

# Emerging MEMS

## Emerging MEMS Patent Investigation 2014

*Who owns key patents for high-growth emerging MEMS innovations?*

The report provides essential patent data, technology analysis and market forecasts for 7 selected Emerging MEMS (eMEMS) technologies that we believe will soon reach the marketplace: autofocus, AOC MEMS, chemical sensors, micro-speakers, scanning micro-mirrors, Si microfluidic and ultrasonic MEMS. The market for emerging MEMS covered in this report is expected to grow from US\$171M in 2013 to US\$2.8B in 2019, corresponding to a 58.2% CAGR.

### REPORT OUTLINE

- Title: Emerging MEMS Patent Investigation 2014
- October 2014
- Patent Analysis
- PDF file
- €5,990 - Multi user license (220+ slides)
- €3,990 - One user license (220+ slides)

### KEY FEATURES OF THE REPORT

- Provides essential patent data, technology analysis and forecasts for each type of selected emerging MEMS (Autofocus, AOC MEMS, Chemical Sensors, Micro-Speakers, Scanning Micro-Mirrors, Si Microfluidics and Ultrasonic MEMS)
- Identifies more than 250 patent holders and provides in-depth analysis of key technology segments and players including:
  - Time evolution of patent publications and countries of patent filings
  - Ranking of main patent applicants
  - IP collaboration networks of main patent applicants
  - Key patents
  - Relative strength of main companies' IP portfolios
  - Main patented technologies of selected companies
- Reviews eMEMS technology and market trends
- Presents patents related to marketed products for selected companies
- Provides an extensive Excel database with all patents analyzed in the report and technology segmentation

### RELATED REPORTS

- Status of the MEMS Industry
- Luxtera Silicon Photonic Die
- Sensirion Humidity & Temperature Sensor

Find all our reports on [www.i-micronews.com](http://www.i-micronews.com)

### UNDERSTAND WHICH COMPANIES OWN THE KEY PATENTS FOR THE FUTURE OF EMERGING MEMS

Patent activity related to eMEMS began in the 1990s and we observe a takeoff of patent publications for AutoFocus (AF), scanning micro-mirrors and ultrasonic MEMS technologies since the mid-2000s.

MEMS AF patent activity is new, but has increased since its emergence in 2009. This period also corresponds to the growth of the CMOS image sensor market for consumer applications, requiring more compact camera modules with more functionalities. Cambridge Mechatronics and DigitalOptics are currently the leading patent holders, but Korean giant LG has become a major force since 2010. Today MEMS AF is still a hot topic especially for cell phones and tablets, but wasn't adopted in 2013. Although MEMS AF has promising market potential, it still faces strong market and technical challenges, which might explain the increasing patent activity of recent years.

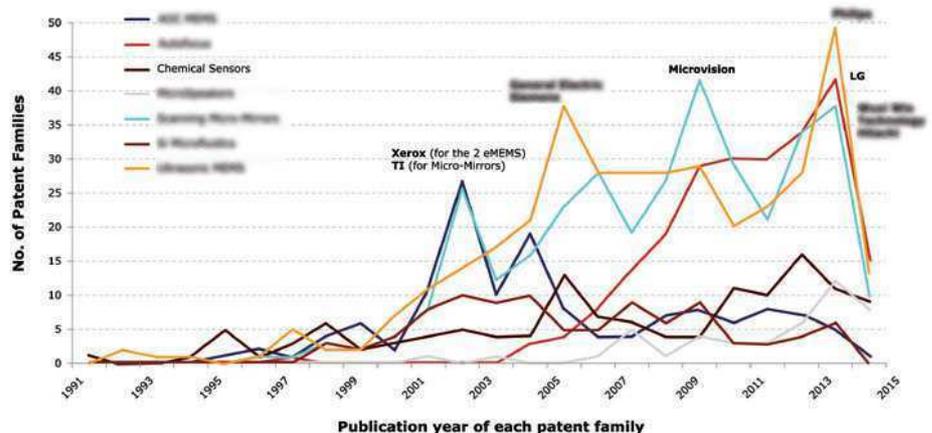
Scanning micro-mirrors have driven a significant number of patent publications since 2003, peaking in 2009-2013. Many companies are doing development to compete with Texas Instruments' (TI) leading DLP technology, which is a MEMS micro mirror array. TI and Microvision are the main patent applicants and both are shipping MEMS-based scanning micro-mirror products. TI

