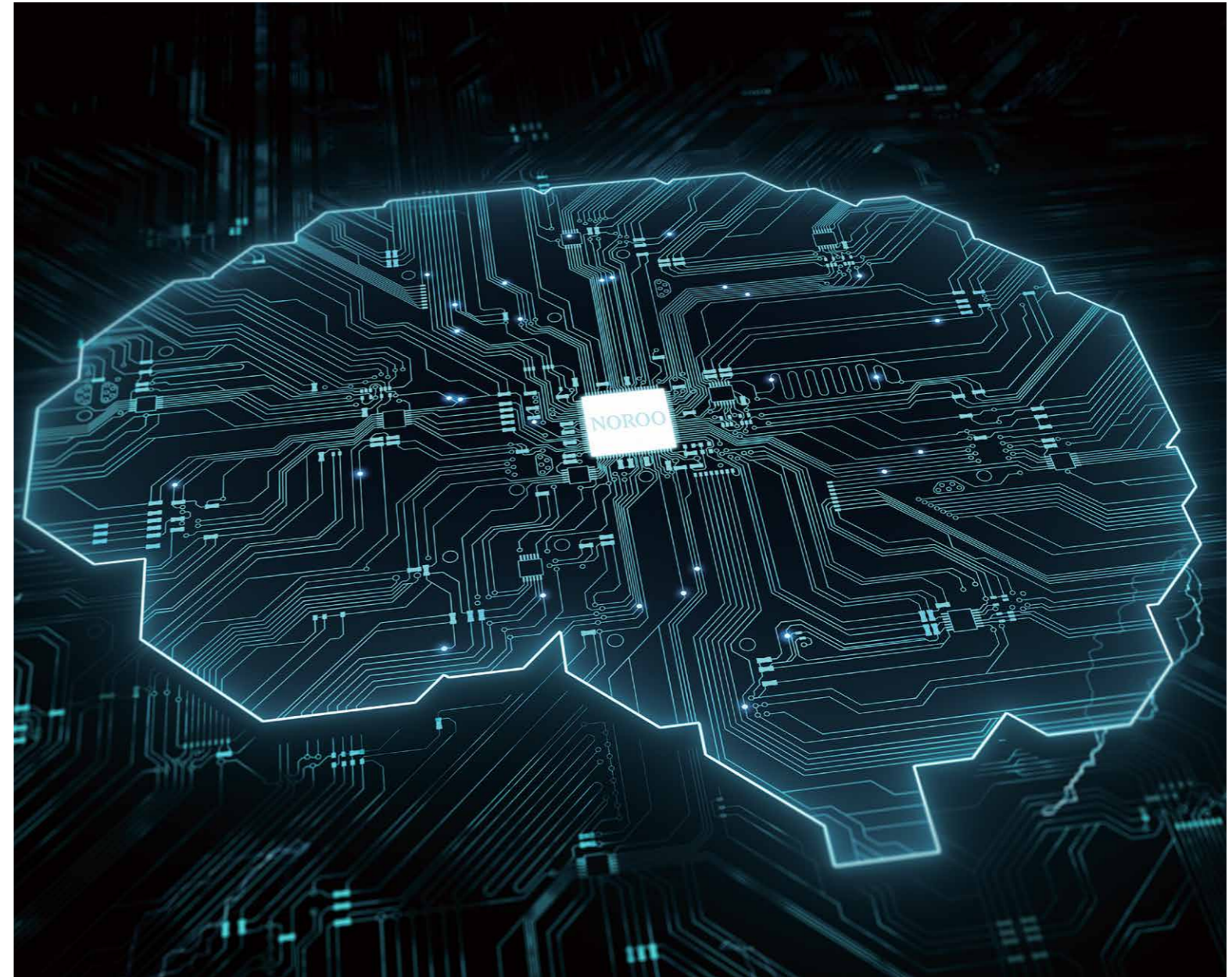


NOROO



Technology

Autumn. 2020

NOROO Quarterly Magazine | No.56, 2020

NOROO

TECHNOLOGY



Special Theme

- 03 Column** Technology Makes Future
技术铸就未来
- 06 Interview I** Pioneering the Market with Surface Technology
NOROO Paint & Coatings Co., Ltd. Chemical Material Teams 1 & 2
利用表面技术开拓市场
纳路涂料股份有限公司化学材料1、2组
- 10 Interview II** Preparing for the Future with New Genetic Resources
Biotechnology Center of the Agricultural Corporation, THE KIBAN Co., Ltd.
利用新遗传资源备战未来
农业公司法人(株) THE KIBAN生命工程中心

NOROO People

- 14 Focus on NOROO I** Save Energy, Safe Privacy
Energy Saver Window of the NOROO Paint & Coatings Co., Ltd.
Building Technology Team 3
节约能源, 保护隐私
纳路涂料股份有限公司建筑技术3组的节能窗户
- 18 Focus on NOROO II** Help the Growth, Grow the Market
NOROO Technical Training Center(NTTC)
助力增长, 培养市场
纳路技术教育院(NTTC, NOROO Technical Training Center)
- 22 High Five I** 75th Anniversary of NOROO, Beyond 100 Years and Into the Future!
NOROO成立75周年, 迈向百年未来!
- 26 High Five II** NOROO amid the COVID-19 Pandemic
新冠疫情期间此时此刻的NOROO

+ COLUMN
Technology

Technology Makes Future

From the steam engine to electricity, computers and today's Fourth Industrial Revolution, the birth and development of technology were the leading factors that cultivated the history of mankind. The outcomes of small and great technology construct our everyday lives and change our outlook and perception of life, cultivating the generation of today and tomorrow. We look upon the future as we stand in the present that was made by the technology of the past. What technology, then, is being used to create the future.

技术铸就未来

从蒸汽机、电气、电脑到当下的第四次工业革命, 引领人类历史进程的始终是技术的诞生和发展, 大大小小的技术构成了我们的日常生活, 改变着生活样貌和人们的认知, 培养着有别于当代人的下一代。站在由过去技术造就的当下展望未来, 今后又会是何种技术创造出怎样的未来呢?

GROWING INFLUENCE OF TECHNOLOGY

The invention of the steam engine, which became the starting point of the First Industrial Revolution in the 18th century, brought a wave of change from agriculture-centered industry to a technology-centered industry. The Second Industrial Revolution in the early 20th century realized mass productions with the development of electricity. The invention and supply of the computer in the 1970s developed the information and communication industry, which led to the Third Industrial Revolution. And today, with the keywords such as AI, IoT, objects, automation, artificial intelligence, and virtual reality, we are stepping into the Fourth Industrial Revolution.

Following the technological inventions that could be seen as the inflection points, we experienced many changes in our daily lives with the increased size and range of the curves. During the First Industrial Revolution when farmers of the time changed occupations to factory workers in the city, merely the form of the work and place of their lives changed; with the Second, Third, and Fourth Industrial Revolutions, however, an influence of new technology impacted all of mankind's actions and even the ways of thinking. For as long as a person continues to live without being cut off from the world, or rather, from Earth itself, he or she remains under the influence of technology.

USE AND SIDE EFFECTS OF TECHNOLOGY

Technology of the Fourth Industrial Revolution has, little by little, seeped into our lives. New technology, products, and services continue to pour into our lives like the smartphone that is now basically an attached part of our physical bodies; the smart speaker that acts as a personal secretary; the GPS that guides us through the quickest routes; the self-driving car that moves on its own; the electric cars that doesn't emit any exhaust fumes; and the drone that continues to expand its role. Things we once saw in sci-fi movies in the past have become a reality. Likewise, the imaginary things we see in the movies today will soon be the reality. A future of cutting-edge technology sounds like a dream or a fantasy. Or is it? Are we satisfied with the world we live in where the imaginations of the past are realized in the present? No one can answer "No" to the question without a shadow of a doubt. Just as shadow is derived from light, new technology is misused or abused, resulting in damages. Technology produces different outcomes

depending on where the user places his or her value of technology.

For example, the distributed authentication technology known as blockchain is used as means of authentication for safe financial transactions. However, due to the difficulty of tracking of cryptocurrency, it is used for circulation of criminal funds as well. Information collected from smartphones and smart speakers of private information is a matter that always requires caution. Technologies that were rapidly introduced in the sudden appearance of COVID-19 pandemic led to malfunctions. The IT market that connected people online through video conferences during the increased need for untact, or contactless, communications was huge, but the technology could not supplement the inconvenience and deprivation for those who could not attain personal space. Media platforms like YouTube and Netflix grew with social distancing, and the technology of big data analysis was used to attract more people. Nonetheless, countless amount of unverified content imprudently spilled out into the world, and media consumption by personal taste or preference has led to confirmation bias, which then deepened the gap of social division. Just like the butterfly effect, in which a flap of a butterfly's wings is connected to a tornado that forms on the other side of the earth, technology creates both unexpected results and errors.

TECHNOLOGY FOR THE PROGRESSIVE DEVELOPMENT

The greatest side effect of technological developments is probably environmental destruction. Climate changes resulting from global warming, such as rainy spells, typhoons, large forest fires, and fine particulate matter that is now a part of our everyday life, escalated gradually to threaten not only the nature but humans as well. COVID-19 also originated from man's mistake by thoughtlessly destroying the environment. Choe Jae-chun, a professor of biology, stated that the virus was spread by "humans who invaded the habitats of animals." Due to the misuse and abuse of technology, humans took notice of the environment and is now reestablishing the course of technology. Electric cars that move by battery instead of fossil fuel have become a trend, and oil suppliers are making strenuous efforts to secure the technology to become battery manufacturers. Technology that increases en-

ergy efficiency and circulates resources is also in the process of being upgraded.

