PRESS RELEASE

PYLOTE DEvelops its CoMMerCiaL preseNce in JaPAN

Tokyo/Toulouse, 12 April 2017 – Pylote, the new player in the green mineral chemical sector, participates at CPhI Japan in Tokyo on April 2017 to promote its breakthrough proprietary innovations providing antimicrobial protection in the pharmaceutical and cosmetics industries.

During this most comprehensive pharma event, which brings together more than 20,000 pharma industry professionals from 100+ countries, Loïc Marchin, CEO of Pylote, will hold a conference on April 20 at 11:00 am on the beneficial effects of its breakthrough proprietary innovation PYCLEAR™ PROTECTION providing antimicrobial protection in many pharmaceutical and cosmetics specialties.

This presence of Pylote at CPhI Japan is part of its 2017 commercial development in Japan with the active and concrete support of Business France, the French national agency supporting the international development of the French economy and responsible for fostering export growth by French businesses.

“Pylote is today able to provide in the Japan pharmaceutical & cosmetic markets its proprietary solutions with complete statutory compliance such as Japanese, European and US pharmacopeias or Food Contact. Our solutions are totally ready to use and adaptable to every type of packaging, manufacturer & contents.” commented Loïc Marchin, CEO of Pylote

In the recent months, Pylote has conducted in Europe a whole set of agreements with key major players in packaging solutions, such as Argo in October 2016, for mutual referencing to provide innovative packaging solutions for greener, cleaner and safer unpreserved pharmaceutical specialties & ophthalmic products. Pylote intends to set such type of partnerships with major key players on these industries in Japan.

Today, Pylote, with its exclusive manufacturing process, has more than 200 partnerships with industry worldwide and more than 50 to provide CE marking & AMM products

Additional information

PYCLEAR™ PROTECTION is a major technological innovation that replaces antimicrobial preservatives used in many pharmaceutical and cosmetic specialties for which no change is needed in packaging nor in existing manufacturing processes. PYCLEAR™ PROTECTION provides an ideal “eco-friendly” answer to the regulatory authorities’ requirements which are looking to remove the use of preservatives. Developed in full compliance with regulations, this solution is highly suited for multi-dose eye drop flasks, nasal spray used preparations, and also for skin care cosmetic products.

In 2016, Pylote has received in Europe three major awards for its innovation PYCLEAR™ PROTECTION: the Pharmapack Award 2016 in the Best Exhibitor Innovation category for “Patient Protection & Cost-Efficiency in February 2016, the prize in the Excellence in Pharma-Packaging category at CPhI Europe Barcelona in October 2016, and the French Packaging Award 2016 in the Small & Medium Enterprises category in November 2016.

ABOUT PYLOTE - Founded in 2009, Pylote is committed to green industrial chemistry in the mineral and ceramic chemical sector. Through the range of its efficient PYCLEAR™ solutions, Pylote conceives and develops innovative mineral microspheres to sell solutions which can be integrated into numerous consumer products. Pylote’s solutions have a major competitive advantage as they make the end products smarter, by giving new and specific advantages and attributes to materials, with no change to the existing manufacturing process. Pylote helps their clients, who are present in pharmaceutical, cosmetic, luxury, food or industrial markets, to propose end consumers with more eco-friendly products that are greener, cleaner and safer. For more information about Pylote www.pylote.com

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SMART & INNOVATIVE
An exclusive process methodology using water as the core of the chemical reaction.

Deliver greener, cleaner, safer consumer products

CLEAR & GREEN
A green and mineral Pulverised Pyrolysis technology which reduces the environmental impact of the manufacturing process.
Pylote is committed to green chemistry in the mineral and ceramic chemical sector. Pylote helps their clients, who are present in pharmaceutical, cosmetic, luxury, food or industrial markets, to propose to end-consumers more eco-friendly products, that are greener, cleaner and safer.

"Pylote unites scientific and technical innovation to make a difference to everyday life, and promotes the benefits of green, mineral chemistry."

We conceive and develop innovative mineral microspheres to sell solutions which can be integrated into numerous consumer products without any change to the existing manufacturing process.

Loïc Marchin - CEO of Pylote
Innovation

- Unique green mineral microspheres
- Regulatory standard
- Final product benefits validation

Intellectual property

- Exclusive proprietary manufacturing process
- 11+ patents and patents applications

Technological solutions with market impact

- Integration into numerous consumer products
- No change to existing manufacturing process
- Cleaner, greener and safer final products

Client partnership benefits

- 200+ ongoing partnerships with industry worldwide
- 50+ ongoing partnerships to provide CE marking and AMM products
Market solutions

Click on the product to access the content

**PROTECTION**
Preservative removing
Packaging simplification

**DURATION**
Extends utilization benefits
Prolongs product's effects

**PRESERVATION**
Prolongs shelf life
Food waste reduction

**AUTHENTICATION**
Authenticity verification - Applied to final products with no design adaptation

**ENERGY**
Energy consumption reduction

Worldwide pioneer in green mineral microspheres

Cleantech & mineral Pyrolyse Pulvérisée™ creating smart materials

Innovative technological solutions under pyclear™ portfolio

No environmental impact & value added benefits of the final products

Committed to Quality-Safety-Environment
Patient protection - Better cost of goods

- Remove preservatives
- Microbial protection
- 100% mineral: nano free & silver free
- Simplifies packaging
- No change in use, design, manufacturing, packaging & content

