

FLUIDIGM

Patent Portfolio Analysis

Fluidigm is taking a leading IP position in emerging microfluidic technologies



REPORT OUTLINE

- Fluidigm
- Patent Portfolio Analysis
- May 2017
- PDF and Excel file
- €3,990 (corporate license)
- Order online: [click here](#)

KEY FEATURES OF THE REPORT

The report provides **essential patent data** for FLUIDIGM's portfolio including:

- Time evolution of patent publications and countries of patent filings
- Current legal status of patents
- Citation network, IP collaboration and competitive networks
- Inventor identification
- Key patent analysis
- Patents recently expired
- Granted patents near expiration

The report also provides an extensive Excel database with all patents analyzed in the study.

OBJECTIVE OF THE REPORT

- Understand the IP strategy of FLUIDIGM
- Understand the competitive IP Environment of FLUIDIGM
- Classify FLUIDIGM's patents by their technical issue as well as their IP blocking potential for other IP players
- Identify key patents
- Identify recent granted patents, expired patents and granted patents near expiration

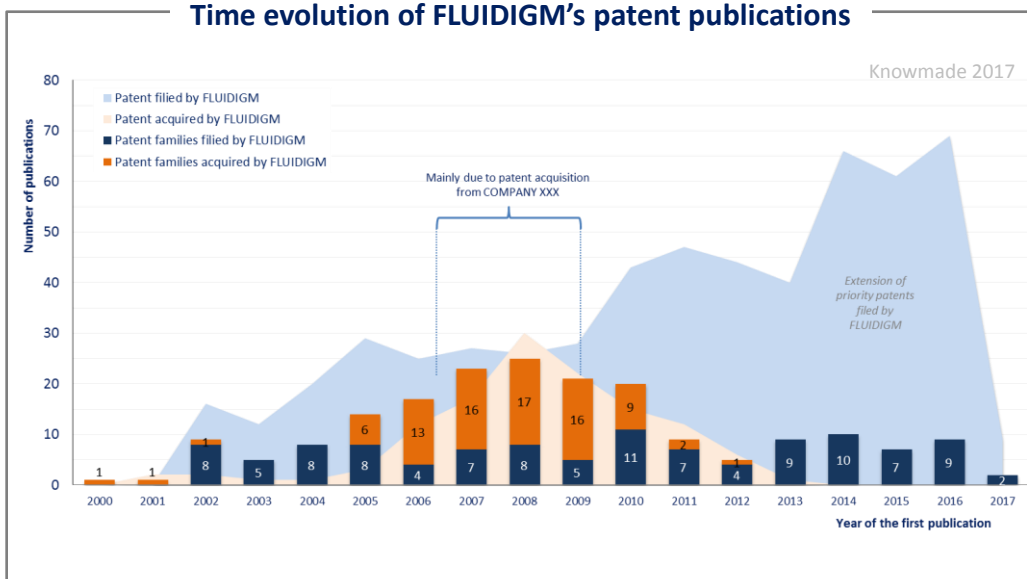
RELATED REPORTS

- [Microfluidic Technologies for Diagnostic Applications Patent Landscape 2017](#)
- [Status of the Microfluidics Industry 2017](#)

FLUIDIGM HAS BEEN HIGHLY INNOVATIVE SINCE THE EARLY 2000s

The microfluidics device market is currently growing, with a wide scope of applications across many industries. According to our partner Yole Développement, the microfluidics device market is worth \$2.5 billion in 2017. With an expected compound annual growth rate of 18%, this market is projected to reach \$5.8 billion by 2022. This high growth rate is largely due to advances in biotechnology, including gene sequencing and genomics. FLUIDIGM is considered as a pioneer in these microfluidic technologies. FLUIDIGM was founded in 1999 to market the integrated fluidic circuit based on a pneumatic rubber valve developed in the laboratory of Stephen Quake, then at Caltech. With this technology, FLUIDIGM became the first company to commercialize a digital polymerase chain reaction (PCR) product in 2006. In 2009, FLUIDIGM was described as "the world's leading manufacturer of microfluidic devices" by the Nanotechnology Business Journal. Today, among the applications in which FLUIDIGM products are put to use are single-cell genomics, gene expression, single nucleotide polymorphism (SNP) genotyping, targeted resequencing, sample quantitation, copy number variation and mass cytometry.