holds many granted patents and has a strong IP portfolio but, whereas Microvision is becoming a major force in the IP landscape, TI has been inactive since 2010. New companies Hitachi, Lemoptix and Funai Electric have been trying to enter this IP arena since 2009. We believe the value for scanning mirrors should be important in the next few years and picoprojectors are expected to bring further growth to MEMS mirrors within a few years.

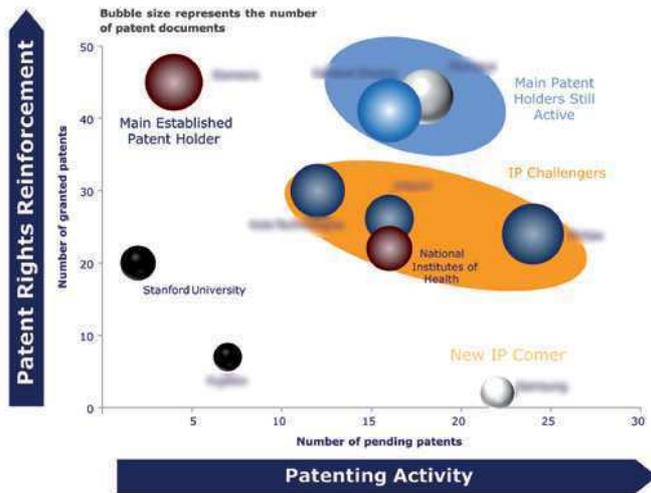
Patent applications for ultrasonic MEMS have increased greatly in 2013, which may correspond to a market need in medical imaging. This application will really grow in coming years, and is expected to reach the market in 2016 in niche applications. Siemens, Philips, Olympus and General Electric are currently the main patent applicants, but Kolo Technologies and Samsung are challenging them.

Other eMEMS segments show less patenting activity. Most AOC MEMS patents were filed in 2002-2004, after the telecom downturn of the 2000s, due to an over-estimated market demand. Xerox, Agilent Technologies and Avago Technologies have been inactive since the mid-2000s, but new IP challengers such as Luxtera and Kaiam are emerging and today offer Si photonic devices.

Time evolution of patent publications for emerging MEMS



**Leadership of patent applicants for ultrasonic MEMS**



(KnowMade, October 2014)

Patent publications for chemical sensors seem to have restarted after a first peak in 2005. Europeans like Sensirion, Cambridge CMOS Sensors and Bosch and Americans like Honeywell are dominating the patent landscape, but Chinese academics have increased their patenting activity since 2010. Numerous manufacturers are working on CO<sub>2</sub> sensors for environmental applications, and much R&D focuses on CO<sub>2</sub> sensors for the HVAC market. Today 100% of CO<sub>2</sub> sensors for indoor air quality are based on NDIR (Non Dispersive IR) sensors but high levels of R&D and patent activity suggest MEMS could enter this market soon. MEMS-based chemical sensors have strong, long term potential due to the future development of the "Internet of Things".

