

Upcycling of Polyolefins

High Performance Stabilizers
and Compatibilizers



Creating the missing link.

Brüggemann

Leading Supplier of Additives for Polyamides



Brüggemann: Newest technology with a high degree of automation



Außerpolimeri: Versatile technology for grafting of maleic anhydride

Brüggemann, the specialist for polymer additives for Polyamides and Polyesters has expanded the product portfolio for recycling additives for Polyolefins. Key ingredient of **BRUGGOLEN® R** series is the new repair technology.

By the acquisition of **Auserpolimeri**, a leading developer and manufacturer of functionalized polymers, the company complements its portfolio by a broad range of **COMPOLINE®** compatibilizers for polyolefin recycling.

- secure long-term supply
- highest reliability and flexibility
- optimum product quality

High Performance Stabilizers and

Stabilizers for Recycling of Polypropylenes

BRUGGOLEN® R – Recycling Stabilizers

Improved Quality Polyolefin Recyclates

Products for PP recycling:

New Repair Technology for Polypropylenes PP

BRUGGOLEN® TP-R2090

Recycling stabilizer for Polypropylenes from post consumer and post industrial waste
Superior quality recyclates via a novel chemical system

- prolonged retention of mechanical strength
- improved process stability

BRUGGOLEN® R8895

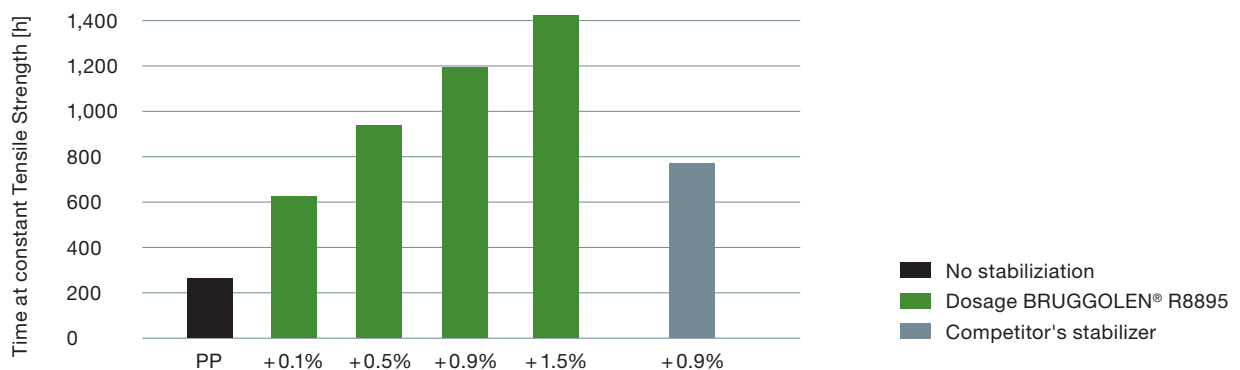
Recycling stabilizer for Polypropylenes containing high amount of battery acids
Higher quality recyclate via a novel chemical system

- increased retention of mechanical properties
- neutralization of high amounts of battery acids
- improved process stability

BRUGGOLEN® R8895 in post consumer-PP

Control of retention of the mechanical strength of polypropylene recyclates

Effect of BRUGGOLEN® R8895 concentration:



and Compatibilizers for Polyolefins

Stabilizers for Recycling of Polyethylenes

BRUGGOLEN® R – Recycling Stabilizers

Improved Quality Polyolefin Recyclates

Product for LLDPE recycling:

New Repair Technology for Linear Low Density Polyethylenes LLDPE

**BRUGGOLEN®
TP-R2162**

Recycling stabilizer for Polyethylenes

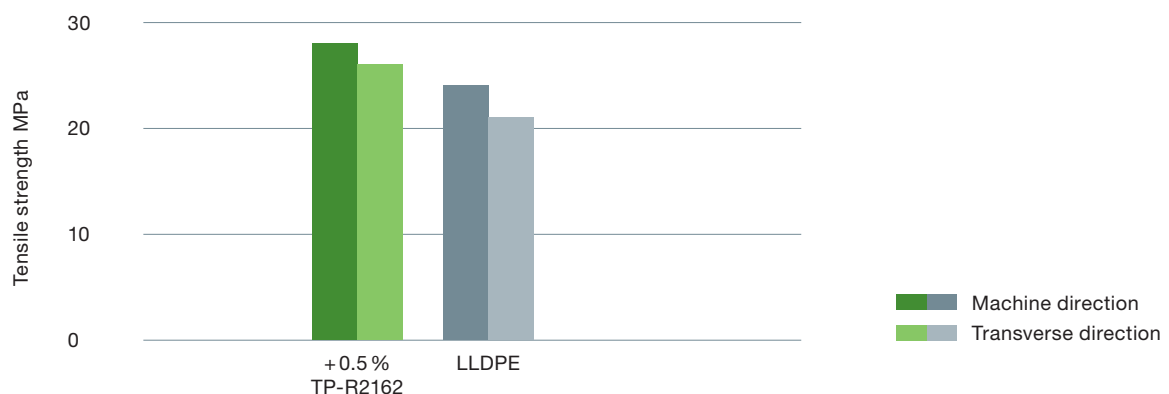
Higher quality recyclates via a novel chemical system