Time evolution of FLUIDIGM's patent publications

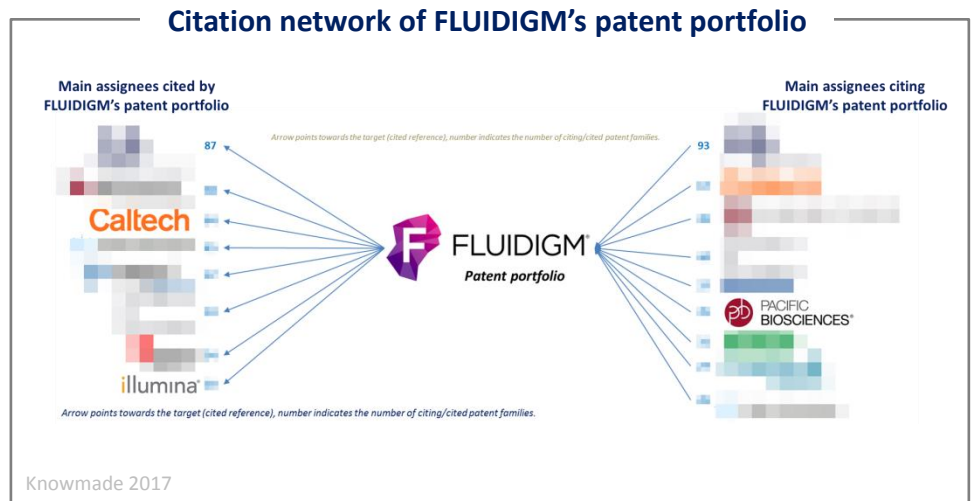


FLUIDIGM started developing its patent portfolio in the early 2000s and the number of new patents filed each year by FLUIDIGM has remained stable since then. Moreover, FLUIDIGM acquired numerous patents from HELICOS BIOSCIENCES, DVS SCIENCES and ARXIS BIOTECHNOLOGIES. In recent years, FLUIDIGM's total revenue has decreased. This decline in revenue was partly due to lower sales for genomic products. Therefore, in order to find new growth engines, technologies patented by FLUIDIGM have evolved considerably since its inception. This technological diversification exposes FLUIDIGM to new competitors, especially some big patent assignees that may assert their patents and other proprietary rights against FLUIDIGM.

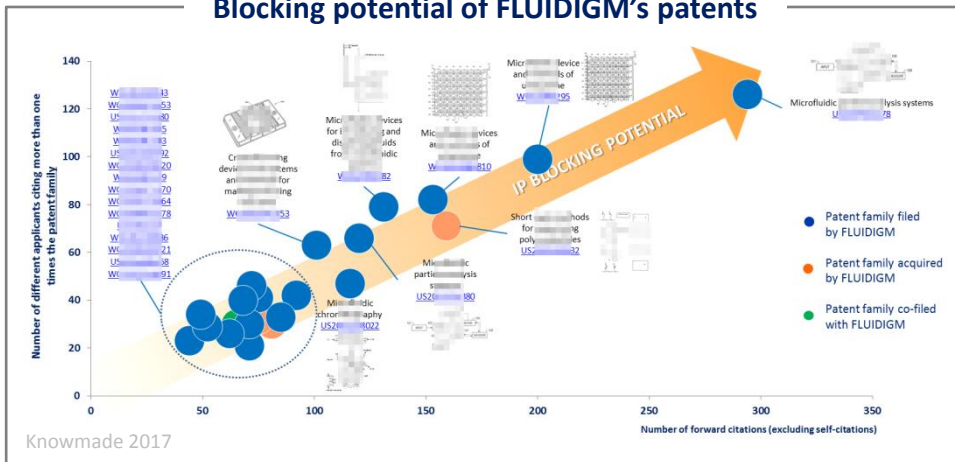
CITATION NETWORK AND COMPETITIVE IP ENVIRONMENT

FLUIDIGM’s patent portfolio has been cited by more than 700 patent assignees in more than 2300 patent families. For its part, FLUIDIGM cites 2600 patent families in its portfolio, representing around 900 assignees.

