

NOROO

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NOROO Quarterly Magazine

AUTUMN . 2021

VOL. 60SPECIAL THEME **WHITE BIO**

Column

WHITE BIO, A NEW RESOURCE FOR CARBON NEUTRALITY
为实现碳中和开发新资源—白色生物

Interview

KOREA'S FIRST WHITE BIO-CERTIFIED PAINTS
MADE BY NOROO, THE ECO-FRIENDLY LEADER
PANTONE WOOD & METAL AND ECO BIO URETHANE LINING
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HOW TO REALIZE CARBON NEUTRALITY FASTER WITH PAINTS 用涂料提前实现碳中和的方法



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SPECIAL THEME

WHITE BIO

Climate change and global warming are no longer a threat but a reality. Earth is literally aflame, and large mountain fires, heat waves, and floods continue to occur throughout the globe. Human technology is needed to stop the climate crisis that has been caused by humans. White bio, which is intended to replace the existing fossil fuel materials with bio materials, is one of the powerful technologies that will contribute to reducing greenhouse gas emissions; thus achieving carbon neutrality. Using its state-of-the-art technologies, NOROO Paint & Coatings leads the development of white bio paints for the earth.

白色生物

气候危机和全球变暖如今已不再是一种威胁, 而是不争的事实。地球正在燃烧, 到处都有不断发生的巨大山火、酷暑和洪水。为阻止因人类所引起的气候危机, 我们需要再次利用人类所创的技术。以生物为基础代替现有化石原料材料的白色生物(White Bio)是减少温室气体、实现碳中和的另一强大技术。纳路为维护地球环境, 正以尖端技术开创白色生物涂料。





White Bio, a New Resource for Carbon Neutrality

为实现碳中和开发新资源—白色生物



From industrial revolution to carbon neutrality

Since the industrial revolution, human race has achieved development at an enormous speed. What enabled the rapid development was fossil fuels, such as coal and petroleum. As the economy of organic matter—wherein wood or livestock excretion was used as the source of energy—shifted to the economy of inorganic matter such as fossil fuels after the industrial revolution, it led to the increase in the human population and production volume, and human life was rapidly restructured centering on consumption. As such, many things have changed since the revolution. It is not just the humans who have changed. Nature has changed, too. Glaciers that had withstood thousands of years started melting down, and gigantic lakes dried up and disappeared. The sea level is rising, and the frequency and intensity of heat waves and cold waves are reaching an extreme state. The destruction of the habitats of flora and fauna led to severe biodiversity loss. This is because carbon dioxide, methane gas, and nitrous oxide emitted in the course of fossil fuel combustion absorb and lock in radiant energy from the ground, making the earth a huge greenhouse. The carbon dioxide concentration in the air soared from 280 ppm during the earlier phase of the industrial revolution to 405 ppm in 2017. As such, the human race is experiencing climate and carbon concentration never before experienced.

Carbon neutrality is a global agreement and effort to overcome the climate crisis that can no longer be overlooked. Aiming to reduce carbon emissions by at least 45% from 2010 to 2030 and achieve net-zero emissions by 2050, carbon neutrality is one of the key implementation strategies of the Paris Agreement to limit global warming to 1.5°C. At the plenary session of the United Nations Framework Convention on Climate Change held in 2015 in Paris—thus referred to as the Paris Agreement—195 countries reached an agreement, and they have been establishing and submitting their individual goals since then. On December 7, 2020, the Republic of Korea, whose CO2 emissions amount is the seventh largest in the world,

从工业革命到碳中和

工业革命以后,人类以惊人的速度发展起来。造成这一快速发展的原因可归究于煤炭、石油等化石燃料的使用。以树木或家畜的粪便作为能源体系的有机物经济,在工业革命后,便转变为化石燃料的无机物经济,人口和生产量也因此增加,生活则以消费为中心快速改变等,许多事物都产生了革命性的转变。不只是人类发生了改变。自然也产生了极大变化。

数千年的冰川融化,巨大的湖泊也干涸消失。海平面上升,酷暑和寒流的次数和强度变得更为极端。随着植物和动物的栖息地逐渐缩小,生态系统的多样性也随之减少。这是因为在化石燃料燃烧过程中产生的二氧化碳、甲烷、二氧化氮等吸收地面辐射能量后,使地球产生温室效应所致。工业革命初期的大气中二氧化碳浓度为280ppm,2017年则达到了405ppm,人类因此生活在前所未有的气候现象及碳浓度当中。

“碳中和”旨在突破气候危机,全世界都不得再继续袖手旁观,而应必须努力达成协议。《巴黎协定》的主要策略是,相比于2010年,截至2030年必须至少将碳排放量减少至45%以上,截至2050年将净碳排放量转为零的碳中和目标,并且将地球上升温度控制在1.5摄氏度以内。2015年在巴黎举行称之为“《巴黎协定》《巴黎气候变化协定》”的联合国气候变化协定公约国总会议,有195个国家对相关协定达成了协议,随后便陆续制定并提出各国的目标。其中,二氧化碳排放量位居世界第7位的韩国也于2020年12月7日发布了《2050碳中和推进策略》。

以白色生物取代化石原料

人类排放出的二氧化碳将被环境全盘吸收,因此为了达到净碳排放量降至0的碳中和目标,新资源白色生物应运而生。白色生物是指以植物资源或农业、林业、畜牧业等副产品有机物质、微生物酶等

announced its carbon-neutral strategy for 2050.

White Bio to Replace Fossil Fuels

White bio is a new resource for carbon neutrality that absorbs as much carbon dioxide as that emitted to reach net-zero emissions. It is a biotechnology used to produce chemical products or biofuels using plant resources or organic substances and microbial enzymes—the byproducts of agriculture, forestry, and livestock industry—instead of fossil fuels. The resource is aimed at restoring the economy of organic matter in the past using technologies of the present time.

White bioproducts contribute considerably to carbon neutrality as not only do plants—the ingredients of white bioproducts—absorb carbon dioxide during the course of their growth; the amount of carbon emissions from the production process is relatively smaller as well. An example is bioethanol, which is used in automobile fuel additives. Bioethanol is made by fermenting plants using microorganisms and enzymes. Unlike gasoline, it does not emit greenhouse gases. The fact that bioethanols can be obtained from plants makes it a renewable resource. In addition, bioplastics—which are made by using microorganisms as the energy source—are naturally degraded; they do not cause pollution.

Based on the given facts, white bio is an essential technology for responding to the market regulations that are getting stricter and stricter for carbon neutrality. Global petrochemical companies have already started extensive R&D and facility investment, and the US and European governments are expanding their R&D support while increasing environmental regulations. The US in particular is promoting the white bio industry centering on agriculture and forestry with the goal of replacing 30% of the country's petroleum consumption with bio chemical products by 2030. The US government is implementing the preferential biobased product purchase system for 139 categories including paints and cleaners.

