



Technology Insight Report

Innovations in Food and Medicine Packaging



This report takes a look into the patenting activity around packaging types and technologies in the Food and Pharmaceutical Industry over the last 20 years, uncovering the key companies, inventors, and different sub categories.

Packaging is the science, art, and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging can be described as a coordinated system of preparing goods for transport, warehousing, logistics, sale, and end use.

In many countries it is fully integrated into government, business, institutional, industrial, and personal use.

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Introduction

In the current market scenario, packaging provides the most important first point of contact by which a company presents its products to consumers. Innovation in packaging designs and colors is taking place as brands jostle for shelf appeal and space. Important types of packaging include Active, Intelligent or smart and green etc.

Active, intelligent and green are terms used to describe innovative packaging technologies developed to prolong the shelf life, enhance the quality and safety of food and protect the environment. Conventional passive packaging systems protect the food product only from external environmental hazards. These new technologies are used to modify and monitor the internal and external food environment and provide multiple barriers or hurdles to protect food.

Active packaging materials change the condition of the packaged food product and are designed to extend shelf life, improve safety and/or enhance sensory properties in foods and beverages, while maintaining the quality of the packaged food.

Intelligent or smart packaging systems monitor the internal and/or external conditions of a product through its life cycle and communicate the quality to a particular user.

Green packaging initiatives are meeting consumer desires for packaging that is earth friendly, biodegradable and/or compostable and made from renewable resources.

Overview

With the help of Patent iNSIGHT Pro, we will analyze the patent data around packaging to find answers to the following:

- What does the IP publication trend for Packaging look like and how have the filings evolved?
- Who are the top companies in the packaging industry and what are their technology wise trends?
- How is research in packaging spread across different countries?
- Which companies hold the maximum inventions across different types of materials used in packaging?
- What are the different packaging processes used by various companies?
- How are the companies spread across different Packaging types?
- Which packaging materials are used across different food formulations?



To get deeper insights the patent set has been classified as follows:

By Types:

- Active
- Aseptic
 - a) Food Types
 - b) Medical Types
- Flexible
 - a) Food Types
 - b) Medical Types
- Nitrogen
- Intelligent/ Smart
- Vacuum



By Food Formulations:

- Beverages
 - a) Alcohol
 - b) Other Beverages
 - c) Tea/Coffee
- Cereals
- Confectionaries
- Dairy Products
- Fruits/Vegetables
- Meat Items
 - a) Livestock
 - b) Seafood
- MRE
- Others
- Seasonings



By Medical Formulations:

- Ampules
- Excipients
- Injections/Syringe
- Ointments
- Others



By Processes/Technologies:

- Canning
- Freeze drying
- Indicators
- Modified Atmosphere
- RFID
- Scavengers
- Sensors



By Materials:

- Amorphous Polyethylene Terephthalate
- Biodegradable Materials
 - a) Cardboard
 - b) Paper
- BoPET
- Ethylene Vinyl Alcohol
- Glass
- Metals
 - a) Aluminium
 - b) Other Metals
 - c) Steel
 - d) Tinplate
- Nitrocellulose
- Other Polymers
- PET
- Plastic
 - a) Films
 - b) Foils
 - c) Laminates
 - d) Other Plastics
- Polyamide
- Polyesters
- Polyethylene Glycol
- Polyethylene Terephthalate Glycol
- Polyhydroxyalkanoates
- Polylactic Acid
- Polystyrene
- Polyvinyl Alcohol
- Polyvinyl Chloride
- Polyvinylidene Chloride



Image Source:

<https://www.google.com/search?q=confectionaries&hl=en&prmd=imvns&tbm=isch&tbo=u&source=univ&sa=X&ei=YQ5PUMS3AsLrrQfywoHoCg&ved=0CEkQsAQ&biw=1600&bih=732>

The illustration below shows the different categories prepared and the number of records in each. The categorization involved defining a search strategy for each topic and then conducting the search using the Advanced Searching capability in Patent iNSIGHT Pro. Details of search strings used for each category are given in Appendix B.

CATEGORIZATION TREE



Search Strategy

Using the commercial patent database PatBase as our data source we used the following search query to create our patent set.

TAC – Title Abstract Claims

PD – Publication Date

(TAC= ((active or smart or passive* or intelligent* or aseptic* or flexible* or green) w/3 packag*))

AND

(food* or snack* or egg* or beverage* or seasoning* or dough* or doughnut* or softdrink* or dry fruit* or dryfruit* or fruit* or vegetable* or confection* or sausage* or meat* or milk or "ice cream" or bakery or crisp* or bread or juice* or comestible or biscuit* or snack* or cookie* or tea or coffee or sauce* or oil or fish or pork or beef or poultry or pulses or ketchup or drink* or beer or wine or whiskey or whisky or petfood* or pet-food* or seafood* or sea-food or marine* or salad* or sandwich* or burger or nut* or cheese or yogurt or curd or cereal* or pickle* or grain* or rice or wheat or maize or barley or sugar or salt or jam or jellies or soup or cake* or pastr* or sake or spirit* or liquor or bean* or dairy or gelato or gelatin* or miso or cheese or butter* or grape* or noodle* or soy or flour or chocolate* or toffee or candy or candies or "chewing gum" or peppermint or sweetener* or tofu or spice* or condiment* or pasta* or margarine* or comestible or marine or toast* or orbun or vinegar or dessert* or syrup* or pharma* or tonic* or medic* or drug or drugs or healthcare or capsule* or drug* or skin or pill or pills or tablet* or ointment* or paste or gel or cream* or powder* or excipient* or injection or homeopath*))

AND

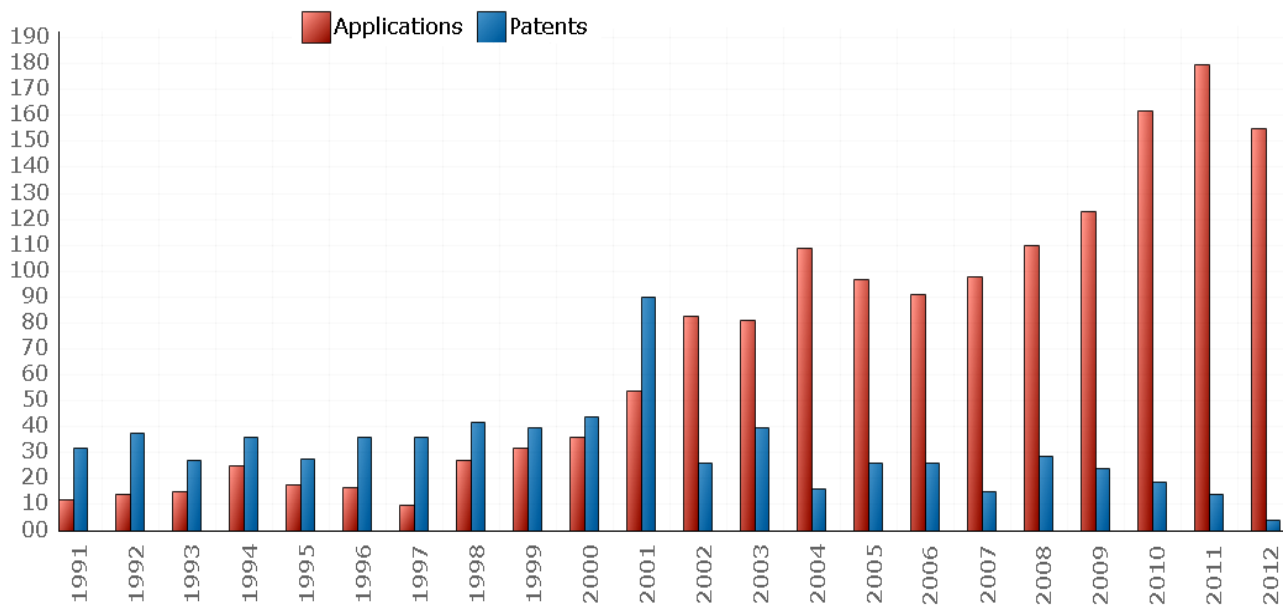
(PD>1991)

The query was directed to search through title, abstract, claims and patent set of 2399 records (one publication per family) published after 1991 was generated.

The publications included in the report are updated as of 28th August, 2012.

Publication Trend

What has been the IP publication trend for Packaging?

