Acquisition of PeroxyChem

FUTURIZE PEROXIDE

8 November 2018
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Acquisition highlights

- Strengthening of Evonik’s growth segment Resource Efficiency
- Focus on environmentally-friendly specialty applications
- Attractive end-market growth with low cyclicality
- Excellent fit with Evonik’s peroxide portfolio – expansion of business in North America
- EBITDA margin of ~20% above Evonik’s average group margin
- Strong FCF generation with sustainable FCF conversion >60%
- Fair valuation with EV / adj. EBITDA multiple 7.8x (incl. synergies)
Strengthening growth segment Resource Efficiency
One of the most versatile and sustainable chemicals available

Hydrogen peroxide (H₂O₂) and Peracetic acid (PAA)

- **Diverse applications and high importance of application development**: to commercialize new and enhanced products, technologies and services
- **Sustainability**: stricter environmental regulations as growth driver for environmentally-friendly peroxide applications
- **Highly contract-based business**: longstanding customer relationships with high share of revenue under contracts of >1 year
- **Resilience**: attractive margin profile with minimal raw material volatility or seasonality in demand
- **Asset set-up and logistics**: customer proximity, supply security and logistics as decisive factors

Resilient and attractive business profile
PeroxyChem – Overview
A global manufacturer and supplier of peroxides

- PeroxyChem is a global manufacturer and supplier of hydrogen peroxide (H$_2$O$_2$), peracetic acid (PAA) and persulfates (PS)
- Headquarter in Philadelphia, Pennsylvania
- Ownership: Private equity (One Equity Partners)
- Founded: 1900s (Foret and Buffalo Electro-chemical Co.)
- Headcount: ~600 globally, thereof ~20% in application development, sales and marketing
- Locations: 8 manufacturing facilities (USA, Canada, Germany, Spain, Thailand), 2 distribution facilities, 5 regional offices, 3 R&D labs

Sales 2018E: ~$300 m
adj. EBITDA 2018E: ~$60 m
adj. EBITDA margin: ~20%
Acquisition of PeroxyChem
Excellent complementary fit with Evonik’s existing peroxide business

<table>
<thead>
<tr>
<th>Evonik Business Line Active Oxygens</th>
<th>PeroxyChem’s peroxide portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Business</td>
<td>Standard Business</td>
</tr>
<tr>
<td>Specialties</td>
<td>Specialties</td>
</tr>
<tr>
<td>H₂O₂</td>
<td>H₂O₂</td>
</tr>
<tr>
<td>PAA</td>
<td>PAA</td>
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<tr>
<td>HPPO</td>
<td>HPPO</td>
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</table>

- Market growth 3% p.a.
- Market growth 6% p.a.

Combined sales\(^1\): > €700 m

1. Sales of Evonik Business Line Active Oxygen and PeroxyChem
Attractive peroxide applications
Focus on specialty applications with strong secular growth drivers

Specialties

<table>
<thead>
<tr>
<th>Industry</th>
<th>Environmental</th>
<th>Electronics</th>
<th>Food &amp; Beverage</th>
<th>Other specialties</th>
<th>Process Chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application fields</td>
<td>▪ Solutions for waste water treatment, soil remediation and groundwater treatment&lt;br&gt;▪ H₂O₂ and PAA as alternative to chlorine</td>
<td>▪ Ultra-pure hydrogen peroxide as cleaning agent in semiconductor Fabs</td>
<td>▪ PAA as disinfectant in poultry &amp; beef processing&lt;br&gt;▪ Aseptic packaging with H₂O₂ and PAA</td>
<td>▪ Medical, consumer and personal care applications such as sterilization of medical equipment and contact lens solutions&lt;br&gt;▪ Energy: Persulfates and PAA in hydraulic fracturing</td>
<td>▪ Hydrogen peroxide for pulp and paper processing&lt;br&gt;▪ H₂O₂ and PAA in chemical synthesis</td>
</tr>
<tr>
<td>Growth driver</td>
<td>▪ Stricter environmental regulations&lt;br&gt;▪ Redevelopments of former industrial or military sites</td>
<td>▪ Growth of mobile devices&lt;br&gt;▪ Automatization and digitalization</td>
<td>▪ Stronger regulations for food safety&lt;br&gt;▪ Increased demand for convenient packaged food</td>
<td>▪ Increased regulations on cosmetic and care products for high purity grades&lt;br&gt;▪ Rising domestic oil and natural gas production</td>
<td>▪ Customer need for increased high product quality and supply security</td>
</tr>
<tr>
<td>Growth</td>
<td>5-6% p.a.</td>
<td>&gt;7% p.a.</td>
<td>4-6% p.a.</td>
<td>3-5% p.a.</td>
<td>3% p.a.</td>
</tr>
</tbody>
</table>
Evonik and PeroxyChem specialty exposure
Expansion of high-growth and -margin specialty applications