The Korean government is also making efforts to promote carbon neutrality and improve the country's global competitiveness. At the fifth Innovative Growth Strategy Meeting held at the end of last year, the associated government agencies jointly announced a strategy to activate the white bio industry in the country. This demonstrates the government's commitment to supporting demand creation, improving regulations, and establishing the base for the white bio industry—for the purpose of developing this promising industry. Efforts are also shown in the private sector to secure and commercialize the technologies. NOROO Paint & Coatings is taking the lead by launching a white bio paint for the first time in the industry and acquiring the USDA (United States Department of Agriculture) Certified Biobased Product certification.

While the public and private sectors across the globe are accelerating carbon neutrality efforts, the awakening of the market where consumption takes place will serve as a driving power for sustainable growth. No matter how excellent and superior the white bioproducts are, failure to attract consumers' attention makes carbon neutrality a far-off goal. Technology development and production for white bio and carbon neutrality require greater cost. As the public and private sectors bear the financial burden, consumers must also set the base of their choices as “environment” in order for the reality faced by the human race and the future of the world to improve. Production and consumption since the industrial revolution have caused the current crisis. As such, the activities for the future must focus on resolving the crisis. White bio, a state-of-the-art technology to bring back the pre-industrial revolution economy of organic matter, will serve as a key solution.



作为原料来取代现有的化石原料,从而生产化学制品或生物燃料等物质的生物技术。也就是说,相当于用现有的技术恢复过去的有机物经济模式。

白色生物制品在其原料植物等生长过程中,不仅能吸收二氧化碳,在产品生产过程中也能相对排放较少的二氧化碳量,因此在实现碳中和目标上具有举足轻重的贡献。举例来说,用于车辆燃料添加剂的生物乙醇,就是最具代表性的实例。利用微生物和酶使植物发酵制成的生物乙醇,与汽油最大的不同之处就是它不会排放温室气体。因为生物乙醇可以从植物中直接获取,所以随时都可以不断再生。此外,利用微生物能源所制的生物塑料可以自然降解,故不会引起公害。

这种白色生物是为了实现碳中和目标而逐渐加强,以克服市场管治的必要技术。因此,全球石化企业早已积极针对这项技术进行研发及设备投资,美国和欧洲政府方面甚至还在加强环境管治的同时,扩大支持研发白色生物技术。尤其,美国表示截至2030年,将使用生物化学产品取代30%的石油消费量为目标,聚焦农林业,以振兴白色生物产业。此外,美国联邦政府也正面向涂料和洗涤剂等139个领域采取优先购买生物基础产品的制度。

另一方面,韩国政府也为了促进碳中和目标、提高全球竞争力,在2020年年末的第5次革新成长策略会议上,联合相关部门发表了白色生物产业激活策略。也就是说,为了发展未来潜力产业—白色生物,政府将支援该产业的创造需求、改善管制及构筑基础。同时,各企业也在确立此项技术,并致力于将其事业化经营。纳路涂料在涂料业界首先推出白色生物涂料,并获得“美国农业部生物基认证(USDA Certified Biobased)”,成为革新涂料的领头羊。

综观来说,全球政府和企业正在加速推进碳中和目标的同时,应促成市场消费,这才能成为白色生物技术持续增长的动力。即使生产得再好的白色生物制品,如果消费者不买账也将永远无法达成碳中和目标。相比于现有技术,针对白色生物、碳中和所开发的技术及产品也同时伴随较高的费用负担。对此,政府和企业必须有照单全收的心态,这样消费者也才会把选择标准置于“环境”基础上,人类的现实环境和地球的未来才会变得更好。工业革命后的生产和消费模式造成了现有的环境危机,因此今后的生产和消费模式应聚焦于解决环境危机上才是。因此,通过高科技重新创造工业革命前有机物原料的白色生物,将成为改善未来环境的主要解决方案。



Korea's First White Bio-Certified Paints Made by NOROO, the Eco-friendly Leader

PANTONE Wood & Metal and Eco Bio Urethane Lining

Suppressing and minimizing the emission of harmful substances are now basic. Production activities in the future must focus on easing dependence on fossil fuels by increasing the biomass content of the raw materials, thus expanding plant resources. The increased demand for plant resources contributes to enhancing the earth's sustainability. This is the reason NOROO Paint & Coatings ("NOROO") created white bio paints and acquired the USDA (United States Department of Agriculture) Certified Biobased Product certification for the first time in Korea.

韩国首款白色生物认证涂料, 由环保龙头纳路打造

PANTONE WOOD & METAL、ECO BIO URETHANE LINING

抑制及将有害物质最小化释放再也不是梦。人类今后的生产活动必须要提高原料本身生物能源的含量, 并降低对化石原料的依赖, 以扩大植物资源的应用。扩大植物资源的需求有助于提高地球环境的可持续性。这就是纳路涂料在韩国率先获得美国农业部生物基(USDA Certified Biobased) 认证, 并领衔研发生产白色生物涂料的原因。



NOROO'S TECHNOLOGICAL POWER VERIFIED WITH USDA CERTIFICATION

On August 17, NOROO announced its acquisition of the USDA Certified Biobased Product certification ("USDA certification") for PANTONE Wood & Metal and Eco Bio Urethane Lining, a floor coating. The USDA certification is awarded by USDA for the purpose of environmental protection and white bio industry promotion. It designates the use of bioresources, i.e., biomass, by a standard level or higher per product category and guarantees conformance through document screening and product test.

The day NOROO announced the successful screening and testing of its products, An Yoon-soo, Lee Won-ki, and other members of Architectural Paint Technology Team 1 and Resin Research Team of the NOROO Research Institute let out an excl-

通过美国农业部 (USDA) 认证证明技术实力

2021年8月17日, 纳路涂料宣布, 建筑涂料PANTONE Wood & Metal和地板材料涂料ECO BIO URETHANE LINING获得了“美国农业部生物基认证(USDA Certified Biobased, 以下简称USDA)”。USDA认证是美国农业部为保护环境和促进白色生物产业而运营的认证制度, 此认证说明产品依类别达到标准值以上的生物资源原料, 即可作为生物能源使用, 并在通过文件审查和产品试验后证明其适用性。

在该审查和试验通过的当天, 以安胤琇次长和李元纪次长为首的建筑技术1组和树脂研究组等纳路涂料研究所欢欣鼓舞地表示“终于成功了!”。这是韩国首次获得USDA认证, 证明了纳路领先的技术能力。

“PANTONE Wood & Metal及ECO BIO URETHANE LINING是使用植物性油脂生物能源的环保白色生物涂料。由于韩国国内的环保认证尚未确立生物能源原料的认证项目, 因此改以通过美国USDA认证的方式获得产品认证。我们想通过严格的认证, 向消费者和地球环境传递有益的产品。因此我们早已着手研发此项任务。”安胤琇次长兴奋地表达成功的喜悦并进行了说明。

“我们最先开始研发的涂料便是PANTONE Wood & Metal。2017年上市当时, 可说是领先业界的白色生物涂料。然而当时市场对碳中和的理解度并不如现在高, 所以仅以卓越的功能性为主进行宣传, 获得了众多关注和好评。现在, 白色生物、ESG等概念逐渐为大众所熟知, 我们当初率先的尝试也得到回响, 因此便再次全新推出了ECO BIO URETHANE LINING涂料。”

由于早已提前进行了准备, 纳路涂料的白色生物涂料技



Geureolssajingwan Hall in Lotte World painted with PANTONE Wood & Metal. PANTONE Wood & Metal is USDA certified with Eco Bio Urethan Lining.



mation of overwhelming joy. Their works were approved for the USDA certification for the first time in Korea, and this has verified NOROO's advanced technological power.

