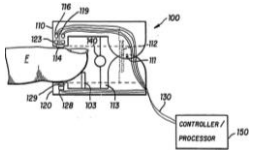
REPORT SAMPLE

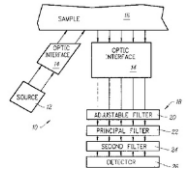
Non-Invasive Glucose Monitoring

Patent Landscape

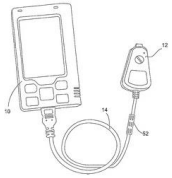


W.F. Mar
US3958560

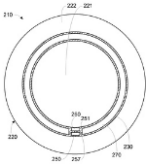
Futrex
WO9007905



Sensys Medical
WO9728437



Integrity Applications
US2011263956



Google
US2014107444

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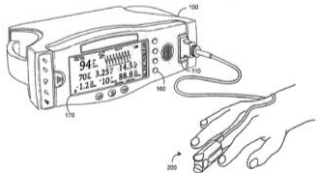
INTRODUCTION
Scope of the Report

How to define a non-invasive technology?

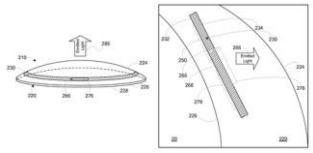
An important point is the definition of “invasive”, “minimally invasive” and “non-invasive”, which can be subjective. For the purpose of this patent landscape, any technology involving collecting blood, inserted sensors or use of needles or microneedles) have been considered as invasive, even if minimally so and thus excluded. Some technologies involving really slightly damaging the surface of the skin in order to extract interstitial fluids have been included.

Included in the study



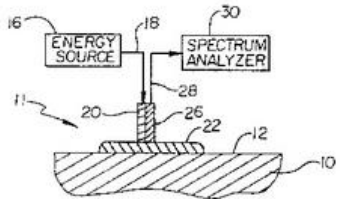
Cercacor, Masimo

Measurements in blood vessels through the skin using spectroscopy techniques (infrared, ultrasound,…)

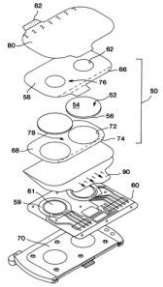


Google

Measurements at the eye level (tears, retina, aqueous humor)



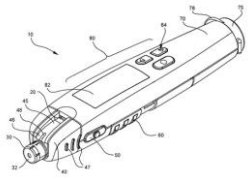
InLight Solutions



Animas Technologies

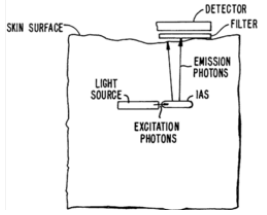
Measurements at the surface of the skin (extraction of interstitial fluids by electrochemical techniques, vacuum, collection of sweat,…) or in the skin (impedance, spectroscopy,…)

Not included in the study



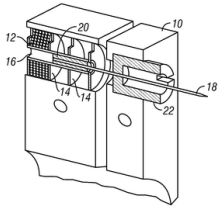
Becton Dickinson

Standard glucometer with lancet

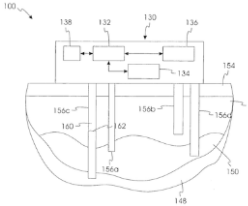


Medtronic Minimed

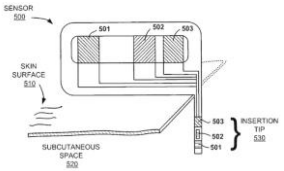
Techniques requiring insertion of a sensor under the skin or in the eye, administration of molecules,…



Sanofi



Bayer



Abbott

Techniques using microneedles or puncture of the skin,…

INTRODUCTION
Methodology

•The data were extracted from the FamPat worldwide database (Questel-ORBIT) which provides 90+ million patent documents from 95 offices.

•The patents search was performed in July 2015, hence patents published after this date will not be available in this report.

•The patent selection was done manually.

Number of selected patent families for non-invasive glucose monitoring technologies IP Investigation: 1,615 over a number of returned results > 5,000

•The statistical analysis was performed with Questel Orbit IP Business Intelligence software.

•The patents were manually categorized using keyword analysis of patent title, abstract and claims, in conjunction with expert review of the subject-matter of inventions.

•The patents were organized according to FamPat's family rules (variation of EPO strict family): A *Patent Family* comprises patents linked by exactly same priority numbers (strict family), plus comparison of priority and application numbers, specific rules by country and information gathered from other sources (national files, legal status …).

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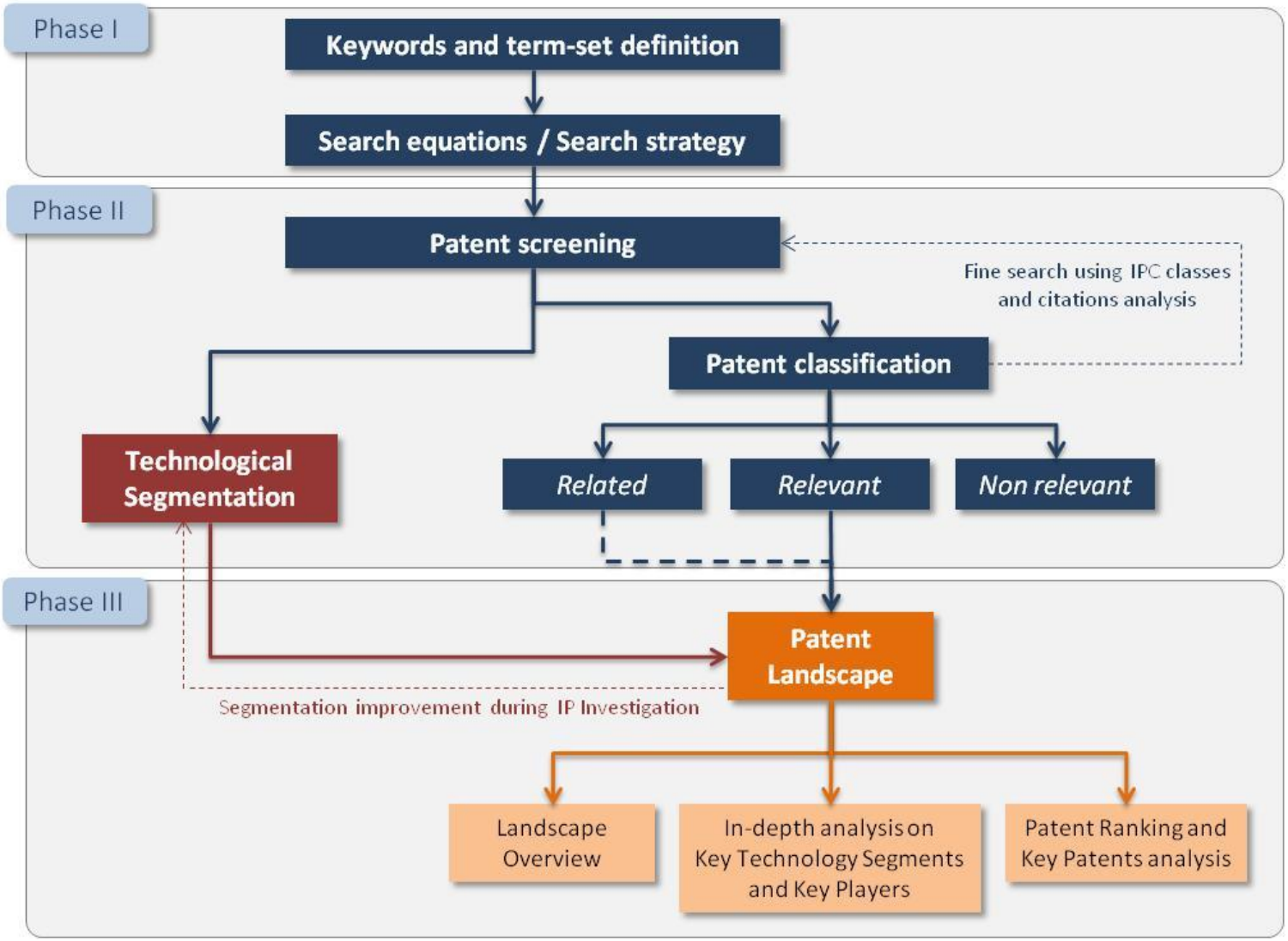
INTRODUCTION
Methodology



