, which was especially developed for this application). Residual acid in the machine or acid containing (separating) additives can cause auto catalytic degradation – even if all the other conditions are perfect.

# MAXITHEN<sup>®</sup> PS 791670 FR

Flame Retardant Masterbatch for XPS-Products

**PRECAUTIONS:** If there is a discolouration towards brown the machine must be emptied and purged. Ensure good ventilation – vapours should not be inhaled.

**STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this product information sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, May 2006

# MAXITHEN® PS 7A1550 FR

Flame Retardant Masterbatch for styrene polymers

**FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.

**COLOUR:** Milky white.

**ACTIVE AGENT:** Organic brominated flame retardant with a very high thermal stability. Under usual processing conditions the preparation can be used up to maximum temperatures of 220°C. If used in injection moulding, the residence time should be kept as short as possible, and the injection process should be gentle. A more highly stabilised alternative is available on request.

**CARRIER MATERIAL:** Styrene polymer

**APPLICATION:** Flame retardancy for styrene polymers. MAXITHEN® PS 7A1550 FR is mainly used in foamed PS products (heat insulation sheets and films).

**DOSAGE RATE:** The dosage rate is dependant on the flame retardancy required in the finished product, but usually lies between 2.8% and 5,0%.

**INFLUENCES:** The effectiveness of the flame retardant is mainly influenced by the dispersion, the dosage, the polymer and the percentage of regrind used. In the case of foamed articles, the structure of the foam (cell size, thickness of the cell wall), the blowing agent and other additives also have an influence.

**NOTE:** Organic brominated compounds are thermally unstable and should therefore be protected from excessive heat as far as possible. If the decomposition temperature is exceeded, serious corrosion of the machinery will occur. In our experience there will be no problems if handled correctly. Avoid melt containing flame retardant from remaining in the machine during stoppages!  
Clean the extruder with natural polymer before switching off. If acid split has occurred or is beginning due to incorrect processing conditions (too high a temperature, shear and/or residence time), the whole machine must immediately be purged. Ideally it should also be cleaned with a suitable neutralising agent (e.g. our MAXITHEN® SB 71820 SF which has been especially developed for this purpose.) Any remaining acid or compositions containing acid can lead to autocatalytic decomposition even if all the other conditions are perfect.

# MAXITHEN<sup>®</sup> PS 7A1550 FR

Flame Retardant Masterbatch for styrene polymers

**PRECAUTIONS:** If there is a discoloration towards brown the machine must be emptied and purged. Ensure good ventilation – vapours should not be inhaled.

**STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this Preliminary Product Information has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, May 2006

# MAXITHEN® PS 78330 MODIFIER

Suitable for Extruded Polystyrene Foamed Sheet

- FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.
- COLOUR:** Natural
- ACTIVE AGENT:** Very tough, rubbery-elastic speciality polymer in combination with highly effective heat-stabilisers. This masterbatch has been particularly designed for the combination with halogenated flame retardants.
- CARRIER MATERIAL:** Polystyrene
- MAIN APPLICATION:** This product is a processing aid designed for extruded polystyrene foam, particularly in combination with flame retardants like e.g. PS 78320/50 FR.
- EFFECT:** MAXITHEN® PS 78330 acts like a lubricant agent, reduces the wall adhesion of the PS-melt, reduces the shear in the melt und thereby the frictional heat in the melt cooler and also increases output by 5%-10% under certain conditions.
- DOSAGE RATE:** Depending on the machinery a dosage rate of ~1% is generally sufficient. The optimum dosage must be determined by varying the equipment and also depends on the sheet thickness.
- THERMAL STABILITY:** In our experience, there will not be any problems if handled correctly at temperatures up to 230°C,. Avoid excessive heat and purge the machine with virgin resin prior to shutting down. Not observing this handling procedure may lead to decomposition and corrosive effects.
- NOTE:** The influence of PS 78830 Modifier on the flame retardant effect must be checked with already existing recipes.
- STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, February 2002  
Replaces Datasheet from October 1985