"PANTONE Wood & Metal and Eco Bio Urethane Lining are eco-friendly white bio paints made using biomass, which is a plant oil. Korea still does not have an eco-friendly certification for biomass resources. Thus, our technological power was verified with the USDA certification. Our goal was to offer products that are beneficial to consumers and the earth by passing the strict screening process. I can say that we embarked on the development earlier than others," said An Yoon-soo, describing the teams' excitement for success.

"It all started with PANTONE Wood & Metal," he continued. "The product was released in 2017, and it certainly is a pioneering white bio paint. Back then, the market understanding of carbon neutrality was not as extensive as it is now. So, we publicized the fact focusing on the product's excellent functionality. It drew much attention and received favorable responses. Now, consumers and the market are gradually understanding the importance of white bio and the environmental, social and governance (ESG) issues. This motivated us to launch the Eco Bio Urethane Lining, believing that our attempt ahead of others would create a sensation."

Having started the preparation a long time ago, NOROO is receiving responses fast in the market with its white bio paint technologies. "Companies also need differentiated paints that would help in their ESG management and carbon-neutral strategy. Because of this, we are getting a number of requests for cooperation to date. We plan to increase the number of white bio paint products and acquire international certifications for not only B2B but also exports."



CARBON NEUTRALITY ACHIEVED THROUGH GOOD PRODUCTION AND CONSUMPTION

To acquire the USDA certification, a product must be made using biomass resources with biocarbon content by a standard level or higher specified for the respective product group. PANTONE Wood & Metal contains 43% of the substance extracted from linseed oil while Eco Bio Urethane Lining contains 48% of the substance extracted from corn oil. With the levels exceeding the standard, these products were awarded the USDA certification. Lee Won-ki explained about the challenging development: "It was not easy to find biomass materials with physical properties similar to those of petrochemical products. But then, we were thrilled when we found suitable materials after numerous tests on various materials considering the balance between durability and eco-friendliness."

NOROO's white bio paints created through the teams' R&D deliver the same performances as those of paints made using petroleum-type materials, according to Lee. "A product of another company promoted as a natural paint did not have satisfactory physical properties," he continued. "But NOROO's new paints create perfect performances. General consumers would not be able to see the difference from conventional paints." Lee added that this has both positive and negative aspects: "For the existing petroleum-based paints, elements harmful to the human body were eliminated by means such as minimizing the use of organic compounds and removing the smell. Through this, consumers would hardly notice the difference between white bio paints and the existing products. They may even feel reluctant to choose white bio paints because they are more expensive. But it's time we take into consideration harmfulness for not only users but also Mother Nature. By consuming products that emit less carbon in the production process, we can make our future and that of our children safer."



PANTONE Wood & Metal is non-toxic and organic "white bio" paint that comes in a variety of colors with excellent results. The eco-friendly and photogenic Geureolssajingwan Hall in Lotte World was painted with PANTONE Wood & Metal.



An and Lee feel rewarded than ever by the accomplishment they have made with PANTONE Wood & Metal and Eco Bio Urethane Lining. More than merely contributing to NOROO's growth, it is an advancement for the global environment. In the paint industry, NOROO fulfilled corporate social responsibility through its development and production activities ahead of all others. NOROO's good production will hopefully lead to good consumption, resulting in a virtuous cycle for all.

术正获得市场的积极回响。“许多企业也认为有助于碳中和和ESG经营的差别化涂料势在必行，因此向我们发出合作的邀请。今后，不论是面向B2B，还是出口等业务，我们计划将扩大白色生物涂料的项目，进一步确立其国际认证的实力。”

碳中和, 正快速走向生产和消费

为获得USDA认证, 碳中和产品必须使用生物能源材料, 并包含相关产品群标准值以上的生物碳含量。PANTONE Wood & Metal使用了43%的亚麻籽油提取物质, ECO BIO URETHANE LINING则使用了48%的玉米油提取物质, 两者皆已超过标准数值而因此获得了USDA认证。李元纪次长说明了过去的开发历程。“寻找与石化产品类似物质属性的生物能源并不容易。我们考量了耐久性和环保性的均衡, 在经过各种原料的无数次测试后, 终于找到合适的材料, 对此我深表欣慰。”

李元纪次长表示, 经过此过程所研发完成的白色生物涂料与利用石油系物质的涂料发挥相同的性能。“其他公司标榜的天然涂料产品, 曾出现过物质属性不佳的反应。然而纳路涂料的新产品能体现完美性能这一点, 对于普通消费者而言, 可能感受不到其与现有涂料的差异。”李元纪次长补充道, 这些涂料皆具有优缺点。“现有的石油系涂料也有实行有机化合物最小化、异味消除等可以排除对人体有害成分的机制, 因此消费者可能会认为白色生物涂料和石油系涂料并无差异。再加上, 白色生物涂料的价格又比现有涂料高, 所以可能就更不会去轻易购买。然而现在不仅要考虑消费者权益, 还要关心有害物质对整个地球共同体所造成的影响。同样地, 若我们的消费在生产过程中也可减少碳元素的产品, 那么 we 和下一代的未来将会更加安全。”

这也是安胤琇次长和李元纪次长对PANTONE WOOD & METAL及ECO BIO URETHANE LINING涂料成果感到无比满意的原因。纳路的成长伴随着对地球环境的关心, 我们也造就涂料业界领头履行社会责任的产品开发和生产。我们期待纳路涂料能带来正面的生产消费模式, 并实现为所有人类造福的良性循环。



How to Realize Carbon Neutrality Faster with Paints

NOROO Paint & Coatings ("NOROO") seeks to achieve the goal of realizing carbon neutrality faster by leading the development of eco-friendly paints made of various materials and ingredients. Some of the examples are PANTONE Wood & Metal and Eco Bio Urethane Lining, as well as anti-fouling film that reduces greenhouse gas (GHG) emissions. These products will not only keep the users safe in their residential, commercial, and industrial spaces but also secure the planet's environment.

