

RF Front-End Modules & Components

Patent Monitoring Service

Stay up to date with the evolving competitive IP landscape through quarterly patent intelligence

Designed for R&D, IP, and strategy teams in the RF front-end ecosystem

SERVICE OVERVIEW



Service type

Patent monitoring service

Technology focus

RF FE modules & components

Coverage

Full value chain: PA, LNA, acoustic wave filters, RF switches, antenna tuners, RF front-end modules and packaging technologies

Subscription

12-month subscription, starting at any time

What you get

- Comprehensive patent database covering all publications up to the previous quarter
- Interactive dashboard for dynamic exploration and instant access to insights
- Quarterly updates including new filings, grants, expirations, and collaborations

Pricing

€7,990 per year

OBJECTIVES

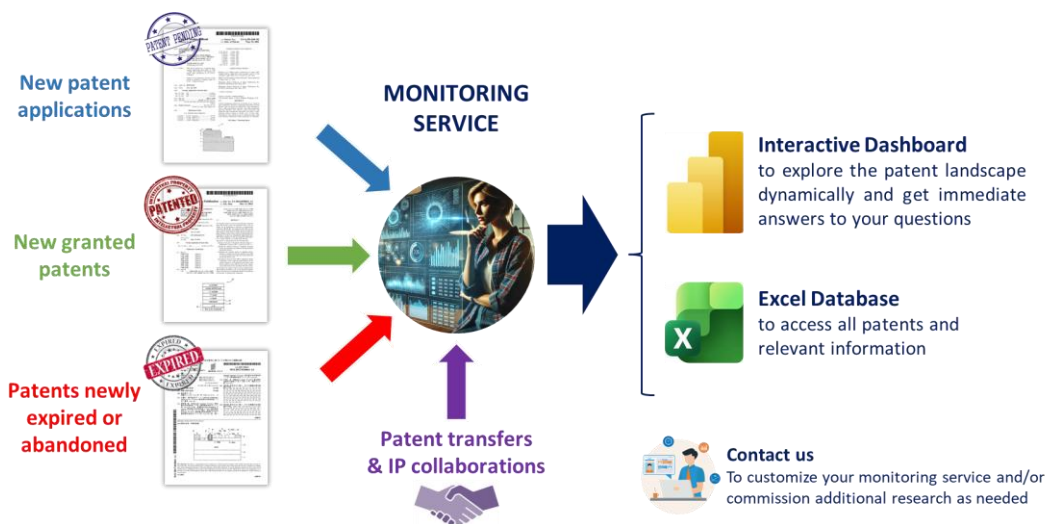
- Map and continuously monitor the competitive landscape and key innovators
- Track technology developments and anticipate emerging trends over time
- Analyze competitors' evolving IP strategies and positioning
- Detect early signals of disruption, risks, and opportunities
- Enable informed and timely strategic decisions in R&D, IP, and investment

Monitoring patent activities to track technology trends, understand the competitive landscape, and anticipate future developments

The RF front-end industry continues to evolve at a rapid pace, driven by the increasing complexity of wireless communication systems and the transition toward highly integrated architectures.

The RF front-end ecosystem showed strong innovation momentum, with over 2,300 new patent families published globally in 2025. These patents span key technological segments such as power amplifiers (PA), low-noise amplifiers (LNA), acoustic wave filters (SAW, BAW, XBAR), RF switches, tuners, RF front-end modules (RF FEM), and packaging technologies. PA and RF acoustic wave filters remain the most active areas in terms of patent filings, reflecting their central role in RF system performance, while RF FEM continue to gain importance, highlighting a broader industry shift toward system-level integration and compact, high-performance solutions. Key players such as Murata, Skyworks, and Qualcomm stand out as intellectual property (IP) leaders, demonstrating both technological maturity and sustained innovation efforts. Other major actors, Qorvo, Samsung Electronics, and Huawei, maintain strong IP positions and contribute significantly to the competitive dynamics of the sector. In parallel, the growing presence of Chinese companies reflects a shift toward a more diversified and multi-polar IP landscape. These players are increasingly active across multiple RF segments, reinforcing competition at both the technology and market levels.

In this context, patent analysis is a critical indicator of technological leadership, competitive positioning, and future market direction.