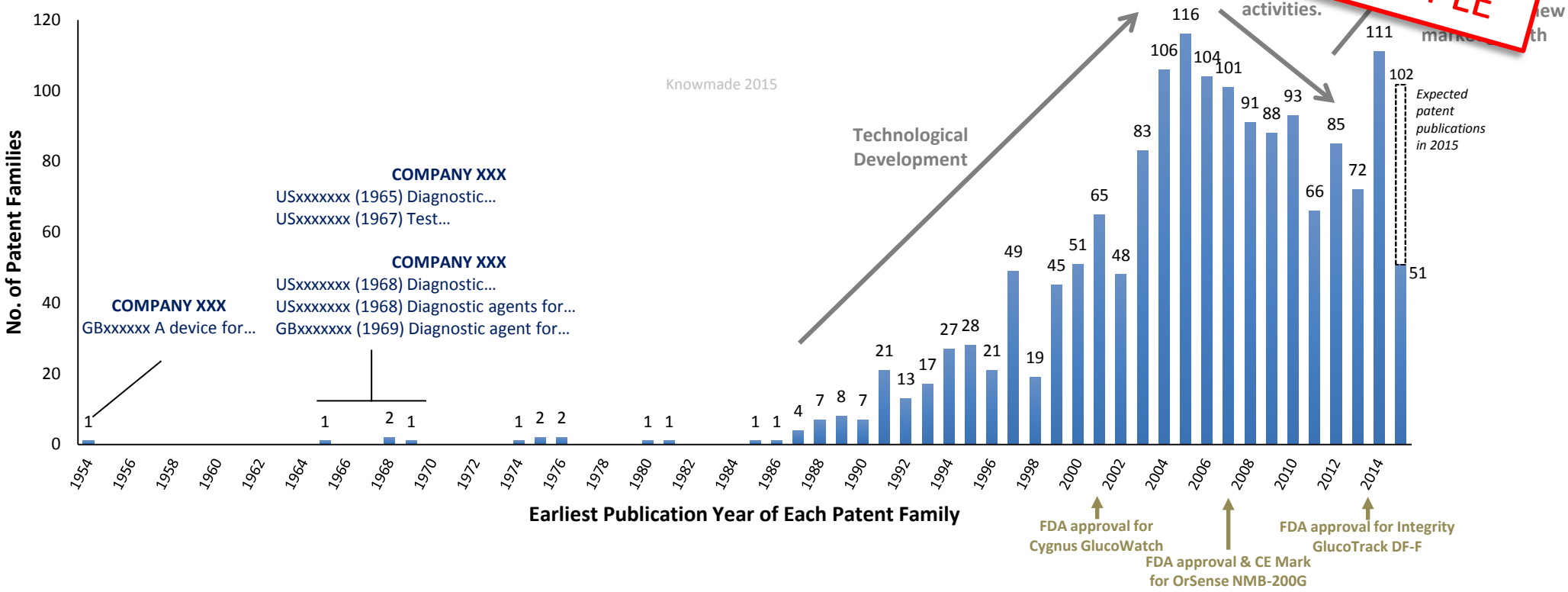
INTRODUCTION
Search Strategy

	Step	Search Equation	Results
Patent Related to Non-Invasive Glucose Monitoring	**Step 1**	(XXX OR XXX)/BI/CLMS/OBJ AND (XXX OR XXX OR XXX))/BI/CLMS	>1,600
Citing and Cited Patents	**Step 2**	CITING AND CITED PATENTS OF SELECTED PATENTS FROM STEP 1	>15,000
Manual Selection	**Step 3**	**SELECTED PATENT FAMILIES**	**1,615**

- + Truncation replacing any number of characters
- ? Truncation replacing zero or one character
- # Truncation replacing one character
- _ Truncation for word that may have a space (ex: semiconductor, semi conductor)
- OR Finds references containing at least one of the words
- AND Finds references containing all words
- S Finds references containing the terms in the same sentence
- nD Finds references containing adjacent terms, regardless of the order, and may be separated by a maximum of n words
- nW Finds references containing adjacent terms, in the order specified, and may be separated by a maximum of n words
- ( ) Parentheses are necessary to combine different operators
- /TI/OTI Search in Title
- /BI Search in Title and Abstract
- /CLMS Search in Claims
- /DESC/ODES Search in Description
- /PA.FLD Search in Patent Assignees
- /IC Search in International Patent Classification (IPC)

IP OVERVIEW

Time Evolution of Patent Publications



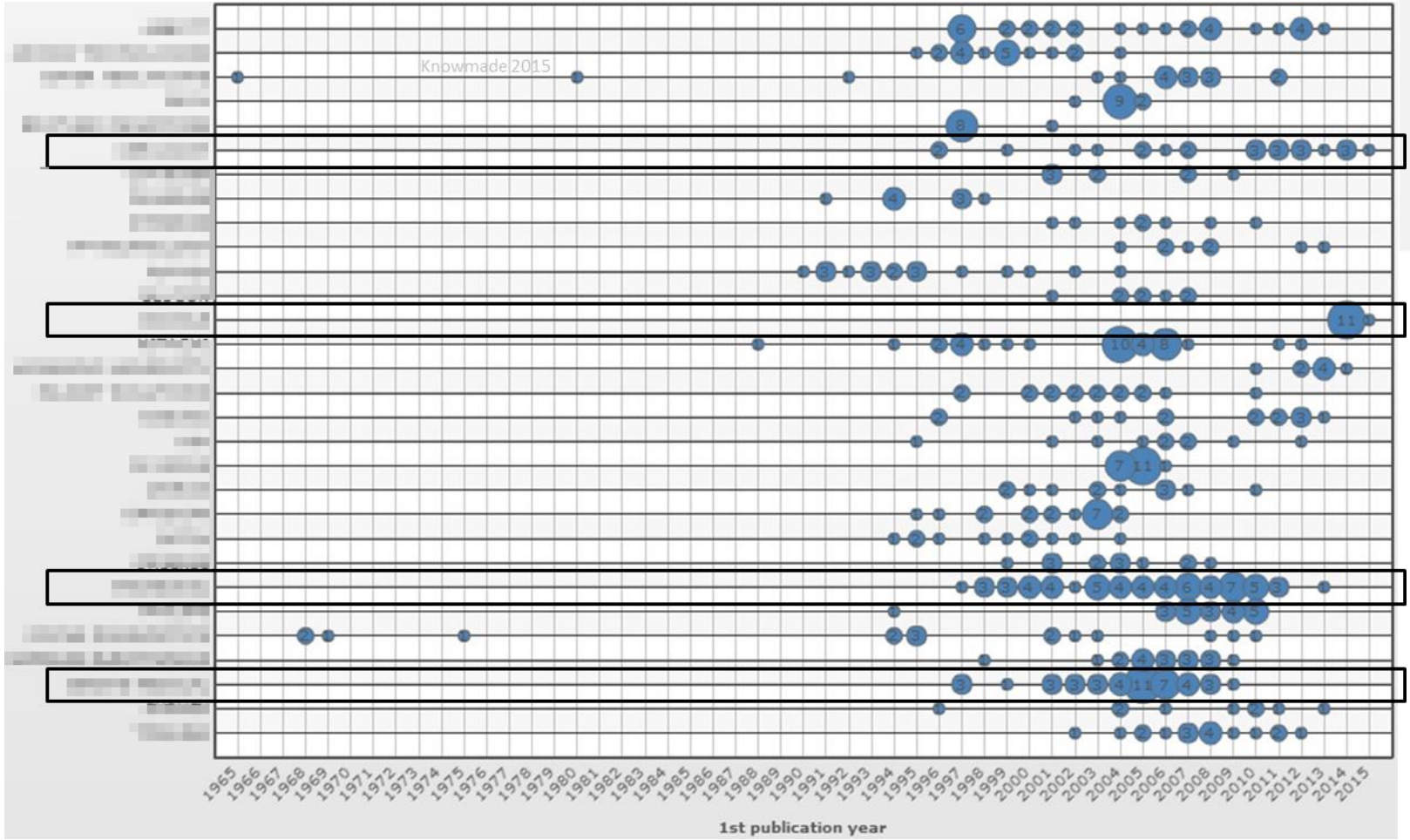
Note: The patent search was done between June and July 2015, the data corresponding to the year 2015 are not complete here. At the time of the patent search, 51 patent families had been published in 2015.