用涂料提前实现碳中和的方法

纳路涂料引领市场开发多种材料和原料的环保涂料, 并提前实现碳中和目标。我们通过使用白色生物技术的PANTONE WOOD & METAL和ECO BIO URETHANE LINING涂料, 以及温室气体减排用防污膜等产品来实现碳中和。在居住空间、商业空间、产业现场, 这些产品不仅能保护使用者的安全, 还能保护地球的环境。



LOW-FRICTION ANTI-FOULING FILM THAT REDUCES GHG EMISSIONS FROM THE SHIPPING SECTOR

Marine organisms, such as barnacles, oysters, and seaweeds, latch onto the submerged surface of ships. Some anti-fouling paints used in the marine industry slowly melt in water, polluting the sea. NOROO is developing anti-fouling film technology to prevent this. This technology consists of a complex technique related to "low-friction anti-fouling silicone coating material and film surface control and process" and removes the VOCs generated while using spray-type anti-fouling paints in the ship painting process—it simplifies the painting process to improve productivity. The technology It also showed low friction against seawater, thereby improving the ship's fuel efficiency and reducing GHG emissions. In 2017, NOROO received a service task as part of the core industrial technology development project under the supervision of the Ministry of Trade, Industry and Energy of Korea. After four years of research and development, NOROO applied for the patent of a new material for the anti-fouling film last December. The company is to complete the eco-friendly anti-fouling film technology that pursues environmental, social and governance (ESG) factors for the shipbuilding industry by the end of this year. NOROO expects a fierce competition in developing value-adding eco-friendly technologies in the marine paint and coatings market. In this situation, we expect the film-type anti-fouling paint to improve the ship's fuel efficiency and reduce GHG emissions for shipowners while offering better productivity and safety for ship-

builders. NOROO will further develop the technology and continue to secure competitiveness with low-carbon and energy-saving parts made of new materials to fight climate change.

降低船舶温室气体排放的低摩擦防污膜

被沉没在水面下的船舶表面经常粘着藤壶、牡蛎、海藻类等水中动植物。为防止这类情况而使用的部分防污涂料, 会在水中慢慢融化并释放涂层涂膜, 从而对海洋造成严重污染。纳路涂料为防止这类情况, 正着手开发防污膜技术。该技术由“低摩擦防污硅涂层材料和薄膜表面调节及处理”相关的复合技术组成, 可使用现有的喷雾型防污涂料去除在涂装船舶时产生的VOC, 以此简化涂装工序并提高生产效率。此外, 这项技术还能实现与海水的低摩擦性能, 降低船舶的油耗和温室气体排放。2017年作为产业通商资源部主管的产业核心技术开发项目的课题, 经过4年的研发后, 纳路涂料终于在2020年12月申请了船舶用防污膜新材料相关专利, 并预计在2021年年末完成造船业环保ESG防污膜技术的相关开发。

今后, 预计船舶用涂料市场将展开激烈的价值创新型环保技术竞争, 而薄膜型防污涂料是提高船舶燃油效率、降低温室气体排放量, 并提升造船企业生产和安全效率的产品。纳路涂料计划进一步发展相关技术, 并利用应对气候变迁所需的低碳、低耗能型新材料确保市场竞争力。

MAKE YOUR FLOOR SOLID AND SAFE WITH ECO BIO URETHANE LINING

Eco Bio Urethane Lining is a flooring product for structures that demand eco-friendliness such as schools, public buildings, and commercial buildings. It has biomass-based material (48% biomass). As a two liquid-type, non-solvent-based urethane lining paint, the paint acquired the USDA Certified Biobased Product certification along with PANTONE Wood & Metal. Like the existing lining flooring, Eco Bio Urethane Lining can create a thick coating with just one layer of coat, offering an elegant look with its outstanding leveling property. Moreover, despite its bio-based ingredient, it is a high-quality polyurethane lining paint with excellent adhesiveness, shock absorption, anti-scratching, and anti-flammability. Using plant-based ingredients increases the cultivation area of plants, thus increasing the earth's carbon dioxide absorption rate. Eco Bio Urethane Lining is created through efficient application of technology that uses corn oil, helping reduce carbon emissions for the next generation. By applying more of these types of products in many sites, we hope to see the day when we achieve carbon neutrality.



PANTONE WOOD & METAL IS THE PRODUCT TO PAINT WOODEN AND METAL SURFACES

PANTONE Wood & Metal shows less emissions of total volatile organic compounds (TVOCs), toluene, and formaldehyde and less VOCs and volatile aromatic hydrocarbons (VACs) content than the environmental indicator management standard, and it has also passed the non-heavy metal test. Thanks to its safe properties, PANTONE Wood & Metal received the eco-friendly certification mark from the Ministry of Environment of Korea and the USDA Certified Biobased Product certification from the US Department of Agriculture in 2021. It has been verified an eco-friendly paint and white bio paint with certifications in Korea and abroad. PANTONE Wood & Metal boasts of outstanding durability and easily latches onto metal and aluminum surfaces. It is also finished with water-soluble urethane alkyd-type paint that provides solid paint barrier, thus, offering strong protection against water and scratches. Thanks to this property, the paint can be used for both indoor and outdoor environments. In particular, it is popular for bathroom doors and kitchen cabinets and is also suitable for metal and wooden surfaces of outdoor playgrounds. It adheres to the surface easily, so there is no need to paint a gesso layer, making it a great time-saver. The product comes in 2,100 PANTONE colors as well as semi-matte and eggshell gloss, allowing consumers to realize the visual effects they want.



坚固安全的地面常用涂料—ECO BIO URETHANE LINING

ECO BIO URETHANE LINING是学校、公共建筑、商业设施等要求高环保性的建筑所使用的基于生物能源(生物碳含量48%)的地面材料, 是与PANTONE WOOD & METAL共同于2021年获得美国农业部生物基认证(USDA Certified Biobased)的双液型无溶剂聚氨酯底漆。ECO BIO URETHANE LINING与现有底漆材料相同, 仅需1次涂装即可进行后膜涂层, 以优秀的平滑性展现涂装后流丽的外观。此外, 本产品以生物物质为基础构成, 是一款在附着性、耐冲性、耐刮性、难燃性等方面展现优秀物性的高级聚氨酯底漆。

使用植物原料可促进植物种植面积的增加, 进而提高地球的二氧化碳吸收率。ECO BIO URETHANE LINING有效应用了玉米油技术, 可以降低环境碳排放量, 造福下一代。今后, 期待更多的作业现场广泛应用本产品, 进而提前实现碳中和的目标。



木材和钢材常用涂料—PANTONE WOOD & METAL

PANTONE WOOD & METAL的TVOC/甲苯/甲醛排量和VOC/VACs含量均低于环境标记管理标准, 通过了重金属无检出标准等, 具有各种安全物性, 继早前获得环境部环保认证标志后, 2021年又获得了美国农业部运营的美国农业部生物基认证(USDA Certified Biobased)。也就是说, PANTONE WOOD & METAL不仅获得海内外公认的环保涂料, 也是一种白色生物涂料。