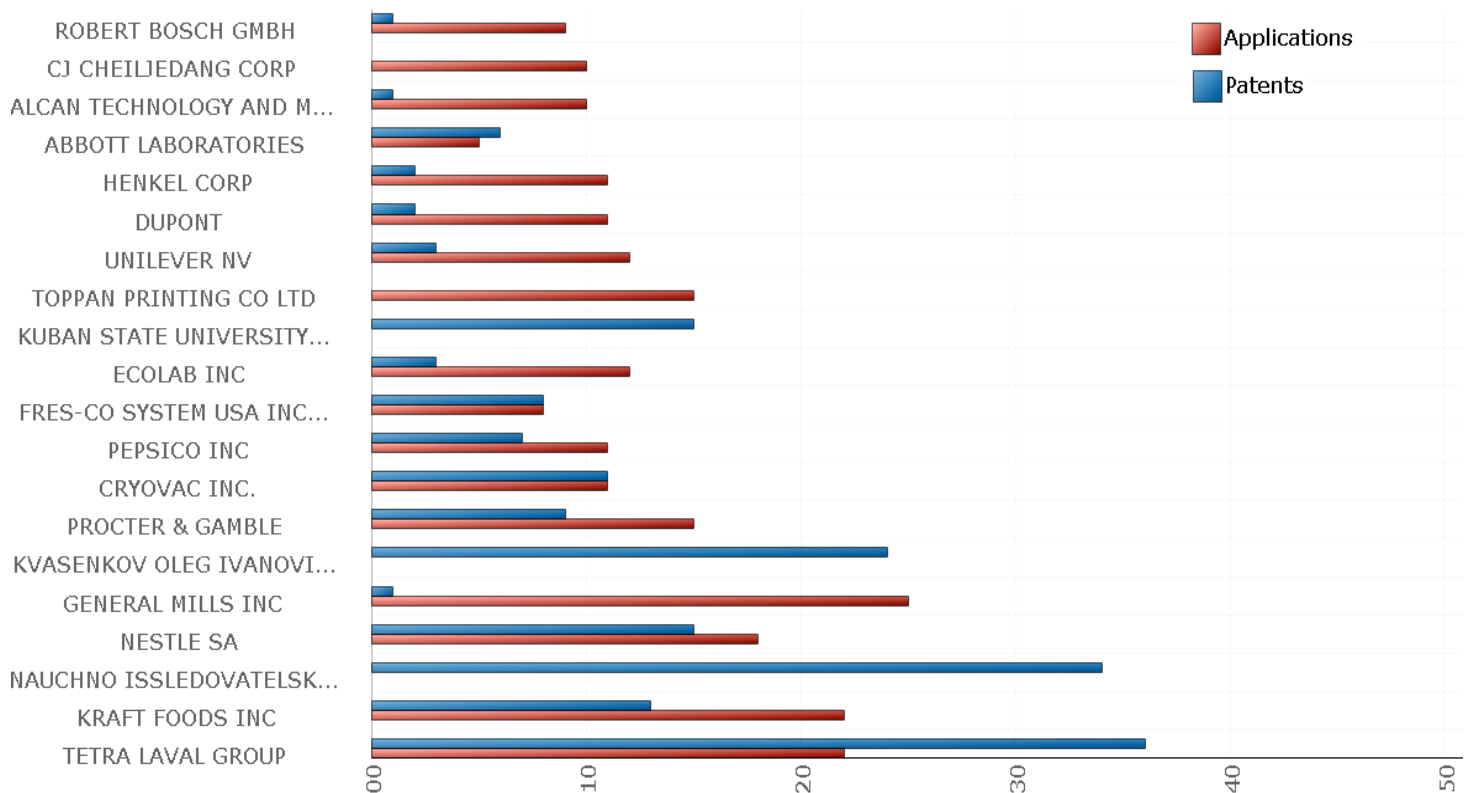


How we did it?

Once the patents were populated in Patent iNSIGHT Pro, the publication trend chart was generated on a single click using the dashboard tool.

Top Companies

Who have been the top companies within the packaging industry?



The top companies are:

1. TETRA LAVAL GROUP
2. KRAFT FOODS INC
3. NAUCHNO ISSLEDOVATELSKIY INSTITUT
4. NESTLE SA
5. GENERAL MILLS INC
6. KVASENKOV OLEG IVANOVICH
7. PROCTER & GAMBLE
8. CRYOVAC INC
9. PEPSICO INC
10. FRES-CO SYSTEM USA INC

11. ECOLAB INC
12. KUBAN STATE UNIVERSITY
13. TOPPAN PRINTING CO LTD
14. UNILEVER NV
15. DUPONT
16. HENKEL CORP
17. ABBOTT LABORATORIES
18. ALCAN TECHNOLOGY AND MANAGEMENT LTD
19. CJ CHEILJEDANG CORP
20. ROBERT BOSCH GMBH

How we did it?

Once the patents were populated in Patent iNSIGHT Pro, the assignee clean-up tools were used to normalize the names. Different cleanup tools were leveraged:

- To locate companies for unassigned records
- To clean up records having multiple companies
- To locate the correct company names for US records using the US assignments database
- To merge companies that resulted from a merger or acquisition or name change.

Please refer Appendix A for more details on company merging.

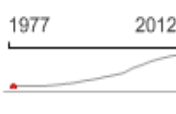
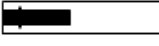



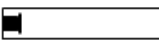
Once the company names were cleaned up, the dashboard tool within Patent iNSIGHT Pro was used to find the top 20 companies within the given patent set. A visual graph was created based on the results of the top companies with the number of patents alongside each one.


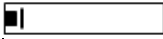

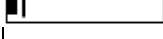




The complete company table is available in the following Excel file:
www.patentinsightpro.com/techreports/0912/List Of Companies.xls


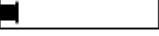



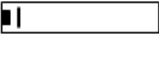

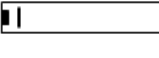
Top Countries


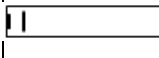

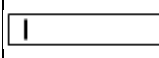
How is research in Packaging spread across different countries?

In terms of regional pockets where patent protection is being sought most frequently for these technologies, US leads the count, followed by the CN and JP. The table below ranks top priority countries and helps provide an indication of where innovation in this area is originating:

Priority Country	Total No. of Records	Avg. No. of Fwd Cites per Patents	Filing Trend (Cumulative)	No. of Filings in last 5 yrs vs Average of Top 20 Priority Country	Filing Year Range	Top 5 Companies	Top 5 Inventors
US	774 (32.3%)	11.41			1979-2012	KRAFT FOODS INC(37) GENERAL MILLS INC(26) CRYOVAC INC(24) PROCTER & GAMBLE(21) PEPSICO INC(17)	KNOERZER ANTHONY ROBERT(11) KOHL GARRETT WILLIAM(10) DOMINGUES DAVID J(7) TUCKER STEVEN KENNETH(7) SWARTZEL KENNETH R(6)
CN	489 (20.4%)	0.03			1990-2012	LIVZON GROUP LIMIN PHARMACEUTICAL FACTORY(7) HUNAN NOVOL MEDICINE CHARTERS MATERIAL SCIENCE TECHNOLOGIES CO(6) TANG HUISONG(5) VIOLET HOME TEXTILE CO(4) CHEN JIANHUA(4)	LIU XIANGHUA(8) LIANG HONG(7) LIU DONGLAI(7) XIE HAIYAN(7) PENG XUNDE(7)
JP	158 (6.6%)	2.26			1984-2011	TOPPAN PRINTING CO LTD(15) TOYO SEIKAN KAISHA LTD(10) HOUSE FOODS CORP(6) TABLEMARK CO LTD(5) YUSHIN CO. LTD.(4)	FUTASE KATSUNORI(6) NOZAWA HIDEKAZU(3) OSADA YUKO(3) WATANABE TOMOYUKI(3) FUJITA TOMIZO(3)

DE	138 (5.8%)	5.04			1982-2012	HENKEL CORP(10) ROBERT BOSCH GMBH(10) MITSUBISHI POLYESTER FILM GMBH(8) DR KARL THOMAE GMBH(7) LTS LOHMANN THERAPIE-SYSTEME AG(5)	PEIFFER HERBERT(7) HILKERT GOTTFRIED(6) KONRAD MATTHIAS(4) LUBITZ WERNER(3) MUELLER ROOSEN MARTIN(2)
FR	133 (5.5%)	4.18			1982-2011	LOREAL(8) FROMAGERIES BEL(3) VETINNOV SARL (3) BONDUELLE SOCIETE ANONYME(3) DANISCO A/S(3)	POUPARD CORINNE(3) MALOISEL JEAN PIERRE(3) BLANCHARD DANIEL(2) POTIER OLIVIER(2) FAUL PATRICK(2)
EP	123 (5.1%)	3.45			1991-2012	NESTLE SA(25) TETRA LAVAL GROUP(16) ALCAN TECHNOLOGY AND MANAGEMENT LTD(8) UNILEVER NV(6) PROCTER & GAMBLE(5)	FONTANAZZI PAOLO(5) BOTTINI GIORGIO(3) GOGLIO FRANCO(3) GUSTAFSSON PER(3) BEVILACQUA MARKUS(3)
GB	112 (4.7%)	9.14			1983-2011	UNILEVER NV(7) ASTRA ZENECA LTD(4) MARS INC(4) PHAMACIA UPJOHN S.P.A.(3) FARMITALIA CARLO ERBA S.R.L.(3)	CROSS PETER E(3) TAIT BRIAN S(2) COURTNEY WILLIAM ALEXANDER(2) ARCAMONE FEDERICO(2) LYON CHRISTOPHER J(2)

RU	105 (4.4%)	0.05			2000-2011	<p>NAUCHNO ISSLEDOVATELSKIJ INSTITUT PISHCHEKONTSENT(34) KVALENKOV OLEG IVANOVICH(24) KUBAN STATE UNIVERSITY OF TECHNOLOGY(15) RATNOJ PROMY I SP NOJ PISHCHEV(7) PA Lang(4)</p>	<p>KVALENKOV OLEG IVANOVICH(50) DOBOVOLSKIJ V F(30) GORENKOV EH S(12) ROSLIAKOVA E JU(3) JUSHINA E A(3)</p>
SE	60 (2.5%)	5.47			1979-2010	<p>TETRA LAVAL GROUP(30) ASEPT INTERNATIONAL AB(5) ASTRA ZENACA LTD(5) ERIKSSON VILHO(2) MEDIVIR AB(2)</p>	<p>STERN LEIF EINAR(4) ROSEN AKE(4) JOHANSSON KARL N G(3) RAUSING HANS A(2) LINDBORG BJOERN G(2)</p>
ES	38 (1.6%)	3.26			1982-2011	<p>NANOBIOMATTER S L(4) ABBOTT LABORATORIES(2) MARCOS DOMINGUEZ CIRILO(2) UNIVERSIDAD DE MURCIA(2) VOLPAK S A(2)</p>	<p>LAGARON CABELLO JOSE MARIA(4) GIMENEZ TORRES ENRIQUE(3) MICOL MOLINA VICENTE(1) GUTIERREZ BARTOLOME LAURA(1) MORENO CANTON JORGE(1)</p>
KR	32 (1.3%)	0.47			1997-2011	<p>CJ CHEILJEDANG CORP(9) INJE UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION(1) CHEIL JEDANG CORP(1) WOOJUNG MULSAN CO LTD(1) PARK TAE WOONG(1)</p>	<p>LEE CHANG YONG(9) KIM SANGYOU(4) CHOI JUN BONG(4) JEONG HYU YOUNG(4) KIM JONG WOOK(3)</p>

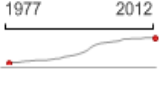



AU	29 (1.2%)	6.17			1986-2011	COMMONWEALTH SCI & IND RES ORG(3) AMCOR LIMITED(2) FOOD SPECTRUM PTY LTD(2) BROCKWELL PAUL NIGEL(1) HOLLAND ROBERT VINCENT(1)	ROONEY MICHAEL LAURENCE(2) CAREW DAVID(2) LEWIS DAVID ADRIAN(2) LEWIS VICTOR MARCUS(2) WOJTALIK JOANNA(1)
CA	8 (0.3%)	10.88			1987-2011	DONALD ROBERT A(1) LYON CHRISTOPHER J(1) ARTHURS MICHAEL D(1) KIEDROWSKI JOHN S(1) ENGRAM SARA(1)	DONALD ROBERT A(1) LYON CHRISTOPHER J(1) ARTHURS MICHAEL D(1) KIEDROWSKI JOHN S(1) ENGRAM SARA(1)







How we did it?





