

Next-Gen
Formaldehyde-Free
Reducing Agents
for Sustainable Emulsion Polymerization



Die entscheidende Verbindung.

Innovative Reducing Agents for Emulsion Polymerization

Brüggemann develops and produces tailor-made reducing agents for polymerization in water – an expertise we have gained since the widespread application of this technology. For successful emulsion polymerization, so-called “redox systems” are required, consisting of a reducing agent and an oxidizing agent.

Brüggemann is the first company to offer a sulfur-based formaldehyde free reducing agent, Bruggolite® FF6 M. Our unique R&D activities continue to develop new, environmentally friendly grades of reducing agents that provide additional benefits. In addition to Bruggolite® grades in solid form, we also produce reducing agents in a stable liquid form for customers that want to avoid the handling of solids. Our latest development – Reducing Agent TP 1646 – displays high stability in acidic aqueous solution and is efficient over a broad range of process variables.

Advanced Formaldehyde-Free Reducing Agents

Formaldehyde-free reducing agents made by Brüggemann help to meet the latest technical challenges of environmental awareness, rising quality demands, and improved application performance. Our products and techniques enable emulsion polymer producers to improve efficiency and sustainability.

- Formaldehyde- and VOC-free
- Increased reactivity – better performance at lower temperatures
- Low to zero residual free monomer levels
- FDA approval for direct food contact
- Dust-free micro granules



Bruggolite® – Reducing Agents

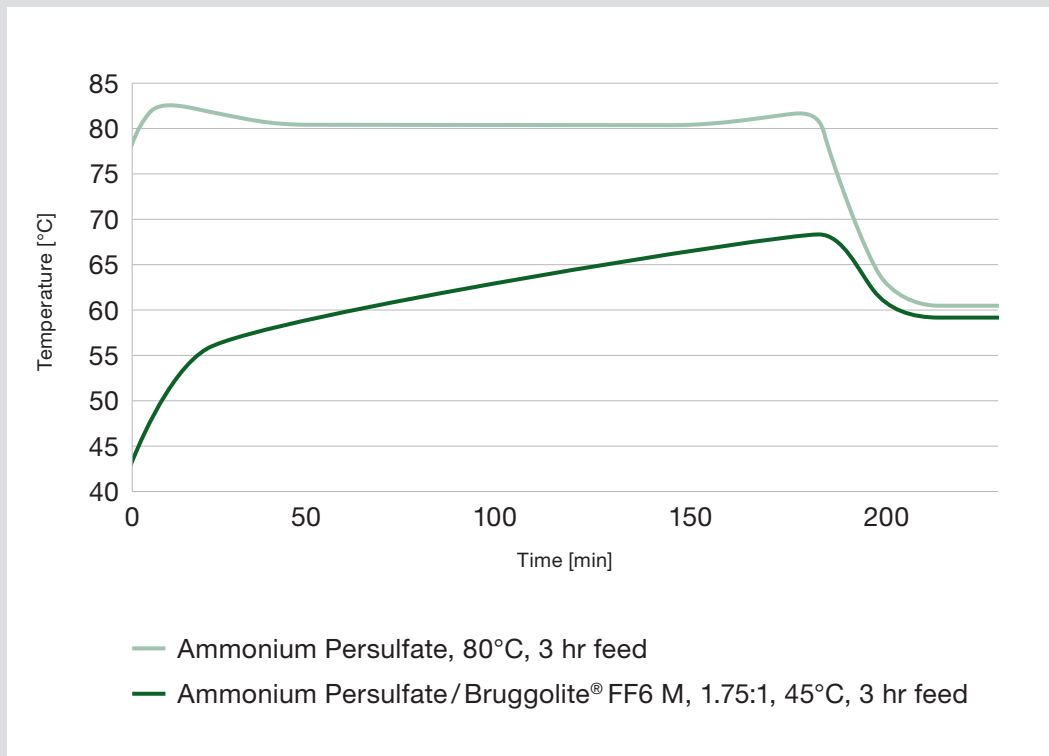
Formaldehyde-Free Reducing Agents

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|-------------------------------|--|
| Bruggolite® FF6 M | <ul style="list-style-type: none">• high reactivity grade• enhanced performance in removal of residual monomers• non yellowing• microgranules |
| Reducing Agent TP 1646 | <ul style="list-style-type: none">• stable under acidic conditions• no odor in aqueous solution |
| Reducing Agent TP 1651 | <ul style="list-style-type: none">• high process robustness• specially suitable for styrene acrylate based systems |
| Reducing Agent TP 1853 | <ul style="list-style-type: none">• high process robustness• specially suitable for vinyl acetate based systems |
| Bruggolite® E28 | <ul style="list-style-type: none">• high reactivity grade• specially suitable for low pH systems• non yellowing |

