

December 2022

pcc

CHEM NEWS

Newsletter of the PCC Rokita Capital Group and affiliated companies



Merry Christmas



Merry Christmas!

May this Christmas season bring you peace,
joy and cheer, and all the best
in the coming year of 2023

Wiesław Klimkowski

PRESIDENT OF THE MANAGEMENT BOARD OF PCC ROKITA

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PCC CHEM NEWS

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PCC Group at *Lubricant Expo 2022*

The Lubricant Expo – a new, and straight away the largest industry event in Europe, was held on 5th-9th September in Essen, Germany. Both the fair and the accompanying conference enjoyed a lot of interest from companies and institutions operating in the lubricants and machining fluids industry.



More than a hundred exhibitors took part in the event to present their latest achievements in the field of industrial lubrication processes, state-of-the-art solutions to increase the efficiency of OEMs as well as strategies and technologies to improve the performance and reliability of new technologies. The important issue of sustainable development, and thus the technologies that reduce the negative impact on the environment, was frequently raised during the fair and the conference.

Beside such exhibitors as Exxon Mobil, Texaco, Castrol, ENI, Q8, Cargill, there was also the PCC Group, presenting its product offer in a dedicated exhibition area in a very interesting way. Our stand was visited by both current and potential customers, raw material suppliers, and representatives of industry institutions and organisations.

The numerous meetings held during the Lubricant Expo were an excellent opportunity for us to revive business contacts and present in person the new product offer after the long and difficult

period of the pandemic. As companies cooperating within the PCC Group, we presented a joint portfolio of base oils and additives. It was also a great opportunity to find out more about current market needs and trends.

We are convinced that our presence at the Lubricant Expo has led to much greater recognition of the PCC Group as a professional lubricant supplier.

It is certain that we will continue to participate in the future editions, which is why we would like to already invite you to the upcoming meetings at Lubricant Expo 2023 Essen, on 23rd-28th September 2023!

Beata Gruś
Marketing Department Manager
PCC Group





The HPCI CEE trade fair has come and gone

Central and Eastern Europe’s producers and experts in the Home and Personal Care industries all gathered to participate in the 10th edition of the HPCI CEE fair at the EXPO XXI Warsaw centre. At the event, exhibitors operating in the cosmetics and household chemicals industry presented their latest achievements in the field of modern raw materials for production and their formulation.

This year’s exhibitors included also PCC EXOL, which – together with its partners (Donauchem Polska Sp. z o.o., Sharon Laboratories, Jojoba Desert (A.C.S) Ltd., Zschimmer & Schwarz and VVF Group) – presented a rich product portfolio of raw materials, additives and chemical formulations dedicated to the detergents and cosmetics industry.

In addition to numerous meetings with current customers and suppliers, the HPCI CEE fair gave us a great opportunity to both obtain new business contacts and gain valuable knowledge on current trends and needs and the industry’s development direction.

For us, as well as for our partners, this year’s HPCI fair was an undisputed success, as confirmed by the very large attendance, the number of contacts made, and a lively interest in the product offer.

Beata Gruś
Marketing Department Manager
PCC Group



The first HPCI (Home and Personal Care Ingredients) Central and Eastern Europe fair was held in 2009, and it has been growing in popularity ever since. The fair is now one of the most important events in the industry of supplies for the production of cosmetics and household chemicals in the Central and Eastern Europe region. All throughout the fair, exhibitors from around the world present the latest solutions dedicated to the Personal Care and Home Care industries. In addition to a wide range of raw materials, exhibitors present also the latest scientific research, new production technologies, innovation in software as well as in test and measurement solutions.





PCC EXOL at the international SEPAWA 2022 congress in Berlin!

*Industry event for producers in the detergent
and cosmetics industry.*

This year, PCC EXOL participated in the SEPAWA fair to present a wide range of modern surfactants and industrial formulations, including such dedicated to the cosmetics and detergent industry.

The company's offer enjoyed great interest among both the exhibitors and visitors from various parts of Europe and the world. Particular attention was paid not only to our products dedicated to the production of detergents and cosmetics, but also to our novelties from the specialist surfactants group used for many other industrial applications. Our specialists answered numerous questions regarding, for example, low-foaming surfactants.

SEPAWA is more than a presentation of the latest trends in the detergent industry. It is also a platform for the exchange of knowledge and experience between cosmetics manufacturers.

Through presenting their commercial offers, companies operating in this branch of industry set industry trends and shape change in terms of new func-

tionality and applications that improve the quality and usability of finished products. PCC EXOL was at the fair to also present its range of products dedicated to the cosmetics and personal hygiene industry. Cosmetic formulations prepared by our R&D department turned out to be a huge hit.

What will the company present at the next SEPAWA fair?

Perhaps we'll see in a year's time!

Beata Gruś
Marketing Department Manager
PCC Group



SEPAWA is a combination of a conference and an exhibition event. This year, the organisers had prepared an agenda consisting of over 150 thematically diverse lectures and presentations for approx. 3,000 participants and made it possible for nearly 300 companies to present their product offer at specially designed stands. The most interesting points in the Sepawa fair's programme are the European Detergents Conference, the Forum for Innovation, the Science Conference.



The PCC Group

More than **1,200** chemical products
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industrial applications



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intermediate products

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and packaging

Surfactants

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products

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PCC Exol at the Green Forum of the Cosmetics and Detergent Industry

The 4th October saw the Polish Association of the Cosmetic and Detergent Industry celebrate in Warsaw its 30th anniversary. A forum of the cosmetics and detergent industry entitled “Don’t Miss the Green – New Responsibilities or Opportunities?” was an integral part of the celebrations.



The event was attended by, among others, PCC EXOL, which represented the environment of producers of raw materials and additives for cosmetics and detergents.

The meeting of the representatives of the cosmetics and detergent industry was an excellent opportunity for them to discuss the upcoming changes involving environmental protection activities. It is already clear today that both these areas will face a number of projects and significant legislative changes that every company will have to adjust to quickly. Changes and new legislative obligations will apply to every producer placing raw materials and finished products on the market.

In line with the conference’s theme, Małgorzata Wadzińska, President of the Association, delivered the inaugural address “Is Green Inevitable?” Experts and representatives of such organisations as: Cosmetics Europe, A.I.S.E., FEA, IKW were invited to participate as speakers. The organisations were rep-

resented by: Birgit Huber, John Chave, Sascha Nissen and Alain D’Haese, who presented the European perspective on the Green Deal project.