Inventors have been working for a long time to develop easy and painless (without drawing blood) ways to monitor the level of glucose of a person, and patents with this goal have been filed since the 1950's. In 1954, the British **COMPANY XXX** disclosed a device to monitor glucose in the eye using a laser beam. A decade later, several patents were filed by **COMPANY XXX** and **COMPANY XXX** regarding solutions and test strip to detect glucose in body fluids, especially in urine. Early developments in the domain also include other systems, such as a lens with a radiation system monitoring blood glucose in the eye published in 1976 by **COMPANY XXX** (USxxxxxxx).

However, patent publications really started in the mid-1980's and ramped up in the early 2000's. The number of patent publications was decreasing between 2006 and 2013, but seems to **start up again in the last couple of years**. To this date, **more than 1,600 patent families** have been published in the domain of non-invasive glucose monitoring, involving more than 500 actors.

IP OVERVIEW

Time Evolution for Main Patent Applicants



Dates [illegible] earliest publica[illegible] each patent family. Bubble [illegible] represents the number of published patent families. The data corresponding to the year 2015 may not be complete since the patent search was done in June 2015.

COMPANY XXX, main patent applicants, has only filed 1 patent in the last 4 years. **COMPANY XXX**'s last application was in 2009. **COMPANY XXX**, 5th by the size of its portfolio, has filed patent regularly in the last 5 years. **COMPANY XXX**, ranked in the top-20 of main patents applicants filed all its patents in 2014-2015. **COMPANY XXX** is specialized in contact lenses equipped with microelectrodes or light source to measure glucose level in the eye. For the 1st half of 2015, China is the 1st country of publications, before the USA, however no Chinese applicants appear among the main 30 applicants. This means applications in China are made by various Chinese actors, new comers in the non-invasive glucose monitoring domain, and that other applicants are newly interested in the Chinese territory.

IP OVERVIEW

Mapping of Main Current IP Holders

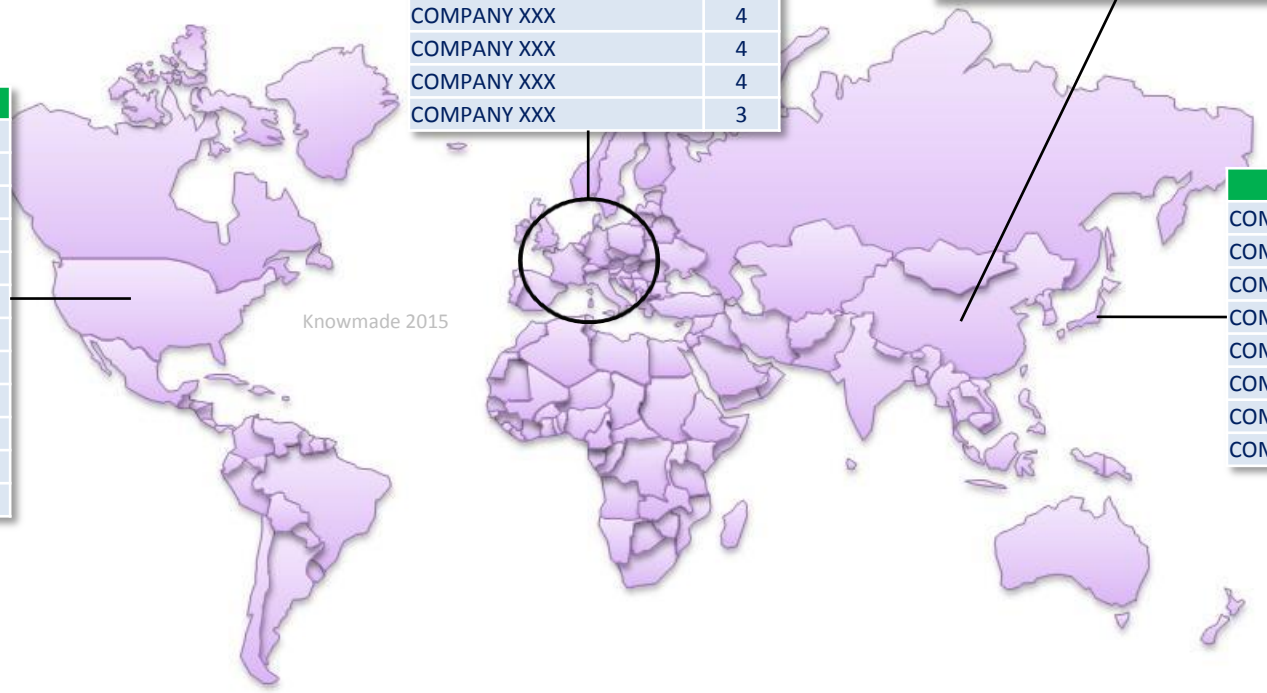
Number of patent families containing granted patents in the corresponding country.

US PATENTS	
COMPANY XXX	24
COMPANY XXX	16
COMPANY XXX	15
COMPANY XXX	14
COMPANY XXX	14
COMPANY XXX	13
COMPANY XXX	9
COMPANY XXX	7
COMPANY XXX	7
COMPANY XXX	6
COMPANY XXX	6
COMPANY XXX	5

EP PATENTS	
COMPANY XXX	10
COMPANY XXX	8
COMPANY XXX	7
COMPANY XXX	4
COMPANY XXX	4
COMPANY XXX	4
COMPANY XXX	4
COMPANY XXX	4
COMPANY XXX	3

CN PATENTS	
COMPANY XXX	5
COMPANY XXX	3
COMPANY XXX	3
COMPANY XXX	2
COMPANY XXX	2

JP PATENTS	
COMPANY XXX	17
COMPANY XXX	11
COMPANY XXX	9
COMPANY XXX	9
COMPANY XXX	6
COMPANY XXX	5
COMPANY XXX	3
COMPANY XXX	3



COMPANY XXX is the main current IP holder in Asia and Europe and is also well ranked in the USA. In the USA, **COMPANY XXX** is preceded by **COMPANY XXX** and **COMPANY XXX**, respectively 2nd and 4th in term of patent portfolio size. **COMPANY XXX**, 3rd main applicant with patents in Japan, Europe, USA and China, is not among the main current IP holders in any territories. In Japan, **COMPANY XXX**, 5th largest portfolio, doesn't appear in the main current IP holder ranking (nor in the main current applicant ranking) despite 19 families filed exclusively in this country over 2004-2006. Noteworthy, all patent applications by **COMPANY XXX** are registered as likely abandoned and have never been granted. Despite its young portfolio (2014), **COMPANY XXX** already has 5 granted patents in the USA. **COMPANY XXX** in the USA and **COMPANY XXX** in Europe are the most well ranked academics among the main current IP holders.

IP OVERVIEW

Technical Issues (1/3)

Patent Applicants	No. of patent families	Technology								Sample									
		Spectroscopy (xx)					Impedance	XXXX	Other, Not specified	Skin Level (xx)			Blood Vessels	Eye (xx)			Urine	XXXX	Breath
		XXXX	Photo-acoustic	XXXX	Ultra-sound	XXXX				XXXX	Interstitial Fluids	XXXX		Tears	Retina	Aqueous Humor			
TOTAL	1612	547	74	54	58	85	91	221	632	238	139	51	250	59	57	69	65	49	61
COMPANY XXX	59	33	xx	2	xx	1	-	2	xx	9	-	2	xx	1	xx	1	2	-	-
COMPANY XXX	xx	xx	xx	1	xx	xx	5	xx	4	xx	xx	-	10	-	3	-	-	-	-
COMPANY XXX	xx	xx	1	-	-	-	1	xx	24	xx	-	xx	xx	-	-	-	-	-	-
COMPANY XXX	xx	xx	5	xx	1	xx	xx	3	xx	xx	5	-	xx	-	-	xx	-	-	xx
COMPANY XXX	xx	3	-	-	-	-	1	2	xx	3	1	-	4	-	-	-	-	-	-
COMPANY XXX	21	9	xx	xx	-	1	-	1	x	xx	-	-	xx	-	-	-	-	-	2
COMPANY XXX	xx	7	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-
COMPANY XXX	xx	xx	-	-	xx	-	-	18	-	-	11	xx	xx	-	-	-	-	-	-
COMPANY XXX	18	17	-	-	-	-	-	-	1	xx	1	-	xx	-	-	-	-	-	-
COMPANY XXX	18	xx	-	-	-	-	2	xx	xx	xx	1	1	x	-	-	-	1	-	xx
COMPANY XXX	xx	4	3	2	-	3	-	-	5	xx	xx	-	xx	-	2	-	-	-	-
COMPANY XXX	xx	xx	-	-	3	xx	1	10	xx	xx	7	-	-	-	-	-	4	-	xx
COMPANY XXX	xx	xx	x	-	-	-	2	-	13	2	-	-	2	-	-	-	-	-	-
COMPANY XXX	xx	xx	-	1	-	1	-	-	1	-	xx	-	3	-	-	-	-	-	-
COMPANY XXX	xx	1	xx	xx	xx	1	-	xx	7	4	xx	-	1	-	-	1	xx	-	-
COMPANY XXX	15	2	-	-	-	-	-	1	xx	3	-	-	4	-	-	-	-	-	-
COMPANY XXX	xx	x	2	-	-	-	x	-	x	-	-	-	12	-	-	-	-	-	-
COMPANY XXX	xx	10	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
COMPANY XXX	xx	-	-	-	-	-	2	x	xx	-	-	-	-	8	-	-	-	-	-
COMPANY XXX	xx	2	-	-	-	-	-	x	xx	-	-	2	-	-	-	-	xx	-	-
COMPANY XXX	11	8	-	-	-	-	-	-	3	-	-	-	5	-	1	-	-	-	-