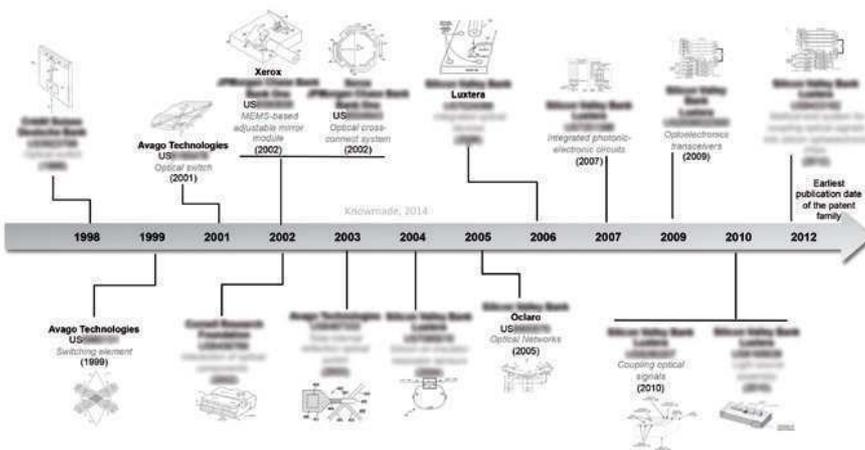
MEMS-based micro speakers could be a real breakthrough as this technology could give new functionalities to sound transmission and compact speakers. Patent activity was almost non-existent before 2007 and increasing patent activity since 2009 is mainly due to Audio Pixels and Bosch. MEMS speakers are still a hot topic in the industry but

unfortunately we do not see any commercialized products at the moment. Audio Pixels and Knowles are the only companies communicating about MEMS speaker products. The MEMS speaker market is expected to start in 2015 and companies already involved in speakers are expected to reach the market first.

Patent publication related to Silicon-based microfluidics is low but steady over the past 10 years, showing it is of interest. Most patents are held by American academics such as Caltech, NIH and University of California that may represent licensing opportunities. Boehringer, Life Technologies/Thermo Fisher, Silicon Biosystems, and Oxford Nanopore are developing microfluidics devices but seem not to hold patents specifically focused on silicon-based technologies.

**NO DOMINANT PLAYER IN THE EMERGING IP MEMS LANDSCAPE**

**Key patent families on AOC MEMS**



(KnowMade, October 2014)

Our analysis shows a wide diversity of business models among the players currently applying for patents covering emerging MEMS devices. No current big MEMS player has patents in all the different emerging MEMS segments we have covered. ST Microelectronics (STM) is one of the rare companies having patents for different devices, in micro speakers and Si microfluidics. For other devices, most of the patents are held by companies who are startups, such as poLight and Cambridge CMOS, or big IC players without significant MEMS activity, like LG and Samsung.

Most of the MEMS market value is today in the hands of a few big players, including Bosch, STM, Knowles and Texas Instrument (TI). These companies will likely enter the emerging MEMS markets in the future as they can provide high volume manufacturing (HVM). Indeed, access to HVM is an entry barrier

to market success. So, for the companies not present in the MEMS landscape today but having patents on emerging devices, market access will go either through partnerships with MEMS foundries (e.g. poLight with STM) or through acquisition.

**IDENTIFY KEY PLAYERS, KEY PATENTS AND DISCOVER NEW IP ENTRANTS**

This patent investigation covers patents published worldwide until June 2014. Our search strategy combines automated and manual screening that has led to the selection of more than 1,300 patent families. For each eMEMS segment, the report

provides a detailed analysis including the time evolution of patent filings, identifying key players, collaboration networks, degree of specialization and leadership of main players, as well as identifying key patents.

More than 250 industrial/academic patent applicants have been identified, and for most eMEMS segments we note differences compared to the well-known players. Taking into account their portfolio size, patent citation networks, country of patent filing and current legal status of patents, this report provides a ranking and relative strength of the top eMEMS patent holders.

More than 80 key patents have been identified based on several indicators, including family size, legal status, citation analysis and impact on eMEMS technology.

The report also includes an Excel database with all patents analyzed in the report. This database allows multi-criteria searches and includes patent publication number, hyperlinks to the original documents, priority date, title, abstract, patent assignees, eMEMS technology and legal status for each member of the patent family.