Conference participants heard also speeches given by representatives of Polish industry institutions. The national perspective on the legislative changes related to the Green Deal was presented by Andrzej Kalski, representing the Bureau for Chemical Substances, and Izabela Burzyńska from the Chief Sanitary Inspectorate.

The high-level content focusing on the most important pro-environmental legislative initiatives along with the presence of high-class European and Polish experts have greatly contributed to the participants’ eagerness to take part in the next edition of the Cosmetics and Detergent Industry Forum.

See you next year!

Beata Gruś
Marketing Department Manager
PCC Group



Chemical alphabet of PCC Group

- products and raw materials from A to Z!

The name "alphabet" comes from the first 2 letters of the Greek alphabet - "alpha" and "beta"? The Greek script was called the "alphabet", hence the name also spread to the Latin script



Thanks to the alphabet, we can effectively organize various data, names or sets. The order of the letters in the alphabet affects the alphabetical order of the information being sorted.

Currently, the PCC Group Product Portal offers a new functionality consisting in searching for products of our companies in alphabetical order.

The chemical names of the offered raw

materials, additives or industrial formulations have been arranged according to the order of the letters in the alphabet. The chemical alphabet of the PCC Group is a solution that takes into account the special preferences of our platform users.

In addition to the recently published alphabetical list, our users can search for products by CAS number, INCI name, industry and application, function, chemical structure and business seg-

ment. It is also possible to generate a list of products manufactured by individual companies and units operating within the PCC Group.

Marketing Department
PCC Group

<https://www.products.pcc.eu/en/chemical-names/>

Green Chemistry

PCC GREENLINE a new segment
of sustainable products

Surfactants,
industrial formulations,
raw materials and additives.



Learn more at
www.products.pcc.eu/en/green-chemistry/

PCC Intermodal

go healthy – go orange!

This time around, the challenge we set for our employees and customers was all about preparing something healthy, delicious and surprising to eat using orange-coloured ingredients only. Let's see what we "cooked up". Here are the photos.









Bon appétit and bon orange to all.

Katarzyna Uklejewska-Krawczyk
External Communication Specialis
PCC Intermodal

We've got chemistry!

28th October 2022 was the day we started a series of chemical workshops in local primary schools – in Brzeg Dolny and Wołów.

"We've got chemistry" is the watchword of our meetings, which aim to show that chemistry accompanies us in many areas of life, and learning it is important from an early age! Our young laboratory technicians have a chance to do chromatography on young beet leaves, flowers, but also to create, on their own, a "Chemical garden" of colourful crystals! All experiments are carried out safely – wearing aprons, glasses and gloves, which have stirred a lot of emotions in students – positive ones, of course.

We are very pleased with the high interest in our meetings – who knows, maybe there's a future chemist among the participants?

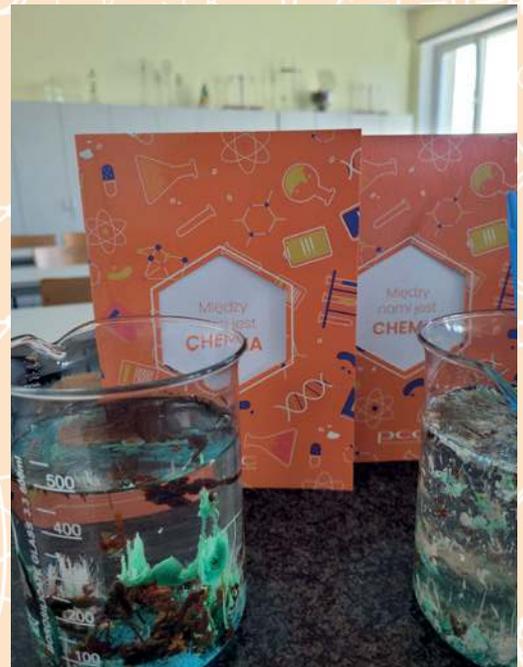
We're secretly hoping there is – after all, "we've got chemistry"

Soon to begin is recruitment to our new class of the Technical Secondary School of Chemistry at the Complex of Vocational Schools in Brzeg Dolny! Scholarships for students, a school starter kit, a school trip, practical vocational training – this is just a part of what we have in stock for the students!

More info coming soon!

Karolina Ławecka
HR Specialist
PCC Group







An internships at PCC

Last September saw the end of the 4th edition of the internship programme under the project: "ZPR PWr – Integrated Programme for the Development of Wrocław University of Science and Technology" no. POWR.03.05.00-00-Z301/17, financed under Priority Axis: III Higher Education for the Economy and Development; Measure 3.5. Comprehensive Programmes for Higher Education Institutions; Operational Programme Knowledge Education Development.

This is the last stage of the project, under which students of the 6th semester of engineering studies at the Faculty of Chemistry of Wrocław University of Science and Technology took part in three-month internships in the PCC Group. Students have been doing internships under this project since 2019, which has allowed several dozen students to learn the nature of work in the labs of Labanalitka, research departments of PCC Rokita (Polyols complex and Phosphorus Chemistry complex), PCC Exol, PCC MCAA, PCC CP Kosmet, and technology departments of PCC Rokita (Polyols complex and Phosphorus Chemistry complex).

The last edition of the internship programme was participated in by 16 students. In addition to the internships, students had the opportunity to gain additional competences as part of the interpersonal communication training (more on that in another article) and learn more about the work of chemical engineers in other areas through meetings with the director of the polyols complex, Sergiusz Stefanowski, and sales manager, Jakub Lipowczan.

In the students' assessment, the first meeting was interesting, as prior to it they hadn't seen any job offers and development opportunities for chemical engineers outside the laboratory, so the PCC Group's job market offer is quite unique in this respect. Students confirmed that director Stefanowski provided interesting facts on the everyday life and development of the company and appreciated the approachable and understandable way of providing information as well as the time devoted

to them. Jakub Lipowczan's presentation also aroused great interest as he showed the path of development from a PCC apprentice to a sales manager. Jakub too is a graduate of Wrocław University of Science and Technology, so for the students, he was a credible example of a chemical faculty graduate's career development.

Some of the interns have already tied their professional careers to the PCC Group, becoming either scholarship holders or our employees, which perfectly confirms how effective the internship programmes have been.