In order to compress all the information into a single report, we used the 360° series of reports available in the software. From the Priority Country 360° report options, we selected the priority countries and the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.


Companies - Key Statistics

Here we summarize key parameters of Top 15 companies such as filing trend, avg. number of forward citations per record, top inventors in each Companies and Coverage of underlying patent families.

Companies	Total No. of Records	Avg. No. of Fwd Cites per Patents	Filing Trend (Cumulative)	Filing Year Range	Key Inventor (Top 5)	Coverage (Includes families)									
						US	EP	WO	JP	DE	CN	AU	GB	CA	RU
TETRA LAVAL GROUP	65 (2.7%)	4.32		1979-2010	FONTANAZZI PAOLO(5) ROSEN AKE(4) FRIBERG LENNART(3) HANSSON LENNART(3) GUSTAFSSON PER(3)	46	23	10	14	15	12	6	2	4	7
KRAFT FOODS INC	41 (1.7%)	11.66		1980-2011	KINIGAKIS PANAGIOTIS(5) POKUSA KENNETH(5) RIVERO ORESTES(3) MALLY TIMOTHY G(3) SCHWARZ DEAN E(3)	31	5	2	0	0	0	0	0	2	0
NESTLE SA	36 (1.5%)	8.25		1986-2012	HUGELSHOFER WILLY(3) SHARMA RICHA(2) SJOEBERG ELISABETH(2) BRAUN MARCEL(2) BERTHOLET RAYMOND(2)	27	11	4	3	4	1	3	0	3	2
NAUCHNO ISSLEDOVATELSKIY INSTITUT PISHCHEK ONTSENT	34 (1.4%)	0		2000-2009	DOBROVOLSKIY V F(23) GORENKOV EHS(10) KVASENKOV OLEG IVANOVICH(1)	0	0	0	0	0	0	0	0	0	34

CRYOVAC INC	27 (1.1%)	12.41		1982- 2011	BEKELE SOLOMON(4) OWENSBY JOSEPH E(4) MUELLER WALTER B(3) COMPTON STEPHEN F(2) SPIGAROLI ROMANO(2)	23	2	4	2	2	1	2	0	2	0
PROCTER & GAMBLE	27 (1.1%)	16.67		1984- 2010	BONO JAMES LEE(4) GRUENBACHER DANA P(3) TUCKER LEWIS ALEXANDER(3) BUNKE PAUL RALPH(2) EKANAYAKE ATHULA(2)	23	5	3	1	1	1	1	0	1	0
GENERAL MILLS INC	26 (1.1%)	2.19		1993- 2011	DOMINGUES DAVID J(6) KIRK DAVID A(5) PERRY MICHAEL R(2) FUNK DEAN F(2) ARCHIBALD WILLIAM E(2)	24	2	2	0	0	0	2	0	0	0
KVASENKO V OLEG IVANOVIC H	24 (1%)	0		2006- 2010	KVASENKOV OLEG IVANOVICH(24)	0	0	0	0	0	0	0	0	0	24
PEPSICO INC	18 (0.8%)	5.67		1993- 2008	KNOERZER ANTHONY ROBERT(11) KOHL GARRETT WILLIAM(10) TUCKER STEVEN KENNETH(7) EDWARDS EDUARD(2) SAGEL JOE(2)	18	2	2	2	1	1	2	0	1	0
UNILEVER NV	18 (0.8%)	5.17		1988- 2009	COLE ANDREW JOHN(2) CASSETTA JAMES VINCENT(2) ROBINS CLAIRE	11	6	2	1	3	0	3	2	2	0

					LOUISE(2) VAS BHAT RAHUL DOMINIC(2) SIKKING ROB(2)												
FRES-CO SYSTEM USA INC	16 (0.7%)	11.94		1993- 2011	BEER JEFFREY SCOTT(5) GALOMB DAVID E(3) PRITCHARD BARRY(3) MARTIN BARBARA ANN(2) HELMER TIMOTHY J(1)	14	4	0	0	1	0	0	0	2	0		
ECOLAB INC	15 (0.6%)	4.2		1995- 2010	MCSHERRY DAVID D(5) HEI ROBERT D P(4) LI JUNZHONG(3) SMITH KIM R(3) MAN VICTOR F(3)	13	2	1	0	0	0	1	0	0	0		
KUBAN STATE UNIVERSIT Y OF TECHNOLO GY	15 (0.6%)	0		2000- 2006	KVASENKOV OLEG IVANOVICH(14) ROSLJAKOVA E JU(3) JUSHINA E A(3) ELIZAROVA ELENA VALER EVNA(1) GAMAJUROVA VALENTINA SEMEONOVNA(1)	0	0	0	0	0	0	0	0	0	15		
TOPPAN PRINTING CO LTD	15 (0.6%)	1.47		1993- 2008	SAKAE KENJI(2) SUGIYAMA MORIHIRO(2) CHIBA ISAO(1) MIYOSHI MASAKI(1) HAMADA KAYOKO(1)	0	0	0	15	0	0	0	0	0	0		






DUPONT	14 (0.6%)	6.71		1987-2008	CHEN JOHN CHU(3) HAUSMANN KARLHEINZ(2) REID AUSTIN H JR(1) SUBRAMANIA N NARAYANAN S(1) LEE HAN IL(1)	11	4	0	1	1	1	1	0	0	0
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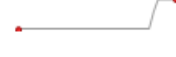


How we did it?




From the Assignee 360° report options, we selected Top 15 companies and the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.

Inventor - Key Statistics

Here we summarize key parameters of Top 15 Inventors such as filing trend, average number of forward citations per record, key associated companies and top 5 co-inventors.

Inventor	Total No. of Records	Avg. No. of Fwd Cites per Patents	Filing Trend (Cumulative)	Filing Year Range	Key Companies (Top 5)	Co-Inventors
KVASENKOV OLEG IVANOVICH	50 (2.1%)	0.02		2000-2010	KVASENKOV OLEG IVANOVICH(24) KUBAN STATE UNIVERSITY Of TECHNOLOGY(14) PA LANG (2) SITET(2) KUZNETSOVA LJUDMILA MIKHAILOVNA(1)	JUSHINA E A(3) ROSLJAKOVA E JU(3)
DOBROVOLSKIY V F	30 (1.3%)	0		2000	NAUCHNO ISSLEDOVATELSKIY INSTITUT PISHCHEKONTSENT(23) RATNOJ PROMY I SP NOJ PISHCHEV(7) EKHNOLGII(1) NII PISHCHEKONTSENT(1)	No Co-Inventor Present
GORENKOV EHS	12 (0.5%)	0		2000	NAUCHNO ISSLEDOVATELSKIY INSTITUT PISHCHEKONTSENT(10) ONSERVNOJ I OVOSHCHESUSHILNOJ PROMYSHLENNOSTI(2)	No Co-Inventor Present
KNOERZER ANTHONY ROBERT	11 (0.5%)	3.82		2000-2003	PEPSICO INC(11)	KOHL GARRETT WILLIAM(10) TUCKER STEVEN KENNETH(6) BARTEL LAWRENCE JOSEPH(1) GEHRING JAY E(1) PAPALIA ROCCO DOMINIC(1)
KOHL GARRETT WILLIAM	10 (0.4%)	4.2		2001-2003	PEPSICO INC(10)	KNOERZER ANTHONY ROBERT(10) TUCKER STEVEN KENNETH(6)

						BARTEL LAWRENCE JOSEPH(1) GEHRING JAY E(1) PAPALIA ROCCO DOMINIC(1)
LEE CHANG YONG	9 (0.4%)	0.33		2003-2010	CJ CHEILJEDANG CORP(9)	CHOI JUN BONG(4) JEONG HYU YOUNG(4) KIM JONG WOOK(3) KIM SANGYOU(3) KIM TAE HYEONG(2)
LIU XIANGHUA	8 (0.3%)	0		2007-2010	HUNAN NOVOL MEDICINE CHARTERS MATERIAL SCIENCE TECHNOLOGIES CO(6) HUNAN CHINASUN PHARMACEUTICAL MACHINERY CO(2)	PENG XUNDE(7) HUANG SHENGQIU(4)
DOMINGUES DAVID J	7 (0.3%)	2		2003-2007	GENERAL MILLS INC(6) DOMINGUES DAVID J(1) LONERGAN DENNIS A(1)	KIRK DAVID A(4) GENG QINGHUANG(1) LONERGAN DENNIS A(1) THURBUSH CLAIRE(1) TODD PURKEY(1)
LIANG HONG	7 (0.3%)	0.14		2007-2008	LIVZON GROUP LIMIN PHARMACEUTICAL FACTORY(7)	LIU DONGLAI(7) XIE HAIYAN(7)
LIU DONGLAI	7 (0.3%)	0.14		2007-2008	LIVZON GROUP LIMIN PHARMACEUTICAL FACTORY(7)	LIANG HONG(7) XIE HAIYAN(7)
PEIFFER HERBERT	7 (0.3%)	4.57		2001-2004	MITSUBISHI POLYESTER FILM GMBH(7)	HILKERT GOTTFRIED(5) KONRAD MATTHIAS(3) MUELLER ROOSEN MARTIN(2) BARTSCH STEFAN(1) CRASS GUENTHER(1)
PENG XUNDE	7 (0.3%)	0		2007-2010	HUNAN NOVOL MEDICINE CHARTERS MATERIAL SCIENCE TECHNOLOGIES CO(5) HUNAN CHINASUN PHARMACEUTICAL MACHINERY CO(2)	LIU XIANGHUA(7) HUANG SHENGQIU(3)
TUCKER STEVEN KENNETH	7 (0.3%)	3.71		2002-2005	PEPSICO INC(7)	KNOERZER ANTHONY ROBERT(6) KOHL GARRETT WILLIAM(6) BARTEL LAWRENCE JOSEPH(1)