Each technology is a part of a life cycle of birth, growth, and death like that of an organism, but the civilization of man that is a collection of technology continues to move forward. Nikola Tesla, a renowned engineer and technician from a century ago who even Elon Musk made use of his name, stated, "The progressive development of man is vitally dependent on invention." We must never forget to make and use technology for progression, and not for retrogression.

技术影响范围逐渐扩大

18世纪第一次工业革命始于蒸汽机的发明,引发了从以农业为中心向以工业为中心的产业转变。20世纪初第二次工业革命通过发展电气实现了批量生产。自20世纪70年代起,电脑的发明和普及带动了信息通信产业的发展,随后引发第三次工业革命。而如今,伴随着AI和IoT等物联、自动、人工智能、虚拟现实等关键词,我们正处于第四次工业革命的浪潮之中。

在研发出革命性技术后,我们的日常生活经历了万千变化,其说波及的深度和广度也在逐渐扩大。第一次工业革命期间,农民们走进城市成为工厂劳动者,仅仅是工作的形态和生活的基础得到了改变。经过第二次和第三次工业革命,如今的第四次工业革命时代所带来的全新技术却改变着整个人类的行动甚至思考方式。除非与世隔绝,不,除非不生活在地球上,否则,所有人都会受其影响。

技术的使用与副作用

被称为第四次工业革命的技术正在一点一点地渗透于我们生活的方方面面。一觉醒来,如人体新器官般时刻伴随左右的智能手机、充当贴身秘书的智能音箱、指引捷径的导航仪和自动驾驶、无废气污染的电动汽车、功能不断增加的无人机等新技术、新产品和新服务便会涌现于眼前。过去只有在科幻电影中才能看到的东西一一变为现实,当下电影中的想象也将在不久的将来与世人见面。表面看来,尖端技术的未来就像实现梦想和幻想的世界,然而真的是这样吗?过去的想象如今已经实现,生活在当下的我们是否心满意足?大概没有人能够毫不犹豫地回答“满足”吧。就像光会衍生出影子一样,新技术也会因误用或恶意使用产生危害。因为技术会因技术使用者的价值观的不同造成完全不同的结果。

例如,分布式认证技术“区块链”可被用作确保金融交易安全的认证方式,也因其难以在虚拟货币中追踪的特性而被用于犯罪资金流通。智能手机、智能音箱收集的信息可以为用户提供个性化服务,同时也要时刻注意避免泄露个人隐私。在新冠肺炎这一突如其来的变化中,突然引进的技术也会引发错误操作。激增的零接触需求扩大了以视频会议等线上方式连接人与人的IT技术市场,但却无法弥补没有私人空间的不便和剥夺感。保持社交距离政策使得YouTube、Netflix等媒体平台进一步发展,开始使用吸引更多人使用的大数据分析技术。但是,未经验证的内容不加限制地喷涌而出,个人品位和喜好的传播极大的拉偏了社会风气,造成社会分裂矛盾不断加深。如同蝴蝶效应一样,技术也会造成意想不到的效果和错误。

朝着进步性发展的技术

技术发达最大的副作用就是对环境的破坏。梅雨、台风、大型山火、已司空见惯的雾霾等温室效应造成的气候变化都在首次工业革命后逐渐加速,现在已不仅仅是对自然,更是对人类造成了威胁。新冠肺炎病毒也是源于人类肆意侵犯自然的代价。生物学博士崔在天教授表示,是侵入和搅乱动物栖息地的人类传播了这种病毒。在滥用或误用技术面前,人类正在环顾四周,重新确立技术的方向。使用电池替代化学燃料驱动的电动汽车已经成为主流,炼油公司正在专注于获得相关技术,从而向电池制造公司转型。提高能源效率,可循环利用资源的技术也在不断更新。

每一项技术都像生物一样,经历诞生、成长、消亡的生命周期。作为技术的集合体,人类文明正在不断前进。1个世纪前最值得尊敬,甚至让伊隆·马斯克以其命名的技术工程师——尼古拉·特斯拉曾经说过:“人类的进步性发展完全依靠发明。”为了避免退步,不断实现进步,我们应时刻铭记创造、使用技术。



Pioneering the Market with Surface Technology

NOROO Paint & Coatings Co., Ltd. Chemical Material Teams 1 & 2

The technology of NOROO Paint & Coatings is making advancements with and beyond the paint. NOROO Paint & Coatings, which changes and protects the colors of buildings and vehicles, will now be introduced to smartphones and televisions to prevent shock and humidity. The technology will hold the battery tightly to electric cars and cover them safely. NOROO's surface technology will protect everyday items.

Surface Technology

利用表面技术开拓市场

纳路涂料股份有限公司化学材料1、2组

一路与涂料相伴，纳路涂料的技术不断发展。改变和保护建筑与汽车色彩的纳路涂料如今进入了智能手机和电视内部，在防撞击和防潮方面发挥着作用。而在电动汽车领域，纳路涂料也起到了将电池紧紧包裹，牢牢固定的作用。NOROO的表面技术守护我们的生活。

FAILURE IS A NEW START

Did you know that the Galaxy phone in your hand contains waterproof tape made with materials from NOROO Paint & Coatings? The television in your home contains silicone conformal coating, and the batteries of electric cars on the road contain fire retardant foam, all from NOROO Paint & Coatings. The Chemical Material Team of NOROO Paint & Coatings is broadening its scope of technology into non-paint areas. The first thing that comes to our mind when we think of "paint" is a paint that we can see with our eyes, and hence, it is difficult to imagine how NOROO Paint & Coatings realized its technology in electrical and electronic objects. This was not easy for the Chemical Material Team. Chief General Manager Chung Hoon of the Chemical Material Team tells of "failure" that made today's market.

"In 2011, we received an order of electronic paper as part of a task for national policy. We first saw it at a graduate school laboratory, and we received funding after deciding that the advantages of NOROO Paint & Coatings could be applied to pigment dispersion and coating, the key technologies of electronic paper." The scale of consortium was immense as this was a national task at a scale of KRW 10 billion. NOROO Paint & Coatings collaborated with companies and research institutions, such as Samsung Display Co., Ltd. and the Korea Electronics Technology Institute, and succeeded in developing electronic paper within four years. However, the project failed business-wise. "Getting to the commercialization stage was complicated. It was a failed project from the company's point of view."

失败乃成功之母

你知道吗？在你的三星盖乐世手机中有使用纳路涂料的材料制作而成的防水胶带，摆在您面前的电视中有纳路涂料的硅胶三防漆，甚至是飞驰在路上的电动汽车内部也装有纳路涂料的阻燃泡沫。纳路涂料的化学材料组正在向非涂料领域拓展技术。一提到“涂料”，大家最先想到的就是油漆，很难想象在电气电子零配件领域，纳路的技术可以发挥何种作用。刚开始化学材料组也并不轻松。化学材料1组首席部长丁勋讲述了“失败”经历，正是这些失败成功开拓了今天的市场。

“2011年，作为国策课题开始接收电子纸订单。读研时在研究室接触过电子纸，本以为只要在颜料分散和涂层这两个核心技术方面应用纳路涂料的优势就可以了，所以在申请资金后便开始着手准备。”作为规模达100亿韩元的国策课题，财团的规模也相当大。纳路涂料带领三星显示、韩国电子元件研究院等有关企业和研究机构，历时4年多，终于成功研发出电子纸。但是，从商业角度看，该项目并未成功。“实现商业化的过程十分复杂。从公司的角度出发，这绝对属于失败项目。”





TIME IS NEEDED FOR CHANGE

However, the failure of the Chemical Material Team was used to create resources. In the meantime, the team members broadened their views to the new market of display and electrical electronics and even obtained a plan for use of polymer design and dispersion technology. The team even expanded their networks into several different directions. "Our technology and materials began to be recognized by others gradually, and we started to receive requests for cooperative projects from various places to develop polymer and binders." For example, NOROO Paint & Coatings began to deliver silicone conformal coating for dampproof insulation to the power board manufacturer for televisions made by Samsung Electronics, which broadened the network. "At the time, we found gaps in markets preoccupied by foreign enterprises and made our way through with the technology. When we properly make products and sell them to the influential clients, we receive requests for more developments from other companies," says General Manager Park Deok-min of Chemical Material Team 2. The Chemical Material Team attained great sales with waterproof tape and silicone insulating material. Eight materials from NOROO Paint & Coatings are directly and indirectly included in Samsung smartphones. NOROO Paint & Coatings supplied adhesives for Hyundai's hydrogen car, Nexo, that was previewed at the PyeongChang Olympics. "It took almost a whole

year to receive an assessment of our adhesive. Now, our adhesive is a part of Hyundai's hydrogen car. We are in development of a binding material that is used in separators and cathodes of the second battery. Not only do we sell fire retardant foam for battery packs of electric cars but also installments as part of the package." Chief General Manager Chung Hoon added to the statement of General Manager Park Deok-min. "The sales we achieved today, however, is not only credited to the Chemical Material Team. This achievement is the result of the constant study and fierce business strategizing of the Operation Division, Sales Division, and the R&D Center who also aimed for the same market. It would have been difficult for us to succeed without the cooperation of manufacturers who helped achieve stable production after continued trials and experiments. We reached a new market because of such cooperative work. The company also provided resources for this challenge and remained patient with us. Time is absolutely necessary for change."

TECHNOLOGY IS HOPE, CHALLENGE, AND FUTURE

The technological developments of the Chemical Material Team are expected to advance even further. With the government's announcement of Korea's New Deal policy, the development and utilization of new materials is expected to be in full demand here-

after. Senior Director Song Jun-seo of the R&D Center says that concreteness will be added to the current open innovation strategy to realize the amalgamation and innovation of technology.

"If unparalleled technology was made through close innovation by research and development in the past, today we must realize faster innovation by breaking down barriers and working cooperatively. NOROO Paint & Coatings will develop water-based resin and material for the second batteries of electric cars regarding the Green New Deal, which was proposed to solve environmental problems. We also plan to prioritize the development of open innovation by capturing the anti-viral market and systematizing paintings."