拥有出色耐久性并以此为荣的PANTONE Wood & Metal在钢材及铝质材料上的附着力相当优秀, 且具有卓越的木材渗透力, 属水性聚氨酯醇酸型涂料, 可牢固地覆盖涂膜, 并兼具防水、耐刮等功能。因此, 室内和室外环境皆可使用本产品, 尤其作为浴室门、水槽上下端涂料广受欢迎, 也适用于室外儿童游乐设施的钢材及木材涂装。同时, 产品粘着性卓越, 可省去涂抹丙烯酸底料, 还可大幅缩短作业时间。产品不仅有反光、蛋壳光两种光泽, 同时还有2100多种颜色的潘通色卡, 可充分表现出想展现的视觉效果。

NOROO Paint Q-fit Master to Protect Buildings for a Hundred Years

The First Multi-functional Anti-oxidant Water Paint for Outer Walls in the Industry

NOROO Paint & Coatings (“NOROO”) recently released “Q-fit Master,” a multi-functional anti-oxidant water paint for buildings, and filed a patent application for “water paint for preventing the neutralization of concrete structures and its manufacturing method.” Let’s listen to the story about Q-fit Master, which has extraordinary functions to extend the lifespan of buildings, from our Architecture Technology Team 1 and Marketing Team.

守护百年建筑的 纳路涂料Q-FIT MASTER

业界首创外墙防旧多功能水性涂料

纳路涂料近期推出了建筑物防旧多功能涂料“Q-fit MASTER”，并同时申请了与其相关的“混凝土结构防止中性化水性涂料及其制造方法”专利。让我们来听听建筑技术1组和营销组为我们介绍的以出色功能延长建筑寿命的Q-fit MASTER传奇。



PAINT TO EXTEND THE LIFESPAN OF BUILDINGS

We mainly spend our time in buildings. We work in the office or a factory, study at school, and rest at home. Almost every activity is done in buildings. The safety of buildings directly connects to our safety. NOROO recently released premium water paint Q-fit Master to keep the safety of buildings by preventing their deterioration. Aside from being rated KS Level 1, Q-fit Master has extraordinary functions such as water repellency, elasticity, high weather resistance, washability resistance, and alkali resistance to protect and extend the lifespan of buildings. How do these functions protect buildings? Kim Moon-woo, vice head of the Architecture Technology Team 1 that developed Q-fit Master, explains,

“Generally, a ferroconcrete building is of very high durability that it can last more than a hundred years. However, this is when the concrete maintains its original strong alkalinity. As the permeating rain neutralizes the concrete, the reinforcing bars get rusty, and the volume of the rusty rebars becomes dilated, which in turn changes the structure of the building and causes cracks. It may lead to a collapse. With excellent weather resistance, Q-fit Master keeps the paint film intact for a long period to protect the concrete and rebars. Its robust and strong film has water repellency, ability to prevent the permeation of water at higher than level 7, and outstanding elasticity to keep hairline cracks from forming. This protects the concrete from being neutralized.”

Realizing perfect water repellency and elasticity involves high technology. According to Vice Head Kim Moon-woo, it was not an easy process. “We first developed the resin in cooperation with the Resin Research Team. We repeated the process of blending paints over and over to match the new resin. We also had to consider the workability in the field. Not only that; we tried to maximize its weather resistance with 100 percent acrylic emulsion and minimize the burden on the market.”



延长建筑寿命的涂料

我们大部分的日常生活都在建筑内度过。在办公室或工厂工作、在学校学习、在家休息等几乎所有活动都在建筑内部进行，所以建筑的安全也就是我们的安全。为此，纳路涂料近期推出了防止建筑老旧现象、守护建筑安全的特级水性涂料“Q-fit MASTER”。Q-fit MASTER不仅是KS 1级标识产品，还兼具疏水性、弹性、高耐候性、耐洗性、耐碱性等卓越功能，可保护建筑并延长其寿命。这些功能如何保护建筑？开发Q-fit MASTER的建筑技术1组金文佑次长为我们做了详细介绍。

“一般的钢筋混凝土建筑是可维持100年以上的高耐久性构造。但前提是混凝土结构必须保持原来的高耐碱性才能维持如此之久。雨水渗透建筑后，混凝土便会中性化而导致钢筋生锈，生锈的钢筋体积会膨胀，从而引发结构变化并产生龟裂。这些现象最终将导致建筑受损。Q-fit MASTER具有优秀的耐候性，可长时间维持涂膜并保护混凝土和钢筋。坚实强韧的涂膜疏水度超过R7，表面防止水分渗透的性能卓越，并且具有良好弹性，不易产生细微龟裂。正因如此，Q-fit MASTER可有效防止混凝土的中性化。”

同时体现周密的疏水性和弹性，这都是靠高端技术才得以实现。金文佑次长表示开发这项技术的过程并不容易。“我们和树脂研究组携手，从树脂开始研发。为了配合新的树脂，我们持续重复了涂料的调和过程。不仅如此，还需要考量在现场的作业可行性。我们使用了100%亚克力乳液，在最大程度地提高涂料耐候性的同时，也致力于降低价格，以减少消费者的费



Developed through intensive research and repeated experiments, Q-fit Master showed its unrivaled excellence: the accelerated weather test found that it has 1.5 times longer weather resistance than that of existing paints.

NOROO enjoys predominance with the release of Q-fit Master, the multi-functional paint specializing in anti-oxidant effect.



Developed through intensive research and repeated experiments, Q-fit Master showed its unrivaled excellence: the accelerated weather test found that it has 1.5 times longer weather resistance than that of existing paints. “Q-fit Master will prevent the original appearance of a building from being altered by the outer environment,” said Kim, his voiced filled with confidence.

BREAKING THROUGH THE MARKET WITH ADVANCED TECHNOLOGY

As the first product that differentiates itself from most widely used type 1 level 1 water paints for outer walls, Q-fit Master is expected to be outstanding in the market for new construction and repainting of apartments. Oh Sang-jin, section chief of the Marketing Team, said the special functions of Q-fit Master will appeal to the clients. “Companies are bleeding in the price competition with their equalized high-level products in the market for type 1 level 1 water paints for outer walls. In the competition, they put too much focus on color design. Now, NOROO enjoys predominance with the release of Q-fit Master, the multi-functional paint specializing in anti-oxidant effect. Typically, buildings have to be repainted with five to seven years’ interval. Q-fit Master can increase the interval to reduce the maintenance expense. It has all the essential functions for an outer wall paint and an additional function for which we applied for a patent. Any reasonable client will see our product as the best choice.”