Patents have been categorized based on the content of title, abstract and claims. Note that a patent can be found in several categories.

1-5 patent families | 6-10 patent families | ≥ 11 patent families

IP OVERVIEW

Summary of Applicant's Patent Portfolio (1/2)

Patent Applicants	No. of patent families	Oldest priority date of the portfolio	No. of families filed / yr (average)	No. of patent documents	No. of patents / Family (average)	Patent average age (yr)	% granted	% pending	% dead (revoked lapsed expired)	No. of alive patents / Family (granted, pending)	No. of granted patent … country			
											US	EP	JP	CN
COMPANY XXX	59	19xx	3	xx	xx	9	38%	7%	55%	xx	xx	x	17	5
COMPANY XXX	xx	19xx	xx	342	xx	xx	xx%	xx%	xx%	1.1	24	xx	xx	xx
COMPANY XXX	xx	19xx	xx	xx	3	12	10%	xx%	xx%	0.5	xx	3	2	xx
COMPANY XXX	xx	1996	xx	xx	xx	12	xx%	14%	xx%	xx	16	xx	9	xx
COMPANY XXX	xx	19xx	xx	87	xx	xx	59%	xx%	xx%	xx	13	4	3	xx
COMPANY XXX	21	19xx	xx	xx	xx	xx	xx%	xx%	xx%	1.2	xx	x	1	1
COMPANY XXX	xx	20xx	xx	19	1	xx	0%	0%	100%	0	-	-	-	-
COMPANY XXX	xx	1993	xx	xx	22.1	xx	xx%	0%	xx%	9.9	xx	8	9	-
COMPANY XXX	18	19xx	xx	xx	xx	20	xx%	0%	xx%	xx	xx	xx	xx	xx
COMPANY XXX	18	19xx	xx	xx	xx	xx	xx%	xx%	xx%	xx	1	2	xx	xx
COMPANY XXX	xx	19xx	1	xx	4	xx	79%	xx%	xx%	xx	14	4	6	3
COMPANY XXX	xx	1964	xx	163	xx	xx	xx%	15%	xx%	xx	xx	xx	5	xx
COMPANY XXX	xx	2001	xx	xx	xx	7	44%	xx%	xx%	xx	xx	xx	11	xx
COMPANY XXX	xx	19x	xx	xx	12.1	xx	12%	xx%	xx%	xx	7	xx	xx	1
COMPANY XXX	xx	19xx	0.3	xx	xx	xx	xx%	xx%	xx%	0.8	xx	xx	xx	xx
COMPANY XXX	15	1995	xx	198	13.2	xx	xx%	16%	xx%	5	6	4	3	xx
COMPANY XXX	xx	19x	0.8	xx	xx	11	31%	xx%	xx%	6.7	xx	7	xx	3
COMPANY XXX	xx	20xx	xx	18	xx	xx	0%	0%	100%	0	-	-	-	-
COMPANY XXX	xx	2012	4	xx	xx	<1	xx%	70%	xx%	xx	5	xx	xx	xx
COMPANY XXX	xx	19xx	xx	47	xx	11	xx%	xx%	85%	xx	xx	xx	2	1
COMPANY XXX	11	19xx	xx	xx	xx	xx	5%	0%	95%	0.3	xx	xx	xx	xx

highest value in column lowest value in column

IP OVERVIEW

Summary of Applicant's Patent Portfolio (2/2)

Globally, more than half of the top-20 main patent applicants started their patent activity in the non-invasive glucose sens... the 1990's. **COMPANY XXX**, who owns the largest portfolio, started filing patent in the domain in 19xx and was still active in the ... 2010's. The Japanese company is also present worldwide. **COMPANY XXX** owns the 2nd largest portfolio in the non-invasive glucose sensing domain and the largest granted portfolio in the USA. The company also has the 2nd highest number of patent documents (342), which is more than **COMPANY XXX**. However, **COMPANY XXX** has ceased its activity and its portfolio is now the property of **COMPANY XXX**. **COMPANY XXX** has the highest ratio of granted patents (79% of its portfolio) and is among the main current IP holders worldwide. While maintaining those patents, the company has decreased its patenting activity (xx% of pending applications). **COMPANY XXX**(now part of **COMPANY XXX**) filed xx documents split in xx families, which is the highest number of documents and by far the highest rate of patent per family (22.1). The company doesn't have any pending application, however xx% of its portfolio is granted, which gives **COMPANY XXX** the highest rate of alive patent per family. The portfolio of **COMPANY XXX** on non-invasive glucose monitoring is in fact composed of patents filed by **COMPANY XXX**, acquired by **COMPANY XXX** in 2005. In particular, **COMPANY XXX** developed and launched the GlucoWatch in 2002, only device for glucose monitoring considered as non-invasive approved by the FDA and having been on the market to this date. If the device is no longer manufactured, 8 patent families related to it are included in this portfolio, most of them are currently still granted.

COMPANY XXX has the 2nd oldest portfolio with an oldest priority date in 19xx and with xx patents split in xx families, the companies shows the 3rd highest rate of patents filed per family. However, the portfolio of **COMPANY XXX** is not recent (patent average age : xx years) and xx% of its patents are dead. **COMPANY XXX** patenting activity has been sporadic, but the company filed 3 patents in 2008-2010.

Four companies started their patent activity in the early 2000's : **COMPANY XXX**, **COMPANY XXX**, **COMPANY XXX** (**COMPANY XXX** owns 3 patents family originally filed in the 1960-70's by **COMPANY XXX**) and **COMPANY XXX**. However, **COMPANY XXX** and **COMPANY XXX**, are no longer active in the domain and their portfolio don't contain any alive patent. Noteworthy, **COMPANY XXX** and **COMPANY XXX** patent applications, exclusively filed in Japan, were never granted and are likely abandoned by applicants.