Senior Director Song Jun-seo says that all this is converged as "surface technology." "Chairman & Ceo Han Young-jae once said that the future path for paint to take was surface technology. By expanding our market to all surface things and not just paint, we will be able to produce more ideas with broader perspectives."

His anticipation has already achieved cases of success. Perhaps this can be attributable to the Chemical Material Team who latched onto a new market with broad perspectives and keen outlooks. Their technology will continue to create a better future through hope and challenges.

变化需要时间

但是, 化学材料组将失败转化为资源。组员们将视野拓展至电气电子这一全新市场, 得出了聚合物设计及分散技术使用方案。业务网也朝多方向延伸。“越来越多的企业了解到纳路涂料持有的技术和材料, 很多地方都向纳路涂料发出聚合物、黏合剂等的开发合作邀请。”例如, 向三星电子电视内电源板生产商交付防潮绝缘用硅胶三防漆产品后, 业务范围更广阔了。化学材料2组组长朴德珉说道“虽然外国企业已经占领了市场先机, 但纳路涂料还是成功找到了市场缝隙, 并利用技术进行突破。打造过硬的产品, 与具有影响力的客户公司进行销售合作, 自然就会有其他企业委托我们进行开发”。化学材料组在防水胶带和硅胶绝缘材料方面创造了超高销售额。三星智能手机直接或间接使用的纳路涂料材料就多达8种。在平昌冬奥会演示的现代汽车NEXO氢能汽车的电池也使用了纳路涂料的黏合剂。“黏合剂评估历时将近一年的时间。目前, 现代的氢能汽车就在使用我们的黏合剂。同时正在开发二次电池的分离膜、阴极材料使用的黏合剂材料。电动汽车电池包材料除阻燃泡沫外, 还销售有包括设备在内的套装。”丁勋首席部长进行了补充说明。

“但是, 现在的销售额并不是化学材料组单方面的功劳, 而是事业部、销售部、研究所专注于同一市场, 并为此不断学习, 积极探讨销售战略的成果。此外, 在反复尝试和试验后, 制造部门实现了稳定生

产。没有他们的合作, 也很难取得成功。换句话说, 是所有人合力推动纳路涂料进入全新市场。公司为我们的挑战投入了资源, 并耐心等待。变化需要时间, 这是绝对不可否认的事实。”

技术是希望、挑战, 亦是未来

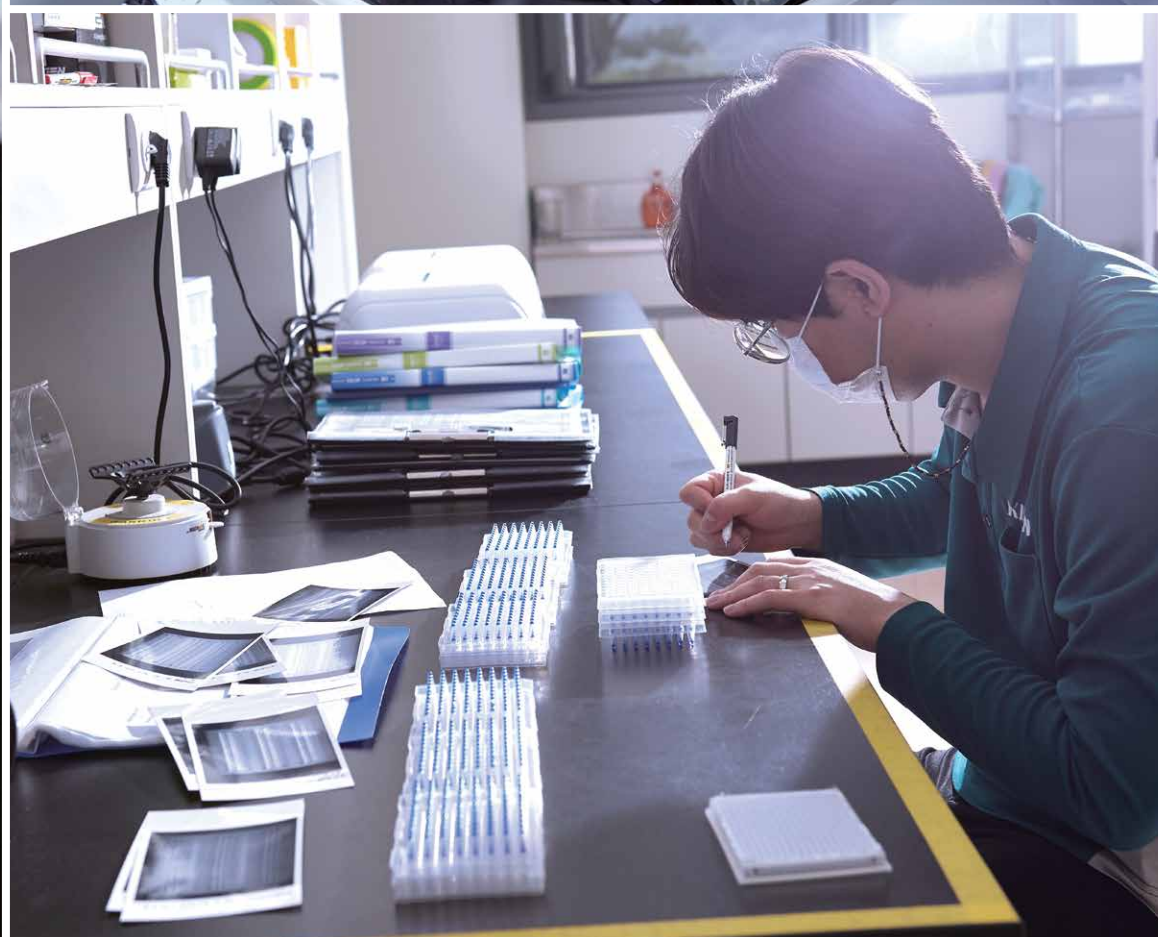
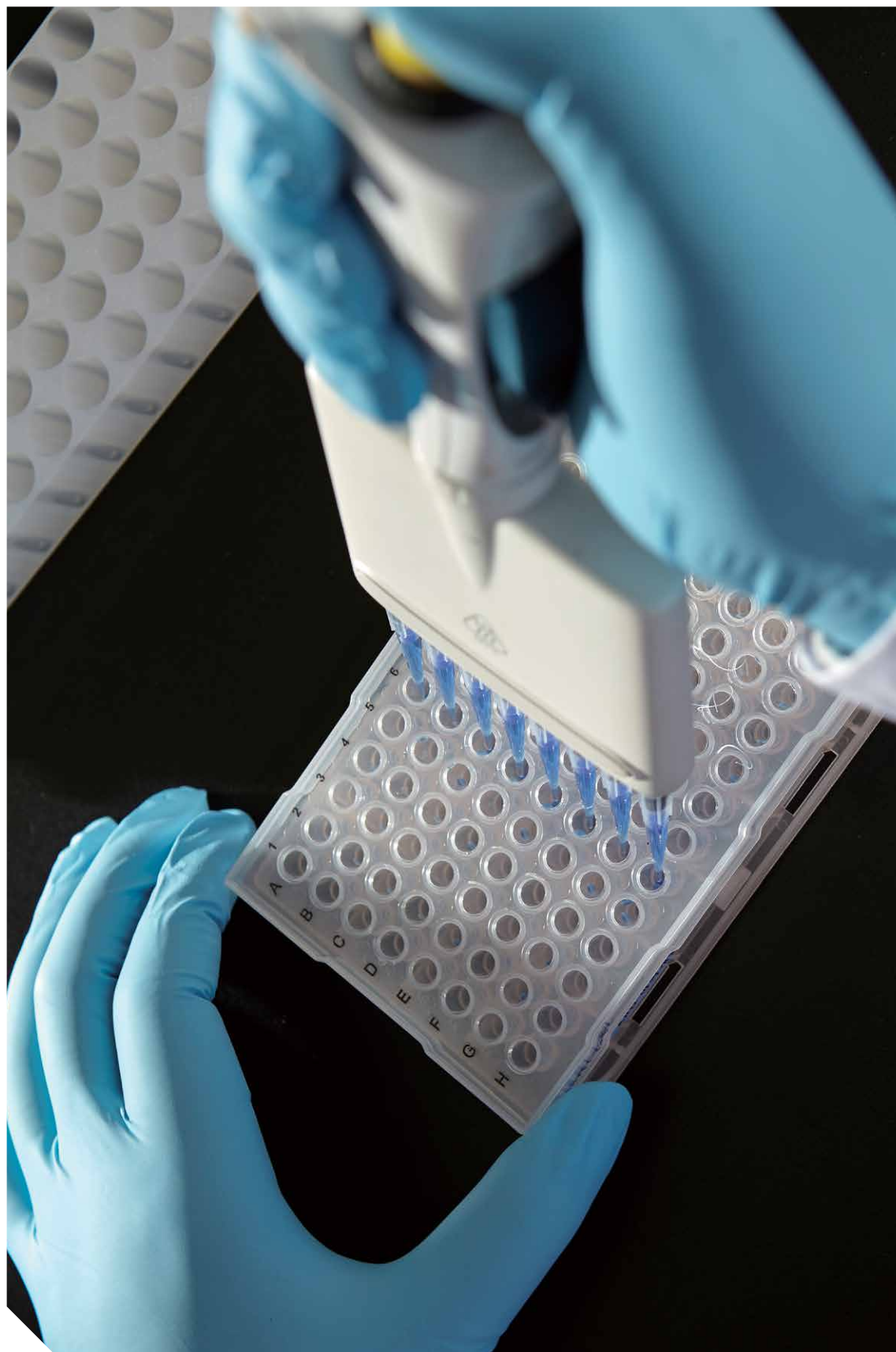
化学材料组坚信未来完全可以进一步提高技术开发速度。因为随着政府发表韩国版新政, 开发及使用新材料的需求将进一步提高。研究所所长宋竣瑞常务表示, 在目前进行的开放创新战略基础上进一步具体化, 想必一定可以实现技术的融合与创新。

“如果说过去的研发是通过封闭式创新建立独家技术, 那么现在就是打破界限, 通过相互连接实现快速创新。对于有助于解决环保问题的绿色新政, 纳路涂料计划在发展水性树脂和二次电池电动汽车材料的同时, 通过开放创新重点攻克抗病毒市场和涂装系统化等。”

宋竣瑞常务认为上述所有内容都可以总结为“表面技术(Surface Technology)”。“韩荣宰会长曾指出过涂料未来的发展道路, 那就是表面技术。除涂料外, 以所有表面(Surface)为对象扩大市场, 纳路涂料一定可以通过更加广阔的视野创造出更多的奇迹。”

他对未来的期许或许已经不断变为现实。凭借广阔的视野和敏锐的嗅觉捕捉全新市场的化学材料组, 今后他们的技术也将通过希望和挑战创造未来。





Preparing for the Future With New Genetic Resources

Biotechnology Center of the Agricultural Corporation, THE KIBAN Co., Ltd.