Oh noted that large construction companies building new apartments are also paying attention to the functions of Q-fit Master. “We are getting quick responses. The unique specification of our product has appealing power as marketing is important in the construction industry as well. Q-fit Master will be sought after as the government is also expected to put more emphasis on reinforcing the durability of buildings



用负担。”经过积极研究和反复试验所开发的Q-fit MASTER, 在加速老化试验中得到相较于现有涂料具有1.5倍以上耐候性的结果, 体现出其优越的性能。“Q-fit MASTER不会因外部环境受到污染, 可长久维持建筑原始外观。”金文佑次长的表达中蕴藏着无比欣慰。



with its policy. Seeing this, we are promoting Q-fit Master as much as we can.” Vice Head Kim Moon-woo and Section Chief Oh Sang-jin, who had to deal with tight schedules to develop and release the new product as soon as possible, say, “We are still hungry. “We will develop another product to satisfy the needs of our clients better. Our clients are ambitious. We will examine the market, supplement our existing products, and prepare to make new products for next year.” They are leading efforts for NOROO to break through the market with advanced technology.



以尖端技术突破市场

Q-fit MASTER与目前广泛应用的一种第1级外墙用水性涂料相比更为优质, 可说是韩国国内首创革新产品, 有望在新建公寓及涂料翻新市场上崭露头角。营销组吴尚振课长表示“Q-fit MASTER的特殊性能将备受消费者关注。”

“目前应用的1种第1级外墙用水性涂料市场在普遍质量上涨平均化的状态下, 正展开一场激烈的单价竞争。竞争要素主要偏重于色彩设计。如今纳路涂料在业界首次推出具有防旧特色的多功能涂料Q-fit MASTER, 具备与众不同的优点。建筑每5~7年就必须进行涂层翻新, 然而Q-fit MASTER可延长这一翻新工程的间隔, 节省建筑管理费用的支出。Q-fit MASTER不仅具有外墙用水性涂料所必备的所有功能, 还兼具已申请专利的其他功能。Q-fit MASTER必将成为消费者理性选择的最佳产品。”

吴尚振课长表示新建公寓市场的大型建设公司也对Q-fit MASTER的性能深感兴趣。“市场的反应相当快速。建设公司特别着重于营销, 因此这款产品的特殊性能具有相当程度的诉求力。此外, 政府的政策也将朝向加强建筑耐久性的方向发展, 可以预见Q-fit MASTER未来将有更多机会活跃于市场。为达到此目标, 我们正积极不懈地推广产品。”

为比预期更快地开发和销售新产品, 马不停蹄努力的金文佑次长和吴尚振课长在已推出Q-fit MASTER的当下也表示“这一切还只是开始”。“我们还要开发更多能满足消费者需求的产品。消费者总是精益求精。在观察市场的同时, 我们还要进一步完善现有产品, 并为明年准备全新产品。”纳路涂料以尖端技术突破市场, 而造就这一切的便是这群先锋者。

No Limits Before Paintings

NOROO Paint & the Art of Banksy Seoul
<The Art of Banksy-Without Limits> World Tour in Seoul

Commonly known as a guerrilla artist and a street art terrorist, Banksy is a “faceless artist” who is in the spotlight in the 21st-century art world. An exhibition where his ever-popular artworks can be witnessed in one place was held at The Seouliteum in Seongsu-dong. His message on a wall painted with NOROO Paint goes beyond limits, delivered in a vivid way.

彩绘面前没有界限

纳路涂料&班克斯艺术
<The Art of Banksy-Without Limits> World Tour in Seoul

“神秘画家”班克斯被冠以街头艺术家、街头艺术恐怖分子等名号，在21世纪美术界经常掀起热门话题。如今，班克斯，将其作品展示于圣水洞THE SEOULITEUM, 让大众得以一览他所有的杰作。在用纳路涂料彩绘的墙上，班克斯生动地向众人传递其超越极限的信息。



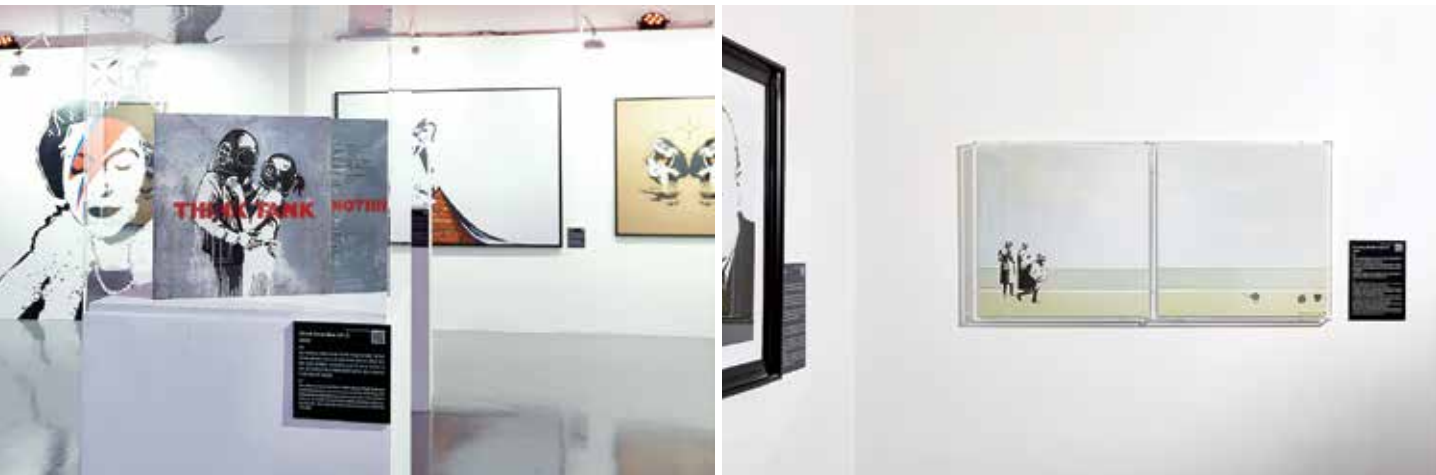
MURALS THAT DELIVER MESSAGE

Average work time: 35 seconds. Materials: paint and 400 mL spray. Estimated highest price of an artwork: KRW 10 billion. These are some of the aspects of Banksy, who calls himself a street graffiti writer. The artist worked in strict anonymity for nearly 30 years mostly in London. He also paints what he calls “graffiti” containing social messages around the world from Germany, Austria, and France to Palestine, Spain, and the United States. His graffiti, which unexpectedly appear and disappear, powerfully delivers—and help visitors understand at a glance—social issues such as wars, refugees, inequality, environmental destruction, and commercialism, as well as the irrationality of the world through acute parodies. All spaces—ranking from shabby walls in old neighborhoods to huge walls in borders and refined walls of art museums—are used as tools to deliver his messages, and the process of erasing and tearing down the murals also adds meaning to his works. This time, NOROO Paint has created a space to deliver his messages at The Seouliteum under the title <The Art of Banksy – Without Limits> World Tour in Seoul (“The Art of Banksy Seoul”). NOROO Paint sponsored PANTONE and Soon & Soo paints to the exhibition center. The exhibition hall is painted with Soon & Soo’s WT 1008 Morning Air White that clearly highlights the work inside a frame, the gray colors of PANTONE paint helping resurrect old cement walls on which murals are