We would also like to thank all internship supervisors – specialists managing employees from PCC Rokita, PCC Exol, PCC MCAA, Lbanalitka and PCC CP Kosmet – for their commitment to teaching and introducing trainees to the intricacies of the chemical industry.

Internships under the "ZPR PWr – Integrated Programme for the Development of Wrocław University of Science and Technology" project ended in September, but students will still be able to take advantage of annual internships carried out by the PCC Group in the technical, technological, research and development or financial controlling departments.

Izabela Dreja-Dulewska
HR Business Partner
PCC Group

And how did the interns evaluate the internships and the teams they worked in?

Let us hear from the interns themselves – here are some of the opinions they shared with us after the internship:

Intern technologist at PCC Rokita

My opinion of the internship is positive. There really isn't anything I would remove or add. The entire PCC team I worked with showed great interest. The atmosphere prevailing during the internship made me gladly come to the plant again and again. Both the supervisor and the employees tried to make me feel as comfortable as possible. I would gladly do the internship again if I could. Whenever I had any doubts, I could easily ask or consult the supervisor and the employees of the Phosphorus Chemistry complex. Each and every employee was willing to share their knowledge, interesting facts and various technological solutions. All throughout the internship, everyone was willing to help and explained things concisely and clearly. To sum up, thanks to the vast knowledge of the FTT-1 and FTT-2 departments' employees, I could always count on support during the internship, I was never left without an answer to any question I asked.

What I liked most about the internship were:

Intern in the analytical laboratory of Labanalitika

The internship programme offers great development opportunities, and the acquired skills will certainly be useful in future career. During the internship, I felt like part of the team. I could always count on the support and assistance of more experienced employees. The questions I asked were never dismissed, and any problem that arose was always solved together.

What I liked the most were:

- the chance to conduct analyses by myself,
- participation in additional workshops/trainings,
- using different types of apparatuses.

The PCC Group is an ideal place of internship/work. I would recommend it to my friends for all the interest in the intern, i.e. detailed, efficient presentation of documentation, assistance in various situations, patient explanations, not treating the intern as a liability. The atmosphere that prevails there certainly encourages entering into cooperation.

- The involvement of the PCC Rokita team in passing on knowledge to the student, treating the student like a member of the team.
- Numerous trainings showing development opportunities in the PCC group and training in team communication.
- Huge support from the supervisor and employees of the Phosphorus Chemistry complex.

I would gladly recommend PCC Rokita as a place of internship/work. The factors that encourage this decision include: great prospects offered by the company, very pleasant atmosphere, and teams' high commitment. The large number of specialised departments means that everyone will probably find something for themselves. Also, the possibility to participate in various interesting training courses that develop both your knowledge and interpersonal skills makes PCC Rokita a company worth recommending as a place of internship/work.

Intern in the R&D laboratory of PCC Rokita

The internship programme is well thought out. It is diverse, and you can learn a lot. It allows you to acquire new skills. The number of hours is sufficient. Workshops conducted by the company's HR department are very interesting, and I would increase their number. The only thing I would change is to reduce the number of documents to fill out and submit. I could always count on an explanation of any given issue, an answer to any question asked. They taught me how to use all the equipment in their lab and were happy to talk about the research and projects they were working on at the time. They showed me what it's like to work in an R&D department, and they were always very kind.

What I liked most about the internship:

- First of all, the working atmosphere. The team I joined turned out to be very friendly, thanks to which I didn't stress about work.
- The possibility to work independently. I could perform analytical research on my own and draw my own conclusions from it.
- The opportunity to work on a pilot plant

I would definitely recommend taking a job or doing an internship at PCC Rokita given the friendly working atmosphere, the possibility to work independently in the lab, and flexible working hours. The internship gives you the opportunity to develop many skills, such as precision, analytical thinking, communicativeness, attentiveness, organisation and teamwork.

Christmas chemistry

What does Christmas smell like?

Christmas is coming up fast. Some of you have probably started unboxing Christmas decorations back in November, while others still get annoyed with the often repeated adverts starring Santa Claus or Christmas hits played over and over again on the radio. For most people celebrating Christmas, it is a busier, and so a more stressful time.

Christmas fever takes its toll on everyone, but once you get a good whiff of Christmas, the world somehow becomes better, more beautiful...

Where does the smell of Christmas actually come from? How is it that we can physically feel the spirit of Christmas?



The smell of the forest

A green Christmas tree smelling like the forest... A smell of resin, the forest, Christmas, so close to heart, awaited all year round. This wonderful characteristic scent of Christmas comes with conifers such as pines, firs and spruces. The beloved scent of the Christmas tree is due to an organic compound called -pinene and found in resin. It is a terpene hydrocarbon with antibacterial and anti-inflammatory properties. It effectively supports the immune system in preventing cancer and improves memory. It also acts as an effective insecticide.



Christmas carp

Christmas Eve wouldn't be the same without a delicious carp. Whether fried, jellied or in sour cream, it is the undisputed king of the Christmas Eve supper. Its characteristic earthy smell comes from an organic compound called geosmin. It is also found in beets, which means it is also present in our beloved red borscht. Interestingly, the smell of this substance is also noticeable after heavy summer rain, especially after a period of drought. Humans can recognise the smell of geosmin even when its concentration is only five parts per trillion. The specific smell of geosmin can be easily eliminated with vinegar.



Christmas spices

Another smell that accompanies us during Christmas is that of clove, whose specific scent comes from a substance called eugenol. It belongs to terpenoids, which are derivatives of terpenes. These, in turn, can be found in turpentine. Eugenol comes in the form of an oily liquid with not only a specific smell, but also anesthetic and antiseptic properties, which is why it is used in dentistry. Combined with zinc, it creates a paste used for filling tooth cavities. It is also used as a tooth antiseptic.

Cinnamal, or cinnamaldehyde, is the key component of the highly popular cinnamon. Its scent is yet another smell reminiscent of Christmas cuisine. In addition to antibacterial properties, cinnamon is a very good lipid metabolism stimulator. It supports fat burning, thus helping in the fight against additional kilograms. A perfect spice for the Christmas feast!



A hint of citrus

If there's to be any fruit in the Christmas culinary experience, it's got to be citrus! A juicy and fragrant orange will be great for a change after all those heavy and calorific dishes. Citrus owe their intense smell to limonene, which is a terpene. It is this particular compound that makes the oil obtained from orange peels flammable. Limonene supports the human body in fending off cancer. It is used in the production of food, cosmetics, detergents and paints.