Interest in biotechnology has heightened due to climate change and the recent pandemic. The Biotechnology Center of THE KIBAN has constructed a mass analysis system based on molecular markers, created new genetic resources, and supported the cultivation and supply of future breeds in response to the climate change.

利用新遗传资源备战未来

农业公司法人(株)THE KIBAN生命工程中心

近期,受气候变化和全球疫情等影响,人们对生物技术的关注度越来越高。THE KIBAN生命工程中心正在以分子标记为基础,构建大量分析系统,创造并供应全新遗传资源,支援培养应对气候变化的未来品种。

MOLECULAR MARKER ANALYSIS THAT REPLACES TIME

Man's efforts, the support of nature, and a long time was needed for the cultivation of crops, the bearing of fruit, and the collection of seeds. Variables of the seeds collected were only identified by an analysis from the process of re-cultivation. Man obtained a variety of provisions from nature through thousands of years of experimentation and selection, success and failure. Now, the time that was absolutely required for such traditional breeding is being replaced with technology. The molecular marker analysis is a representative technology that makes time reduction possible.

"A molecular marker can be seen as a part of a gene. Like a cancer diagnosis test that can find the rate of latent cancer or like an amniocentesis that can discover disorders of an unborn baby, an analysis of the parts around the genes of a plant can predict the future phenotype of a plant. This can analyze the disease resistance of a plant in a short time without infecting the plant. This can also determine whether peppers will be spicy or not even before they are grown or actually cultivated and whether a flower will be fertile or infertile. The accuracy of this analysis is close to a hundred percent. The molecular marker analysis heavily reduces breeding time. This can simply be seen as riding a car to quickly reach the goal point of plant breeding instead of walking towards the same destination. Of course, this requires an early investments," says the chief of THE KIBAN's Biotechnology Center.

用分子标记分析代替时间

从栽培作物、获取果实到重新摘取种子,需要人类的努力、自然的助力,以及相当长的一段时间。而想要了解摘取的种子有何变化,就需要重新栽培结出果实。人类经过数千年的试验和筛选,成功和失败,才从自然中获得了各种粮食。在传统育种过程中,时间这一要素必不可少,而如今技术正在一点点取代时间。最具代表性的缩短时间技术就是分子标记分析技术。

THE KIBAN生命工程中心负责人解释称,分子标记可以说是遗传基因的一部分。就像可以确认潜在癌症发病率的癌症诊断检查或是通过羊水检查确认胎儿是否正常一样,植物也可以通过分析遗传基因的周围部位预测未来出现的显性性状。在植物体未感染的存活状态下,还可以短时间分析出抗病性。无需实际栽培辣椒,既可以区分辣椒的辣度。就算不开花,也可以分辨出是受孕植物,还是不孕植物。这方面的准确性几乎接近100%。分子标记分析有助于大幅度缩减育种时间。简单来说就是驱车快速驶向培育品种这一目的地。正因如此,初期投资必不可少。



SUPPORT WITH BIOTECHNOLOGY

The Biotechnology Center of THE KIBAN supports the development of seeds by the Breeding Institute with biotechnology. The first type of support given is the support of breeding using the previously mentioned molecular marker analysis. The second support is tissue cultivation, and the third is pathology experiment. Tissue cultivation, also known as culture research, is the process of making new materials by cultivating tissue. Many different materials must be secured through various methods by the breeder because the matter of retaining various genetic resources with materials determines the competitiveness of the development of new breeds. "We travel around the world to collect new breeds and even bring in existing superior breeds. We also make and use new genetic resources, and this is where the Biotechnology Center comes in to help. Materials made from tissue cultivation becomes material exclusive to THE KIBAN which cannot be found elsewhere. The method of diversifying cultivation materials is the second role of the Biotechnology Center." The significance of the pathology experiment is emphasized with the two previous types of support as the chief of THE KIBAN's Biotech-

nology Center continues to explain.

"The key point of cultivating breeds is disease resistance. In the selection process of acclimatizing wild plant breeds by humans, crops lose their abilities of disease tolerance and disease resistance. Furthermore, diseases continue to break out during the process of mass cultivation. For decades, breeders devoted themselves to introduce the disease resistance to the plants. The Biotechnology Center inoculates plants in advance to help the breeding of plants through a screening process that recognizes disease resistance."

TECHNOLOGY THAT INCREASES THE SELF-SUFFICIENCY RATIO

The Biotechnology Center organizes support methods and development strategies in stages for the cultivation of breeds and development of seeds at THE KIBAN. "We will support the cultivation of breeds with marker examinations, provide cultivation material for new breeds through tissue cultivation, and support the cultivation of breeds, which is an act of response to climate changes through pre-breeding that combines MAS(Marker Assisted Selection),

MAB(Marker Assisted Backcross, Breeding), and the search for new resources. We must also study disease tolerance, heat resistance, and drought resistance.

In a time when climate change, which scientists have continuously warned us about, is directly and indirectly experienced, the response strategy by THE KIBAN's Biotechnology Center is nationally critical. Due to the COVID-19 pandemic, the feeling of fear has grown, advocating the increase of the self-sufficiency ratio. Warnings about a global shortage of food resulting from limited international travels and its influence on the production, processing, and distribution of food have been made by the FAO(Food and Agriculture Organization of the United Nations), the WHO(World Health Organization), and the WTO(World Trade Organization) early in the year, and the prices of rice rose sharply in the world grain market in April. When Malaysia declared a national lockdown due to COVID-19, the neighboring country Singapore saw cases of vegetable and fruit hoarding. Although the public fails to see the gravity of the whole grain situation, Korea too hit a low grain support rate of 21.7%.

"A country must have a foundation of a minimal self-

sufficiency rate for grains and vegetables in order to avoid extreme circumstances. THE KIBAN will expand its technical skills and scale to realize this and provide good food for the public. Of course, THE KIBAN must also branch out domestically and internationally." The pivotal division that will soon manifest this mission and produce positive results is the Biotechnology Center of THE KIBAN. We look forward to the Biotechnology Center's biotechnology that will defend our dining tables and even further, global health.

提供生物技术支持

THE KIBAN生命工程中心利用生物技术支持育种研究所开发种子。支援方法共三种,第一是使用上述分子标记分析法的培育支援,第二是组织培养,第三是病理实验。

组织培养又被称为培养体研究,顾名思义,就是通过培养组织,创造新的品种。在育种过程中,最重要的就是品种。因为各种品种中含有大量不同遗传资源直接影响新品种开发的竞争力。因此,育种专家会通过各种方法确保收集到尽可能多的品种。“有些品种是出国时采摘的,有些是

直接使用现有优秀品种,还有一部分是创造使用新的遗传资源,而这一部分正是生命工程中心的责任所在。通过培养体研究制成的品种是很难在其他地方见到的THE KIBAN独家品种。实现培养品种多样化的方法性工具是生命工程中心的第二项任务。”生命工程中心负责人在说明中强调,病理实验的重要性不亚于上述两种方法。

“培育品种的核心之一是抗病性。植物在人类驯化野生种群的选拔过程中,失去了耐病性和抗病性。再加上密集栽培,自然会导致植物经常生病。育种专家专注于抗病性数十年之久。生命工程中心通过提前接种疾病,了解抵抗力,通过筛选过程改善这一方面缺陷。”

提高粮食自给率的技术

生命工程中心为THE KIBAN的育种和种子开发分阶段制定支援方法和发展战略。“通过标记鉴定支援培育,利用培养体研究供应新品种培育材料。同时,利用MAS(Marker Assisted Selection),MBS(Marker Assisted Backcross, Breeding),以及融合新资源搜索的前育种(Pre-Breeding)支援培养应对环境变化的品种。目前需要全面考虑耐病性、能够抵抗酷暑的耐热性

和抵抗干燥的耐旱性等特性。”

目前,全球正在直接或间接经历着众多科学家多次警告的气候变化,THE KIBAN生命工程中心的应对战略对国家来说也是重中之重。特别是受新冠肺炎这一全球性流行病的影响,各国对需要提高粮食自给率的危机意识逐渐提高。联合国FAO(粮食及农业组织)、WHO(世界卫生组织)、WTO(世界贸易组织)等自2020年年初便持续警告国际社会对运输业的限制会影响粮食的生产、加工和流通,从而导致国际性的粮荒。实际上,国际谷物市场的米价已在4月出现了激增。受疫情影响,马来西亚下达了国家封锁令,随即在邻近的新加坡出现了囤积蔬菜和水果的事情。虽然韩国老百姓没有特别明显的实际感受,但不可否认韩国的谷物自给率非常低,只有21.7%。因此,绝对不能忽视这一问题。

“无论是谷物还是蔬菜,至少应保证拥有自给自足的基础,才不会使国家陷入极端情况。为此,THE KIBAN将继续培养技术力和规模,提供优质农产品。今后需要同时扩大韩国国内和海外市场。”推进快速完成这一使命并取得优秀成果的核心支援组织就是THE KIBAN的生命工程中心。希望生命工程中心的生物技术可以守护韩国人的餐桌,保障全世界的健康。



Save Energy, Safe Privacy

Energy Saver Window of the NOROO Paint & Coatings Co., Ltd. Building Technology Team 3

As the time spent at home is getting longer recently, houses we live in need to perform many functions in keeping up with this trend. We now use our houses as a school and office for online classes and telecommuting, as well as a theater, gym, and restaurant as we work, exercise, eat, and have fun at home. No individual would want to open these activities to strangers outside the window. Hence, the Energy Saver Window is an absolute necessity for saving energy, with safe privacy.