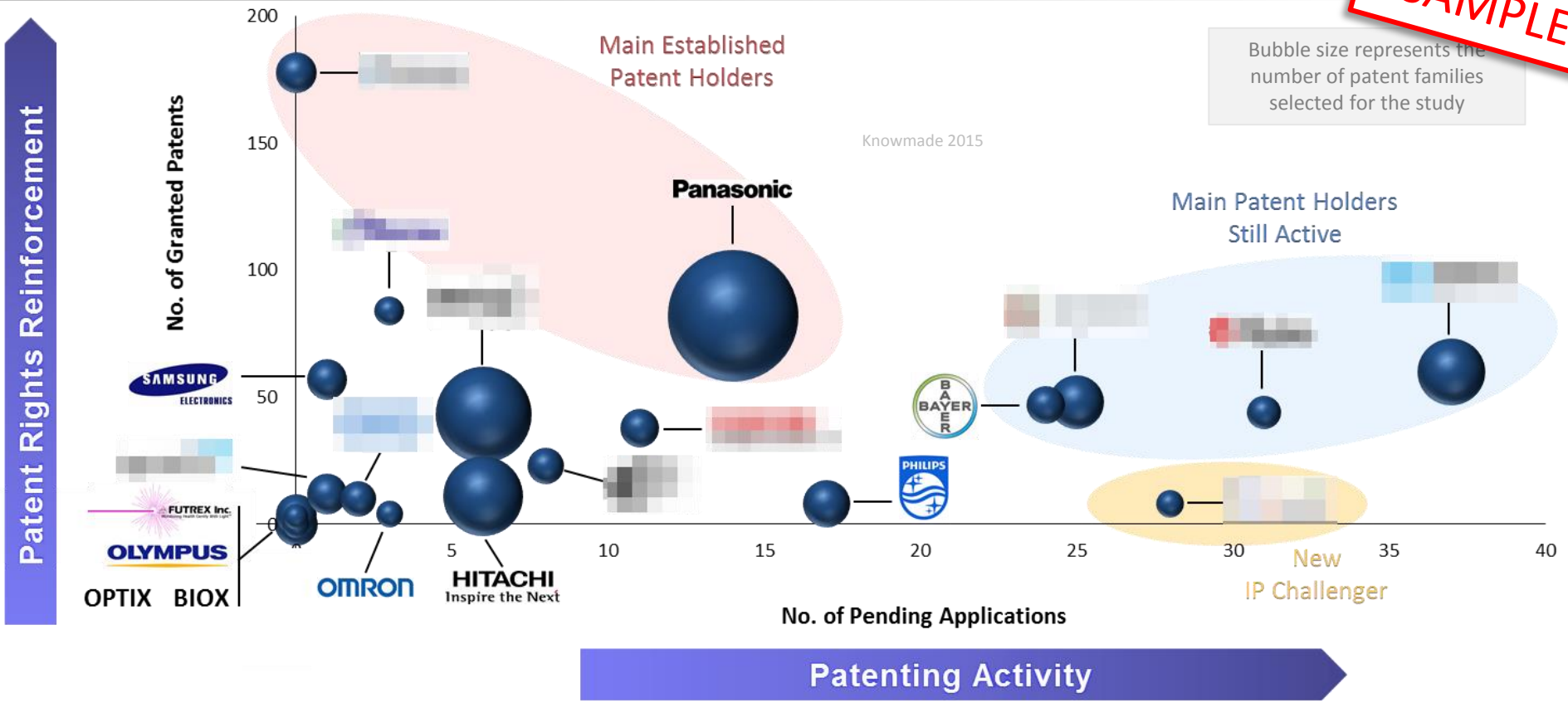
COMPANY XXX owns xx families and xx patents in its portfolio, and shows the 2nd highest rate of alive patents per family (6.7). The Israeli company, specialized in non-invasive monitoring technologies, is well ranked among the main current IP holders, especially in the USA, Europe and China.

With 59% of granted patents and xx% of pending patents, xx% of **COMPANY XXX**'s portfolio is composed of alive patents. The company's 1st patent in the non-invasive glucose monitoring domain was published in 19xx, but **COMPANY XXX** has been the most active since 2010.

COMPANY XXX is the newest patent actor, and with xx families filed since 2012, the firm has the highest rate of filing per year (4 families/year). **COMPANY XXX** also has the highest percentage of pending applications in a portfolio (70%) and xx% of its portfolio is alive. **COMPANY XXX** is specialized in contact lenses for monitoring glucose level.

IP OVERVIEW

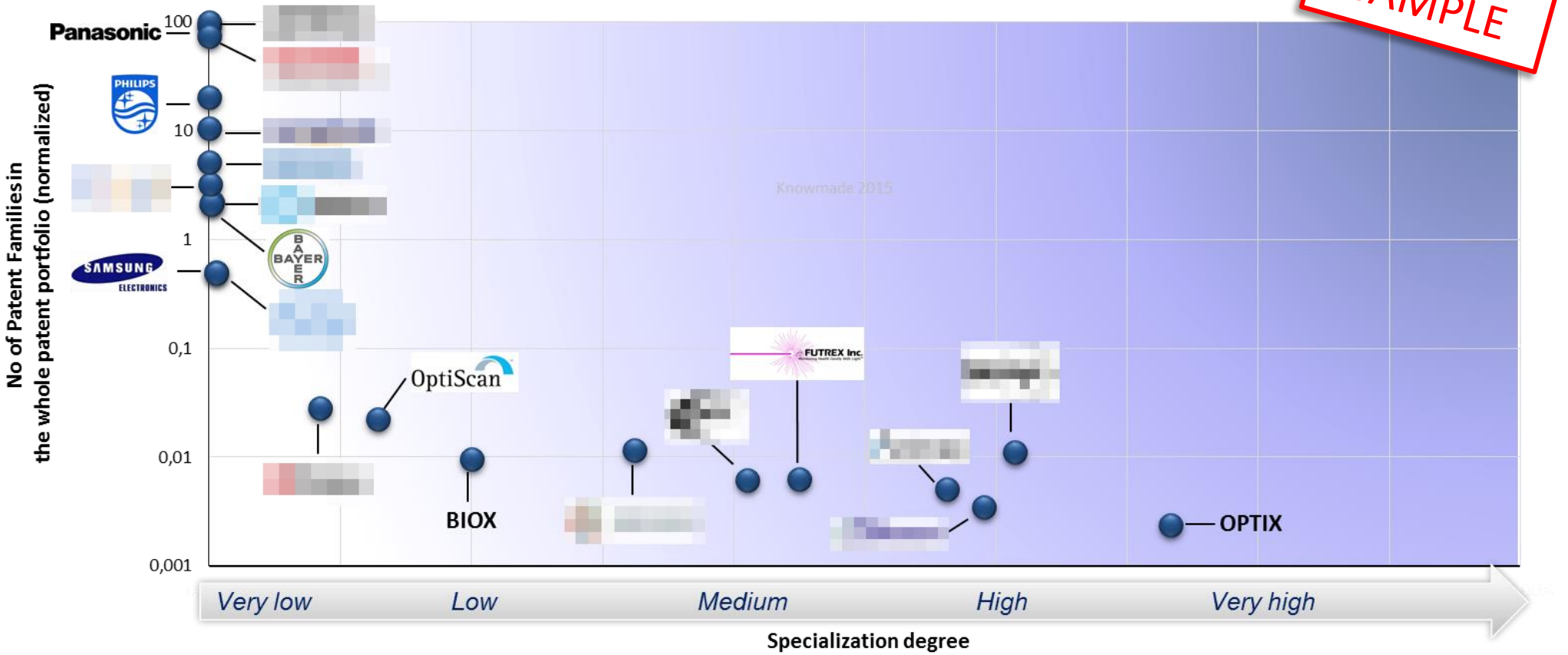
Leadership of Patent Applicants



COMPANY XXX has a very strong leadership in term of patenting activity in the non-invasive glucose monitoring domain. Ranked behind, **COMPANY XXX** and its former subsidiary **COMPANY XXX** as well as **Bayer** also appear among the main IP holders still active, expending their portfolio with new applications. Thus they also have a significant leadership in the domain. **Panasonic** has a large portfolio that ensures the company a certain predominance. **Panasonic** should enhance the importance of its portfolio with the acquisition of the Diabetes Care business of **COMPANY XXX** (the deal should be completed in early 2016). As a consequence, **COMPANY XXX**'s leadership position should regress. Currently **COMPANY XXX** has no patenting activity, however, the company is handling a very high number of granted patents worldwide. Despite the lack of success of the GlucoWatch product derived from its patents, **COMPANY XXX** is continuing its R&D activities in the domain of diabetes (insulin pumps and continuous glucose monitoring). Even if **COMPANY XXX** is no longer active, its portfolio remain of importance. **COMPANY XXX** and **COMPANY XXX** are the only company having more pending applications than granted patents. However, if **COMPANY XXX** have filed many applications, the company has tendency to abandon them during the examination procedure. On the contrary, the influence of the new-comer **COMPANY XXX** is expected to grow in the near future, especially for glucose detection in the eye.

IP OVERVIEW

Degree of Specialization in Non-Invasive Glucose Monitoring



Specialization degree: The specialization degree of a company represents the percentage of patents filed in a specific field over the whole patent portfolio of the company. It is an indicator of the patenting activity on a specific field.