Christmas sweets

Who doesn't like vanilla desserts or vanilla-flavoured Christmas baked sweets? Remember that vanilla comes in vanilla sugar, and what you'll find in vanillin sugar is vanillin. Vanillin is one of the fragrance compounds found in vanilla. In addition to its characteristic smell and taste, vanilla has beneficial health effects. It relaxes smooth muscles, regulates metabolism, and relieves rheumatic and degenerative pain.

Among the fragrances of Christmas you can also smell the aromatic scent of marzipan. Marzipan is but a sweet confectionery paste made of roasted almonds, sugar and almond oil. It owes its taste and aroma to benzaldehyde formed from amygdalin contained in bitter almonds. It is the simplest aromatic aldehyde, used in pharmaceuticals as well as in the production of perfumes and dyes. Marzipan has its cheaper substitute in the form of persipan made of ground apricot or peach kernels and sugar.



Christmas is one of the most festive holidays. Regardless of our individual world view, we willingly let ourselves be carried away by the magic of the celebrations. And we all celebrate it our own way. Some focus on a rich Christmas menu, while others commit themselves to hunting down that perfect Christmas tree and decorating their homes with countless lights. There's also those looking forward to all the gifts and the great joy of giving them to their loved ones.

One thing's certain. Christmas chemistry works! It helps us and offers us all the best.

Let's be together this Christmas!

Beata Gruš

Marketing Department Manager
PCC Group



Essential oils

The magic world of fragrances...

What are smells and how do we register them?

A healthy person takes about 23,000 breaths per day. Along with the air, into our respiratory system come, among other things, odoriferous substances. Through the sense of smell, you're able to read and interpret the environment in which you find yourself. Smells can also evoke memories from the past, and even

the accompanying positive or negative emotions. So smells stay with us all our lives. Both the most beautiful and the less pleasant ones have influence on our feelings, comfort of life, and even various everyday decisions..

How is it that we register smells?

The sense of smell is the most sensitive of the human senses. It allows us to perceive smells even unconsciously. Smells can greatly influence people's well-being and behaviour. It is mentioned in the Bible, the Koran, Egyptian papyri or ancient Indian books. Numerous references to fragrances testify to the important role they played over the centuries.

We get to use the sense of smell when we breathe in air that contains one or more odorous substances. In order to effectively smell a fragrance, the content of the fragrance in the air must be higher than its minimum concentration.

Also, an element or chemical compound is fragrant when it has a certain volatility and a high vapour pressure. It should also have the ability to penetrate the mucous membrane of the olfactory organ, as well as to create special combinations with receptor proteins located in the membrane of the olfactory epithelial cells. These cells transport information about receiving a stimulus to the olfactory brain and further on to the higher structures of the central nervous system.

What is a smell, then?

Smelling (Latin *Olfactus*) is the ability of elements, chemical compounds and their mixtures (odorants) to stimulate the olfactory organ through stimuli that cause a specific sensation.

In other words, a smell is an olfactory sensation perceived as a result of a chemical stimulus.

In addition to having the ability to be perceived by humans, smells can support health through having a therapeutic effect. The field of natural medicine that uses the therapeutic effects of smells is called aromatherapy.

The key role here is played by essential oils, which contain active substances derived from flowers, leaves, roots, seeds or bark. Essential oils can be used either for inhalation of the respiratory tract or in the form of preparations applied to the skin during massage, bath or other cosmetic procedures.

How many olfactory stimuli can a human distinguish?

According to scientists, a person can distinguish several million colours and almost half a million different tones, but the number of distinguishable olfactory stimuli has not yet been thoroughly studied. According to the available literature, humans distinguish about 10,000 smells. This has not, however, been confirmed empirically.

C. Bushdid, together with a team of fellow scientists, conducted psychophysical research to determine the resolution of the human sense of smell. He tested

people's ability to distinguish mixtures of smells with different numbers of common ingredients. The results of the test were spectacular as it turned out that humans can distinguish at least one trillion olfactory stimuli. This is much more than previous estimates showed. The implications for this is that the human olfactory system, with hundreds of its different olfactory receptors, far surpasses the other senses in terms of the number of physically different stimuli between which it can differentiate.

What are essential oils and what are they used for?

Essential oils – often referred to as "liquid gold" – are a group of chemical compounds that are a source of specific, intense fragrances. These substances are used in the production of various types of goods, including:

- perfume, eau de toilette, deodorants;
- white and colour cosmetics;
- cosmetics from the group of personal care products;
- car cosmetics and accessories;
- air fresheners;
- detergents;
- scented candles;
- flavourings and foodstuffs;
- pharmaceutical preparations;
- fodder and articles for animals;
- agricultural preparations.

Essential oils are fragrant mixtures of organic chemicals. They come as an oily, usually colourless liquid. Depending on the type and origin, they can be green, blue or dark brown. They have

a lower density than water, which is why they practically do not dissolve in it. They do, however, dissolve very well in such substances as: ethyl alcohol, ether, chloroform, waxes and fats, vegetable and mineral oils, as well as other ethereal compounds.

Essential oils are made as highly concentrated extracts obtained from various parts of plants (seeds, flowers, stems, leaves, roots). As a result of their processing, intensely aromatic, volatile substances are formed. In addition to their fragrant qualities, plant fragrance molecules participate in numerous biochemical processes as transporting and regulating particles. Their other role is to protect against pests and pathogens. Their part in the process of pollination of flowers by insects cannot be overestimated.

The content of fragrant substances in plants varies depending on many different external factors. Their number can change even within one day.



Ways of obtaining essential oils

Practically any plant found in nature can be a source of essential oils. However, only some contain large amounts of fragrance compounds, and these are called oil plants. They belong mainly to families such as Umbelliferae, Pinaceae, Labiatae, Rosaceae and Rutaceae.

Depending on the raw material, different types of essential oils are extracted using different methods and processes. The most important of them are described below. It is worth knowing that the extraction method has direct impact on the final properties of the oil.

Distillation

Distillation is one of the most popular methods of extracting essential oils on a large scale. Simply put, distillation is the conversion of a liquid into vapour, and then its liquefaction.

The distillation process can be carried out using one of the following three methods:

Steam distillation – involves boiling water and then passing the resulting steam through parts of plants and flower petals. In the next step, water vapour, along with volatile fragrance molecules, is condensed, which is when the water-insoluble fragrance oils are separated from the condensed water.

