EURECO™
RP103
The complement to a renovated 2nd generation of products for low temperature bleach in consumer and professional markets

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Thorsten Pohl
Agenda

• General introduction
• Available grades / risk profile
• Biocidal product regulation (BPR)
• Novelty: EURECO™ RP 103 – granules
  • Product data
  • Stability
  • Dissolution time
  • Opportunities for usage
  • Performance

• Summary
Eureco™

*EURECO™* is the registered trade-mark of Solvay for its commercial preparations based upon “PAP”, a preformed peracid developed and patented by Solvay

**Active Peroxy Group**

ε-phthalimido-peroxy-hexanoic acid (PAP)

*EURECO™* is a unique auxiliary material which readily delivers superior bleaching, deodorizing and disinfection performance without need of activation or alkalinity. Its action is quick and strong.
PAP

• PAP main physical properties are:
  ✓ crystalline, solid phase with high melting point
  ✓ odourless
  ✓ white appearance

• PAP main chemical properties are:
  ✓ $M = 277.28$
  ✓ 5.7% Available Oxygen
  ✓ Strong oxidation potential
Product range

**Liquids**
- **Eureco LX5**
  - Stabilized water suspension with ~5% of tiny PAP crystals ready to be used as laundry bleach booster in consumer market
- **Eureco LX10**
  - Stabilized water suspension with 10 and 17% of tiny PAP crystals ready to be used as bleach and disinfecting agent in the I&I market LX grades provides an outstanding set of savings
- **Eureco LX17**

**Solids**
- **Eureco WM1**
  - Powdered formula with 70% of micronized PAP developed for ADW unit doses or tablets
- **Eureco RP103**
  - Novel Boron-free granular composition with 62% PAP with high stability and performance

**Health Care**
- **Eureco HC P11**
  - Molecular inclusion complex between PAP and b-cyclodextrine suitable for manufacturing whitening products
- **Eureco HC L17**
  - Stabilized water suspension with 17% of tiny PAP crystals suitable to manufacture whitening gels or creams
The eco/toxicological profile of PAP is exceptionally favourable:

- **no long-term/chronic effects**
- **not toxic to humans**
- **inherently biodegradable**

In fact after its performance PAP is totally converted to PAC which is 100% biodegradable:

More data on PAC can be found on ECHA website:


Such feature and related data are specifically important to calculate the environmental compliance with the Ecolabel requirements – DID 2615
The classification assigned to PAP is outstanding though its activity is very high.

<table>
<thead>
<tr>
<th>PAP concentration</th>
<th>CLP word</th>
<th>CLP symbol</th>
<th>CLP phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAP &lt; 5%</td>
<td>WARNING</td>
<td>![Warning Symbol]</td>
<td>H319</td>
</tr>
<tr>
<td>Eureco LX5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5% ≤ PAP &lt; 25%</td>
<td>DANGER</td>
<td>![Danger Symbol]</td>
<td>H318</td>
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<tr>
<td>Eureco LX10 - Eureco LX17</td>
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<tr>
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</tr>
<tr>
<td>PAP ≥ 25%</td>
<td>DANGER</td>
<td>![Danger Symbol]</td>
<td>H318 H400</td>
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<tr>
<td>Eureco WM1 - Eureco RP103</td>
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In NO cases the current PAP mixtures are considered Comburent or Oxidizers in the frame of the CLP regulation.

PAP is a disinfecting agent!
PAP is registered and accepted in the list of active ingredients of the ‘Biocide Products Regulation’ with relevance to the following Product Types:

- **PT1** - Human hygiene biocidal products
- **PT2** - Private area and public health area disinfectants and other biocidal products
- **PT3** - Veterinary hygiene biocidal products
- **PT4** - Food and feed area disinfectants

“PAP is currently evaluated under the review program of existing active substances and its approval is expected to occur at the earliest in the course of 2016 meaning that its inclusion in the list of approved active substances is expected in 2018 at the earliest”
Eureco RP103 is a new granular grade developed by Revolymer (UK) and now available from Solvay for use in cleaning, disinfecting and deodorizing products.

The new composition has outstanding features:

- Boron free PAP composition
- Stable in bulk
- Stable with alkalis
- Stable in presence of relative humidity
- Stable in PVOH pouch
- Dust free, mechanically robust, free flowing particles
- Very rapid dissolution at low temperature
- Stable in domestic detergent powders (ADW & laundry)
- Stable in I&I formulations
- Commercially available
### RP103

**Product data**

<table>
<thead>
<tr>
<th>PAP content, %</th>
<th>Particle size, µm</th>
</tr>
</thead>
<tbody>
<tr>
<td>61 - 64%</td>
<td>Max 2% &lt; 200</td>
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<tr>
<td></td>
<td>Max 2% &gt;1200</td>
</tr>
</tbody>
</table>

- **160-400 µm**: 0.6%
- **400-800 µm**: 35.4%
- **800-1000 µm**: 44.2%
- **1000-1200 µm**: 18.2%
- **1200-1400 µm**: 1.5%
RP103
Storage stability

✓ Excellent bulk stability after 5 weeks at 40°C

7 days at 40°C
35 days at 40°C

% Remaining PAP vs. original assay

98,97
98,41

✓ Excellent stability in AATCC powd. detergent
pH 11.3 (not developed for PAP !)

7 days @ 32°C, 60%RH
42 days @ 32°C, 60%RH

% Remaining PAP vs. original assay

89,52
84,32
Model experiment:
- Dosage: 100 ppm RP103
- T = 30°C
- Hard water conditions (300 ppm Na₂CO₃)
- Without surfactants or reducing substances

![Graph showing dissolusion rate of RP103 over time]

% PAP in Solution vs. Time, Min
RP103

Performance @15°C vs. SPC/TAED

- 0.21g of 100% active PAP per wash cycle at pH 8.2
- 1g of SPC with 0.25g TAED per wash cycle at pH 10.5
- Measured parameters: Reflectance at 460nm
Opportunities in Household

- ADW Powder and tablets
  - Smaller tablets
  - Less aggressive formulations
  - Disinfection
- Liquid multi compartment ADW pouches
RP103

Opportunities in Household

- Laundry powder, tablets, PVOH unit dose - total/partial replacement of SPC/TAED/sodium carbonate
  - Compact formulations, lower temp. performance, milder wash, disinfection
- Laundry multi compartment liquid unit dose with PAP bleach (pouch)
- Laundry powdered bleach boosters, de-stainer products
Opportunities in I&I

- Laundry powder
- Laundry bleach booster
- Disinfecting agent for laundry powders
- ADW bleach & disinfecting agent
**Conclusion**

- Novel boron free PAP composition (~62% PAP)
- Dust free, mechanically stable, robust particles
- Excellent stability in domestic and professional formulations:
  - laundry powder and tablet and liquid unit dose 2 compartment
  - ADW powder and tablet
- Excellent compatibility with PVOH film
- Very rapid dissolution at low temperature
- Fully commercial 2015
- Samples available
Summary

- High bleach efficiency
- Wide disinfection range already at low temperatures
  - No in situ problematic!
- Bleach @ mild pH
- Savings:
  - Low dosage of alkalis
  - Low energy consumption
  - Low waste water treatment
  - Low wearing out of textiles
  - Low rinsing water
- Safe handling
Thanks for your attention!

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