Companies like **Panasonic**, **COMPANY XXX**, **COMPANY XXX**, **Philips**, **COMPANY XXX** or **Samsung** cover a wide range of technologies with their patent portfolios and therefore have a very low specialization degree. The pharmaceutical companies **COMPANY XXX** and **Bayer** are not specialized in non-invasive glucose monitoring technologies. The American **Optix** shows a very high specialization degree. **Optix** filed 14 patent families regardless of the domain, including 11 in the non-invasive glucose monitoring domain. **Optix** could be considered as an IP pure player, however, most of its patents are dead and the company is no longer active (last application in 20xx). **COMPANY XXX**, **COMPANY XXX** and **COMPANY XXX** also have a high specialization degree, before **Futrex**, **COMPANY XXX** and **COMPANY XXX**.

IP OVERVIEW

Citations analysis

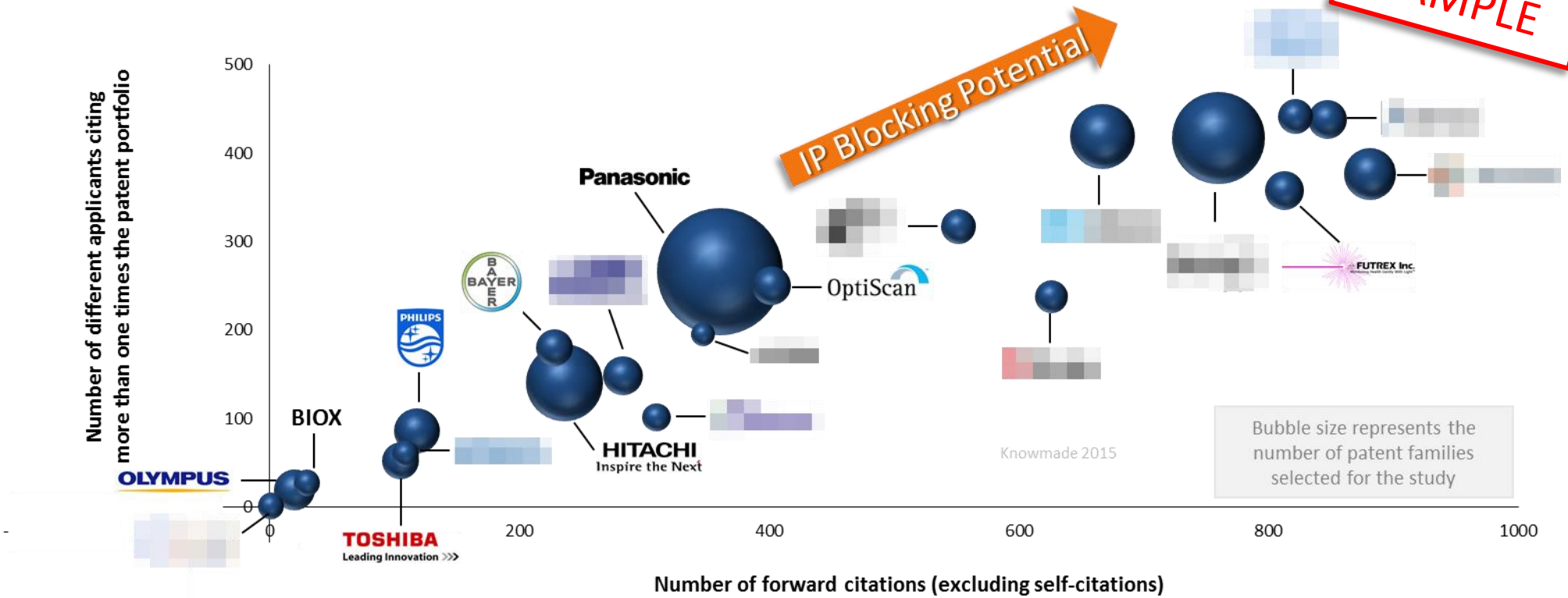
	A	B	C	D	
Patent Applicants	**No. of patent families**	**No. of citing patent families** (excluding self-citations)	**No. of citing patent families / patent family** (= B/A)	**Relative Impact Factor of the patent families** (= C /6.77*)	**Strength in of the patent portfolio** (= A x D)
COMPANY XXX	59	361	xx	xx	xx
COMPANY XXX	xx	760	xx	xx	112
COMPANY XXX	xx	xx	xx	xx	35
COMPANY XXX	xx	xx	22.2	xx	xx
COMPANY XXX	xx	881	xx	xx	130
COMPANY XXX	21	118	xx	xx	xx
COMPANY XXX	xx	xx	xx	xx	3
COMPANY XXX	xx	xx	47.1	7	xx
COMPANY XXX	18	xx	xx	xx	xx
COMPANY XXX	18	xx	xx	3.3	59
COMPANY XXX	xx	xx	xx	2.3	xx
COMPANY XXX	xx	xx	13.4	xx	34
COMPANY XXX	xx	xx	xx	0.9	xx
COMPANY XXX	xx	552	xx	xx	xx
COMPANY XXX	xx	xx	51.4	7.6	121
COMPANY XXX	15	xx	xx	6.2	xx
COMPANY XXX	xx	xx	23.8	xx	xx
COMPANY XXX	xx	xx	xx	xx	xx
COMPANY XXX	xx	1	0.1	0	0
COMPANY XXX	xx	109	xx	xx	16
COMPANY XXX	11	xx	31.5	xx	xx

highest value in column
lowest value in column

**1,612 patent families are cited by the whole of the 10,910 patent families, thus corresponding to an average of 6.77 citing patent families per patent family. A relative impact factor of 1 indicates that the portfolio is in the average range of citations. A relative factor of 2 indicates that the portfolio has two times more citations than the average, while a relative impact factor of 0.5 indicates that the portfolio is half that of the average.*

IP OVERVIEW

IP Blocking Potential of Patent Applicants



The more the number of forward citations from different patent applicants is high, the more the capacity to hamper the other firms' attempts to patent a related invention is important. Note, however, that the identification of a "blocking patent" requires an in-depth specific analysis of each patent documents.

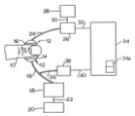
The IP blocking potential is an indicator of how an actor and its patents are difficult to circumvent in a technology. The IP blocking potential is not necessarily linked to the size of the portfolio.

COMPANY XXX, **COMPANY XXX**, **Futrex**, **COMPANY XXX** and **COMPANY XXX** as well as **COMPANY XXX** have a significant IP blocking potential. **COMPANY XXX** and **COMPANY XXX** are ranked ahead of companies like **Panasonic**, **COMPANY XXX**, **COMPANY XXX** or **Bayer**. The IP blocking potential of **COMPANY XXX** is currently very low. The portfolio of the company is very young and mostly focused on lens technology, which is not a widespread approach. If this technology grows and attracts other applicants, **COMPANY XXX** will likely have a strategic position in this particular domain.

IP OVERVIEW

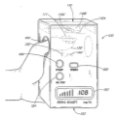
Key Patent Families

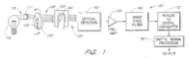
Company XXX
USxxxxxxx
Spectrophotometric method for...



Company XXX, Company XXX
WOxxxxxxx
Active pulse blood ...

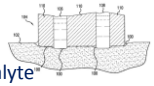
Company XXX
WOxxxxxxx
Blood glucose ...





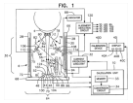
Company XXX
EPxxxxxxx
Method of determining a glucose concentration...

Company XXX
WOxxxxxxx
Non-invasive determination of analyte concentration...



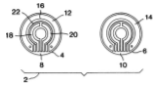
Company XXX
USxxxxxxx
Device for non-invasively measuring...

Based on the th... correlations... ...onal

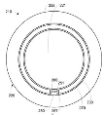


Company XXX
WOxxxxxxx
Method and apparatus for...

Company XXX, Company XXX
WOxxxxxxx
Method and device for predicting...

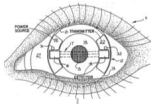


Company XXX
USxxxxxxx
Microelectrodes in an ophthalmic...

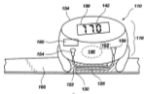


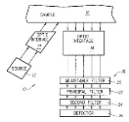
Company XXX
WOxxxxxxx
Physiological measurement using...

W.F. March
USxxxxxxx
Non-invasive automatic glucose...



Company XXX, Company XXX
USxxxxxxx
Enhancement of transdermal monitoring...

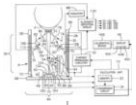




Company XXX
WOxxxxxxx
Method and apparatus for...

Company XXX, Company XXX
WOxxxxxxx
Non-invasive tissue glucose ...