The steam distillation method is used to obtain essential oils from flower petals, leaves and stems of plants with high resistance to high temperatures.

Dry distillation – a similar process, but without the steam. It consists in heating up the raw material from which the essential oil is to be extracted, which in turn makes it possible to obtain a variety of fragrance notes.

Fractionation – an additional stage in the distillation process. It consists in separating the components of a mixture, where a certain amount of it is divided into smaller fractions. Then it is given specific properties according to precise

guidelines. This method makes it possible to isolate particular fragrance molecules that have impact on the modification of an essential oil's characteristics.

Pressing

Pressing is a method used in the production of essential oils from citrus peels. The oils are extracted either manually or mechanically using special presses. Citrus peels are centrifuged or cold-pressed. In this way, extremely fragrant bergamot, lemon or orange oils are obtained.

Extraction using organic solvents

Extraction is a method that uses various chemical compounds from the organic solvents group. In this method, the solvent used chemically binds the given essential oil derived from the plant material immersed in the chemical. In the next step, the oil is separated from the solvent. Here, however, there is a chan-

ce that some solvent will remain in the composition of the essential oil, which is why oils obtained through extraction are not used in aromatherapy. Fragrances of this type are dedicated mainly to the production of perfumes.

Enfleurage – absorption

The enfleurage method, often referred to as absorption, is a rarely used and quite complex method of obtaining fragrances. It is used to produce essential oils from flower petals.

It consists in applying fat to special plates on which flower petals are then placed. The fat dissolves and binds the essential oils contained in the flowers. The next step is to separate the oil from the fat, which is possible using some alcohol.

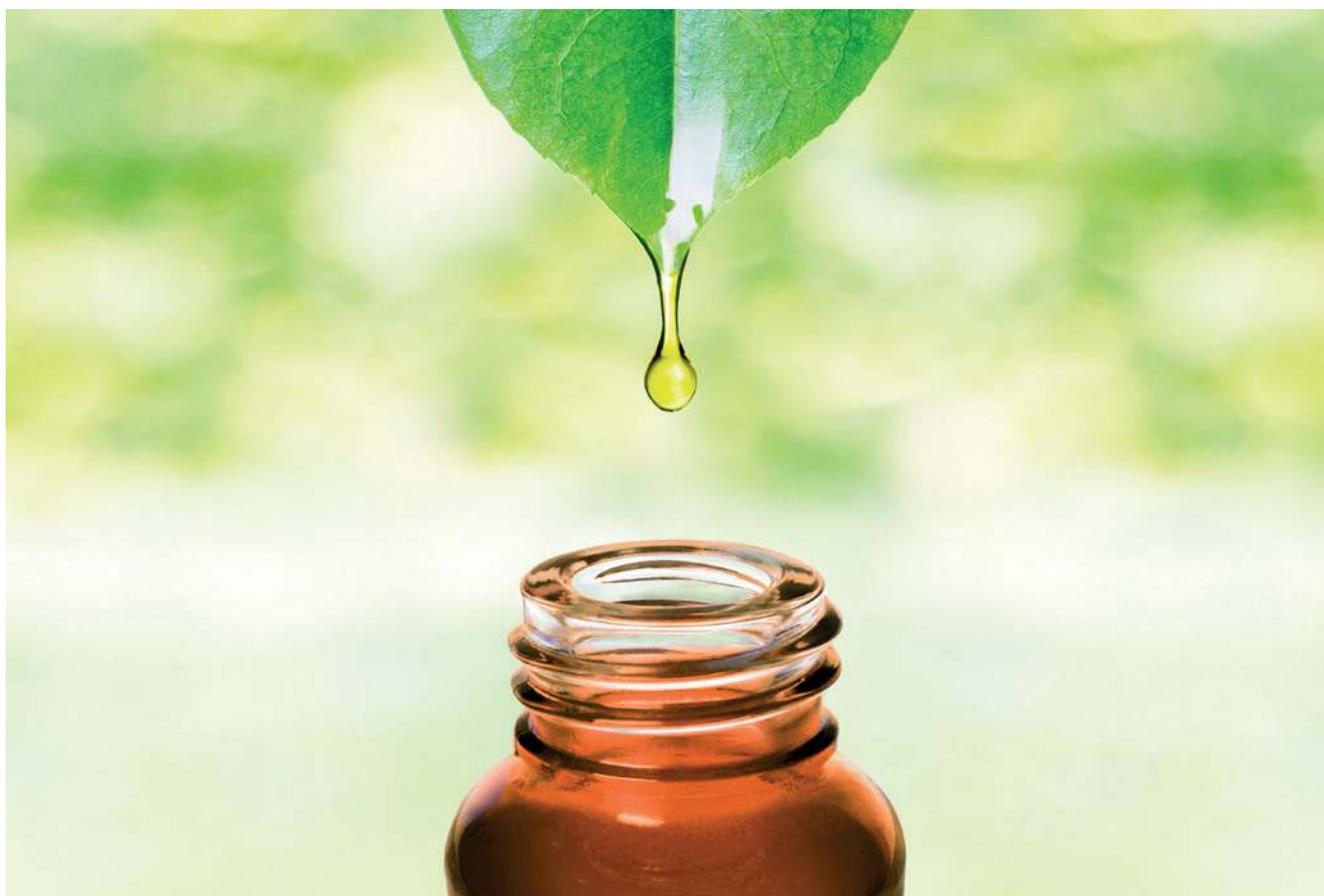
Maceration

Maceration is a method similar to absorption; however, it requires the use of high temperature. The plant material is soaked in tanks filled with liquid fat. These tanks, in turn, are placed in a water bath heated up to 50-70°C. This process should last two days.

In this way, a semi-finished product, called concrete, is obtained. It is then dissolved in alcohol, which acts as a carrier of fragrance compounds.

In industrial production, chemical compounds are added to the mixture of flowers and fat to dissolve unnecessary plant particles. Their task is also to prevent separation of the semi-finished product into layers, which affects the clarity of the obtained liquid.

As you can see, the methods of obtaining oils are different and depend on the plant material, scale of production or intended use. It is worth remembering that essential oils can penetrate into the body through breathing or through the skin. They have healing and relaxing properties, but you should not use them excessively as essential oils used in excess can cause skin irritation or other undesirable reactions of the body.