## OBJECTIVES OF THE REPORT

- Provide an overview of eMEMS technology and market trends.
- Review context for eMEMS technology.
- Understand the IP landscape for eMEMS.
- Identify key patents of eMEMS technology.
- Understand trends in eMEMS IP.
- List the major players in eMEMS IP and the relative strength of their patent portfolio.
- Name new players in eMEMS IP.
- Identify IP collaboration networks between key players

## COMPANIES CITED IN THE REPORT

Agilent Technologies, Alcatel Lucent, Anritsu, Audio Pixels, Avago Technologies, California Institute of Technology, Cambridge CMOS Sensors, Cambridge Mechatronics, Carl Zeiss, Carnegie Mellon University, CEA, China University of Mining & Technology, Corning, DigitalOptics, Edwards Systems Technology, Electronics and Telecommunications Research Institute (ETRI), E-pin Optical Industry, Figaro Engineering, Fraunhofer, Fujifilm, Funai Electric, Gemfire, General Electric, GSBS Development, Hitachi, Honeywell, Institute of Microelectronics (CAS), Kaiam, Knowles Electronics, Kolo Technologies, Kotura, Lemoptix, Lensvector, LG, Luxtera, Microvision, MST Technology, National Institutes of Health (NIH), National Science Foundation (NSF), Northrop Grumman, Oclaro, Olympus, Panasonic, Philips, poLight, Purdue Research Foundation, Reflectivity, Robert Bosch, Samsung, Sensirion, Siemens, Siimpel, Stanford University, STMicroelectronics, Texas Instruments, University of Beijing, University of California, University of Michigan, US Department of Energy, Varioptic, Wuxi Wio Technology, Xerox



## AUTHORS

**Dr. Audrey Bastard** works for Knowmade in the field of Microelectronics and Nanotechnology. She holds a PhD in Physics from National Polytechnic Institute of Grenoble, France in collaboration with STMicroelectronics, CEA-Leti and CEMES Toulouse. She also holds a Materials Engineering Degree from the Superior Engineering School of Luminy, Marseille, France.



**Dr. Nicolas Baron** is CEO and co-founder of Knowmade. He leads the Microelectronics and Nanotechnology scientific and patent analysis department. He holds a PhD in Physics from the University of Nice Sophia-Antipolis, and a Master of Intellectual Property Strategies and Innovation from the European Institute for Enterprise and Intellectual Property (IEEPI Strasbourg), France.

## TABLE OF CONTENTS

• <b>Introduction</b>	<b>4</b>	<ul style="list-style-type: none"> <li>&gt; Chemical sensors</li> <li>&gt; Micro-speakers</li> <li>&gt; Scanning micro-mirrors</li> <li>&gt; Si microfluidic</li> <li>&gt; Ultrasonic MEMS</li> <li>&gt; Conclusions</li> </ul>
<p style="margin-left: 20px;">&gt; The authors</p> <p style="margin-left: 20px;">&gt; About the authors of this report</p> <p style="margin-left: 20px;">&gt; Scope of the report</p> <p style="margin-left: 20px;">&gt; Key features of the report</p> <p style="margin-left: 20px;">&gt; Objectives of the report</p> <p style="margin-left: 20px;">&gt; Assignee mentioned</p> <p style="margin-left: 20px;">&gt; Terminology for patent analysis</p> <p style="margin-left: 20px;">&gt; Methodology</p> <p style="margin-left: 20px;">&gt; Rationales for choice</p> <p style="margin-left: 20px;">&gt; Patent search strategy</p> <p style="margin-left: 20px;">&gt; Patent selected</p>		
• <b>Executive Summary</b>	<b>21</b>	<p style="margin-left: 20px;">&gt; Overview</p> <p style="margin-left: 20px;">&gt; eMEMS market</p> <p style="margin-left: 20px;">&gt; Case study</p> <p style="margin-left: 20px;">&gt; Time evolution of patent publications</p> <p style="margin-left: 20px;">&gt; Patent publications/market forecast</p> <p style="margin-left: 20px;">&gt; AOC MEMS</p> <p style="margin-left: 20px;">&gt; Autofocus</p> <p style="margin-left: 20px;">&gt; Chemical sensors</p> <p style="margin-left: 20px;">&gt; Micro-speakers</p> <p style="margin-left: 20px;">&gt; Scanning micro-mirrors</p> <p style="margin-left: 20px;">&gt; Si microfluidic</p> <p style="margin-left: 20px;">&gt; Ultrasonic MEMS</p>
• <b>eMEMS patent investigation</b>	<b>40</b>	<p style="margin-left: 20px;">&gt; AOC MEMS</p> <p style="margin-left: 20px;">&gt; Autofocus</p>
<p style="margin-left: 20px;">&gt; Time evolution of patent publications</p> <p style="margin-left: 20px;">&gt; Geographic breakdown of patent filings</p> <p style="margin-left: 20px;">&gt; Main patent assignees ranking</p>		
<p style="margin-left: 20px;">&gt; Time evolution by country of publication</p> <p style="margin-left: 20px;">&gt; Time evolution of top-15 patent assignees</p> <p style="margin-left: 20px;">&gt; Country of publication for top-15 patent assignees</p> <p style="margin-left: 20px;">&gt; Mapping of current IP holders</p> <p style="margin-left: 20px;">&gt; Patent assignee IP network</p> <p style="margin-left: 20px;">&gt; Summary of main assignee patent portfolios</p> <p style="margin-left: 20px;">&gt; Degree of specialization</p> <p style="margin-left: 20px;">&gt; Leadership of main patent assignee</p> <p style="margin-left: 20px;">&gt; Impact factor of main assignee patent portfolios</p> <p style="margin-left: 20px;">&gt; Key patent families</p> <p style="margin-left: 20px;">&gt; Main Patented Technologies of Applicants</p>		