						BEZEK EDWARD A(1) EDWARDS EDUARD(1)
XIE HAIYAN	7 (0.3%)	0.14		2007-2008	LIVZON GROUP LIMIN PHARMACEUTICAL FACTORY(7)	LIANG HONG(7) LIU DONGLAI(7)
FUTASE KATSUNORI	6 (0.3%)	0		2008-2010	YUSHIN CO. LTD.(4) YUSHIN KK(2)	SHINODA YUMA(2)
HILKERT GOTTFRIED	6 (0.3%)	4		2001-2007	mitsubishi polyester film gmbh(6)	PEIFFER HERBERT(5) KONRAD MATTHIAS(3) MUELLER ROOSEN MARTIN(2) CRASS GUENTHER(1) JESBERGER MARTIN DR(1)

How we did it?

From the Inventor 360° report options, we selected the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.

Packaging: Materials vs Companies

Which companies hold the maximum inventions across different types of materials used in packaging?

Tetra Laval Inc dominates patent holdings for Biodegradable Materials, Metals and Plastics followed by Procter & Gamble, Nestle Inc and Kraft Foods Inc. Cryovac Inc leads the record count for Polyamide and Ethylene Vinyl Alcohol.



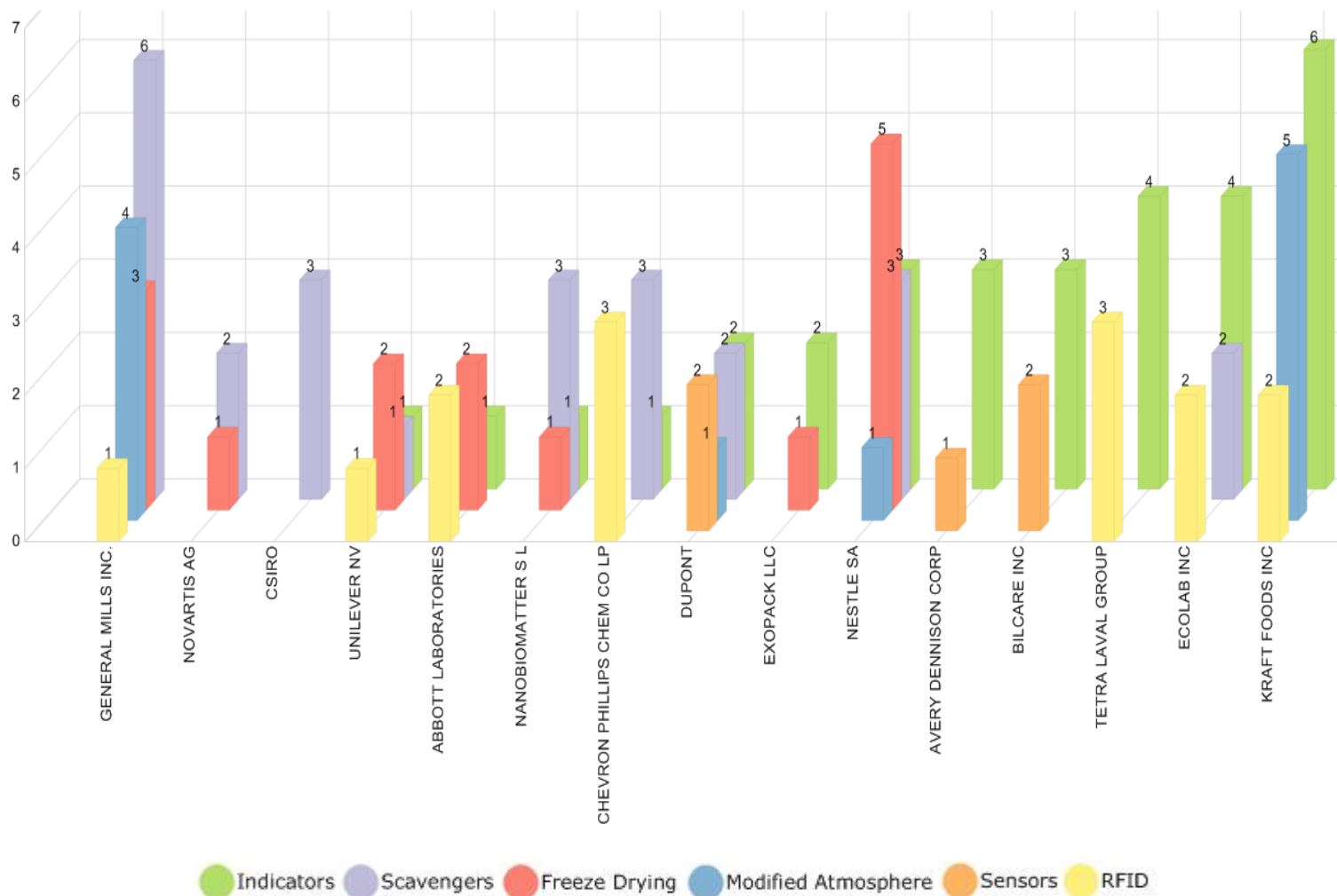
How we did it?

Once various material types were identified by online research, patents were categorized accordingly. Using the co-occurrence analyzer, the records were mapped with top 20 companies and the resulting matrix was converted into a bubble chart.

Packaging: Processes vs Companies

What are the different packaging processes used by various companies?

Dupont and Bilcare Inc are more active in using RFID's as compared to other companies



How we did it?

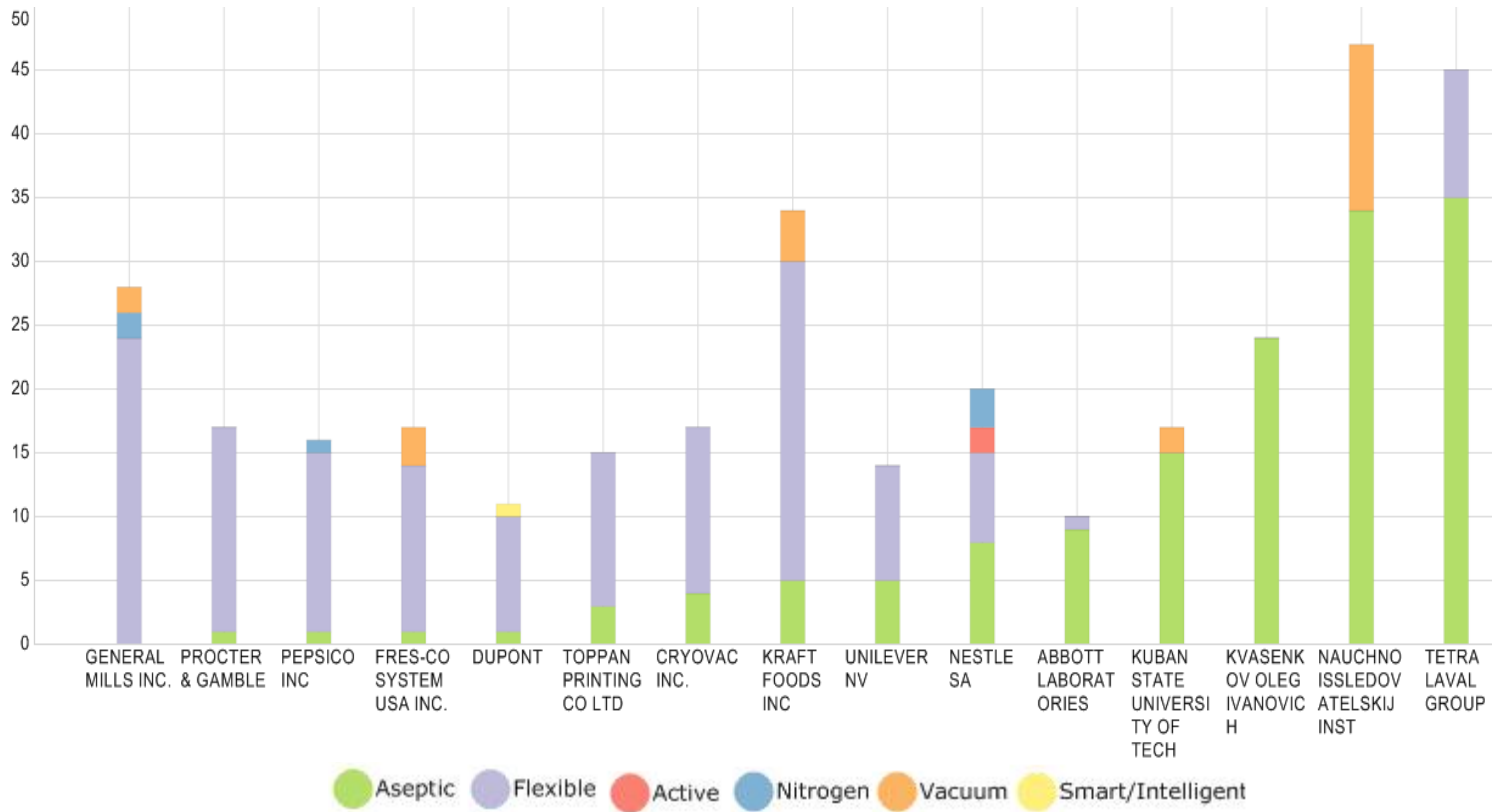
The clusters that were created for analysis were correlated using the co-occurrence analyzer and then the resulting matrix was converted into a 3-D column chart.