Popular groups of essential oils depending on the extraction method

The choice of the extraction method is very important in terms of essential substances' purpose and effect, hence we distinguish the following groups on the basis of which they are produced:

- **monoterpenes** – highly concentrated compounds that have antiseptic, antiviral and bactericidal effects. Improper use can lead to severe skin irritation. The best-known fragrance substance containing these compounds is pine oil.
- **esters** – they make essential oils have a very pleasant smell. They provide a soothing and calming effect. Also, they have fungicidal properties. The most popular oils produced with the use of esters are bergamot, lavender and sage oil.
- **aldehydes** – substances with excellent antiseptic and calming properties. The group of oils produced with their use includes citronella oil and melissa oil.
- **ketones** – these compounds have properties that stimulate skin hyperaemia. Toxic substances can also be found in this group. Commonly used aromatic oils based on ketones include: hyssop, sage and dill oils.
- **alcohols** – compounds with excellent antibacterial and antiviral properties. Popular fragrances containing alcohols include rose and geranium oils.

- **phenols** – substances with a strong bactericidal properties and irritating effect. Caution should be exercised when using these compounds. The following oils are made with their use: thyme, oregano and clove.

- **oxides** – compounds with expectorant and bactericidal properties. As fragrance ingredients, they show excellent effects in the treatment of respiratory diseases. The oils produced using them are: rosemary oil and tea tree oil.

It's worth mentioning that essential oils are very sensitive to UV radiation as well as to low and high temperatures. They usually dissolve well in alcohols and oils, but do not dissolve easily in water, where they form short-lived suspensions.

The high quality of essential oils is primarily determined by the quality of the plant material. It is therefore worth ensuring that it comes from ecological, sustainable sources.



The use and effect of essential oils

Essential oils play a very important role in the cosmetics industry, and not only because of their fragrant nature, but also because of their ability to penetrate the skin. Thanks to their properties, these compounds act on the human body in different ways. They effectively strengthen the skin, have calming or stimulating effect.

The use of essential oils in cosmetology cannot be overestimated. They are used in aromatherapy as properly prepared fragrance mixtures. Oils are used to

saturate scented cosmetic wipes with them, but above all they are used in the production of perfumes, deodorants, creams, lotions, personal hygiene products such as soaps, shampoos, shower gels or hairdressing formulas.

Essential oils also show excellent aromatherapy effects. They are perfect for SPA & wellness treatments (massages, masks, cosmetic treatments, inhalations, compresses, saunas).

How do essential oils work?

They:

- improve the condition of the skin – firming, brightening, smoothing effect;
- soothe and eliminate allergies and skin diseases (psoriasis, mycosis, eczema);
- heal burns;
- accelerate wound healing;

- stimulate the skin (remove toxins, exfoliate the epidermis);
- have a relaxing and soothing effect achieved through the sense of smell.

Good quality essential oils are a phenomenal treasury of valuable plant-based components. They are used not only in cosmetology, but also in the production of candles, food, textiles, detergents, fodder, medicines and many other products.

Examples of how essential oils work

The main advantage of essential oils is their scent. But is it the most important feature? Of course, fragrance compounds give different products particular scents, but they can also play an important therapeutic role in the treatment of various diseases. Here are some examples:

- **patchouli oil** prevents skin aging caused by UV radiation,
- **tea tree, lavender and copai-ba oils** treat acne and prevent skin eruptions;
- **myrrh** oil has a soothing effect on sensitive skin;
- **sandalwood oil** prevents wrinkles and skin lesions, smoothes and firms the skin;
- **lavender oil** tones, firms and smoothes the skin, calms you down and relaxes, soothes and eliminates skin eruptions;

- **rosemary, peppermint and clove oils** support hair growth as well as make it soft and supple.

The above examples are only a few on the long list of essential oils' beneficial properties. However, the fragrance and therapeutic qualities should never obscure the issue of their safe use. Key here is the selection of optimal concentrations of fragrance compounds. They should be selected and dosed with caution, as some of them can be allergenic or phototoxic.



Safe use of essential oils in cosmetics

Despite their natural origin, essential oils should be used with caution. This is a specific group of cosmetic ingredients that, in high concentration, can be toxic, photosensitising or allergenic.

In the cosmetics and perfumery industries, there are so-called dermal limits, which can be found on the website of the International Fragrance Association (IFRA). The aim of this organisation is to promote and ensure safety in the use of fragrance compounds in cosmetics, as well as in detergents, hygiene products, toys and many other everyday products.

What are dermal limits and why are they so important?

Dermal limits are the maximum permitted doses of substances that ensure their safe use by humans. Dermal limits are why only products containing specific concentrations of chemical compounds are allowed for sale – compounds that, when used in doses higher than recommended, may cause irritation, allergic

reactions and other health problems. The limits apply to e.g. essential oils that contain compounds considered harmful to health (toxic, phototoxic, carcinogenic, etc.).

IFRA publishes a set of standards that govern the use of fragrances. Whether they're safe for use is first assessed by the Research Institute for Fragrance Materials (RIFM). The team of RIFM experts consists of high-class specialists in the field of dermatology, pathology, toxicology as well as scientists and practitioners related to the area of environmental protection. IFRA members are required to comply with the standards and the RIFM Code of Practice, which contain rules for the production and handling of fragrance materials. It is worth knowing that 90% of fragrance producers op-

erating around the world belong to the IFRA.

Cosmetics manufacturers selling their products in the EU and in countries that

respect its directives (Brazil, China) are obliged to strictly comply with the regulations on dermal limits.

In addition to IFRA standards and guidelines, the rules on the production and use of fragrance compounds are also regulated by the European Union through various publications. The most important of these is "Essential Oils Safety" by Tisserand and Young.

Responsibilities of cosmetics manufacturers

Pursuant to the EU Cosmetics Regulations 1223/2009, cosmetics manufacturers are required to disclose on products' labels the names of allergenic fragrance substances present in their composition. Currently, 26 such substances have been registered, if their content in a cosmetic is above 0.001% in case of a product that

stays on the skin and 0.01% in a wash-off product.

Currently, there are about 3,000 fragrances available on the market. They are used both in cosmetic products and detergents, but also in cleaning agents, air fresheners, hygiene products and

toys. Widespread use of fragrance compounds increases people's exposure to them, thus making the risk of allergic reactions and skin irritation greater.

How to use essential oils safely?

It is well known that "the dose makes the poison." And so, the key word in using essential oils is moderation. Fragrance compounds used in appropriate concentrations are safe and have therapeutic and health effects. However, it should be remembered that overusing highly concentrated extracts may result in allergies or other skin problems.