节约能源, 保护隐私

纳路涂料股份有限公司建筑技术3组的节能窗户

全民宅家时代, 家要承担更多的功能。在远程教学和居家工作期间, 我们在家中工作、运动、吃饭、娱乐, 家成为了我们的学校、办公室、电影院、健身房、餐厅等等。家里发生的一切, 我们并不想透过客厅的玻璃窗展示给他人。彻底保护隐私, 精打细算地节约能源, 这正是我们需要节能窗户的原因。

REDUCE ENERGY THROUGH THE WINDOW

The Energy Saver Window is a product comprised of a PEELABLE special emulsion binder and special nanomaterials, which protects personal privacy with its translucent effect when applied to a window. The coating also blocks the penetration of visible light, ultraviolet and infrared rays to reduce energy consumption. Moreover, even beginners can easily use this product and if desired, the coating can be neatly removed by peeling off the coated film. The coating does not require cut-outs like any other film products and there are no concerns for wrinkling or leftover glue. This is the product suitable for anyone wanting to transform their transparent windows to translucent ones. This convenient product was developed by the Building and Technology Team 3, a team that ceaselessly developed energy saving paint.

"We started making energy saving products since the 2000s. With increased interest and need for eco-friendly products, we believed that reduction of energy through paint would help ease the urban heat island phenomenon and global warming; not to mention that consumers would enjoy insulation. Products that perform these functions are the Energy Saver Cool Roof, Energy Saver Urethane, Energy Saver Cool-Road, etc. Our team is prioritizing the development of waterproof and flooring materials using urethane and polyurea."

General Manager Ham Young-jae added to Deputy General Manager Kim Sung-dae's explanation: "There has been heat-insulating paint for rooftops and outer walls but none for glass, and we recognized the need for such a product. Many parts of buildings in our country use glass, and because the hot sunlight penetrates the glass windows, the buildings get easily heated and thus requires heavy energy consumption. At first, a transparent heat-insulating paint was developed, but this was a job that only professionals could accomplish for application that was free from stains or brush marks. After much consideration of product marketability, we asked ourselves the question, 'Why does it need to be transparent?'"

The limitations of transparency actually became a moment of possibility for translucency. "We recontinued our development with the idea of making translucent paint, since there is already a need to make window translucent by attaching the film anyway. And the result was successful." This was the introduction of the first translucent heat-insulating paint for glass from a paint industry.

利用玻璃窗节能

节能窗户由PEELABLE特殊乳胶粘合剂和特殊纳米物质构成, 涂在玻璃窗上可以形成半透明效果, 从而保护个人隐私。同时, 阻隔阳光中的可见光、紫外线和红外线的通过, 可以有效节能降耗的涂层剂。最重要的是, 非专业人士也可以自己动手完成粉刷, 还可以根据需求轻松揭掉涂膜, 不留痕迹。无需像贴膜产品一样进行裁剪, 不会起皱, 揭掉后也无需担心黏合剂残留问题。因此, 对于想将透明玻璃改为半透明玻璃的顾客来说, 绝对是不二之选。这款产品的开发团队正是建筑技术3组, 他们一直致力于节能型涂料的开发。

"从进入21世纪开始, 我们便坚持研发节能产品。对环保的关注度及需求不断提高, 我们坚信通过涂料节约能源有助于缓解城市热岛现象和地球温暖化。同时, 还可以为消费者提供隔热和绝热等效果。这一系列产品包括节能降温屋顶、节能聚氨酯、节能Cool-Road等。此外, 建筑技术3组正在重点研发使用聚氨酯、尿素成分的防水材料 and 地板材料。"

在金成大次长进行说明后, 咸英载部长又进行了补充: "市场上常见的隔热涂料多用于屋顶、外墙等结构, 从未涉及玻璃领域。因此, 我们认为在这方面有必要开发玻璃专用产品。韩国建筑多使用玻璃材质, 炙热的阳光会直接穿透玻璃, 从而造成环境过热, 能源消耗过高。初期我们研发出了透明隔热涂料, 但要想使用效果均匀, 没有刷子痕迹, 只能由专家进行施工。所以考虑到市场性, 我们一直在推敲'产品一定要透明吗?'"

这正是将透明的局限性转换为不透明可能性的决定性瞬间。"有顾客为了得到半透明玻璃而使用贴膜, 既然市场有这种需求, 何不研发一款半透明涂料呢? 这种想法促使我们再次进行研发。事实证明这样做是行得通的。"涂料业界的首款玻璃用半透明隔热涂料就此诞生。



FROM TRANSPARENCY TO TRANSLUCENCY, ADDING FUNCTION

Assistant Manager Jin Sung-hyun led the official development of the paint. "Because the coating would be applied over smooth glass, the product had to have excellent leveling power, be easy for anyone to apply, and produce balanced results. We were perplexed at how to keep the coating applied on a vertical surface where paint could easily drip down on. We held meetings and shared ideas about such matters and made it work by getting advice from one another."

After six months of research and development, the Energy Saver Window was launched in February 2020, and the product gradually became known in the market and was a hit with consumers. The rating on the online shopping mall shows 4.6 stars out of 5. The low ratings mostly pointed out slow shipping, and ratings for product satisfaction remains high. The majority of reviews say, "It's so original. It's much easier than applying a film. It's really effective."

Assistant Manager Jin Sung-hyun commented, "I applied the product to my parents' living room window, and they were very satisfied." General Manager Ham Young-jae added, "It helps protect the personal privacy and the nanomaterials block out heat, which lowers indoor temperature during the summer by 1-3 degrees. One consumer used this product for decorations because you can apply it in different

patterns on glass. I was content to see such diverse results." The Energy Saver Window started as an insulator, but changed into a translucent form, offering privacy protection which is even used for decorations.

PAINT, IMPROVING THE QUALITY OF LIFE

The Building Technology Team 3 plans to continue with developments in various areas so that the Energy Saver products can be used in various ways. General Manager Ham Young-jae says, "We plan to improve durability and contamination resistance in the current functions. We also need to consider ways to apply insulating paints to more places." Assistant Manager Jin Sung-hyun adds, "I believe that the energy-saving paint market will grow further when government policies on eco-friendliness is fortified and more resources are provided. Consumers will recognize that paint can perform such functions and increase use of our products. This will definitely encourage future developments."

We look forward to the technological developments of the Building Technology Team 3 that will improve the quality of life and reduce energy consumption through paint found all around us, such as rooftops, windows, and roads.



从透明到半透明, 提高功能

正式研发由代理陈星显进行。他表示：“对于用于玻璃上的产品来说，重要的是要有平滑性，而且要方便顾客施工，使用效果均匀。还有一个需要解决的问题就是在垂直面上施工，容易导致涂料顺着玻璃流下来。综合这些需求事项，我们反复开会研究并交换了意见，最终确定了这种设计功能。”

经过为期6个月的研究，NOROO最终于2020年2月正式推出了节能窗户，随着在市场上的认知度越来越高，消费者的响应也极其热烈。从线上购物商城的评分来看，在5分满分的情况下，消费者给出了4.6的高分。较低分数主要与配送有关，而对产品本身的满意度极高。大部分评价都是“真的很神奇”“比贴膜方便多了”“效果非常好”等。

陈星显代理表示“父母家的客厅使用了这款产品，父母非常满意。”，之后咸英载部长又补充道：“在保护个人隐私的同时，纳米物质发挥隔热效果，在夏季室温可有效降低1-3度。另外，这个产品可以先在

玻璃窗上设计出各种独特图案后再进行涂刷，因此还能起到装饰的作用。我们非常高兴能够看到各种不同的使用反馈。”节能窗户从隔热出发，转换为半透明质地后增加了保护个人隐私功能，同时兼具装饰作用。

涂料, 提高生活质量

建筑技术3组计划今后继续进行多方面研究，确保可以在各个方面使用节能产品。咸英载部长称：“我们将在当前产品功能上添加耐久性和耐污性，并继续深入钻研可以在更多地方使用隔热涂料的方法。”陈星显代理也表示：“我们坚信只要政府不断强化环保政策，提高环保支援，节能涂料市场一定能够展现出极大的活力。消费者在了解节能涂料的本质后也一定会大量选用。从而为研发注入弹性。”

期望建筑技术3组能够坚持技术研发，帮助我们在屋顶、窗户、道路等生活的方方面面通过涂料节能降耗，享受更高质量的生活。

Help the Growth, Grow the Market

NOROO Technical Training Center(NTTC)

The Refinish Technical Center(RTC) for automobile repair that opened in November of last year at the NOROO Paint & Coatings Co., Ltd. Poseung Plant was selected as an operating institution for the Consortium for HRD Ability Magnified Program(CHAMP) project and reborn as the NOROO Technical Training Center(NTTC). For the next six years, the NTTC will receive support of up to KRW 2 billion in business expenses to manage training course that specializes in paint and coating.