Medicines  Cosmetics

Eye dropper  Nasal spray  Skin care
Context & challenges

- Antimicrobial preservatives: side effects for patients
- Market/regulatory pressure: remove preservatives, lowering preservative volume/number
- Public perception: parabens, nanosilver, bacterio-resistance, microbiome challenges

Contamination localization\(^{(1)}\):

\[ > 85\% \text{ located on tip} \]
\[ < 15\% \text{ located in residual solution} \]


PYCLEARTM PROTECTION ANSWERS

- Remove antimicrobial preservatives from formula
- Protect content & each delivered doses until the consumer
  - No change in consumers buy-act nor usage
  - No packaging / process modification
  - Nano-free, Silver-free, fully recyclable
  - Regulatory / stability / safety compliance
Agreed Supply chain

Microspheres production
- One-step “cleantech” patented process: Pyrolyse pulvérisée®
- Improved 100 % mineral microspheres (nano-free, silver-free)
- Food contact agreement, Ph. Eur., USP compliance, Ecocert

Management by Pylote’s Experts
- No change to the existing manufacturing process
- Supply chain evaluation/agreement
- Specific products Data acquisition for regulatory files

Pyclar Protection benefits
- More eco-friendly products: cleaner, greener, safer
- No change in use, design, manufacturing & content
# Proof of concept

## Dispenser contamination protection

### Antimicrobial activity (JIS Z 2801 : 2010)

<table>
<thead>
<tr>
<th>Strains</th>
<th>Log reductions / cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em> CIP 53126</td>
<td>5.2</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em> CIP 4.83</td>
<td>&gt; 3.1</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em> CIP 82118</td>
<td>4.4</td>
</tr>
<tr>
<td><em>Streptococcus pyogenes</em> CIP 5641T</td>
<td>2.9</td>
</tr>
<tr>
<td><em>Herpes simplex virus type 1</em> (HSV-1)</td>
<td>2.2</td>
</tr>
<tr>
<td><em>Influenzavirus A</em> (H1N1)</td>
<td>2.6</td>
</tr>
</tbody>
</table>

## Dose and content protection

In-use tests performed in worst conditions: Full protection (dispenser contamination 2 times/day by *P. aeruginosa, S. aureus, E. coli, C. albicans, A. brasiliensis*).

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### Reglementary analysis

- Food contact agreement, Ph. Eur., USP compliance, Ecocert
- Complete antimicrobial protection until the consumers
- Formulation stability (no physico-chemical changes)
- Leachables and extractables within limit
Simplified regulatory approach

• Only 1 modification to the entire process: adding microspheres to your actual plastic resin (already in your regulatory file)

• Microspheres composition was referenced in the monographs (Eu.Ph., USP,...), so already in compliance

• Microspheres are Ecocert certified

• We provide data concerning the microspheres and suppliers evaluation to complete your specifications

• Data for your specific formulations are generated during Pre-Industrial Contract by independent and certified labs

• Easy to understand specifications and drawings - no technical knowledge required

• Packagings remain fully recyclable

• Multi sourcing of your packaging

Business model opportunities

Case studies with Pylote Added ophthalmic products in 5 or 10mL classic plastic eye dropper. PYCLEAR™ PROTECTION allow a downgrade of your MD from 2b to 2a class for 2 mains reasons listed in the Pharmacopoeias:

• Dropper volume limited to 10mL

• Treatment period limited to 4 weeks (you need an authorization to prolong)
• **Full consumers protection:**
removes the use of preservatives and ensure clean & pure doses upon each application

• **Complete statutory compliance:**
European Pharmacopoeia, USP, Food contact

• **Packaging simplification and economic benefits:**
no changes in the manufacturing packaging process

• **Adaptable to every type of packaging, manufacturer and contents.**

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**Contact us**
to transfer our innovative technology to your commercial product!

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(1) Accepted paper (2016): “Unpreserved opthalmic formula: PYCLEAR™ PROTECTION fully controlled risk of contamination with common 3-parts eye droppers”.

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Extends time-life effect & delivery

- Extends utilization benefits
- Reduces replacement frequency, material and transport requirements
- 100% mineral: nano free & silver free
- Allows drug delivery with release control

Pills  Implants & patch  Biological medicines
Desired release profile can be achieved

- Uniform size, spherical shape: improve delivery to specific target site
- High sphericity: more controlled integration and release
- A bioceramic matrix: chemical protection and biocompatible ingredients
- Fully controlled release with different kinds of molecule/API
- Tailored and sequential drug release kinetics with specific microspheres porosity
Sealed microspheres loading dyes - stationary applications -

- All colors available
- Food, Drug, and Cosmetic grade dyes (ex Acid Dye)
- Core and Shell
  - 100% mineral
  - Biocompatible
  - FDA compliance
  - Nano-free

- Integrable into organic and water-based ink
- Waterproof to organic solvant and water
- Microspheres protect Dye from chemical incompatibilities and degradation
- Pylote greentech micro-encapsulation Patented process
- Dense colored (<5m²/g)
- Ultra low leakage (<1%)
- Benefits -

**Universal color:**
Dye+Microspheres become compatible with all chemistry inks

**Scale effect:**
Only 1 dye reference for all your product

**Economic benefits:**
Manage only 1 reference for all your product

**Regulatory:**
Dyes referenced in eco-friendly list