Packaging: Types vs Companies

How are the companies spread across different Packaging types?

Packaging Types	Total	Aseptic			Flexible			Active	Nitrogen	Vacuum	Smart/Intelligent
Companies		Aseptic	Food	Medical	Flexible	Medical	Food				
Total	302	145	136	29	152	37	133	2	6	25	1
TETRA LAVAL GROUP	41	35	35	6	8		8				
NAUCHNO ISSLEDOVATELSKIY INSTITUT PISHCHEKONTSENT	34	34	34							13	
KRAFT FOODS INC	31	4	4	2	25	1	25			5	
KVASENKOV OLEG IVANOVICH	24	24	17	10							
GENERAL MILLS INC	24				24	5	23		2	2	
PROCTER & GAMBLE	19	1	1		18	12	11				
NESTLE SA	17	7	7	4	7	2	7	2	3		
CRYOVAC INC	17	4	4		13	3	12				
PEPSICO INC	16	1	1		14		14		1		
UNILEVER NV	15	5	5	4	10	5	6				
TOPPAN PRINTING CO LTD	15	3	2	2	12	3	10				
KUBAN STATE UNIVERSITY OF TECHNOLOGY	15	15	15							2	
FRES-CO SYSTEM USA INC	14	1	1		13	4	10			3	
DUPONT	11	2	1	1	8	2	7				1
CJ CHEILJEDANG CORP	9	9	9								

The above matrix represents the number of records for various types of packaging across top 15 companies and the graph below is a cumulative graph for the same.



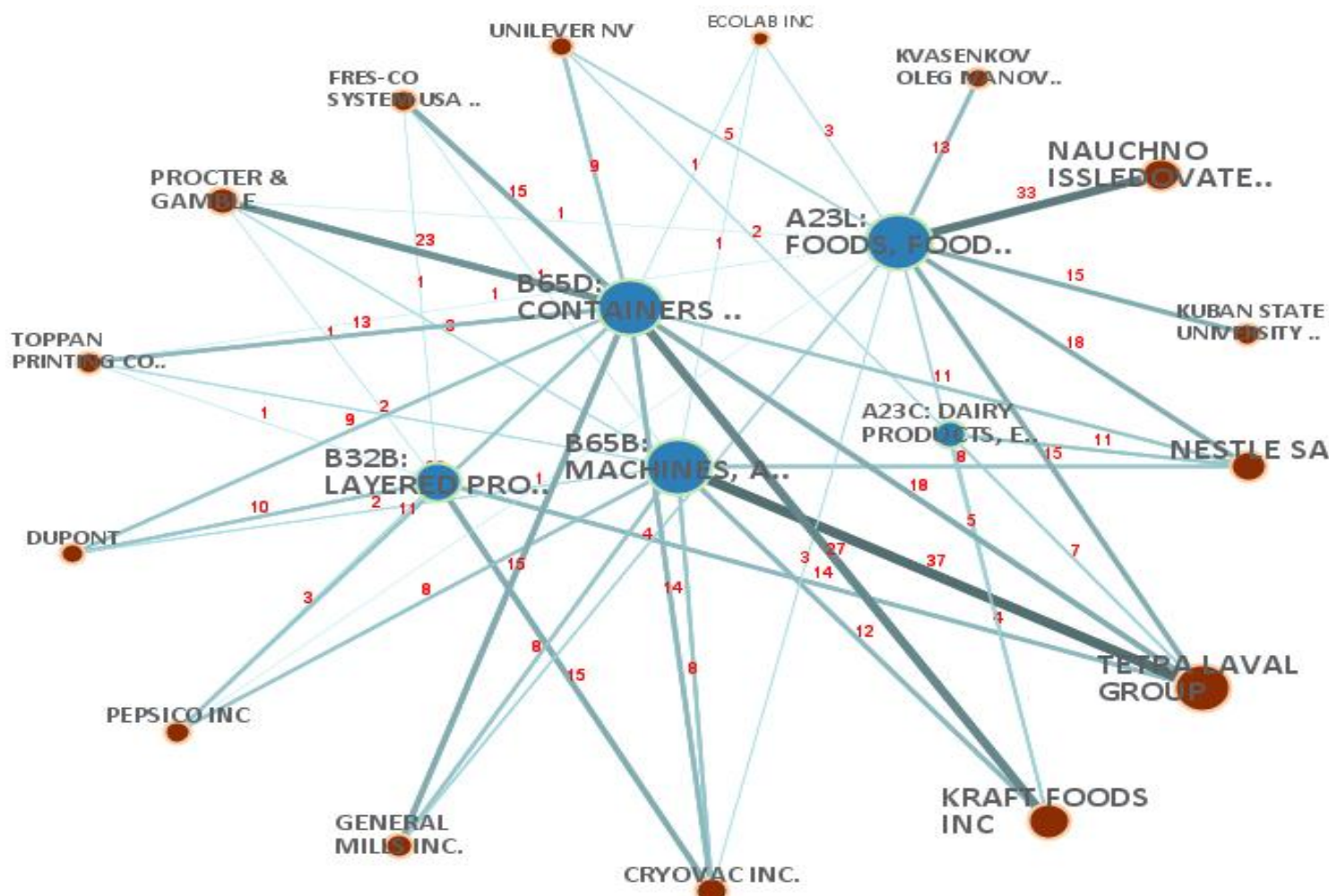
How we did it?

The clusters that were created are correlated using the co-occurrence analyzer and then the resulting matrix was converted into a stacked column chart.

Company Portfolio spread across main IPC

In the map, each company is connected through links whose thickness and color intensity is directly proportional to the number of records relating them. The number (in red) next to each line represents the number of records published in main IPC.

The map shows that Kraft Foods Inc and Procter & Gamble are actively involved in B65D: Containers for storage or transport of articles or materials.



Class Descriptions:

A23L: FOODS, FOODSTUFFS, OR NON-ALCOHOLIC BEVERAGES, NOT COVERED BY SUBCLASSES A21D OR A23B-A23J; THEIR PREPARATION OR TREATMENT, e.g. COOKING, MODIFICATION OF NUTRITIVE QUALITIES, PHYSICAL TREATMENT
A23C: DAIRY PRODUCTS, e.g. MILK, BUTTER, CHEESE; MILK OR CHEESE SUBSTITUTES; MAKING THEREOF
B32B: LAYERED PRODUCTS, i.e. PRODUCTS BUILT-UP OF STRATA OF FLAT OR NON-FLAT, e.g. CELLULAR OR HONEYCOMB, FORM
B65B: MACHINES, APPARATUS OR DEVICES FOR, OR METHODS OF, PACKAGING ARTICLES OR MATERIALS; UNPACKING
B65D: CONTAINERS FOR STORAGE OR TRANSPORT OF ARTICLES OR MATERIALS

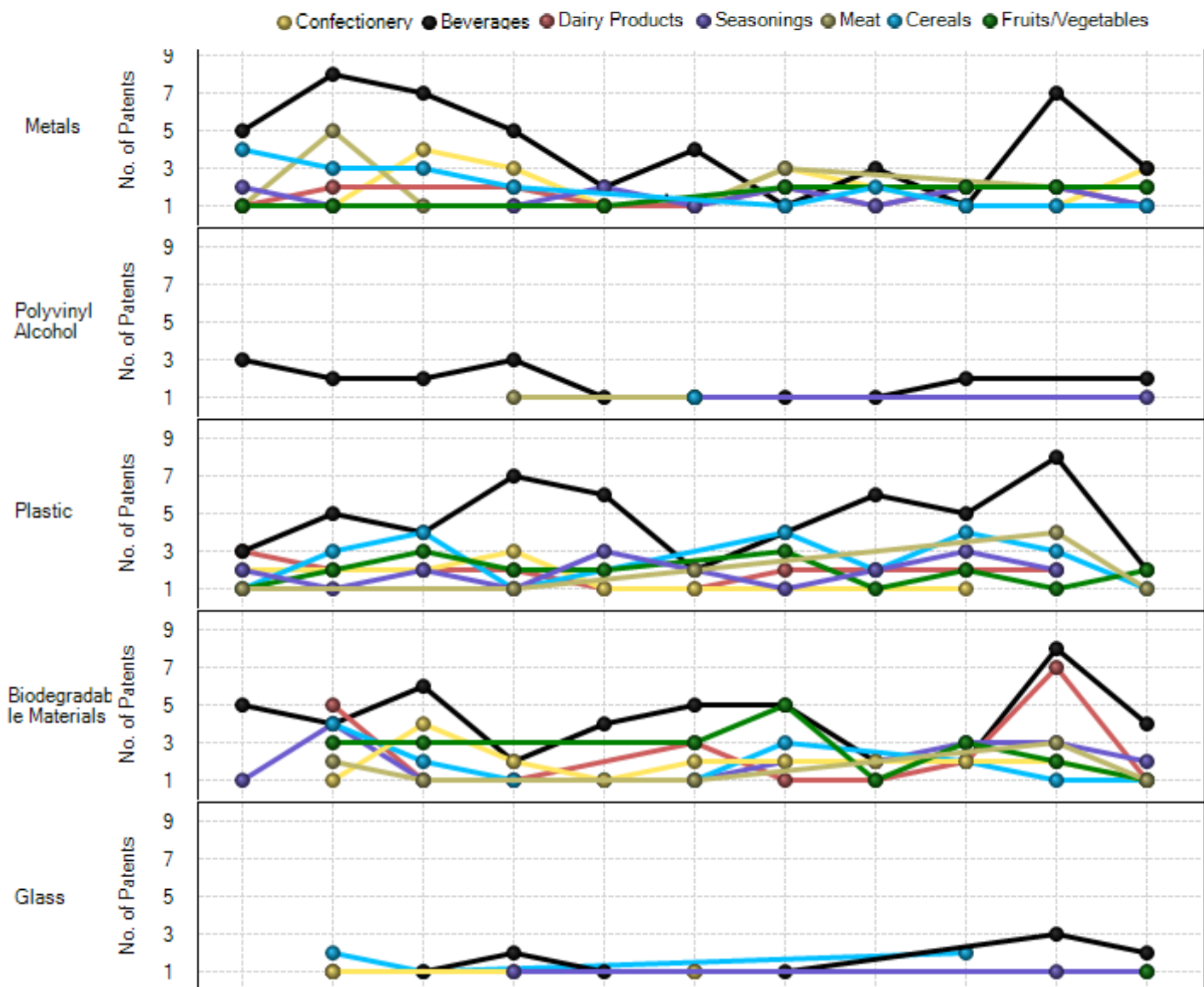
How we did it?