Combined peroxide portfolio with higher specialty exposure

Share of specialty business increasing from ~50% to ~65%

Combined specialty applications Evonik and PeroxyChem
Impressive growth track record and attractive growth perspective
Earnings growth driven by portfolio shift to specialty business

<table>
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<tr>
<th>Resilient and strongly growing business (adj. EBITDA)</th>
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<tr>
<td><strong>Evonik</strong></td>
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<tr>
<td><strong>PeroxyChem</strong></td>
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</table>

**Future growth drivers**

- **Sustainability** drives growing demand for environmentally-friendly specialty applications
  - e.g. **new Memphis plant** with long-term *take-or-pay contract* with City of Memphis for municipal wastewater treatment
- Increased exposure towards *specialty applications*
- **Optimization** in combined *asset set-up and logistics*
- Realization of *synergies*

**Portfolio optimization:**
- Successful strategic shift towards specialty applications
- Strong application development to commercialize new products

**Introduction of new HPPO technology**
- Higher share of specialty applications and optimization of logistics
- Acquisition and successful integration of assets, e.g. Delfzijl (NL) site in 2015
PeroxyChem – capital expenditures and free cash flow
Low capital intensity and attractive FCF conversion

Investing phase

Normalized capex

Free cash flow

>60% FCF conversion\(^1\)

- FCF in 2019 with integration costs and additional CAPEX for growth and production platform optimization
- Positive FCF in 1\(^{st}\) full year after closing, further ramping up in following years

\(\text{FCF} = \text{FCF conversion} \times \text{adj. EBITDA}\)

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<tbody>
<tr>
<td>Capex</td>
<td>~10% capex/sales</td>
<td>~6% capex/sales</td>
<td>~6% capex/sales</td>
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(e.g. new Saratoga (US) plant for electronic applications and new Memphis (US) plant for municipal wastewater treatment)

1. FCF conversion: FCF / adj. EBITDA
Synergies and integration costs
Tangible synergies driven by excellent strategic fit; low integration complexity

<table>
<thead>
<tr>
<th>Synergies</th>
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<tbody>
<tr>
<td>Cost Savings in Production, Logistic</td>
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<tr>
<td>Cross Selling</td>
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<tr>
<td>SG&amp;A</td>
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</tbody>
</table>

Total synergies:
~$20 m p.a.
fully realized by 2022

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<tr>
<th>Integration costs</th>
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<tr>
<td>Integration costs (e.g. IT integration, consultants)</td>
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Expected cash-out of
~$20 m
in first 2 years

Integration costs excluding transaction costs
Attractive valuation

Enterprise Value

$625 m

adj. EBITDA 2018E

Synergies

adj. EBITDA incl. synergies

EV / adj. EBITDA 2018E

7.8x including synergies

10.4x excluding synergies

EPS accretive
in 1st full year after closing
Transaction summary

Structure
- 100% acquisition of PeroxyChem
- On a cash- and debt-free basis

Financing
- Financing secured via cash and committed credit facilities

Timing
- Approved by PeroxyChem Board and Evonik’s Supervisory Board
- Aiming for closing by mid 2019, subject to approval by responsible authorities
Acquisition highlights