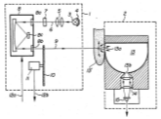
Company XXX
USxxxxxxx
Noninvasive measurements of...



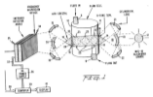
1974 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

Earliest application date of the family

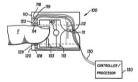
Company XXX
USxxxxxxx
Spectrophotometric method and apparatus for...



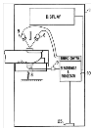
Company XXX, Company XXX
USxxxxxxx
Method of and apparatus for determining...



Company XXX
WOxxxxxxx
Non-invasive measurement...

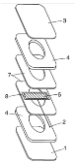


Company XXX
USxxxxxxx
Method for providing custom calibration for ...

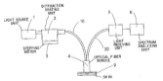


Company XXX, Company XXX
USxxxxxxx
Analytical system for monitoring...

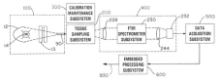
Company XXX, Company XXX
WOxxxxxxx
Device and method for sampling of...



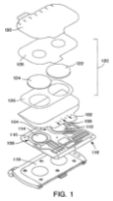
Company XXX
EPxxxxxxx
Device for non-invasive determination of...



Company XXX
WOxxxxxxx
System for non-invasive measurement of...



Company XXX, Company XXX
WOxxxxxxx
Methods and devices for prediction of...



Company XXX
USxxxxxxx
Glucose level control method and system

Company XXX
WOxxxxxxx
A method of monitoring glucose level

Company XXX
WOxxxxxxx
Compact apparatus for noninvasive measurement of glucose through...

The selection of key patent families is based on the family size, current legal status of patents, citations analysis and impact on the technological segment. See annexes for methodology for key patent identification. Patent numbers correspond to representative member of the families, assignee names take into account original applicants and reassignments.

IP OVERVIEW

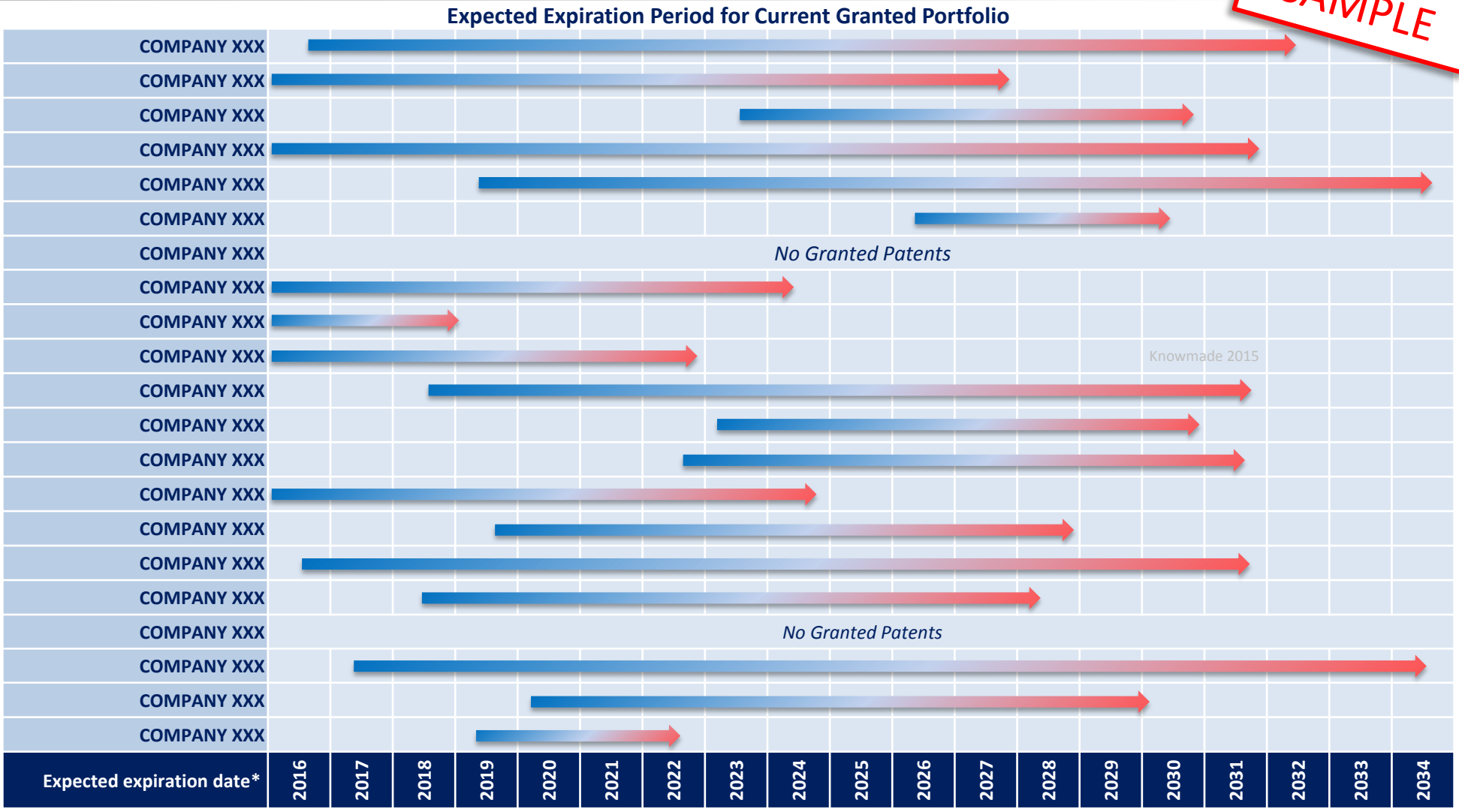
Granted Patents Near Expiration (1/2)

Assignee	Title	Publication Number	PDF	Expected Expiration Date *
COMPANY XXX	Method and apparatus for non-invasive blood…	USxxxxxxx	Open	2015-08-09
COMPANY XXX	Diffuse reflectance…	USxxxxxxx	Open	2015-08-09
COMPANY XXX	Method for non-invasive blood…	USxxxxxxx	Open	2015-08-09
COMPANY XXX	Non-invasive…	MXxxxxxxx	Open	2015-08-16
COMPANY XXX	Non-invasive…	AUxxxxxxx	Open	2015-08-16
COMPANY XXX	Liquid correlation..	SGxxxxxxx	Open	2015-08-18
COMPANY XXX	Active pulse…	USxxxxxxx	Open	2015-09-09
COMPANY XXX	Method for glucose…	USxxxxxxx	Open	2015-09-11
COMPANY XXX	Chemical signal-impermeable…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Method of measuring chemical concentration…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Chemical signal-impermeable…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Chemical signal-impermeable…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Methods of producing an…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Chemical signal-impermeable…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Chemical signal-impermeable…	USxxxxxxx	Open	2015-09-12
COMPANY XXX	Process and device for…	TWxxxxxxx	Open	2015-10-06
COMPANY XXX	System and method for…	USxxxxxxx	Open	2015-10-26
COMPANY XXX	Measurement equipment of…	JPxxxxxxx	Open	2015-10-31
COMPANY XXX	Transcutaneous non-bloody…	USxxxxxxx	Open	2015-11-17
COMPANY XXX	Non-invasive…	EPxxxxxxx	Open	2015-11-29
COMPANY XXX	Self-emission noninvasive…	AUxxxxxxx	Open	2015-11-30
COMPANY XXX	Glucose monitoring apparatus and method using…	USxxxxxxx	Open	2015-12-01

** Expected Expiration Date is dependent on the accuracy and timeliness of the information provided by the patent offices. This indicator may change at any time without notice based on new information received from the patent offices. No decision should be made based solely on this indicators.*

IP OVERVIEW

Granted Patents Near Expiration (2/2)



For example, the oldest patents of **COMPANY XXX**'s current granted portfolio are expected to expire mid-2016 and the latest patents currently granted should expire early-2032.

** Expected Expiration Date is dependent on the accuracy and timeliness of the information provided by the patent offices. This indicator may change at any time without notice based on new information received from the patent offices. No decision should be made based solely on this indicators.*

NON-INVASIVE DEVICES FOR GLUCOSE MONITORING

Non-Invasive Glucose Monitoring Device Landscape

As seen previously, the domain of non-invasive glucose monitoring is the subject of many patents involving a huge number of [illegible] and various kind of technologies. Over the last 3 decades of R&D in the non-invasive glucose monitoring field, several companies have announced the development of a device. However, only a few have passed the prototype stage and obtained the approval of authorities (FDA in the USA or CE Mark in Europe).