助力增长,培养市场

纳路技术教育院 (NTTC, NOROO Technical Training Center)

纳路涂料浦升工厂于2019年11月启用的汽车修补漆培训中心(RTC(Refinish Technical Center)入选2020年韩国国家人力资源开发财团事业运营机构,以纳路技术教育院NTTC(NOROO Technical Training Center)之名重新起航。今后,NTTC将每年获得最高20亿韩元的事业经费补贴,共计6年,用于运营涂料、涂装实习特色培训课程。

INCREASE OCCUPATIONAL SKILLS, INCREASE HUMAN RESOURCES

A lecture was taking place as the theory training center located on the second floor of the NTTC. Trainees today are those who need professional training in various fields to carry out the technology assessment of companies — employees from the Technology Assessment Team of the SCI Information Service. Manager Park Min is leading the group of trainees in theory education; the faces seem quite serious as they are looking into the screen filled with unfamiliar terminology. The training was a one-day course and the twenty-second course held after the RTC was changed into NTTC.

The CHAMP is a nationally supported project that uses the excellent infrastructures of enterprises as a joint training center, extending opportunities for occupational training to all workers. This project continuously and systematically develops human resources to create an ecosystem for training personnel in conglomerates and small and medium enterprises. Workers can receive gratuitous training to foster their occupational skills and enterprises can secure the talented human resources. As operating institutions receive great amount of support for the training, a large number of enterprises are eager to participate in this project. It isn't easy, however, to be selected since only one or two enterprises are chosen every year. In spite of the fierce competition, the RTC of NOROO Paint & Coatings was designated this year.

职业能力UP, 人力资源UP

位于纳路技术教育院2层的理论培训中心正在如火如荼地授课中。当天的训练生为SCI评估信息公司的技术评估组。为对企业的技术力进行评价,这些人需要接受各个领域的专业培训。负责进行理论培训的课长朴珉正在上课,培训生们认真地看着屏幕上陌生的术语。当前进行的培训为一日课程,这已经是RTC作为NTTC运营后进行的第22次培训了。

国家人力资源开发财团将企业自身的优质基础设施用作共同培训中心,是为扩大全体劳动者职业培训机会的国家支援项目。本项目持续、系统性地开发人力资源,构建大企业和中小企业共赢的人才培养体系。劳动者通过免费培训提升业务能力,企业则借此确保优质的人力资源。由于对运营单位的培训费用规模比较高,所以参加该项目竞争的企业众多,每年最终入选的企业不过一两家,想要通过评审并不容易。纳路涂料的RTC经过一番激烈的竞争,最终成功入选。



**NTTC,
THE NATION'S TOP PAINT TRAINING FACILITY**

“The Consortium mainly chooses big enterprises with big and stable scale equipped with training capacity because its infrastructure needs to be utilized. When the business plan is passed by the Ministry of Employment and Labor, the judges determine the suitability of the enterprise through an on-site evaluation,” Manager Lee Chang-hyup explained. The RTC started to prepare for this project in advance, went through an evaluation in June and finally chosen on July 30.

“We were pleased when we heard the result. The fact that we were chosen among all the companies throughout the country, and not just from the paint industry, was a proof of our center’s excellence and the company’s necessity for training.” Manager Park Min shared the joy he felt back then with a big smile on his face. Having been opened last year, the RTC have prepared the nation’s best training facility. After being selected by the CHAMP, it is preparing for a more subdivided and specialized training course with the business expenses received as support funds. For next year, the RTC plans to prepare a website and an online training system for micro learning as well as build a futuristic training center.

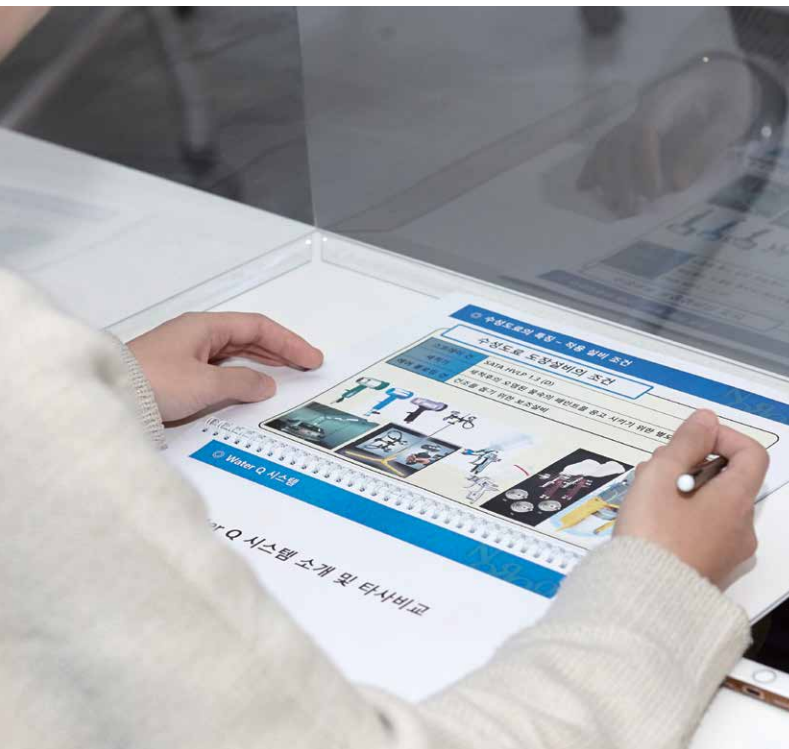
“We have prepared eight training courses including water-based paint coatings, automatic mixing of colors using big data, and electric car coating. In terms of facilities, we plan to add a third and fourth floor to add a futuristic training center and conference room.” The futuristic training center as described by Manager Lee Chang-hyup will use the Microsoft HoloLens System for practical training in a virtual reality setting that is more evolved than the current VR systems. “Such training will enable win-win growth, enhance the NOROO’s value and status, and help us secure the future clients.” This is the role and goal of the NTTC.

HELPING THE COUNTRY THROUGH TRAINING

Trainees who completed their theory education had lunch and moved to the practical training center on the first floor to experience the painting under the guidance of Manager Son Byung-gil. The trainees commented, “Having a practice time after learning about paint technology will help us better understand the situations when we’re on the field,” and expressed their hope for more training in the future. This training course can be taken twice for repetitive training which will help to fully acquire the working skills. Training, accommodations and meals, and practical training are provided for free — as one trainee

put, this is a must-do training not when having the chance, but by “making the chance.”

“The NTTC will not only offer training in vehicle repair painting but become the main center for technological training in all paint areas, encompassing on-site training, key duties training, and advanced training. Our ultimate goal is to establish a ‘paint college.’ We hope that many will develop their capacities at the NTTC.” The NTTC’s aspirations are in line with NOROO’s spirit of business patriotism as it plans to use the NOROO infrastructure to aid the nation’s development of human resources and lead the mutual growth. The NTTC will slowly but steadily achieve its goals.



韩国顶级涂料培训设施, NTTC

“因为需要使用企业的基础设施,所以财团主要评选具有稳定规模和培训能力的大企业。首先提交的事业计划书要通过雇佣劳动部的公开招聘,然后经审查委员的现场评审判定是否符合条件。”课长李昌协进行了详细说明。RTC提前准备了事业计划书,在6月经审查后,最终于7月30日接到了入选通知。

“我们特别高兴。因为这次评选的范围并不只局限于涂料产业,而是面向所有韩国企业。这是对我们培训中心优秀性和必要性的一种肯定。”朴珉课长笑容满面,可见当时的喜悦之情。RTC于2019年正式启用,配备了韩国顶级教育培训设施,这次入选后将利用补贴经费配备更加详细且专业的教育课程。另一方面,他们还计划在2021年创建网站和零接触教育系统,正式开展微型学习,并新建未来型培训中心。

“教育课程包括水性涂料涂装、利用大数据的自动调色、电动汽车涂装等八门课程。设备方面计划增建3层和4层,设立未来型培训中心和会议室等。”在李昌协课长介绍的未来型培训中心将搭载有微软HoloLens的混合现实MR系统,

可以在比当前VR更加先进的虚拟现实中进行实习。“此类培训不仅可以帮助客户,实现共同发展,还可以进一步提升纳路的价值和形象声誉,成为吸引未来客户的坚实后盾。”这是纳路技术教育院的作用,也是其目标。

教育兴国

结束一上午的理论教育,午餐后培训生们会前往1层的实习中心,在课长孙秉吉的指导下进行涂装体验。培训生们表示,对于涂料技术相关知识的积累和实践将有助于今后更深层次地理解现场工作,也希望今后能够多提供这样的培训。实际上该项培训可以对同一课程反复进行2次,有助于全面提升业务能力。再加上免除培训费、食宿费、实习材料费等一切费用,借用一位培训生的话来说就是“没有机会也要创造机会”来参加这个培训项目。

“今后纳路技术教育院的教育范围将不仅限于汽车修补漆,而是要成为整个涂料行业技术教育的中心,提供现场训练及核心业务培训,以及高熟练培训课程等,最终实现扩大为‘涂装专业大学’的目标。希望能有更多人到纳路技术教

育院开发自身能力”。纳路技术教育院之风还包含了NOROO事业报国的精神。因为可充分利用NOROO的基础设施帮助国家开发人力资源,同时谋求所有人的共赢。纳路技术教育院今后将继续发扬这种精神。





NOROO is my _____ .

75th Anniversary of NOROO, Beyond 100 Years and Into the Future!

NOROO Group celebrates its 75th anniversary this year. The year 2020 is also meaningful as it is the centennial of the founder of NOROO and a former Chairman & CEO, Han Jeong-dae's birth. During a time when group events cannot be held due to the COVID-19 pandemic, the NOROO Group has put together a video of employees to share the joy of the company's 75th anniversary via online while remembering the entrepreneurship spirit of the former Chairman & CEO Han.