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Evonik portfolio strategy
Healthy mix of growth & financing businesses

**Strengthen leading positions in attractive markets**
- Strong growth profile
- Above-average returns
- Focus of capital allocation (capex, R&D, acquisitions)
- Examples: High Performance Polymers, Comfort & Insulation

**Generating financing power**
- Attractive market growth
- Below average capex allocation
- Stable returns and high FCF contribution
- Examples: Perf. Intermediates (C4), Active Oxygens, Oil Additives
## PeroxyChem Business Overview

### Hydrogen Peroxide (H₂O₂)
- Environmentally-friendly oxidizer and disinfectant, replacing chlorine derivatives
- Hydrogen and oxygen as primary raw materials
- H₂O₂ is purified and diluted to various concentrations depending on the end use application
- Purity grades range from standard grade for numerous industrial applications to ultra-high purity grades for electronics and propulsion
- Decomposes to yield only oxygen and water

**Applications**
- Electronics, Food Safety, Environmental, Medical, Energy, Process Chemicals

### Peracetic Acid (PAA)
- PAA is an equilibrium mixture of hydrogen peroxide, acetic acid and water that is available in various grades
- Broad-spectrum sanitizer, disinfectant and sterilant, primarily used as an antimicrobial
- Easily dilutes in water and decomposes into non-toxic by-products
- Purified and diluted to various concentrations, ranging from 5% to 35% PAA in equilibrium solution
- Exceptional product stability, ensuring reliability and safety in production, transportation and usage

**Applications**
- Food Safety, Environmental, Medical, Energy, Process Chemicals

### Persulfates (PS)
- Oxidizing agents manufactured as solid salts in an electrochemical process
- Ammonium, sodium and potassium persulfates used in a wide number of applications
- Key application for persulfates are in polymer initiation, soil and groundwater remediation and as a viscosity breaker in oil and gas fracking

**Applications**
- Electronics, Environmental, Personal Care, Energy, Process Chemicals
Specialty Application Example (1): Wastewater disinfection

PAA is expected to enjoy robust growth in the near future

Industry Overview and Growth driver

- Chlorine, sodium hypochlorite (NaOCl) or UV are today’s most commonly used technologies to disinfect wastewater

- PAA as “green” alternative gaining more and more relevance, with the following advantages:
  - vs Chlorine: low-capital alternative, eliminating safety risks
  - vs NaOCl: lower operating costs and elimination of by-products
  - vs UV: performance improvement, lower maintenance and capex spending

- PAA introduced in U.S. municipal wastewater market by PeroxyChem in 2013, as of today already approved by 14 U.S. states

Long-term take-or-pay contract with City of Memphis for municipal wastewater treatment, start of product delivery late 2018

Technologies

<table>
<thead>
<tr>
<th>Water Treatment Technology</th>
<th>Water Treatment Technology Growth Rate (in %)</th>
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<tbody>
<tr>
<td>Chlorine</td>
<td>5</td>
</tr>
<tr>
<td>NaOCl</td>
<td>-2</td>
</tr>
<tr>
<td>UV</td>
<td>111</td>
</tr>
<tr>
<td>PAA</td>
<td>-5</td>
</tr>
</tbody>
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Wastewater Disinfection Alternatives

<table>
<thead>
<tr>
<th>Safe transportation and storage</th>
<th>Chlorine</th>
<th>NaOCl</th>
<th>UV Light</th>
<th>PAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low toxicity to aquatic life</td>
<td>X</td>
<td>x</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>No harmful disinfection by-products</td>
<td>X</td>
<td>x</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Effectiveness in low water quality</td>
<td>✔️</td>
<td>✔️</td>
<td>x</td>
<td>✔️</td>
</tr>
<tr>
<td>Low complexity of operation</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Low operating costs</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Low capital costs</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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Specialty Application Example (2): Electronics
Ultra-high purity H₂O₂ essential in manufacturing of electronic devices