The **RF Front-End Modules & Components patent monitoring service** enables you to stay continuously up to date with the evolving patent landscape by providing:

- An **initial dataset** covering all patents published up to the previous quarter, categorized by devices (PA/LNA, acoustic wave filters, multiplexer, switch, tuner, packaging, RF FEM).
- One-year access to an **interactive dashboard** to dynamically explore the patent landscape and instantly drill down from a high-level view to specific players, technologies, and patents.
- **Quarterly updates** of the **database** and **dashboard**, including new patent applications, newly granted patents, expired or abandoned patents, and IP collaborations, with a focus on key highlights on emerging trends, key players, and technological developments.

A comprehensive patent intelligence solution with quarterly updates, combining a robust database and an interactive dashboard to deliver both exhaustive data access and powerful analytical capabilities

INTERACTIVE DASHBOARD

Quarterly updated online dashboard, powered by a carefully selected and enriched patent dataset curated by our IP analysts.

Key features:

- Dynamically explore the evolving competitive IP landscape based on your priorities
- Access clear, interactive visualizations for immediate insights
- Filter and analyze data by assignees, technologies, countries, dates, and legal status
- Focus on key quarterly highlights on emerging trends, key players, and technological developments
- Drill down instantly from high-level trends to specific players, technologies, and patents
- Tailor insights to the needs of each team (R&D, IP, strategy, business development)

Benefits:

- Stay up to date with the evolving patent landscape
- Get immediate answers to your key questions
- Save time and accelerate decision-making
- Focus on the insights that matter most

[Discover the dashboard](#)

The dashboard interface shows a central navigation hub with the following modules:

- Easily filter the data**: A sidebar with filters for various parameters.
- Landscape at a glance**: A high-level overview of the patent landscape with charts.
- Assess technology segment impact**: Detailed charts showing the impact of different technology segments.
- Deep dive by publication country**: A detailed view of patents from a specific country.
- Understand IP dynamics**: Charts and graphs showing trends and dynamics in the IP space.
- Identify key players and newcomers by country and technology segment**: A section for identifying major players and emerging ones.
- Key IP players**: A detailed view of a specific key player's IP portfolio.
- IP newcomers**: A detailed view of a specific newcomer's IP portfolio.
- Select a player to view its IP profile**: A comprehensive profile of a selected player, including strategy, positioning, strengths, and weaknesses.
- Browse patent families and spot key patents**: A list of patent families with key patents highlighted.
- List of patent families**: A detailed list of patent families.
- Select a patent family and explore it in depth**: A detailed view of a selected patent family, including full text, geographic coverage, and citations analysis.



PATENT DATABASE

Quarterly updated Excel database covering all patents published up to the previous quarter, including:

- Key patent information (numbers, dates, assignees, titles, abstracts, etc.)
- Hyperlinks to an up-to-date online database (original documents, legal status, etc.)
- Technology segmentation (PA, LNA, SAW, BAW, LBAW/XBAR, multiplexer, switch, tuner, packaging)