Combining the citation network with the analysis of the content of citing/cited patents, FLUIDIGM’s IP competitors have been ranked in order to establish a general view of the competitive IP environment. Thus IP competitors developing microfluidic technologies have been identified for various applications such as protein crystallization, next-generation sequencing (NGS) and digital PCR, single cell genomics or mass cytometry.



Blocking potential of FLUIDIGM’s patents



IDENTIFY BLOCKING PATENTS

Analyzing citations and citing applicants, FLUIDIGM’s patents with a high potential for IP blocking of other patent applicants in the field of microfluidics have been identified. Most of those patents are related to single cell analysis or digital PCR. Several of these patents were acquired by FLUIDIGM from other companies, or co-filed with academics. The IP blocking power of product categories and applications claimed by FLUIDIGM was also analyzed.

IDENTIFY KEY PATENTS

Key patents have been identified based on several indicators, including family size, legal status, citation analysis and impact on microfluidic technology. Newly granted patents, recently expired patents and patents expiring in the next few years have also been analyzed. Several patents were granted recently in the USA, Europe and China, in particular in the field of mass cytometry.

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

Granted Patents Recently Lapsed/Expired

Title	Apparatus and methods for analyzing samples
Patent Assignee	FLUIDIGM
Application date	2007-10-01
Patent Number	US7593109
Status & date	Lapse for failure to pay maintenance fees 2013-09-22
Forward Citations	64 forward citations, mainly from COMPLETE GENOMICS and FIO CORPORATION

Invention:
The invention relates to apparatus, systems, and methods for analyzing biological samples. The apparatus, systems, and methods can involve using a vacuum source to pull microfluidic volumes through analytical equipment, such as flow cells and the like. Additionally, the invention involves using optical equipment in conjunction with the analytical equipment to analyze samples and control the operation thereof.

Knowmade 2017

ASSIGNEES CITED IN THE REPORT :