Regular Reducing Agents

- | | |
|------------------------|--|
| Bruggolite® E01 | Sodium Formaldehyde Sulfoxylate <ul style="list-style-type: none">• for water-based polymerization• powder or granules |
| Bruggolite® L40 | Sodium Formaldehyde Sulfoxylate <ul style="list-style-type: none">• water-based solution ready for processing• for water-based polymerization• optimization of handling |

Energy Savings by Redox Initiation for Main Polymerization



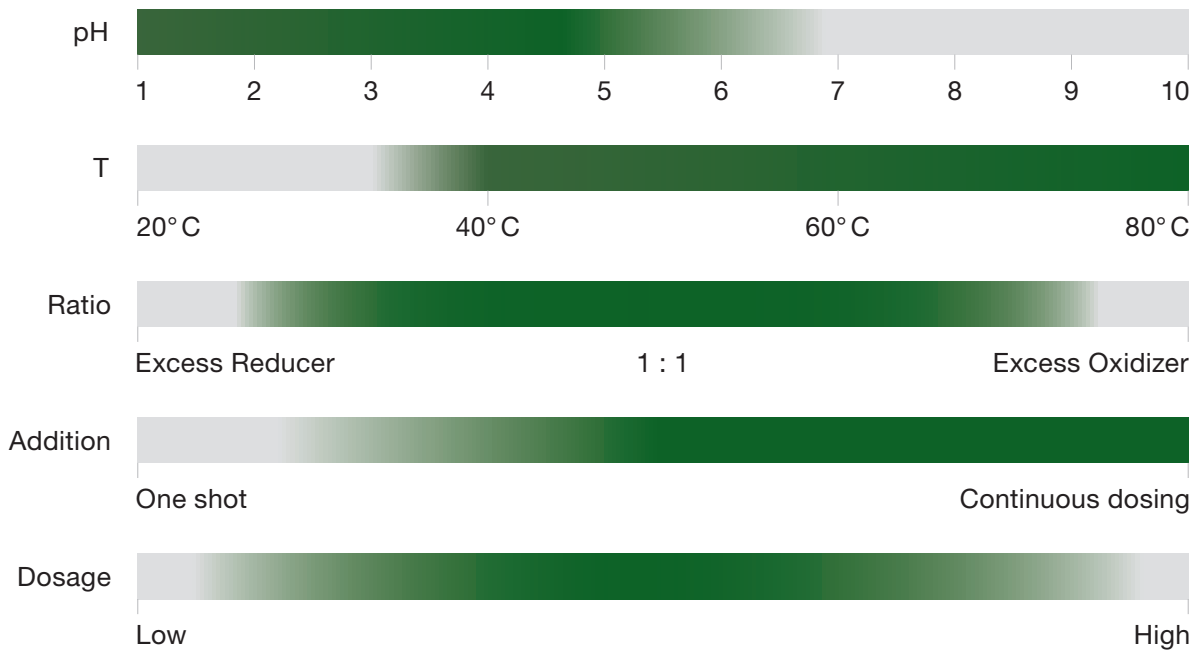
- Transfer of **redox initiation** from post to main offers **energy and time savings**
- Initiation **at low temperatures** is possible
- **Less by-products** during polymerization
- Polymer **characteristics** are **comparable** to standard polymers
- **Biocidal stability** could be in favor of redox initiation

Advantages of our New Reducing Agent TP 1646

- New generation of formaldehyde-free reducing agents
- Zn/Mg-based salt of sulfinic acid
- Highly water-soluble reducing agent
- More stable under acidic conditions
- No odor

Application Technology Profile Reducing Agent TP 1646

Green zone = recommended variables



TP 1646 Solution Concentration 3 - 5 %

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