| Family number (first applicant family ID from EPO database) | Patent number (national patent number) | Country patent assignee (national assignee) | Patent assignee name (in the report) | Title | Abstract | Index summary link to full report | Earliest application date of the family (YYYY-MM-DD) | Earliest publication date of the family (YYYY-MM-DD) | Earliest grant date of the family (YYYY-MM-DD) | Key word expert (YYYY-MM-DD) | Status (Patent Status, Patent Exp. Date) | RF FEM | PA | LNA | SAW filters | BAW filters | LBAW/XBAR filters | Multiplexers | RF switches | Tuners | Packaging | |
|---|--|---|--|--|--|-----------------------------------|--|--|--|------------------------------|--|--------|----|-----|-------------|-------------|-------------------|--------------|-------------|--------|-----------|--|
| 10734742 | US2020044972 | SOLYTICS SOLUTIONS | Systems and methods for Li-ion batteries | Systems and methods for Li-ion batteries | Abstract | Link | 2019-05-21 | 2020-01-27 | | US2020044972 | PENDING | | | | X | X | | | | | X | |
| 10734803 | CN201921271 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | Basic wave device | The application | Link | 2019-03-30 | 2020-02-09 | | CN201921271 | PENDING | X | | | X | X | X | | | | | |
| 10734808 | WO2020246488 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | Prohibited in use | Prohibited in use | Link | 2019-05-23 | 2020-02-04 | | WO2020246488 | PENDING | X | | | X | X | X | | | | | |
| 10734835 | CN201921791 | RENJING | RFI Corp | Surface acoustic wave resonator | A surface acoustic wave resonator | Link | 2019-03-09 | 2020-02-28 | | CN201921791 | PENDING | X | | | X | X | X | | | | | |
| 10734872 | US2020049528 | QORVO | Qorvo | Systems and methods for Li-ion batteries | Systems and methods for Li-ion batteries | Link | 2019-05-09 | 2020-02-27 | | US2020049528 | PENDING | X | | | | | | | X | X | | |
| 10734936 | CN201921274 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921274 | PENDING | X | | | X | X | X | | | | | |
| 10734951 | CN201921275 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921275 | PENDING | X | | | | | | | | | | |
| 10734952 | CN201921276 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921276 | PENDING | X | | | | | | | | | | |
| 10734953 | CN201921277 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921277 | PENDING | X | | | | | | | | | | |
| 10734954 | CN201921278 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921278 | PENDING | X | | | | | | | | | | |
| 10734955 | CN201921279 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921279 | PENDING | X | | | | | | | | | | |
| 10734956 | CN201921280 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921280 | PENDING | X | | | | | | | | | | |
| 10734957 | CN201921281 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921281 | PENDING | X | | | | | | | | | | |
| 10734958 | CN201921282 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921282 | PENDING | X | | | | | | | | | | |
| 10734959 | CN201921283 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921283 | PENDING | X | | | | | | | | | | |
| 10734960 | CN201921284 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921284 | PENDING | X | | | | | | | | | | |
| 10734961 | CN201921285 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921285 | PENDING | X | | | | | | | | | | |
| 10734962 | CN201921286 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921286 | PENDING | X | | | | | | | | | | |
| 10734963 | CN201921287 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921287 | PENDING | X | | | | | | | | | | |
| 10734964 | CN201921288 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921288 | PENDING | X | | | | | | | | | | |
| 10734965 | CN201921289 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921289 | PENDING | X | | | | | | | | | | |
| 10734966 | CN201921290 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921290 | PENDING | X | | | | | | | | | | |
| 10734967 | CN201921291 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921291 | PENDING | X | | | | | | | | | | |
| 10734968 | CN201921292 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921292 | PENDING | X | | | | | | | | | | |
| 10734969 | CN201921293 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921293 | PENDING | X | | | | | | | | | | |
| 10734970 | CN201921294 | FAIRFROCK SOLUTIONS | PowerPack (PowerPack) Charge | The invention | The invention | Link | 2019-03-26 | 2020-02-21 | | CN201921294 | PENDING | X | | | | | | | | | | |

ORDER FORM

RF Front-End Modules & Components

Patent Monitoring Service

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: 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, Le Drakkar
06560 Valbonne Sophia Antipolis
FRANCE

Money Transfer

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

Payee: KnowMade S.A.R.L.
Bank: Banque Populaire Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var
IBAN: FR76 1460 7003 6360 6214 5695 139
SWIFT: CCBPFRPPMAR

Paypal

To pay your invoice via PayPal, you must first register at www.paypal.com. You can then send money to KnowMade S.A.R.L. by entering our email address contact@knowmade.fr as the recipient and entering the invoice amount.

PRODUCT ORDER

7,990 EUR – Quarterly updated Excel database⁽¹⁾ and interactive dashboard⁽²⁾ for one year.

For price in dollars, please use the day's exchange rate.

For French customer, add 20% for VAT.

The Excel database and access to the interactive online dashboard will be delivered electronically upon receipt of payment.

⁽¹⁾The Database is provided under a **multi-user license and can be shared internally** among employees of the purchasing organization. Subsidiaries and joint ventures are excluded from this license.

⁽²⁾Access to the interactive dashboard is granted for **one year (12 months) to an unlimited number of authorized users** within the purchasing organization. Access codes must not be shared with any third party. The dashboard must not be used to produce analyses or reports that are resold, sublicensed, or otherwise made available to any external user or entity outside the purchasing organization.

RETURN ORDER BY

E-mail: contact@knowmade.fr

Mail: KnowMade S.A.R.L. 2405 route des Dolines, Le Drakkar, 06560 Valbonne Sophia Antipolis, FRANCE

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. Multi user license: the report can be used by unlimited users within the company. Subsidiaries and Joint Ventures 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 Méditerranée, CAP 3000 Quartier du lac, 06700 St Laurent du Var

BIC or SWIFT code: CCBPFRPPMAR

IBAN: : FR76 1460 7003 6360 6214 5695 139

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.