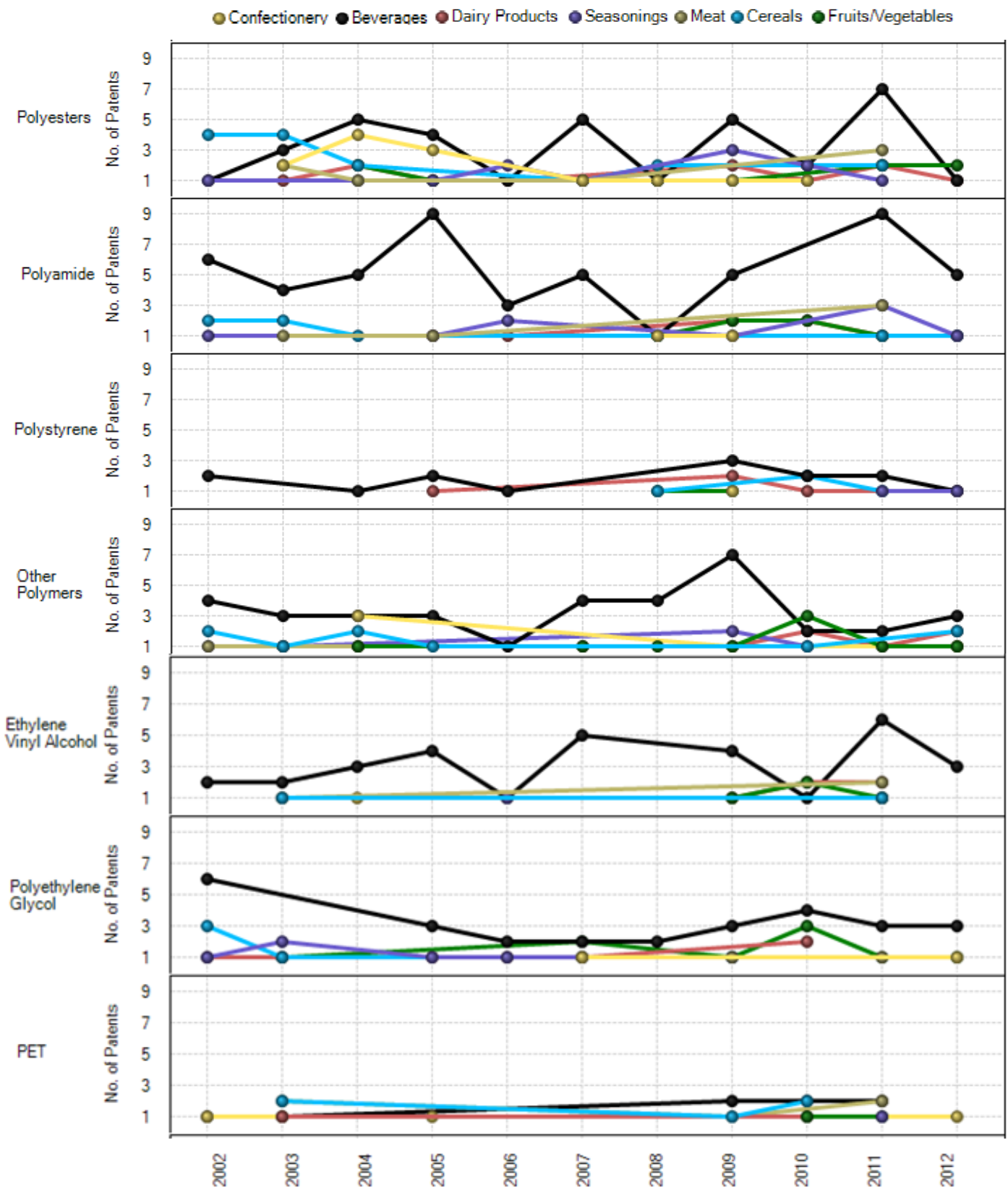
We filtered records for beverages under food formulations using co-occurrence analyzer and matrix for top 15 companies and top 5 IPC was generated. The matrix was converted to a correlation map.

Packaging: Food Formulations Vs Materials

Which materials are used across different food formulations?

From the chart we can infer that metals are used in all the different food formulations for packaging purposes.





How we did it?

The clusters that were generated analysis were correlated using the co-occurrence analyzer and the resulting matrix was converted into a 4-D Matrix containing types of materials and different food formulations, publication year and results were restricted to last decade.

Packaging Technology Landscape across various Food Types

Category: Fruits & Vegetables

The contour map below represents different technologies used in fruits and vegetables packaging with respect to complete patent portfolio. Clusters for fruit-and-berry desserts are close to each other as there is high degree of relevance between the records present in those technology areas.



Note: In the map above, records are placed based on their contextual similarity shared with neighboring records. Closer the clusters, more is the overlap or correlation between them. Each cluster or topic appears as either a shallow water area or land mass. Closely related topics collate to form larger land masses having individual peaks based on those topics that have maximum records. Labels for topics that are shared across various peaks appear between them.

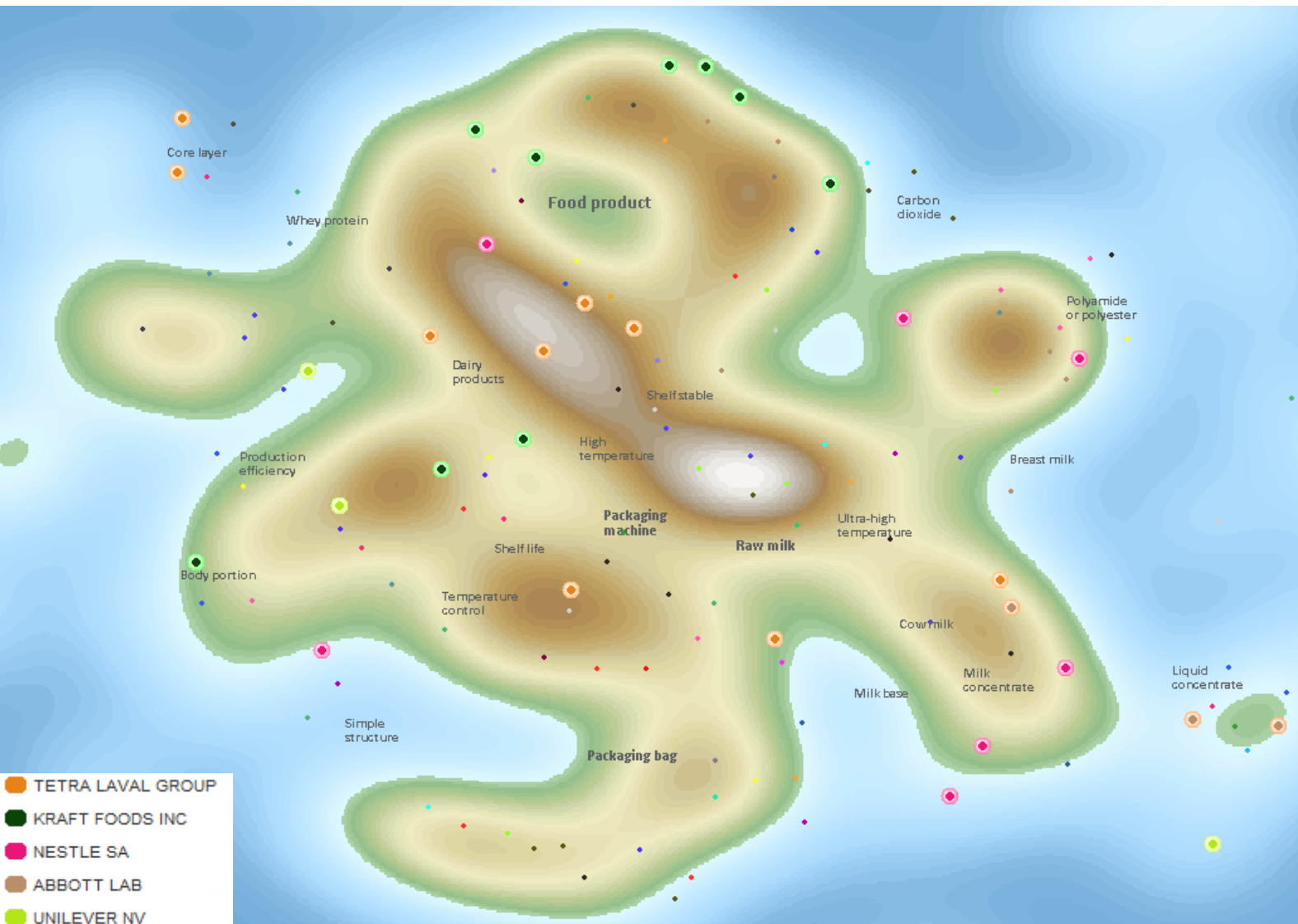
Category: Beverages

The contour map below represents different technologies used in beverage packaging with respect to complete patent portfolio. The records are coloured according to time with the darker colors representing recent records.