NOROO成立75周年 迈向百年未来!

2020年不仅是NOROO集团成立75周年纪念,也是前会长韩鼎大先生诞辰100周年,是颇具深意的一年。受疫情影响,为避免举办集体活动,NOROO集团制作了由员工参与的视频,通过线上方式共同分享75周年的喜悦,并重温了韩鼎大前会长的创业精神。

WORDS BY NOROO-ERS

The company's anniversary video started with employees making hearts with their hands and shouting "Go NOROO Group!" The introduction of the video showed bloopers featuring employees during their interviews. Unlike the previous events that was held with a serious and solemn vibe until last year, this atmosphere of this year is quite different. Since it wasn't an event where all employees were gathered, and rather a video shared via online, it was not easy to hold the attention of NOROO-ers for twenty minutes; however, the NOROO Paint & Coatings Co., Ltd. Digital Marketing Team incorporated the individual voices of employees working at NOROO- to create the "commemorative" 75th anniversary "celebration." Listening to what NOROO-ers answered to the question, "To me, NOROO is?," helped to better understand the meaning and the value of the NOROO Group.

TO ME, NOROO IS?

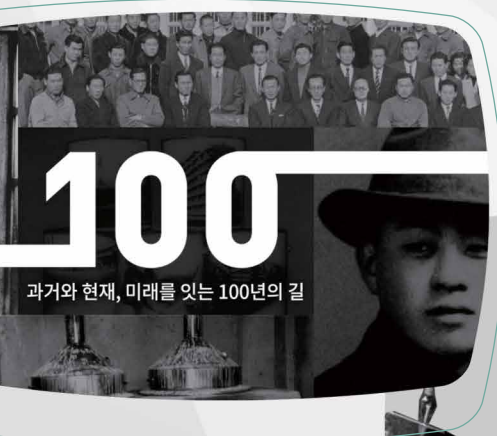
"To me, NOROO is life." Manager Kim Chung-hyun of the Production Team of NOROO BEE Chemicals Co., Ltd. who worked in NOROO for thirty years answered that NOROO is life. "I started working here in my twenties and I'm now in my mid-fifties. I spent almost my entire life here." Manager Kim's story overlaps with the answer by Manager Chung Hae-deok of the Facility Maintenance Team of NOROO Paint & Coatings Co., Ltd. Manager Chung also worked at NOROO for thirty years. He commented, "I got married, had kids, accomplished everything with NOROO for the past 30 years. NOROO is my life." NOROO's history was made because of their thirty years. There were employees who referred to NOROO as a life guide. Manager Kim Soon-ki of the Technology and Research Center of NOROO BEE Chemicals Co., Ltd. said, "NOROO showed me the path I should take like a green signal light." Manager Jin Seol-hwa of the Technology Team 4 of NOROO Automotive Coatings Co., Ltd. commented,

NOROO人如是说

庆祝集团75周年活动视频在双手比心和高喊“NOROO集团,加油!”的愉悦声中开始。视频第一部分是员工采访视频的NG集合,充满了欢笑和率真。有别于以往纪念活动的严肃和真挚,展现出了完全不同的气氛。本次活动并非大家在同一时刻齐聚一堂,而是采用线上分享视频的方式进行。要确保所有NOROO人在20多分钟的时间里认真观看并仔细聆听视频,并不是一件容易的事情。负责制作视频的纳路涂料股份有限公司数字营销组将每一名NOROO人的心声融入视频,制作出真正“值得纪念的”75周年“庆典仪式”。对于“我心中的纳路”这一问题,NOROO人的回答体现了NOROO集团的意义和价值。

我心中的NOROO

“对我来说,NOROO是生活。”NOROO碧化学有限公司生产组课长金忠铉已经在纳路工作了长达30年之久。对于他来说,NOROO就是生活。他解释称,自己20岁就进入公司,现在已经年过半百,在这里度过了整个人生。与其有相似经历的还有纳路涂料股份有限公司设备维修组课长郑海德。他同样是工作30年的NOROO人。他表示,不管是结婚还是生子,NOROO



"NOROO was the GPS that showed me the way whenever I hit a speedbump in my life." Manager Lee Jin-hyung of the Environmental Safety Team of NOROO Automotive Coatings Co., Ltd. alluded to his parents as he spoke of NOROO. "I became an adult like my parents who raised me. They were the ones who taught me about life when I stepped out into the world; that's what NOROO did for me as well." The interviews that showed affection and a partnership spirit towards NOROO showed how the seventy-five-year history of NOROO was formed and how NOROO changed the lives of countless employees in its history.

THE POWER OF 75 YEARS

The video continued with an imagination of what NOROO would be like at its 100th anniversary and greetings by representatives of subsidiaries. Representative Cho Sung-kug of NOROO Paint & Coatings Co., Ltd. and NOROO Coil Coatings Co., Ltd. and Representative Shin Joon of NOROO Automotive Coatings Co., Ltd. and NOROO BEE Chemical Co., Ltd. stated, "We are celebrating the 75th anniversary amid difficult circumstances during the COVID-19 pandemic, but all the employees are working hard to keep in step with the changes," as he encouraged the NOROO-ers. Representative Choi Myung-hee of NOROO Chemicals Co., Ltd. and NOROO R&C Co., Ltd. commented, "I hope that we will achieve our given missions during this time of the Fourth Industrial Revolution," and rooted for NOROO and its tomorrow to come. Vice Chairman Kim Yong-kee of the NOROO Group encouraged the employees, saying, "No one can imitate our history of seventy-five years," and expressed his excitement for the NOROO Group for the upcoming seventy-five years. The powerful voices of the employees shouting, "Let's go, NOROO Group" and "Congratulations

on the 75th anniversary," followed by the list of long-service employees helped NOROO-ers recognize once again the rich history of NOROO.

INDOMITABLE NOROO, A GREAT JOURNEY

Together with the 75th anniversary video was the commemorative video of the 100th anniversary of the former Chairman & CEO Han Jeong-dae's birth. Born in Hamheung, Hamgyongnam-do Province on November 2, 1920 Chairman Han lived through the Japanese Colonial Era and founded Daehan Offset Ink, the former name of NOROO, in 1945 with the spirit of business patriotism in "contributing and offering services for the nation and society through an enterprise." Han turned crises into opportunities while experiencing fires and a war as he continued to help make the company grow. The message by the founder Han in the old video remained clear. "Successful companies of all countries have histories of 100, 200, and 300 years. Let's make the effort together to flourish in the next 100, 200, and 300 years." Following his speech, Chairman & CEO Han Young-jae spoke of today's NOROO and NOROO of tomorrow. "During the past seventy-five years, we had the underlying strength to overcome crises through countless challenges and innovations. You are the future who will achieve NOROO's vision to be a global enterprise based on this strength. The indomitable NOROO will be with you during this great journey." The 75th anniversary event of 2020 shared the 100-year story and seventy-five-year history of the company as well as the power and spirit of NOROO through the voices of NOROO-ers. Although the employees could not gather in one place, the echo of the event will continue to powerfully resonate.

从未在自己的青春岁月中缺席。正是这30年的每一天缔造了NOROO的历史。

还有很多员工认为NOROO是人生的方向标。NOROO碧化学有限公司技术研究所课长金舜气称,就像代表出发的绿灯一样,NOROO为自己指明了前进的道路。NOROO汽车涂料有限公司技术4组课长陈雪华表示,在人生的每一个关卡,NOROO都是指路的方向标。NOROO汽车涂料有限公司环境安全组课长李镇亨则将NOROO比作父母。他认为就像儿时抚养我们的父母一样,NOROO是我们成人并开始社会生活后,教导人生的另一位父母。采访中,大家对NOROO的定义充满了温馨的热爱和坚守与陪伴。从大家的言论中可以深刻体会到NOROO是如何走过这75年的,这份历史又是如何开拓众多员工的生活的。

75年,时间的力量

视频展望了NOROO的百年愿景,随后播放了各子公司领导的问候。纳路涂料、NOROO汽车涂料的法人代表赵成国和NOROO汽车涂料、NOROO碧化学的法人代表申峻对NOROO人付出的辛勤劳动表达了勉励之意,赞扬了全体员工在新冠肺炎疫情这一艰难时期,仍积极配合工作不断努力。NOROO碧化学和NOROO特种树脂的法人代表崔明姬为NOROO加油打气,表达了延续NOROO历史的意志,期望进入第四次工业革命时代的同时,可以完成时代赋予我们的使命。