<table>
<thead>
<tr>
<th>Industry Overview and Growth driver</th>
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<tbody>
<tr>
<td>▪ Growing trend towards smaller electronic device geometries results in increasing number of process steps</td>
</tr>
<tr>
<td>▪ This requires ultra-high purity cleaning agents in semiconductor manufacturing - driving more demand for ultra-high purity H₂O₂</td>
</tr>
<tr>
<td>▪ High-purity, electronics-grade H₂O₂ is preferred because of their low cost, effectiveness and reduced waste disposal</td>
</tr>
<tr>
<td>▪ Electronic-grade H₂O₂ difficult to transport, as maintaining high quality requires specialized transportation equipment</td>
</tr>
<tr>
<td>▪ Geographic proximity is key to cost and reliability</td>
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<table>
<thead>
<tr>
<th>Manufacturing Process Steps</th>
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<tbody>
<tr>
<td><img src="chart.png" alt="Bar chart showing process steps" /></td>
</tr>
</tbody>
</table>

PeroxyChem with dedicated electronic-grade H₂O₂ plant in Saratoga Springs close to end customer with long-term supply contract

1. Long-term 2017-2023E growth rate, according to Gartner, Mercury Research and Barclays Research | “nm” represents nanometers
Specialty Appplication Example (3): Food & Beverage

Stricter regulations in food & beverage processing offer further growth potential

**Industry Overview and Growth driver**

- **Increased demand for food safety as well as stricter regulations**

- **Poultry and meat processing:**
  - PAA replacing chlorine as primary treatment method for poultry due to superior efficacy

- **Beverage industry:**
  - Rising hygienic requirements for dairy products, juices or nutritional natural drinks
  - Aseptic packaging utilizes $\text{H}_2\text{O}_2$ or PAA for the sterilization of packaging material and machines
  - Extends shelf life and preserves flavor and taste
  - Can work with both polyethylene bottles and paperboard containers

**Aseptic packaging – Spraying Technology**
Combined production set-up
Strengthening of global position and stronger footprint in North America and Europe

- Prince George, BC – Canada
  - $\text{H}_2\text{O}_2$

- Tonawanda, NY – USA
  - PAA
  - PS

- Saratoga Spring, NY – USA
  - Purification facility
  - $\text{H}_2\text{O}_2$ Electronic Grade

- Rheinfelden – Germany
  - PS$^1$

- Bayport, TX – USA
  - $\text{H}_2\text{O}_2$

- Memphis, TN – USA
  - PAA
  - Start delivery in late 2018

- Saraburi – Thailand (JV)
  - Thai Peroxide Ltd.$^2$
  - $\text{H}_2\text{O}_2$
  - PAA

PeroxyChem
- Headquarters
- Manufacturing facility
- Regional office

EVONIK

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Hydrogen peroxide is purified in a sequential process leading to different specialty grades for various applications.
HPPO Technology
HPPO process as more favorable process to produce propylene oxide

HPPO: Technology to manufacture propylene oxide (PO), a polyurethane (PU) precursor, on basis of H₂O₂

Intermediates
- Propylene
- Hydrogen Peroxide

Applications
- Polyols
- PU Foams
- Polyglycols
- Filler material
- Insulation of buildings
- Carpet underlay
- Seat cushion
- Elastomers
- Mattress

Benefits from HPPO technology
- Substantial cost advantages versus alternative processes
- More environmentally friendly, only water as side stream
- Own technology licensed by Evonik; Evonik as only grantor of a licence for HPPO
- Evonik and Dow/BASF only players with proprietary technology
- Cost advantage of new H₂O₂ plants will also allow to capture growth in other H₂O₂ applications besides HPPO

* Hydrogen Peroxide to Propylene Oxide