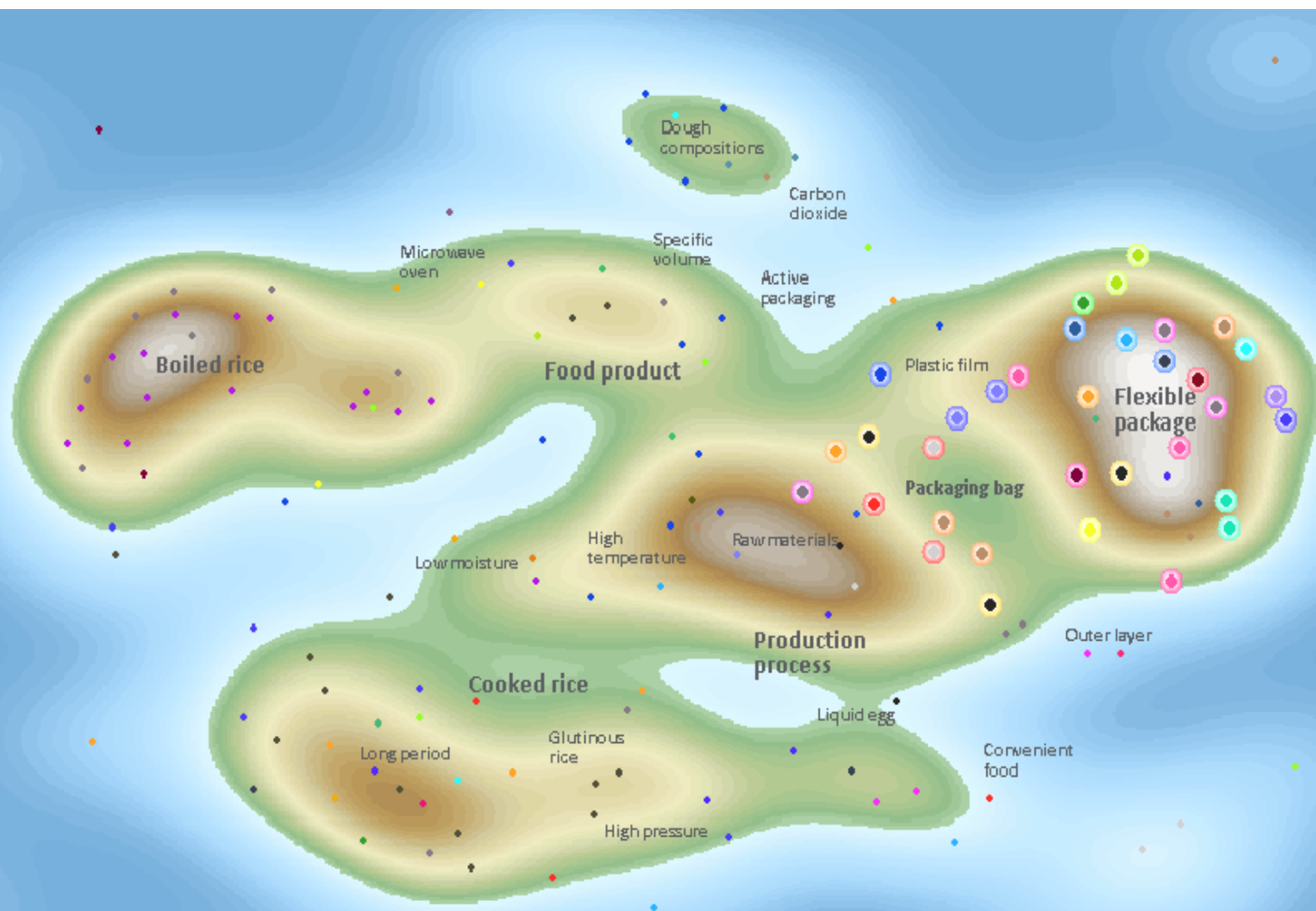
Category: Dairy Products

The contour map below represents different technologies used in dairy product packaging with respect to complete patent portfolio. The nodes were coloured by companies, as can be seen Tetra Laval has presence in most of the technology areas



Category: Cereals

The contour map below shows different technologies appearing in cereal packaging. One can see that flexible packaging is widely used and has the presence of top companies in its cluster. Dough compositions are not relevant to other clusters and that's why it is represented as an independent cluster.



How we did it?

The categories we created at the top level on food formulation types were used as the base set for creating technology landscapes. Each category was loaded into VizMAP and then contextually clustered (using Title and Abstract as the text) using the 'Context Mode' option in VizMAP to generate its technology landscape. (The contour based thematic coloring option is automatically enabled in the Context mode in VizMAP.) We refined each of the generated map in two ways. First some unrelated topics such as "Degrees C" or "Preparation Method" were removed. Second we removed unrelated patents using the "Hide Unrelated records" option. In such maps unrelated records are those that do not share any similarity with any of the generated technology. Clusters appear usually in the blue ocean areas away from the land parcels. Since they don't have any significance for the map, and then can simply be removed using the above mentioned option.

Appendix A: Key Companies Normalization Table

Note: The tables below include normalization from US Assignments database and so some companies may appear under multiple normalized names.

TETRA LAVAL GROUP

TETRA LAVAL HOLDINGS AND FINANCE
TETRA PAK INT
TETRA PAK DEV
TETRA LAVAL HOLDINGS AND FINANCE SA
TETRA LAVAL HOLDINGS AND FINANCE SA LINDQUIST ANDERS
TETRA LAVAL HOLDINGS AND FINANCE SA PALM LARS ERIK
TETRA DEV CO
TTETRA ALFA HOLDINGS

KRAFT FOODS INC

KRAFT FOODS GLOBAL BRANDS LLC
KRAFT FOODS HOLDINGS INC
KRAFT FOODS GLOBAL BRAND LLC
GEN KRAFT FRANCE

NESTLE SA

NESTEC SA
BRAUN MARCEL
NESTEC SA
NEUMANN FRED
WANG MARCEL
BERTHOLET RAYMOND
NESTEC SA
NESTEC SA
OLMOS PAOLA
PUAUD MAX MICHEL

CRYOVAC INC

GRACE W R AND CO CRYOVAC DIV
CRYOVAC INC
STOCKLEY HENRY WALKER
CRYOVAC INC
D APOLLO FRANCESCA
RE FRASCHINI ROMANO
URSINO FELICE

GENERAL MILLS INC

GEN MILLS INC
GENERAL MILLS INC
FUNK DEAN F
GEN MILLS MARKETING INC
ENGESSER MICHAEL D
GENERAL MILLS INC
PETERSON ANDREW A
WHITE STEVE D

Appendix B: Search Strings Used for Categorization

Categorization: Types

1. Active

Active	
(TAC) contains (active* w/3 packag*)	127 results

2. Aseptic

a) Food Types

Food Types	
(TAC) contains ((aseptic* w/3 packag*)and (food* or snack* or egg* or beverage* or seasoning* or dough* or doughnut* or softdrink* or dry fruit* or dryfruit* or fruit* or lettuce or vegetable* or confection* or sausage* or meat* or gelato or milk or "ice cream" or bakery or crisp* or bread or juice* or comestible or biscuit* or snack* or cookie* or tea or coffee or sauce* or oil or fish or pork or beef or poultry or pulses or ketchup or drink* or beer or wine or whiskey or whisky or seafood* or sea-food or marine* or salad* or sandwich* or burger or nut* or cheese or yogurt or curd or cereal* or pickle* or grain* or rice or wheat or maize or barley or sugar or salt or jam or jellies or soup or paste or pastes or cake* or pastr* or sake or liquor or spirit*or bean* or dairy* or miso or cheese or butter* or grape* or noodle* or soy or flour or chocolate* or toffee or candy or candies or "chewing gum" or peppermint or sweetener* or sweet or sweets or tofu or spice* or condiment* or pasta* or margarine* or comestible or marine or toast*or bun or vinegar or dessert*or wafer*))	439 results

b) Medical Types

Medical Types	
(TAC) contains ((aseptic* w/3 packag*) and (syrup* or pharma* or tonic* or medic* or ointment* or paste* or gel or cream* or powder* or excipient* or injection or syringe* or homeopath* or tablet or ampoule or ampule or globule* or ampulla or capsule* or drug* or skin or pill or pills or tablet*))	176 results

3. Flexible

a) Food Types

Food Types	
(TAC) contains ((flexible w/3 packag*) and (food* or snack* or egg* or beverage* or seasoning* or dough* or doughnut* or softdrink* or dry fruit* or dryfruit* or fruit* or vegetable* or confection* or sausage* or meat* or gelato or milk or "ice cream" or (pet w/2 food*) or bakery or crisp* or bread or juice* or comestible or biscuit* or snack* or cookie* or tea or coffee or sauce* or oil or fish or pork or beef or poultry or pulses or ketchup or drink* or beer or wine or whiskey or whisky or seafood* or sea-food or marine* or salad* or sandwich* or burger or nut* or cheese or yogurt or curd or cereal* or pickle* or grain* or rice or wheat or maize or barley or sugar or salt or jam or jellies or soup or cake* or pastr* or sake or liquor or spirit* or bean* or dairy* or miso or cheese or butter* or grape* or	711 results

noodle* or soy or flour or chocolate* or toffee or candy or candies or "chewing gum" or peppermint or sweetener* or sweet or sweets or tofu or spice* or condiment* or pasta* or margarine* or comestible or marine or toast* or bun or vinegar or dessert* or wafer*))

b) Medical Types

Medical Types	
(TAC) contains ((flexible w/3 packag*) and (syrup* or pharma* or tonic* or medic* or ointment* or paste or pastes or gel or cream* or powder* or excipient* or injection or syringe* or homeopath* or tablet or ampoule or ampule or globule* or ampulla or capsule* or drug* or skin or pill or pills or tablet*))	403 results

4. Nitrogen

Nitrogen	
(TAC) contains (nitrogen* w/3 packag*) or ((packaging or inert or noble or propellant or reactive or volatile) w/2 gas*)	46 results