To safely use essential oils, follow these rules:

- essential oils are not edible. Consuming them can cause burns to the mouth, tongue, esophagus and internal organs;
- do not apply concentrated essential oil directly to the skin. Any essential oil concentrate must be diluted in a base oil before use;
- essential oils must be kept away from children;
- oils are best stored in tightly closed dark glass containers, away from sunlight;
- essential oils in every cosmetic must be properly diluted. This also applies to home-made cosmetics for personal use. Ethereal compounds are insoluble in water, vinegar, 40% alcohol or glycerine. They do, however, dissolve in such substances as: spirit or perfumers alcohol, fats, some cosmetic emulsions, solubilisers (mists, sprays, micellar liquids), surfactants (soaps, shampoos, gels).

List of allergenic fragrances

The list of 26 fragrance substances that have been recognised by the EU as allergenic includes the following (according to INCI nomenclature):

1. Amyl cinnamal,
2. Benzyl alcohol,
3. Cinnamyl alcohol,
4. Citral,
5. Eugenol,
6. Hydroxycitronellal,
7. Isoeugenol,
8. Amylcinnamyl alcohol,
9. Benzyl salicylate,
10. Cinnamal,
11. Coumarin,
12. Geraniol,
13. Hydroxyisohexyl 3-cyclohexene carboxaldehyde,
14. Anise alcohol,
15. Benzyl cinnamate,
16. Farnesol,
17. Butylphenyl methylpropional,
18. Linalool,
19. Benzyl benzoate,
20. Citronellol,
21. Hexyl cinnamal,
22. Limonene,
23. Methyl 2-octynoate,
24. alpha-Isomethyl ionone,
25. Evernia prunastri extract,
26. Evernia furfuracea extract.

It is highly probable that in future the above list will be extended with more fragrances, the safety of which is supervised by the EU Scientific Committee on Consumer Safety.

Essential oils banned in the EU

In addition to the IFRA guidelines, cosmetics manufacturers are required to control the products' composition in accordance with Regulation (EC) No. 1223/2009 of the European Parliament and of the Council on cosmetic products. This directive outright prohibits the use of certain essential oils and other substances extracted from aromatic plants

These include, among others:

- Ammi majus L. and officinal formulas based on it (including essential oil);
- Apocynum cannabinum L. and its derivatives;
- Chenopodium ambrosioides L. (essential oil);
- Anamirta cocculus (fruit products);
- Cephaelis ipecacuanha Brot. and other species of the genus Cephaelis (roots, powder and products thereof);
- Lobelia inflata L. and its preparations;
- Prunus laurocerasus L. and its derivatives;
- Juniperus sabina L. (leaves, extract and other preparations);
- Schoenocaulon officinale Lind (seeds and preparations);
- Pyrethrum album L. (raw material and preparations);
- Laurus nobilis L. (seed oil);
- Inula helenium L. (products);
- Ficus carica L. (leaf absolute);
- Lippia citriodora Kunth. (products other than absolute);

Apart from the above, strict restrictions also apply to other essential oils and plant extracts, with guidelines such as these, for instance:

- extracts and essential oils obtained from such plants as silver fir, Siberian fir, white fir, balsam fir,

mountain pine, Scots pine, black pine, longleaf pine, maritime pine, Swiss pine and other pines, black spruce, northern white-cedar, Atlas cedar, Mediterranean cypress and turpentine must have a peroxide value of less than 10 mmol/l.

- the permissible standard for the use of Peru balsam extracts and distillates is 0.4%;
- the permissible amount of cumin oil and extracts in leave-on products is 0.4%;
- benzoin oil and extracts (Liquidambar orientalis and Liquidambar styraciflua) should not be used in doses higher than 0.6%;
- opoponax resin oil or extract should not be used in doses higher than 0.6%;
- opoponax chironium resin may be used at a concentration of not more than 0.6%;
- lemon verbena absolute (Lippia citriodora Kunth.) may not be used at a concentration higher than 0.2%.

The topic of essential oils is quite extensive. As a rule, these are substances with an extremely complex chemical composition. Although they are a true boon of nature, they can be harmful when used in excess. However, if you use them with care, you can derive many benefits from their properties. After all, there's a reason people have been using essential oils for over 5,000 years. Both Egyptian and Greek women used them as perfume and aphrodisiacs. What is more, these compounds were used in ancient Egypt to embalm the bodies of the dead.

Today, essential oils are experiencing a renaissance. Their magical power will be appreciated by anyone who experiences their soothing effect at least once.

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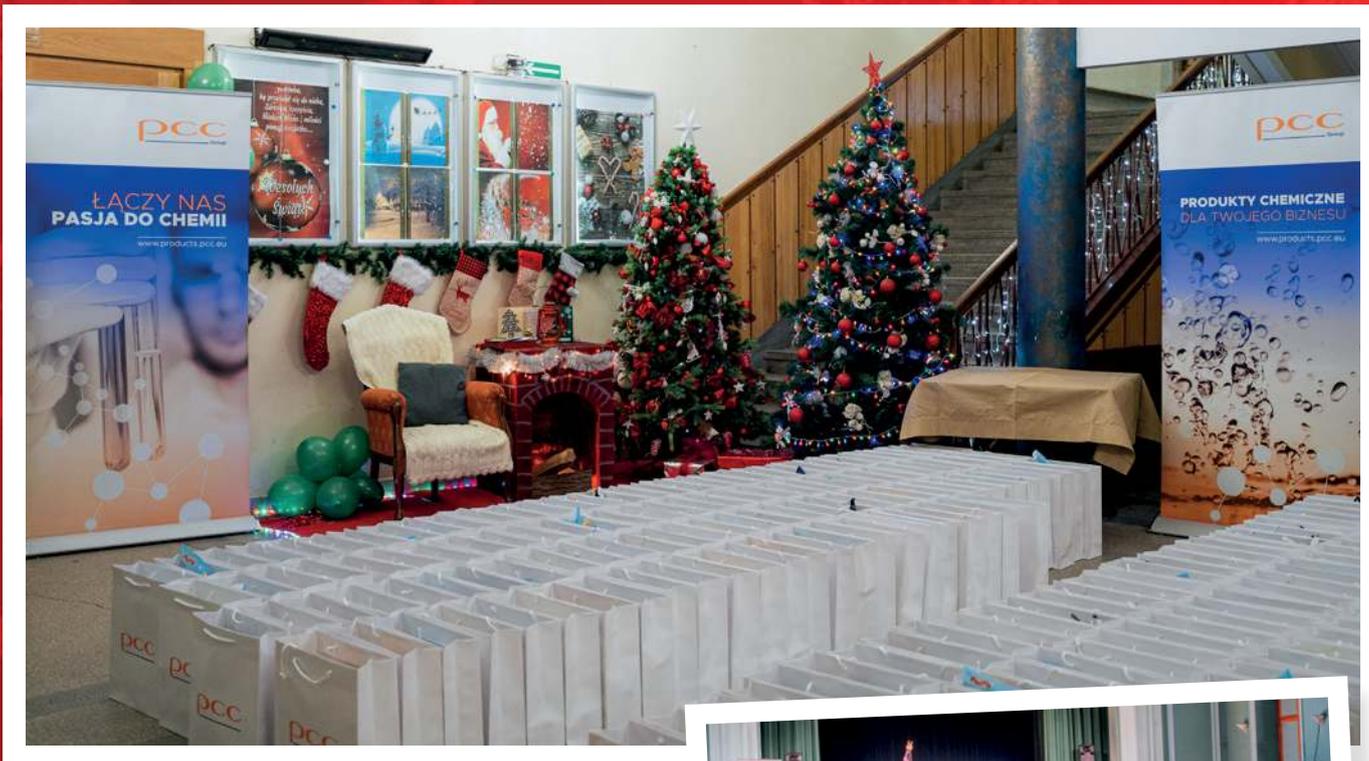
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Beata Gruś

