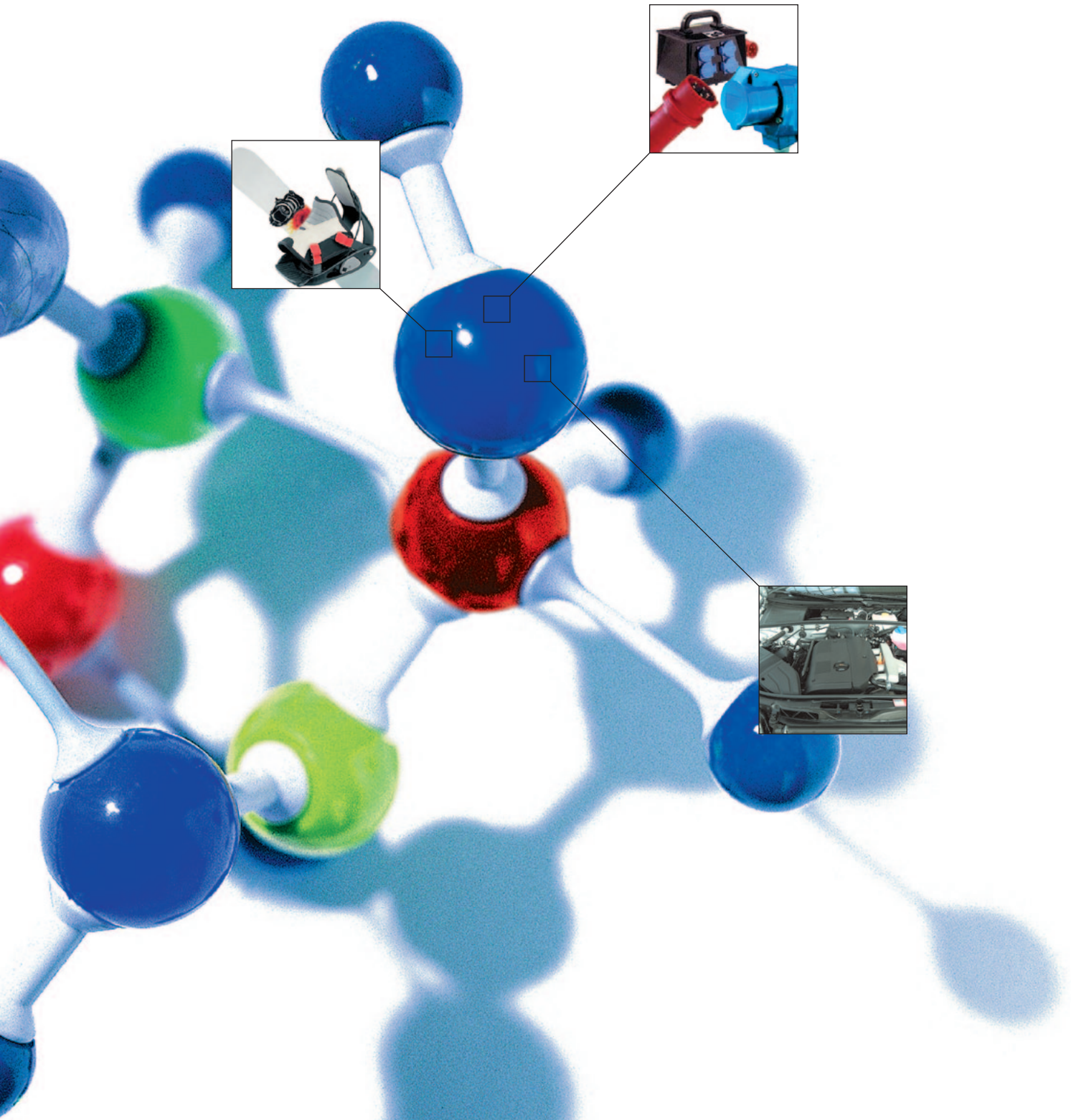


Brüggemann
Chemical



POLYMER ADDITIVES

HIGH PERFORMANCE ADDITIVES FOR POLYAMIDES AND OTHER ENGINEERING THERMOPLASTICS

BRUGGOLEN® H – Heat Stabilizers

Copper based antioxidants – Most efficient heat stabilization of Polyamides

Classic Copper Salt based Heat Stabilizers

Bruggolen® H320 / H321* TP-H8017/TP-H9023* TP-H9016	Highly effective antioxidants for Polyamides: → powerful long-term protection at service temperatures up to 180°C → characteristic greenish discoloration
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High Performance Copper Complexes – Best stabilization for natural color (or for light colored) Polyamides

Bruggolen® H3336 / H3346* H3373 / H3374* H3350 / H3351** TP-H6010 / TP-H6015** TP-H7004 / TP-H7013*	Unique set-up of properties: → long-term heat stabilization at service temperatures of 180°C or even up to 210°C → excellent UV-stabilization → little or no discoloration during processing and after conditioning → high extraction resistance; no plate-out → suitable for E/E applications: High CTI values ≥ 550 achievable → excellent dispersion
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Processing stabilizers – Best protection against discoloration

Bruggolen® H10	Highly efficient protection of Polyamides during melt processing against yellowing and against degradation → excellent resistance against shear stress and/or elevated temperatures → non volatile → resistant against hydrolysis Perfect for GF-reinforced Polyamides
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Bruggolen® H175	Very efficient color and long-term heat stabilization of Engineering Thermoplastics → non-extractable; no plate-out → excellent color stabilization
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Heat and processing stabilizer packages based on phenolic antioxidants + synergists