# MAXITHEN® SB 78690 NU

Nucleating Masterbatch (Cell-Regulator) For Extruded PS-Foamed Sheet

- FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg PE bags, on pallets, covered with a UV stabilised hood (standard packaging). For colouring and stabilising the packaging material, a combined MAXITHEN® colour/stabiliser Masterbatch has been used to protect both, the packaging material as well as the content.
- COLOUR:** Pale grey
- ACTIVE AGENT:** Inorganic, fine-sized, and highly purified filler in a well balanced concentration with regard to the final application.
- CARRIER MATERIAL:** Polystyrene
- APPLICATION:** MAXITHEN® SB 78690 NU is designed as a nucleating agent in the production of extruded PS-foamed sheet with an extremely fine cellstructure.
- The incorporation of physical blowing agents such as FRIGEN to thermoplastic melts needs additives to yield a uniform cell-structure. MAXITHEN® SB 78690 NU acts in such way as to create "hot spots". The fine sized filler disperses homogeneously in the melt. Caused by better heat transfer of the filler compared to the polymer melt, one achieves fine, hot particles on which the blowing-gas builds up preferably. This function could also be achieved by using a chemical blowing agent (MAXITHEN® HP 78980/50 TR). Sometimes a mixture of both mentioned products is used.
- DOSAGE RATE:** The typical dosage is between 0,5% and 1%, in special cases even up to 3%.
- STORAGE CONDITIONS:** Storage time of 12 months should not be exceeded. Particular attention should also be paid to dry and cool storage and protection from sunlight. In order to prevent moisture absorption from the air, opened bags should be kept tightly closed. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, April 2010  
Replaces March 1996



# MAXITHEN® PS 790980 NU

Nucleating Masterbatch For Extruded PS-Foam Sheet

**FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.

**COLOUR:** Light grey

**ACTIVE AGENT:** Inorganic fine-particle filler

**CARRIER MATERIAL:** Styrenics

**APPLICATION:** MAXITHEN® PS 790980 NU is designed as a nucleating agent for extruded PS-foam sheet with an extremely fine cell-structure.

The gassing of melts with physical blowing agents, e.g. partly halogenated hydrocarbons, needs suitable additives to yield a uniform cell-structure. MAXITHEN® PS 790980 NU acts in such way as to create 'hot spots'. The fine sized filler disperses homogeneously in the melt. Caused by better heat transfer of the filler compared to the polymer melt, fine, hot particles are achieved on which the blowing gas builds up preferably. This function could also be achieved by using a chemical blowing agent (MAXITHEN® HP 78980/50 TR). Sometimes a mixture of both mentioned products is used.

**DOSAGE RATE:** Typical dosage rate is between 1% and 3%, in exceptional cases even above.

**NOTE:** In contrast to chemical blowing agents MAXITHEN® PS 790980 NU does not need a minimum temperature. It is extremely heat resistant and free of degradation. Interactions with other additives are unlikely. The slightly higher density of the foam compensates for the lower raw material price of the inorganic nucleating agents. Further, MAXITHEN® PS 790980 NU reduces the moisture absorption of the PS-foam.

**STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, March 2003

# MAXITHEN® HP 781700 TR

## Blowing Agent Masterbatch

**FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.

**COLOUR:** White to pale yellow

**ACTIVE AGENT:** Endothermic blowing agent

**CARRIER MATERIAL:** Polyethylene

**APPLICATION:** MAXITHEN® HP 781700 TR is a universal blowing agent for the processing of thermoplastic polymers on extrusion and injection moulding machines. For weight reduction purposes we recommend a dosage rate between 1% and 3%. In order to prevent sink marks the dosage rate is usually between 0.3% to 0.5%.