传递信息的壁画

班克斯平均彩绘工作耗时35秒，使用涂料和400毫升喷漆作为材料，其作品最高估价100亿韩元。这就是自称“街头涂鸦创作家(street graffiti writer)”的班克斯展现自我的一面。近30年来，班克斯以完全以匿名方式活动，在伦敦、德国、奥地利、法国、巴勒斯坦、西班牙、美国等世界各地的墙上，通过涂鸦蕴藏社会信息。他用犀利的讽刺性模仿手法表达战争、难民、不平等、环境破坏、商业主义等社会问题和世间万物的不合理性。让人一眼就能理解的班克斯涂鸦总是突然出现又转瞬即逝。不论是老旧小区简陋的墙面、阻隔国境的巨大墙面，还是美术馆的高雅墙面等，这所有的空间都被班克斯用为传递信息的工具，就连抹平、拆除墙面的过程也赋予了彩绘作品更深的意义。这次，纳路涂料为传达班克斯的信息创造了一个空间。在《The Art of Banksy-Without Limits》World Tour in Seoul(以下简称《Art of Banksy Seoul》)THE SEOULITEUM展厅使用了纳路涂料所赞助的潘通涂料和纯&秀涂料。使用将画框内作品鲜明衬托的纯&秀WT 1008 Morning air 白色涂料、帮助曾画有壁画的旧水泥墙重现风采的潘通涂料





drawn, the PANTONE Pirate Black 19-4305 reproducing the black that is indispensable in Banksy's works, and the vivid yellow of PANTONE Blazing Yellow 12-0643 that reminds people of Disneyland and helps produce "Dismaland"—all of which completely draw the attention of visitors to the works. As you are engrossed in the exhibit, you may hear giggles that tell you to look at the other side of the world. But you are not sure if the giggles are his since no one has ever heard his voice.

STREETS OF THE WORLD ENCOUNTERED IN THE EXHIBITION

The Art of Banksy Seoul exhibits a total of 151 works, including 27 of Banksy's original works, 90 replicas (printings), 16 installations and sculptures, and 18 reproduced murals. The exhibition breaks away from the typical format of dividing into sections, allowing visitors to enjoy the works in their desired routes and to walk through the venue as if enjoying graffiti on streets where different works suddenly pop up in front of them. This is how the Art of Banksy Seoul displayed Banksy's "limitless" world of artwork encompassing paintings, sculptures, installations, and videos. There are a great number of works, and they all have detailed captions attached so it takes a while to complete the tour. About adding a caption to each artwork, Park Bong-su, the director of LMPE Company as the host, stressed the delivery of messages: "This exhibition focuses on Banksy's messages. In today's world where there are limitations in every move, we aimed to reproduce Banksy's works and gather the

灰色系、利用潘通Pirate Black 19-4305体现班克斯作品中必不可少的黑色、让人联想到迪斯尼乐园，诠释“暗黑版迪士尼乐园(Dismaland)”的潘通Blazing Yellow 12-0643鲜黄色等涂料所绘制的展厅，让参访游客情不自禁陶醉在作品之中。当参访游客忘情于展览之时，说不定还会幻听到班克斯在耳边咯咯地笑着说“看清这世界的底细吧”。这究竟是否为创作家的原声无人知晓。因为他的真实原声从不为人所知。

在展厅邂逅的“全球街头”

《The Art of Banksy Seoul》展有班克斯原创作品27件、摹本(印刷品)90件、布景及雕刻16件、壁画重现18件等共151件作品。与普通展览不同，这场展览由于没有划分区域，游客可随心所欲按照自己的移动路线参观。就像突然看到出现在街头的涂鸦一般，游客可尽情享受展览中不期而遇的作品。班克斯穿梭于彩绘、雕刻、布景、影像等“无拘束”的作品世界，将在此次展会中被结合起来展现给大家。由于作品数量众多，加上每样作品都具备详细的说明，因此观览起来比较耗时。对于作品上一一加入说明这方面，主办方LMPE公司朴峰秀本部长强调这是为了“传递信息”。 “本次展览聚焦于班克斯的信息。在当下出行受限的情况下，我们想重现班克斯遍布世界各地的作品，将其货真价实



originals and replicas in one place to deliver the artist's messages in a more influential way." Director Park expressed words of gratitude, stating how artists who visited Korea to reproduce Banksy's murals loved PANTONE and Soon & Soo paints as they enabled free expression of colors and easier and speedier work. This Seoul exhibition marks the beginning of <The Art of Banksy-Without Limits> World Tour in Asia, and the murals produced will be preserved and transferred to the tour's next city. In other words, it will be a great opportunity to show Banksy's murals repainted with NOROO Paint's PANTONE and Soon & Soo paints.

ARTWORKS THAT RAISE QUESTIONS

Banksy once said, "People either love me or they hate me, or they don't really care." Every time his work is discovered, an irony occurs at both extremes. He once painted a mural that oozed with sarcasm on the gap between rich and poor, but this led to a rise in housing prices in the neighborhood. In fact, a resident even sent him an email urging him not to paint. During an auction in 2018, as soon as his work was auctioned off for KRW 1.5 billion, he attempted to destroy the work at the scene. The intention of the artist, who sought to criticize the art market paradoxically, raised the work's estimated price up to KRW 10 billion. Ironically, such happenings reignite his reputation and make us brood over his messages. It seems like his works pull in every issue like a black hole, and we all come to think, what is an art? How is an art exposed, delivered, and, finally, empowered? The white walls



的作品汇聚一堂，传递更加强烈的信息。”朴峰秀本部长表示为了重现壁画而访韩的作家们使用潘通涂料和纯&秀涂料进行墙面彩绘工作后，都表示涂料色彩可自由表现且快干，因此作业过程相当轻松愉快，并表达了感谢之意。本次首尔展览是《The Art of Banksy-Without Limits》世界巡回展的亚洲首站，此次绘制的壁画将原封不动地保存，并转移到下一个迎接巡回展的城市。由纳路涂料的潘通涂料和纯&秀涂料绘制的班克斯重现壁画将再次遍布亚洲各地。