Bruggolen® H11 H160 H164	Long term protection of Polyamides against heat ageing → non discoloring → synergistic packages
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Bruggolen® H161	Long term protection of Polyamide fibers and of unfilled injection/extrusion grades → very good color stabilization, e.g. during storage → non-extractable; no plate-out
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Bruggolen® H180	Excellent processing stabilizer and antioxidant package for POM → scavenges formaldehyde
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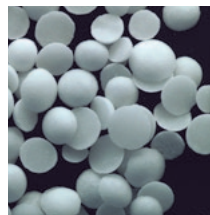
Stabilizers against hydrolysis and aggressive solvents including amine based antioxidants

Bruggolen® H20 H2002	Stabilization against hydrolysis and heat ageing → best protection of polyamides against hot oils, fats and glycols → characteristic brownish translucent discoloration
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PRODUCT INNOVATIONS TARGETED TO CUSTOMER DEMANDS

BrüggemannChemical continuously develops speciality additives which are serving market requirements. More than 30 years experience in the polymer industry, along with the technical expertise of specialized personnel and close partnerships with customers, are the basis for the timely development of innovative solutions. This enables customers to enhance the value of their products to meet high technical requirements thus realizing a respective lead in the market.

Important parts of the product range are tailor-made and well-balanced additive packages, so-called "One-Packs". These are mixtures of two or more additives and present solutions for specific applications in customized product forms, i.e. as powder, pellet or masterbatch.



"One-Packs" offer significant advantages for polymer producers and converters:

- Improved dosing accuracy
 - Less off-spec material
 - Homogeneous resin quality
 - Simplified manufacturing
 - Lower cost in purchasing, warehousing and quality control
- **Reduced operating cost!**

"One-Packs" as dust-free pellets or granules provide further benefits:

- Improved flow-ability, easier conveying and feeding
 - Better workspace hygiene
- **Analogous to masterbatch utilization, but more efficient due to almost 100% concentration of active components!**

BRUGGOLEN® P – Processing Agents

Nucleating Agents

Bruggolen® P22 P2034**	Highly efficient nucleation of Polyamides <ul style="list-style-type: none">→ reduction of cycle time in injection molding→ improved dimensional stability; significant reduction of warping in GF-reinforced PA→ improved mechanical properties (tensile strength, stiffness, ...)→ increase of HDT→ improved mold release→ non-volatile; non-extractable
Bruggolen® P250	Highly efficient nucleation of Polyesters <ul style="list-style-type: none">→ reduction of cycle time in injection molding→ improved dimensional stability→ improved mechanical properties (tensile strength, stiffness, ...)→ increase of HDT→ non-volatile; non-extractable

Lubricating / Demolding packages

Bruggolen® P12 P130	Well balanced combination of internal and external lubricants especially for Polyamides (P12 and P130) and Polyesters (P130) <ul style="list-style-type: none">→ very low volatility→ high gloss and good surface protection→ improved melt flow→ excellent mold release→ improved dispersion of fillers
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Processing One-Packs

Bruggolen® P30 / P31* P32 / P33* P34 / P35*	Synergistic ready-to-use packages for injection molding grades <ul style="list-style-type: none">→ P30/P31 is specifically designed for recycling of PA fiber waste or of PA regrind→ improved melt flow→ strongly reduced cycle times; very good mold release→ efficient color protection / processing stabilization
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Processing auxiliary for dry blending

Bruggolen® P60	Improved quality of polymer chips + additive powder blends <ul style="list-style-type: none">→ reduced separation during transport→ improved additive dispersion
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BRUGGOLEN® M – Modifiers

Chain Extenders

Bruggolen® M1251
M1253****

Unique linear chain extension of Polyamides

- increase of molecular weight
- reduction of MFI; increase of viscosity
- no cross-linking!
- increase of impact strength
- increase of elongation at break

Typical applications in blow-molding, extrusion, recycling etc.

M1253 is especially designed for monofilament and fiber applications

Further Modifiers

Bruggolen® M1420

Controlled chain braking of Polyamides

- reduction of molecular weight
- increase of MFI; reduction of viscosity

Bruggolen® M21

Plasticizer for Polyamides and other Engineering Thermoplastics

- toughening and improved melt flow

BRUGGOLEN® L – Light Stabilizers

Light Stabilizers / Optical Brighteners for Engineering Thermoplastics

**Bruggolen® L11
L12**

Very efficient optical brightener + stabilizers + processing auxiliaries One-Pack

- bright colors of injection molded parts, fibers...
- compensation of yellowish discoloration
- resistant to high processing temperatures

Bruggolen® L20

Effective protection against ageing caused by UV-light and heat

- synergistic UV-stabilization package

Further commercial BRUGGOLEN® – Polymer Additives and new test products are available on request.

The information given herein and otherwise supplied to users is based on our general experience and, where applicable on the results of tests on samples of typical manufacture. However, because of the many factors which are outside our knowledge and control which can affect the use of these products, we cannot accept liability for any injury, loss or damage resulting from reliance upon such information.

Products are in powder form except: * granules, ** masterbatch

FURTHER PRODUCT GROUPS

AP-NYLON® Additives for Cast Nylon and NYRIM®

BrüggemannChemical is the leading supplier of raw materials and additives for nylon casting. The product portfolio comprises special catalyst and activator systems, impact modifiers, heat stabilizers and processing auxiliaries. Complementary, **BrüggemannChemical** provides the monomer AP-Caprolactam. NYRIM® stands for specific nylon block copolymers which are processed via Reaction Injection Molding (RIM) and exhibit inherent excellent low temperature impact resistance (down to -30°C). **BrüggemannChemical** supports customers in co-operations based on a team of experienced experts with a sophisticated technical/R&D center.



Toll Production

BrüggemannChemical offers diverse advanced production plants for chemical synthesis, mixing, grinding and drying. A variety of products are produced in constant quality and according to customer requirements.

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