**NOTE:** A processing temperature of at least 200° C should be applied in order to achieve an optimum nucleating effect,. Mould corrosion is possible where inappropriate tool steel qualities are used. We therefore recommend suitable chromium nickel steels.

**STORAGE CONDITIONS:** A storage time of 6 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, January 2003

# MAXITHEN® HP 78980/50 TR

Blowing Agent Masterbatch (Nucleating- / Cell regulator)  
For Polyolefins and Extruded PS-Foamed Sheet

**FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg PE bags, on pallets, covered with a UV stabilised hood (standard packing). For colouring and stabilising of the packing material, a combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used to protect both the packing material as well as the content

**COLOUR:** Nature

**ACTIVE AGENT:** Endothermic blowing agent

**CARRIER MATERIAL:** Low density polyethylene

**APPLICATION:** MAXITHEN® HP 78980/50 TR is used as a chemical blowing agent for the production of foamed products of medium to fine cell structure. MAXITHEN® HP 78980/50 TR act also as a nucleating agent / cell-regulator in the production of extruded polystyrene foamed sheets. The gassing of melts with physical blowing agents in order to obtain a uniform cell structure requires appropriate auxiliary agents. Depending on the desired effect different additives can be used to form those spots where the physical blowing agent is preferably taken up later. HP 78980/50 TR does this in an excellent manner. Gabriel-Chemie also offers an inorganic nucleating masterbatch: MAXITHEN® SB 78690 NU. Both products can be used together to obtain special effects.

**DOSAGE RATE:** Addition rate is usually between 0,5% and 5%. For extruded foamed sheet the typical dosage rate is between 0,5% - 1% is. Products with higher active agent concentration are available but may cause poor homogenisation due to the low dosage.

# MAXITHEN® HP 78980/50 TR

Blowing Agent Masterbatch (Nucleating- / Cell regulator)  
For Polyolefins and Extruded PS-Foamed Sheet

NOTES: In order to achieve an optimum nucleating effect, a processing temperature of at least 200° C should be applied. The product is physiologically safe and does not produce Ammonia gas like most exothermic blowing agents that are commonly in use. Accompanying substances will not change the gas-formation temperature.

STORAGE  
CONDITIONS: Storage time of 6 months should not be exceeded. Particular attention should also be paid to a cool and dry storage and protection from sunlight. In order to prevent moisture absorption from the air, opened bags should be kept tightly closed. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, March 2010  
Replaces October 2001

# MAXITHEN® SB 71820 SF

Acid Scavenger for Polystyrene Melts containing Flame-Retardant

- FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.
- COLOUR:** Light grey
- ACTIVE AGENT:** Combination of various components which function as an acid scavenger.
- CARRIER SUBSTANCE:** Styrene polymers
- APPLICATION:** SB 71820 SF is designed to neutralise acid residues which are produced by thermal damage of halogen-containing flame retardants in the processing machine (deposits at the metal surface). In this way, further degradation of the flame retardant caused by the catalytic effect of the remaining acid can be avoided. MAXITHEN® SB 71820 SF is not designed for the thermal stabilisation of flame retardants. In these cases please contact our technical department.
- ADDITION:** To purge the foam extruder as well as the recycling equipment we suggest adding approximately 10 % of MAXITHEN® SB 71820 SF to the virgin polymer.
- STORAGE CONDITIONS:** A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

All information in this MAXITHEN® data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Substitute from December 1993  
Gumpoldskirchen, April 1994

**BUSINESS UNITS OF GABRIEL-CHEMIE GROUP:**



Building & Agriculture



Home & Lifestyle



Packaging for Industrial & Consumer Goods



Cosmetics Packaging



Food & Beverage Packaging



Medical



GABRIEL-CHEMIE Gesellschaft m. b. H.

Industriestraße 1  
2352 Gumpoldskirchen  
Austria

Tel. +43 2252 636 30 0

Fax +43 2252 627 25 0

info@gabriel-chemie.com

**WWW.GABRIEL-CHEMIE.COM**