- enhanced initial mechanical strength of extruded PE films
- improved process stability

BRUGGOLEN® TP-R2162 in post consumer LLDPE cast film

Improvement of initial mechanical strength

Initial tensile strength of film samples:



Compatibilizers for Recycling of Polyolefins

COMPOLINE®

Improved Quality Polyolefin Recyclates

Compatibilizers from Auserpolimeri: COMPOLINE®

Maleic anhydride grafted polyolefins compatibilize different polymers to

- optimize mechanical and surface properties
- improve processing and mechanical film performance
- homogenize polar polymer contamination

Compatibilization of PE films

- preserve weldability
- no softening
- increase stiffening

AUSERPOLIMERI
a Company of Brüggemann

Case Study: COMPOLINE® in LLDPE packaging

- restore 100 % tensile strength in machine direction
- as high as virgin PE



25 kg Industrial packaging bag with 46 % low quality recyclates

Contacts

L. Brüggemann GmbH & Co. KG

Salzstrasse 131
74076 Heilbronn, Germany
Telephone +49 7131 1575-0
Fax +49 7131 1575 25 111
info@brueggemann.com

BruggemannChemical U.S., Inc.

18 Campus Blvd, Ste. 100
Newtown Square,
PA 19073, USA
Telephone +1 610 353 9852
Fax +1 610 353 9853
usa@brueggemann.com

BrueggemannChemical Asia Ltd.

Room 1705, 17/F
625 King's Road
North Point, Island East, Hong Kong
Telephone +852 3460 2527
Fax +852 3460 2522
asia@brueggemann.com

www.brueggemann.com

Disclaimer of representations and warranties: Limitation of Liabilities

L. Brüggemann GmbH & Co. KG., BruggemannChemical U.S., Inc., BrueggemannChemical Asia Ltd. and their affiliated companies (collectively, the "Bruggemann Group") make no representations or warranties of merchantability or of fitness for any particular purpose or use, and make no other express or implied representations or warranties with respect to the Bruggemann Group products described herein, including, but not limited to, any information provided by any company of the Bruggemann Group, whether orally or in writing, as to the chemical and physical characteristics of such products.

The information contained herein – and any other related information provided, orally or in writing, by any company of the Bruggemann Group is provided to the best of the Bruggemann Group's knowledge. The information contained herein is of a general nature and is for informational purposes only. Product specifications must in each case be expressly agreed upon in writing or may be provided by the respective company of the Bruggemann Group in a separate document which must be expressly related to a particular purchase order. Each buyer or user is responsible for conducting its own tests to determine the chemical and physical characteristics of a Bruggemann Group product or its suitability for an intended purpose or use.

In no event shall any company of the Bruggemann Group be liable to any buyer or user of the Bruggemann Group products for any loss or damages, direct or indirect, of any kind or nature (including general, special, incidental, consequential, liquidated, or punitive damages or any damages calculated by reference to loss of anticipated revenues or profits, or loss of use of products, costs of replacement products, or additional expenses incurred in the use of products), or for any other damages to the property or person of any buyer or user, in each case which may arise as a result of the use or application of the Bruggemann Group products described herein or the information provided by any company of the Bruggemann Group, negligently or otherwise, or the infringement of any patent, trademark or other intellectual property rights.

Each buyer and user of a Bruggemann Group product shall obtain and review the applicable material safety information before handling any of the Bruggemann Group products.

All of the provisions of the General Terms and Conditions of Sale and Delivery of any company of the Bruggemann Group, as amended from time to time, including, but not limited to, those relating to the extent and limitations of the liability of the respective company of the Bruggemann Group, will apply to all sales of the Bruggemann Group products and are incorporated by reference herein.