**Dr. Eric Mounier**, has a PhD in microelectronics from the INPG in Grenoble. He previously worked at CEA LETI R&D lab in Grenoble, France in marketing dept. Since 1998 he is a cofounder of Yole Développement, a market research company based in France. At Yole Développement, Dr. Eric Mounier is in charge of market analysis for MEMS & Sensors, visible and IR imagers (CIS, microbolometers), semiconductors, printed electronics and photonics (e.g. Silicon photonics). He has contributed to more than 200 marketing & technological analysis and 100 reports. Eric is also an expert at the OMNT («Observatoire des Micro & Nanotechnologies») for Optics.

# ORDER FORM

## Emerging MEMS Patent Investigation 2014

### SHIP TO

Name (Mr/Ms/Dr/Pr): \_\_\_\_\_

Job Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Postcode/Zip: \_\_\_\_\_

Country: \_\_\_\_\_

VAT ID Number for EU members: \_\_\_\_\_

Tel: \_\_\_\_\_

Email: \_\_\_\_\_

Date: \_\_\_\_\_

### PAYMENT METHODS

#### Check

To pay your invoice using a check, please mail your check to the following address:

KnowMade S.A.R.L.  
2405 route des Dolines, BP 65  
06902 Valbonne Sophia Antipolis  
FRANCE

#### Money Transfer

To pay your invoice using a bank money wire transfer please contact your bank to complete this process. Here is the information that you will need to submit the payment:

Payee: KnowMade S.A.R.L.  
Bank: Banque populaire St Laurent du Var CAP 3000 - Quartier du lac-  
06700 St Laurent du Var  
IBAN: FR76 1560 7000 6360 6214 5695 126  
BIC/SWIFT: CCBPFRPPNCE

#### Paypal

In order to pay your invoice via PAYPAL, you must first register at [www.paypal.com](http://www.paypal.com). Then you can send money to the KnowMade S.A.R.L. by entering our E-mail address [contact@knowmade.fr](mailto:contact@knowmade.fr) as the recipient and entering the invoice amount.