Company	Device	Approval	Technology	Related Patents*
COMPANY XXX	Device XXX	FDA, CE Mark (20xx)	Reverse iontophoresis	WOxxxxxxx, WOxxxxxxx, USxxxxxxx, WOxxxxxxx, USxxxxxxx, WOxxxxxxx, USxxxxxxx, WOxxxxxxx, WOxxxxxxx
COMPANY XXX	Device XXX	CE Mark (20xx)	Impedance spectroscopy	WOxxxxxxx, WOxxxxxxx
COMPANY XXX	Device XXX	CE Mark (20xx)	Occlusion infrared spectroscopy	WOxxxxxxx, WOxxxxxxx, WOxxxxxxx, USxxxxxxx, USxxxxxxx, WOxxxxxxx, WOxxxxxxx
COMPANY XXX	Device XXX	CE Mark (20xx)	Ultrasound, electromagnetic and thermal	WOxxxxxxx, USxxxxxxx
COMPANY XXX	Device XXX	CE Mark (20xx)	Raman spectroscopy	WOxxxxxxx, WOxxxxxxx
COMPANY XXX	Device XXX	-	Interstitial fluids extraction (Prelude SkinPrep)	WOxxxxxxx, WOxxxxxxx, USxxxxxxx
COMPANY XXX	Device XXX	-	Laser microporation	WOxxxxxxx, WOxxxxxxx

**The operating of the device has been linked to patents filed by the company. Only patent families filed before the launched of the device were taken into account.*

Many other companies have communicated about non-invasive glucose monitoring device or presented devices and prototypes, including : **COMPANY XXX** with Device XXX, **COMPANY XXX** with Device XXX, **COMPANY XXX** with Device XXX. However, there is no accurate data concerning some of those devices. The devices which obtained an approval from authorities are detailed in the next pages.

Sources : J. L. Smith, The Pursuit of Noninvasice Glucose : "Hunting the Deceitful Turkey" (2015)
S. K. Vashist, Non-Invasive glucose monitoring technology in diabetes management : A review. Analytica Chimica Acta (2012)

KEY PLAYERS

Company XXX

Large portfolio	**xx** Oldest priority date	**xx** Patent average age
xx Families	**342** Patents	**US, EP** Main countries of filings
xx Granted patents	**xx** Pending applications	**xxxx** Portfolio Strength
Very High IP Blocking potential	**xxxx** Leadership	

Note that the average of main patent assignee is set at 1 and the company values are normalized by the average of main patent assignees.

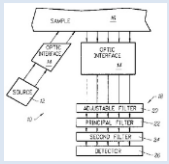
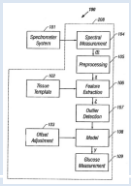
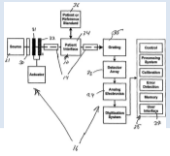
COMPANY XXX has a large portfolio (2nd main patent applicant) with a very high IP blocking potential in the non-invasive glucose monitoring domain. The company mainly focused on near infra-red spectroscopy technology. The portfolio of the company contains a high number of documents. But many applications filed have been abandoned during the examination procedure and were never granted.

COMPANY XXX ceased its activity and its portfolio is now owned by **COMPANY XXX**, a subsidiary of **COMPANY XXX**. Despite its R&D activity, **COMPANY XXX** didn't manage to develop a product and reach the market.

COMPANY XXX also acquired the patents of another company, **COMPANY XXX**, a company more focused on optical coherence tomography techniques. The activity of **COMPANY XXX** in the non-invasive glucose monitoring domain is currently unclear.

KEY PLAYERS
Company XXX

Main Key Patent Families

Patent Family	Key Features
WOxxxxxxx Method and apparatus for… (1996) 	• A method of determining the concentration of an analyte… • Patents granted in the USA, Europe, Australia and Taiwan
WOxxxxxxx Noninvasive measurement of glucose through… (2002) 	• Determination of blood analytes, such as glucose, through… • Very large patent family • Patents granted in the USA
WOxxxxxxx Compact apparatus for noninvasive measurement of… (2003) 	• A spectrometer based system.. • Very large patent family • Patents granted in the USA

EXCEL DATABASE

Containing all the patents analyzed in this report

REPORT SAMPLE

This database allows multi-criteria searches and includes patent publication number, hyperlinks to the original docume priority date, title, abstract, patent assignees, and legal status for each member of the patent family.

	A	B	C	D	E	F	G	H
1	PATENT NUMBER	PATENT ASSIGNEE	PRIORITY DATE	TITLE	PDF	ABSTRACT	LEGAL STATUS	ACTUAL OR EXPECTED EXPIRATION DAT
2	CA25	SON	2005-	Agents and	Open	The invention	LEGAL DETAILS FOR CA	2010-
3	AU2	SON	2005-	Agents and	Open	The invention	LEGAL DETAILS FOR AU	2012-
4	EP18	SON	2005-	Agents and	Open	The invention	LEGAL DETAILS FOR EP	2010-
5	WO2	SON	2005-	Agents and	Open	The invention	LEGAL DETAILS FOR W	2013-
6	US20	SEN	2003-	Method and	Open	The invention	LEGAL DETAILS FOR US	2010-
7	WO2	SEN	2003-	Method and	Open	The invention	LEGAL DETAILS FOR W	2007-
8	US20	MAYO	2010-	Non-invasive	Open	This document	LEGAL DETAILS FOR US	2031-
9	WO2	SEN	2004-	Method and	Open	The invention	LEGAL DETAILS FOR W	2007-
10	CN10	YA	2015-	A composite	Open	Questel Machi	LEGAL DETAILS FOR CN	2035-
11	CN10	JIUMU	2015-	A smart toile	Open	Questel Machi	LEGAL DETAILS FOR CN	2035-
12	DE10	JOHAN	2014-	Non--invasi	Open	Questel Machi	LEGAL DETAILS FOR DE	2034-
13	CN10	POK H	2015-	A noninvasi	Open	Questel Machi	LEGAL DETAILS FOR CN	2035-
14	WO2	I	2013-	Device and	Open	An integrated	LEGAL DETAILS FOR W	2034-
15	KR20	SON	2013-	Smartphone	Open	Questel Machi	LEGAL DETAILS FOR KR	2033-
16	CN10	GUILIN	2015-	A noninvasi	Open	Questel Machi	LEGAL DETAILS FOR CN	2035-
17	US20		2013-	Closed Loop	Open	Methods and s	LEGAL DETAILS FOR US	2033-
18	WO2		2013-	A closed loo	Open	Methods and s	LEGAL DETAILS FOR W	2034-
19	CN20	SHENZ	2014-	Wearable n	Open	Questel Machi	LEGAL DETAILS FOR CN	2024-
20	US20	H	2013-	Non-invasive	Open	A non-invasive	LEGAL DETAILS FOR US	2034-
21	KR20	SE	2013-	Non-invasive	Open	Questel Machi	LEGAL DETAILS FOR KR	2033-
22	CN20	AN	2014-	Infrared spe	Open	Questel Machi	LEGAL DETAILS FOR CN	2024-
23	TWM	O	2014-	Intelligent p	Open	The present in	LEGAL DETAILS FOR TW	2024-
24	MX2	C	2013-	Device for m	Open	The present in	LEGAL DETAILS FOR M	2033-
25	CN10	SUZH	2014-	A method ar	Open	Questel Machi	LEGAL DETAILS FOR CN	2034-
26	US20	A	2013-	Device and	Open	A device and n	LEGAL DETAILS FOR US	2034-
27	KR10	G	2014-	Method and	Open	The present in	LEGAL DETAILS FOR KR	2034-
28	CN10	FOSHA	2014-	A minimally	Open	Questel Machi	LEGAL DETAILS FOR CN	2034-
29	US20	AEG	2013-	Systems and	Open	A method dete	LEGAL DETAILS FOR US	2034-

ORDER FORM

Non-Invasive Glucose Monitoring Patent Landscape

SHIP TO

Name (Mr/Ms/Dr/Pr):

_____

Job Title:

_____

Company:

_____

Address:

_____

City:

_____

State:

_____

Postcode/Zip:

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Country:

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VAT ID Number for EU members:

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Date:

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"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.

Terms and Conditions of Sales

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.

Terms and Conditions of Sales

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.