NOROO集团副会长金容基则强调75年的历史是他人无法复制的,同时他也表达了对75年后的NOROO集团的期许。全体

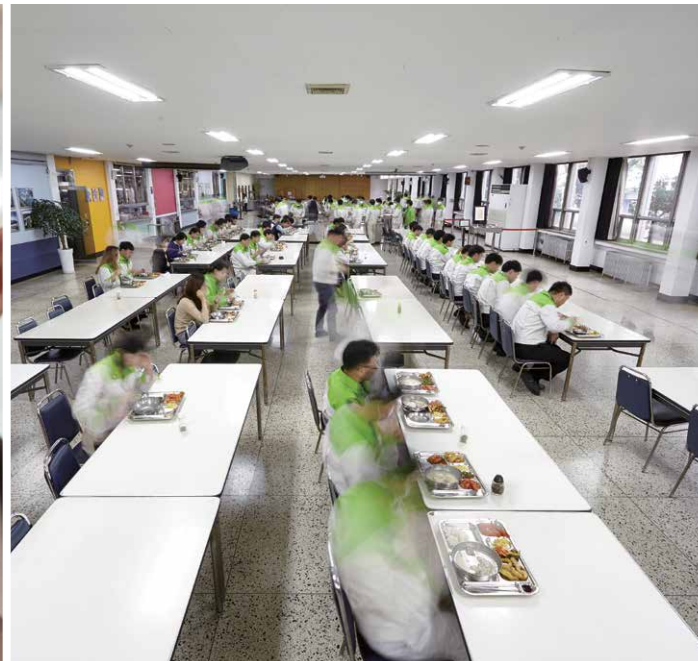
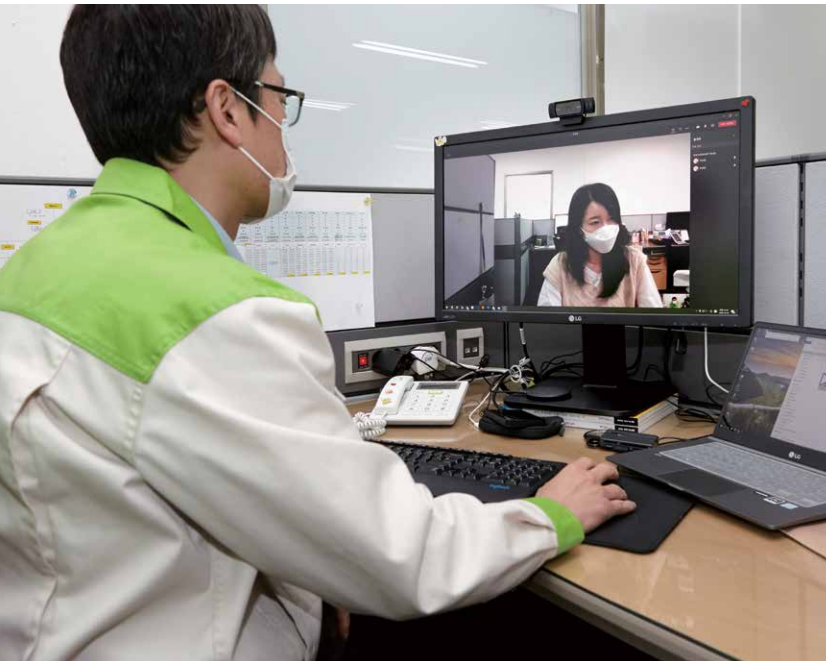
员工齐声高呼"NOROO集团加油"和"祝贺集团成立75周年",随后播放的公司长期工作的老员工名单再一次见证了NOROO深厚的历史基础。

勇于拼搏的NOROO,伟大的征程

除了成立75周年活动视频,NOROO集团还制作了前会长韩鼎大先生诞辰100周年的纪念视频。韩鼎大前会长于1920年11月2日出生于咸镜南道咸兴,经历过日本帝国主义殖民统治时期。凭借"通过企业为国家和社会做出贡献"这一事业报国精神,于1945年创建了NOROO的前身——大韩平板印刷油墨公司。此后虽经历过火灾和战争等难关,但始终将危机转换为机会,默默地发展事业。早期影像中,韩鼎大前会长的话语依然清晰。"所有的成功企业都拥有百年以上的历史。基于此,我们也要为了NOROO今后一百年,两百年,三百年的繁荣共同努力!"

接着,韩荣宰会长讲述了NOROO的现在与未来。"在过去的75年里,我们具备通过不断的挑战和革新克服危机的实力。凭借这种实力开启'世界级企业'NOROO未来的主人公正是你们各位。勇于拼搏的NOROO,让我们一起完成这一伟大的征程吧"

今年NOROO成立75周年活动通过叙述百年故事、回顾公司75年发展史和聆听NOROO人心声的视频展现了NOROO的实力和精神。虽然大家未能相聚,但活动的余韵更加强烈,将永远留在大家心中。



NOROO amid the COVID-19 Pandemic

In the midst of the prolonged COVID-19 crisis, NOROO has made some changes to adapt to the pandemic. In accordance with the quarantine guidelines provided by the government authorities, the company has observed the quarantine guidelines and all employees have made the effort to protect the common health and safety. Let's take a look into the office life in NOROO and its efforts to keep the workplace and everyday life safe.

新冠疫情期间 此时此刻的NOROO

面对持续的新冠疫情, NOROO公司内部也发生了转变。根据政府的防疫政策和指南严格制定并遵守公司内部方针和规定, 所有人为彼此的安全和健康竭尽全力。让我们来看一下为守护健康的工作环境和日常生活NOROO付出了怎样的努力。

01. STAYING SMART WITH VIDEO CONFERENCES

First, conferences in NOROO have changed. Conferences requiring an attendance of several people or taking place at faraway locations are being held as video conferences when possible. At first, employees found their faces and faces of their counterparts on the monitor awkward, but now, not only are they comfortable with it, but they find the video calls useful and convenient as they say it saves travel time and allows convenient data sharing. One tip regarding video conference calls is that using the hand gestures are efficient when several people are speaking simultaneously! It is even more effectual using you facial expressions and gestures by showing others that you are paying attention to what they are saying.

02. REPEATED TEMPERATURE CHECKS

At the entrance to the cafeteria at the NOROO Paint & Coatings Co., Ltd. Anyang Plant is a thermal imaging camera. The camera checks the temperatures of everyone entering the cafeteria, and those with high temperatures are detected for a separate temperature check with a contact-free thermometer. Visitors can enter the cafeteria only after having their temperatures checked at the Customer Information Center and when their temperature falls in the normal temperature range. NOROO does its best to prevent the risk of the infection in advance through thorough temperature checks.

03. A SINGLE LINE IN THE CAFETERIA

The cafeteria at the Anyang Plant is known for its generous portions and delicious food. The cafeteria that was once packed with the sound of joyful chats is now filled with the sound of spoons and chopsticks only as the employees are asked to sit in a row and quickly enjoy their meal without speaking to anyone in accordance with the social distancing guidelines provided by the government authorities. Social distancing was lowered to level 1 when the photo was taken, and the number of people allowed to sit at one table was increased. We look forward to the day when the cafeteria will be filled with pleasant conversations like the delicious smell of food.

04. ALWAYS WEAR YOUR MASK

The Korea Disease Control and Prevention Agency(KDCA) has used the expressions of "self-vaccine" and "seatbelt" to repeatedly stress the importance of wearing masks. In the midst of the COVID-19 pandemic, masks have now become a part of us. The wearing of masks at all times is mandatory at NOROO, and in the early months after the COVID-19 outbreak, NOROO shared masks with employees who had trouble purchasing masks in the market. An employee who was in charge of delivering masks at the time commented, "I was proud to be a part of NOROO since I felt the company's concern and responsibility for its employees' health."

05. SANITATION FOR EVERYONE'S SAFETY

At NOROO Holdings Co., Ltd., a spray-type disinfectant for living spaces is used to regularly disinfect the offices once a week. The disinfectants are also kept in the offices for anyone to disinfect the space when deemed necessary. "We disinfect the offices after office hours and mainly around the entrance and exits that are most frequently used by people. We use the method of spraying the disinfectant upward so that the virus falls downward, as recommended by the disinfection company," said an employee in charge of disinfections.

01. 视频会议更加智能

NOROO人的会议有别于以往。尽可能将需要多人聚集或远距离移动的会议改为视频会议。虽然一开始透过屏幕看自己和对方感觉有些陌生,但现在已经很自然了。不仅有助于节省移动时间,还便于分享资料,在使用方面没有任何困难。视频会议小妙招,多人同时回话时,可以通过手势提高效率!利用表情和手势回应对方发言可以进一步提升会议效果。

02. 多次测量体温

纳路涂料股份有限公司安养工厂的食堂入口设置有热像仪。在员工进入公司食堂时测量体温。一旦出现体温过高者,将使用非接触式体温计再次准确测量。一般访客需要在待客室测量体温,体温正常者方可入内。NOROO通过层层把关严格测量体温预防潜在风险。

03. 食堂坐成一列

以美味丰盛而远近闻名的安养工厂内部食堂。以前,员工们会趁中午休息时间在食堂里聊天说地,如今这里只能听到餐具的声音。这是因为工厂严格遵照防疫当局的保持社交距离各阶段方针,禁止员工面对面就餐或聊天,所有人必须坐

成一列,最短时间内专注于用餐。拍摄当天,正好赶上保持社交距离调至一级,每张桌子可接待人数稍微有所增多。无论何时走进食堂,总会有幸福的美味香气扑鼻而来,希望像往常一样大家在食堂尽情交谈的日子可以早日到来。

04. 口罩必不可少

疾病管理厅用“自助疫苗”和“安全带”来反复强调佩戴口罩的重要性。经过这次疫情,口罩仿佛成为了人体的某个器官。NOROO也以时刻佩戴口罩为基本原则。甚至在口罩紧俏的疫情初期,公司还曾想尽一切办法购买口罩,分发给员工。当时收到口罩的员工表示,可以充分感受到公司对员工健康的关心和责任感,为自己是NOROO人而感到骄傲。

05. 杀菌消毒安抚众心

NOROO控股股份有限公司配备有家庭型喷雾杀菌消毒水,除每周对办公室进行一次定期消毒外,也方便所有人根据需求随时进行消毒。负责消毒的员工表示,“主要消毒时间是下班后,消毒重点是多人进出的大门位置。消毒方法严格按照消毒公司的使用说明,通过向空中喷洒消毒液使病毒落到地面提高消毒效果。”

NOROO

NOROO Magazine | Vol. 56 (not for sale)

Class: Informational publication(Quarterly) · Registration number: Anyang Ba00022 · Registration date: March 15, 2019
Date of publication: November 26, 2020 · Published by: Noroo Holdings Co., Ltd. · Publisher: Kim Dong-hwan · Editor: Chung Suk-chan
Planning and design: Recommunication Co., Ltd., Noroo Loginet Co., Ltd. · Photo: URL Studio · Printed by: Daehan Printech Co., Ltd.
Publishing location: 351, Bakdal-ro, Manan-gu, Anyang-si, Gyeonggi-do · Inquiries: 02-2191-7700