### RETURN ORDER BY

**E-mail:** [contact@knowmade.fr](mailto:contact@knowmade.fr)

**Mail:** KnowMade S.A.R.L. 2405 route des Dolines, BP 65 06902 Sophia Antipolis FRANCE

### CONTACT

**E-mail:** [contact@knowmade.fr](mailto:contact@knowmade.fr)

### PRODUCT ORDER

- EURO 3,990 – One user license\*
- EURO 5,990 – Multi user license

*For price in dollars, please use the day's exchange rate. For French customer, add 20% for VAT.*

*All reports are delivered electronically in pdf format*

### Signature:

*I hereby accept Knowmade's Terms and Conditions of Sale*

\*One user license means only one person at the company can use the report. Please be aware that our publication will be watermarked on each page with the name of the recipient and of the organization (the name mentioned on the PO). This watermark will also mention that the report sharing is not allowed.

### ABOUT YOLE DEVELOPPEMENT

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media in addition to corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing (technology or process), Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics. The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

### ABOUT KNOWMADE

Knowmade is specialized in analysis of patents and scientific research findings. We provide patent search, IP landscape, patent valuation, IP due diligence, FTO search, scientific literature landscape, identification of technologies available for transfer/licensing/sale, alerts and updates. Our service offer consists of custom studies, analysis reports, on-demand tracking and strategy consulting. Knowmade combines information search services, scientific expertise, powerful analytics and visualization tools, and proprietary methodologies for analyzing patents and scientific information. With a solid focus on Compound Semiconductors, LED, MEMS, Nanotechnology and Biotechnology, Knowmade supports research laboratories, industrial companies and investors in their business development.

# TERMS AND CONDITIONS OF SALES

## Definitions

“Acceptance”: Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”.

“Buyer”: Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

“Contracting Parties” or “Parties”: The Seller on the one hand and the Buyer on the other hand.

“Intellectual Property Rights” (“IPR”) means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

“License”: For the reports and databases, 2 different licenses are proposed. The buyer has to choose one license:

1. Single user license: a single individual at the company can use the report.
2. Corporate license: the report can be used by unlimited users within the company. Subsidiaries are not included.

“Products”: Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

“Seller”: Based in Sophia Antipolis (France headquarters), Knowmade is a technology intelligence company specialized in the research and analysis of scientific and technical information. We provide patent landscapes and scientific state of the art with high added value to businesses and research laboratories. Our intelligence digests play a key role to define your innovation and development strategy.

## 1. Scope

1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBJECTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.

1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions “I hereby accept Knowmade’s Terms and Conditions of Sale”. This results in acceptance by the Buyer.

1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer’s address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

## 2. Mailing of the Products

2.1 Products are sent by email to the Buyer:

- within [1] month from the order for Products already released; or

- within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.

2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer.

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including in cases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.

2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.

2.4 The mailing is operated through electronic means either by email via the sales department. If the Product’s electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to produce sufficient evidence of such defects.

2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer’s risk.

## 3. Price, invoicing and payment

3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.

3.2 Payments due by the Buyer shall be sent by cheque payable to Knowmade, PayPal or by electronic transfer to the following account:

Banque populaire St Laurent du Var CAP 3000 - Quartier du lac- 06700 St Laurent du Var

BIC or SWIFT code: CCBPFRPPNCE

IBAN: : FR76 1560 7000 6360 6214 5695 126

To ensure the payments, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.

3.3 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.

3.4 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

## 4. Liabilities

4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.

4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement

4.3 In no event shall the Seller be liable for:

a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller's website or the Products, or any information provided on the website, or in the Products;

b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.

4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.

4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.

4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.

4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non-acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of saleability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

## 5. Force majeure

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

## 6. Protection of the Seller's IPR

6.1 All the IPR attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.

6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:

- Information storage and retrieval systems;
- Recordings and re-transmittals over any network (including any local area network);
- use in any timesharing, service bureau, bulletin board or similar arrangement or public display;
- Posting any Product to any other online service (including bulletin boards or the Internet);
- Licensing, leasing, selling, offering for sale or assigning the Product.

6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.

6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.

## 7. Termination

7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.

7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

## 8. Miscellaneous

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party.

The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

## 9. Governing law and jurisdiction

9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Grasse, which shall have exclusive jurisdiction upon such issues.

9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.