3M, ABBOTT, AFFYMETRIX, AGENA BIOSCIENCE, AGILENT TECHNOLOGIES, ARCXIS BIOTECHNOLOGIES, BD, BECKMAN COULTER, BIORAD, CALIPER, CALTECH, COMPLETE GENOMICS, DOW, DVS SCIENCES, FLUIDIGM, GE HEALTHCARE, GPB SCIENTIFIC, HANDYLAB, HELICOS BIOSCIENCES, HITACHI, HYALOS THERAPEUTICS, IBM, ILLUMINA, INTEGENX, LECO, LGC, LIFE TECHNOLOGIES, LUMINEX, NATERA, OPKO, PACIFIC BIOSCIENCES, PERKINELMER, PHILIPS, QUANTERIX, RAINDANCE, ROCHE, SEQLL, SEQUENOM, SHIMADZU, SIEMENS, SONY, THERMO FISHER SCIENTIFIC, UNIVERSITY OF BRITISH COLUMBIA, UNIVERSITY OF CALIFORNIA, UNIVERSTY OF CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION	5	SEGMENTATION BY PRODUCT	35
Scope of the Report	6	Segmentation by Product	36
Key Features of the Report	7	Timeline of the Product Segmentation	37
Objectives of the Report	8	Current Legal Status of Patents	38
Key Features of the Report	9	Granted Patents and Pending Applications Analysis	39
Main Patent Assignees Mentioned In the Report	10	Main Inventors	40
Terminology for Patent Analysis	11	IP Blocking Potential by Product Segment	41
METHODOLOGY	13	Citation Network	42
Methodology for Patent Search, Selection and Analysis	14	Competitive IP Environment	43
Key Patents Analysis	16	Key Patents	44
FLUIDIGM IP PROFILE	17	SEGMENTATION BY APPLICATION	45
Company Presentation	18	Segmentation by Application	46
Patent Portfolio Composition	19	Timeline of the Application Segmentation	47
Patent Portfolio – Main Acquisition: HELICOS BIOSCIENCES	20	Current Legal Status of Patents	48
Patent Portfolio – Main Acquisition: DVS SCIENCES	21	Granted Patents and Pending Applications	49
Patent Portfolio – Main Acquisition: ARCXIS BIOTECHNOLOGIES	22	Main Inventors	50
Time Evolution of Patent Publications	23	IP Blocking Potential by Application	51
Timeline of Countries of Publication	24	Citation Network	52
Mapping of Granted Patents and Pending Patent Applications	25	Competitive IP Environment	53
Main IP Representatives	26	Key Patents	54
Main Inventors and Collaborations	27	LICENSE AGREEMENTS	56
Timeline of the Contribution of Main Inventors	28	Terminated License Agreements	57
Main IP Collaboration	29	License Agreements In Progress	58
Main Cited Patent Families	30	NEW GRANTED PATENTS	62
IP Blocking Potential of Most Cited Patent Families	31	GRANTED PATENTS RECENTLY LAPSED/EXPIRED	70
Forward Citations Timeline	32	GRANTED PATENTS EXPIRING BETWEEN 2018 & 2019	74
Citation Network	33	CONCLUSION	79
Competitive IP Environment	34	Conclusion	80
		Patent Portfolio Summary	81
		SWOT Matrix	82

AUTHORS



Brice Sagot

Brice is COO and co-founder of Knowmade. He leads the Biotechnology and Life Sciences department. He holds a PhD in molecular biology from the University of Nice Sophia-Antipolis, France.



Nicolas Baron

Nicolas is CEO and co-founder of Knowmade. He leads the Microelectronics and Nanotechnology department. He holds a PhD in Physics from the University of Nice Sophia-Antipolis, and a University Diploma in Intellectual Property Strategies and Innovation from the IEEPI, Strasbourg, France.

ABOUT KNOWMADE

Specializing in analysis of patents and scientific information, **Knowmade** provides Technology Intelligence and IP strategy consulting services. The company supports R&D organizations, industrial companies and investors in their business development by offering them a deep understanding of the technology trends and their IP environment. **Knowmade** operates in the following industrial sectors: Microelectronics, Compound Semiconductors, Power Electronics, RF & Microwave Devices, MEMS Sensors & Actuators, LED/OLED, Imaging & Display, Photonics, Battery, Manufacturing & Advanced Packaging, Micro & Nanotechnology, Biotechnology, Cellular & Molecular Biology, Microbiology, Dermatology, Pharmacology, Oncology, Immunology, Medical Devices, Medical Imaging, Agri-Food & Environment.

Knowmade performs prior art searches, patent landscape analysis, scientific literature analysis, patent valuation and freedom-to-operate analysis. In parallel the company offers litigation/licensing support, technology scouting and an IP watch service. **Knowmade's** analysts combine their technical and patent expertise by using powerful analytics tools and proprietary methodologies to deliver relevant patent analyses and scientific reviews.

<http://www.knowmade.com>

ORDER FORM

FLUIDIGM Patent Portfolio Analysis 2017

Ref.: KM17005

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

Order online for instant download: [Click here](#)

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. Then you can send money to the KnowMade S.A.R.L. by entering our E-mail address contact@knowmade.fr as the recipient and entering the invoice amount.

RETURN ORDER BY

E-mail: contact@knowmade.fr

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

PRODUCT ORDER

€3,990 – Corporate 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 at payment reception.

I hereby accept Knowmade's Terms and Conditions of Sale

Signature:

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.