5. Intelligent/Smart

Intelligent/Smart	
(TAC) contains ((intelligent* or smart*) w/3 packag*)	33 results

6. Vacuum

Vacuum	
(TAC) contains (vacuum* w/3 packag*)	88 results

Categorization: Food Formulations

1. Beverages

a) Alcohol

Alcohol	
(TAC) contains ((Wine* or whiskey or whisky or sake or beer* or alcohol* or liquor* or spirit*) and pack*)	149 results

b) Other Beverages

Other Beverages	
(TAC) contains ((softdrink* or soft-drink* or juice* or beverage* or drink*) and pack*)	160 results

c) Tea/Coffee

Tea/ Coffee	
(TAC) contains ((tea or coffee* or coco) and pack*)	64 results

2. Cereals

Cereals	
(TAC) contains ((rice or barley or flour or grain* or wheat* or pulses or maize or cereal*) and pack*)	170 results

3. Confectionaries

Confectionaries	
(TAC) contains ((bread* or cake* or muffin* or pancake* or chocolate* or toffee or candy or candies or "chewing gum" or peppermint or biscuit* or cookie* or crisp* or confection* or baker* or pastr* or jam or jelly or toast* or bun or burger* or dough* or doughnut* or chips or wafer* or toast* or yeast) and pack*)	152 results

4. Cooking Oil

Cooking Oil	
(TAC) contains ((edible* or vegetable* or olive* or cooking* or coconut*) w/2 oil*) and pack*)	35 results

5. Fruits/Vegetables

Fruits/Vegetables	
(TAC) contains ((vegetable* or fruit* or salad* or soup*) and pack*)	271 results

6. Meat

a) Livestock

Livestock	
(TAC) contains ((chicken or poultry* or livestock* or pork or beef or egg* or sausage*) and pack*)	77 results

b) Sea Food

Sea Food	
(TAC) contains ((marine* or fish or sea-food* or seafood*) and pack*)	42 results

7. MRE

MRE	
(TAC) contains ((self* w/2 (cool* or heat* or chill* or warm*)) or flameless* or "ready-to-eat" or (Ready* w/2 (eat* or cook)) or MRE or "ready-to -eat")	49 results

8. Other Food Formulations

Other Food Formulations	
(TAC) contains ((noodle* or starch or (pet w/2 food*) or pickle or gelato or gelatin* or soya* or sugar or sweetner* or flour or salt or spice* or condiment*) and pack*)	276 results

9. Seasonings

Seasonings	
(TAC) contains ((miso or meso or soy or soya or sauce or flavour* or flavor* or ketchup* or vinegar*) and packa*)	155 results

Categorization: Medical Formulations

1. Ampules

Ampules	
(TAC) contains ((pharma* or medic*) and (ampule* or ampoule* or ampulla))	7 results

2. Excipients

Excipients	
(TAC) contains(excipient* and (medic* or pharma*))	21 results

3. Injection/Syringe

Injection/Syringe	
(TAC) contains ((injection* or syringe*) and pack*)	135 results

4. Ointments

Ointments	
(TAC) contains ((pharma* or medic*) and (ointment* or cream* or paste* or gel) and pack*)	24 results

5. Other Medical Formulations

Other Medical Formulations	
(TAC) contains(((tablet or pill* or syrup* or capsule*) and packag*) and (medic* or pharma*))	22 results

Categorization: Processes/Technologies

1. Canning

Canning	
(TAC) contains (canning or canned or caning)	12 results

2. Freeze Drying

Freeze Drying	
(TAC) contains ("Freeze-dried" or "Freeze-drying" or "Freeze-dried" or trehalose or sucrose or polyalcohol* or polyhydroxy* or freeze* or "dry ice" or dehydrat* or lyophilisation or lyophilization or cryodesiccation or (freeze* w/2 (dry* or dried or dried)))	76 results

3. Indicators

Indicators	
(TAC) contains (indication* or indicate or indicates or sens* or TTI or time* temperature* or (temperature w/2 record*))	189 results

4. Modified Atmosphere

Modified Atmosphere	
(TAC) contains (((modified* or equilibrium*) w/2 atmospher*) or "temperature monitor" or aerobic or EMAP or MAP or flushing or compensated or breathable)	41 results

5. RFID

RFID	
(TAC) contains (RFID or "radio frequency")	22 results

6. Scavengers

Scavengers	
(TAC) contains (scaveng* or evaporat or (oxygen* w/2 (absorb* or control*)) or oxidation* or oxydation* or (moisture* w/2 (migration or control*)))	83 results

7. Sensors

Sensors	
(TAC) contains (biosensor* or ripeness* or spoilage* or sensor*)	75 results

Categorization: Materials

1. Amorphous Polyethylene Terephthalate

Amorphous Polyethylene Terephthalate	
(TAC) contains(("amorphous polyethylene terephthalate" or "APET") and pack*)	2 results

2. Biodegradable Materials

a) Cardboard

Cardboard	
(TAC) contains ((cardboard* or paperboard* or chipboard*) and pack*)	65 results

b) Paper

Paper	
(TAC) contains ((kraft* or sulfite* or sulphate* or greaseproof or glassine* or parchment* or killer* or paper or paper-bag or cellophane* or cellulose) and pack*)	240 results

3. BoPET

BoPET	
(TAC) contains ((BoPET or "Biaxially-oriented polyethylene terephthalate" or Mylar or Melinex or Hostaphan) and pack*)	7 results

4. Ethylene Vinyl Alcohol

Ethylene Vinyl Alcohol	
(TAC) contains (("Ethylene vinyl alcohol" or EVOH or "vinyl acetate" or "ethylene vinyl acetate" or EVA) and pack*)	79 results

5. Glass

Glass	
(TAC) contains (glass)	47 results

6. Metals

a) Aluminium

Aluminium	
(TAC) contains ((aluminium* or AL) and pack*)	63 results

b) Other Metals

Other Metals	
(TAC) contains (((canister* or tin-free or alloy* or aerosol* or metal*) and not(aluminium or AL or SN or tin* or tinplate or tin-plate))and pack*)	232 results

c) Steel

Steel	
(TAC) contains ((steel) and pack*)	21 results

d) Tinplate

Tinplate	
(TAC) contains((tinplate or SN or tin-plate) and pack*)	3 results

7. Nitrocellulose

Nitrocellulose	
(TAC) contains ((Nitrocellulose or "cellulose nitrate" or (flash w/3 (paper or cotton or string) or pyroxylin or "guncotton" or "gun cotton") and pack*))	5 results

8. Other Polymers

Other Polymers	
(TAC) contains (((polymer or polymers) and not (PVA or PVAI or polyactide or polyhydroxyalkanoate* or PHA or polylactic or PLA or polyvinyl or POVH or	166 results

compost*)) and pack*)

9. PET

PET	
(TAC) contains ("terephthalate glycol" or PET or PETE or (poly(ethylene terephthalate)))	47 results

10. Plastics

a) Films

Films	
(TAC) contains (((film* or gelatin* or opal* or photonic or "color changing") and plastic*) and not (extrusion* or foil*))	122 results

b) Foils

Foils	
(TAC) contains ((foil* and plastic*) and not (laminat* or extrusion* or film*))	23 results

c) Laminates

Laminates	
(ttl to spec) contains ((laminat* and plastic*) and not (foil* or extrusion* or film*))	26 results

d) Other Plastics

Other Plastics	
(ttl to spec) contains ((plastic* or blister*) and not (laminat* or extrusion* or film* or foil*))	210 results

11. Polyamide

Polyamide	
(TAC) contains ((Polyamide or Aliphatic or Polyphthalamides or Aramides or copolymers or homopolymers) and pack*)	130 results

12. Polyesters

Polyesters	
(TAC) contains ((polyester* or polycarbonate* or polybutyrate* or thermoplastic* or thermoset*) and pack*)	204 results

13. Polyethylene Glycol

Polyethylene Glycol	
(TAC) contains (glycol or polyether or "polyethylene oxide" or PEO or "polyoxyethylene" or POE or Carbowax or GoLYTELY or GlycoLax or Fortrans or TriLyte or Colyte or Halflytely or Macrogol or MiraLAX or MoviPrep)	90 results

14. Polyethylene Terephthalate Glycol

Polyethylene Terephthalate Glycol	
(ttl to spec) contains (("terephthalate glycol" or PETG or "polietilentereftalato ") and pack*)	4 results

15. Polyhydroxyalkanoates

Polyhydroxyalkanoates	
(TAC) contains ((polyhydroxyalkanoate* or PHA) and pack*)	2 results

16. PolylacticAcid

Polylactic Acid	
(TAC) contains ((polyactide* or polylactic* or PLA) and pack*)	10 results

17. Polystyrene

Polystyrene	
(TAC) contains ((Polystyrene or PS or thermocole) and pack*)	47 results

18. Polyvinyl Alcohol

Polyvinyl Alcohol	
(TAC) contains (("polyvinyl alcohol" or POVH or PVA or PVAI) and pack*)	24 results

19. Polyvinyl Chloride

PolyvinylChloride	
(TAC) contains (("polyvnil chloride" or PVC or polychloroethylene) and pack*)	13 results

20. Polyvinylidene Chloride

Polyvinylidene Chloride	
(TAC) contains (("polyvinylidene chloride" or PVDC or "vinylidene chloride") and pack*)	40 results

Summary

This report categorizes and graphically analyzes packaging technologies, types and materials used in food and medical packages from various perspectives and highlight the key companies involved. The contextual similarity between different technologies across complete patent portfolio is represented by contour maps. In contour the distance between clusters is proportional to the difference between patent themes.



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Sources & References

1. http://en.wikipedia.org/wiki/Packaging_and_labeling
2. http://en.wikipedia.org/wiki/Active_packaging
3. <http://www.packagingconsultancy.com/articles/active-intelligent-food-packaging.html>
4. http://wikieducator.org/Food_Packaging_Technology
5. http://en.wikipedia.org/wiki/Food_packaging
6. http://en.wikipedia.org/wiki/Packaging_engineering