Marketing Department Manager
PCC Group



Santa came to visit

Nearly 300 children and their carers took part in the St. Nicholas Day event organised for children at the Cultural Centre in Brzeg Dolny.

Children and their parents saw two performances. The first told the story of "Santa's Golden Bell" that made it possible for all children to receive gifts. The second – entitled "Beautiful Day" – was aimed at older children and told the story of an elderly man who lost all his friends (pets), but thanks to the kind people he met, he managed to get them all back.

Not only were both performances very well received by our young audiences, but also, at the end of each, Santa Claus showed up and handed out gifts to all the children.

Thank you for coming to see the show.

Maciej Trubisz
Editorial Team

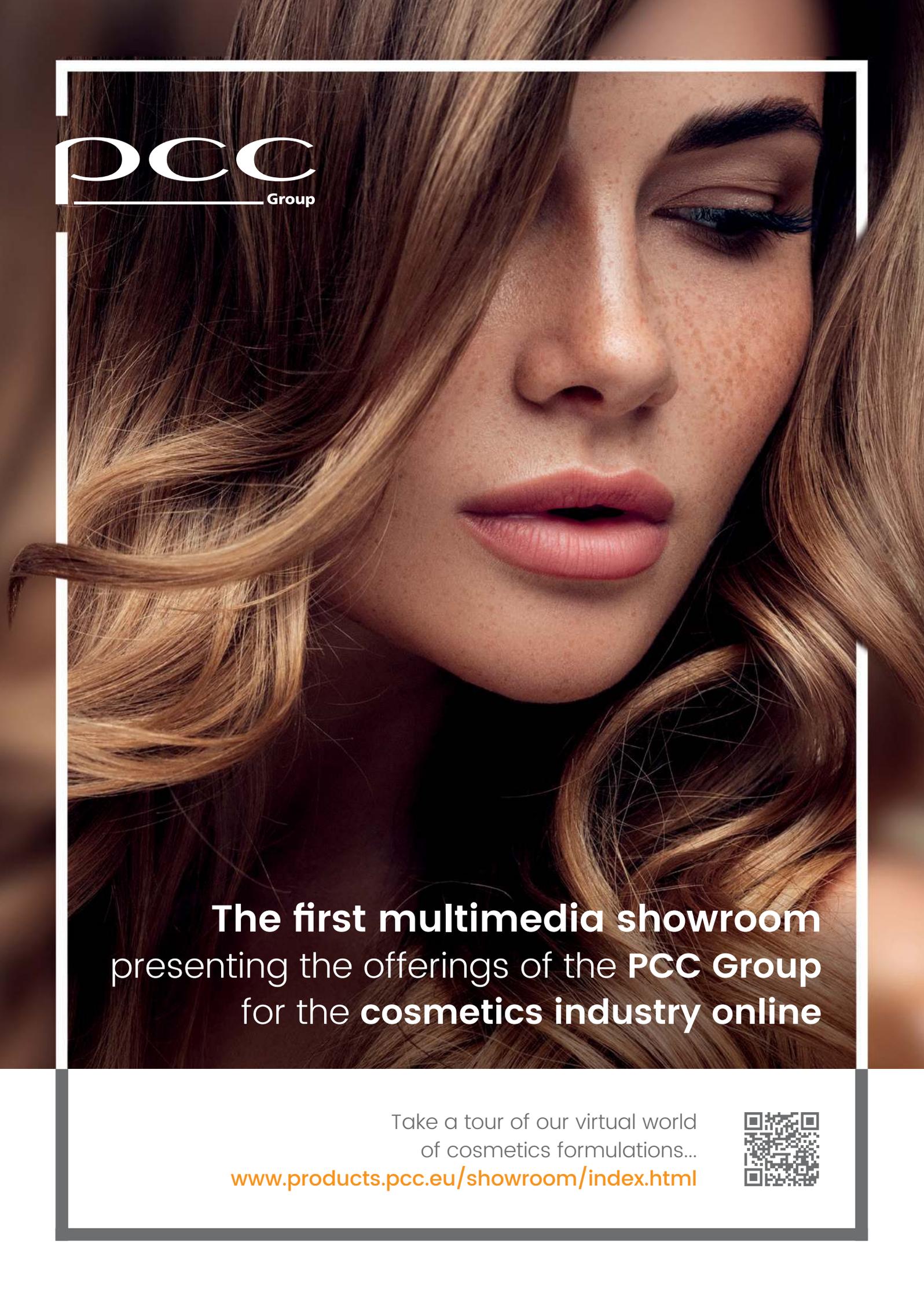


Christmas contest for our employees

As many as 420 works had been submitted in this year's Christmas contest. The theme was the Christmas card. Congratulations to all the contestants! All submitted works have been awarded, and the main prize in the amount of PLN 1,000 goes to Ms Agnieszka from LabAnalytika.

Maciej Trubisz
Editorial Team





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