提出质疑的美术

班克斯曾这样说过，“人们要么很喜欢我，要么很讨厌我。如果两者都不是的话，干脆我不感兴趣。”每当他的作品被众人发现时，就连冷嘲热讽也是两极化的反应。某小区因绘有班克斯嘲讽贫富差距的壁画，导致小区房租上涨。对此，一位居民甚至给他的网站发邮件，要求他不要再画画。在2018年的拍卖会上，班克斯在自己的作品以15亿韩元成交后，还曾试图在现场随即破坏作品。然而，评价美术市场的作家竟反其道而行，甚至将作品的估价提高到100亿韩元。这种种奇闻轶事使班克斯名声大噪，他想传递的信息也得以再次被世人思索。

通过如黑洞般吸入所有议题的班克斯杰作，我们可以重新思考其中滋味。美术是什么？美术是如何在表现和传递后获得力量的？展厅中的白色墙面将会让观览者不断回想这些问题，激起思考的壮阔波澜。展览将持续至2022年2月6日。



NOROO illuminates the spirit of Koreans through murals at the Independence Hall of Korea

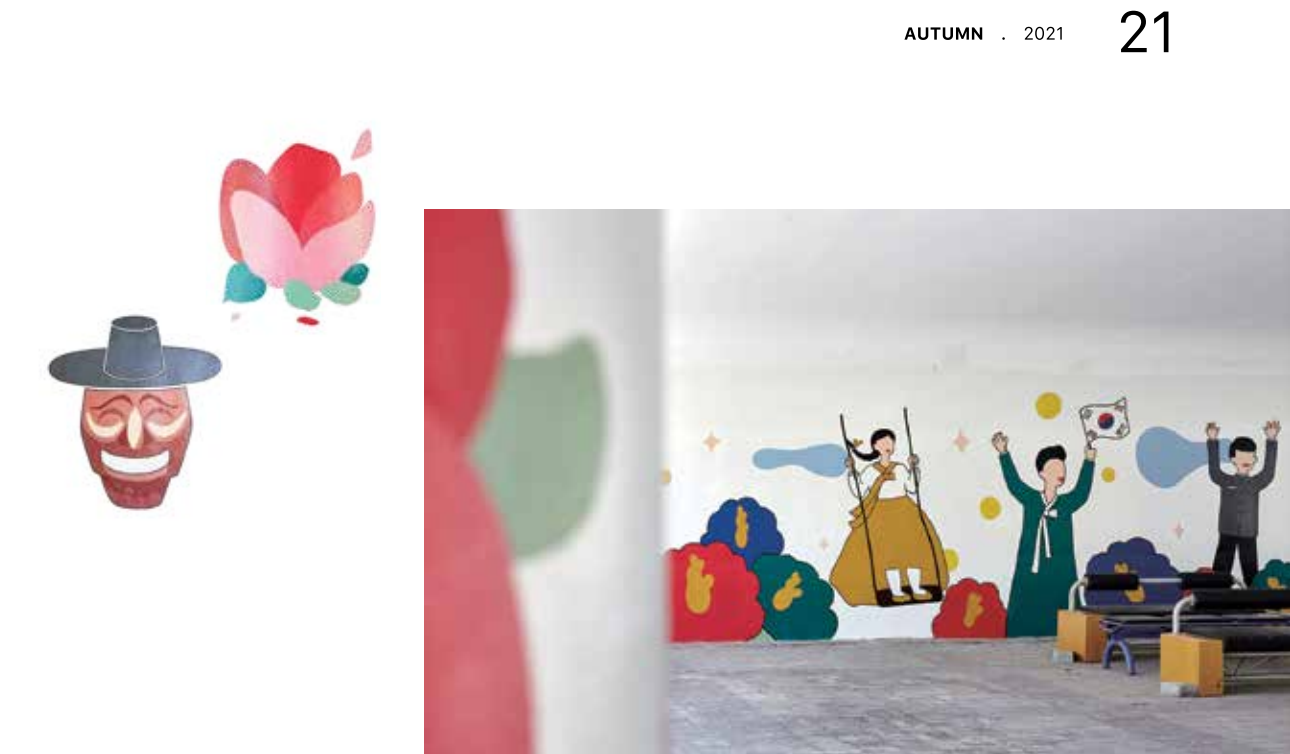
NOROO Paint commemorates National Liberation Day by painting murals

In July ahead of the 76th anniversary of Korea's National Liberation Day, NOROO Paint sponsored the Independence Hall of Korea's mural project by providing paints to help complete a meaningful and beautiful scenery. The murals painted using the vivid colors of NOROO present various symbols of Korea, such as the Taegeukgi and mugunghwa (rose of Sharon), to illuminate the spirit of Koreans once again.

NOROO绽放的民族精神——独立纪念馆壁画

纳路涂料,用壁画纪念光复节

2021年7月迎来光复节76周年,纳路涂料通过赞助使用于独立纪念馆壁画项目中的涂料,完成意义深远且美不胜收的景致。用NOROO的鲜明色彩绘制的壁画通过太极旗和木槿花、韩国的各种象征,再次绽放我们民族的精神。



CHEERS FOR LIBERATION ECHOED BY NOROO PAINT'S MURALS

"If the sounds of Korean liberation are heard in heaven, I will dance and shout manse! (hooray!)." These are the words of Ahn Jung-geun. In 1945, the cries of liberation probably reached the heaven and made him dance with joy. We are able to hear the overwhelming roars of that day once again through the murals painted using NOROO Paint. The hanbok (traditional Korean clothes) of Koreans cheering "Long Live Korean Independence!" are shining delightfully like the bright green, pink, and yellow colors of blooming flowers. The distinct red color inside the Taegeuk symbol is as clear as the desire for independence, and the blue is as pure as the hope for the future. You can check out this beautiful mural beneath the "Liberation Bridge" of the Independence Hall. Located in Cheonan, Chungcheongnam-do, the Independence Hall of Korea overwhelms visitors with its vast size nearly twice as large as Seoul's Yeouido. The Monument to the Nation, which stands tall to display the Korean people's strong will for independence and self-reliance, and the Grand Hall of the Nation, regarded as the largest tile-roofed structure in Asia, tell us the magnificent history of the liberation. And what connects these two places is the "Liberation Bridge." The bridge serves as the central pathway, while the area underneath is utilized not only as a stop for the Taegeuk Tram that circulates the precincts, but also where visitors can take a rest. In order to deliver the significance of independence more powerfully, NOROO Paint painted murals in collaboration with the community service group from Dankook University (DKU) College of Arts.

NOROO, ESTABLISHED IN THE SAME YEAR AS LIBERATION, WORKS WITH THE INDEPENDENCE HALL OF KOREA

Creating a mural at the Independence Hall was an idea from the

光复的呼喊,纳路涂料壁画来传承

“大韩独立的呼声响彻天际,我当欢欣鼓舞,呼喊万岁。”这是安重根烈士所留下的遗言。1945年,独立的呼喊传遍大地,安重根烈士定会十分欣慰。使用纳路涂料绘制的壁画中,我们可以再次听到独立那天的振奋呐喊。高呼“独立万岁”的烈士们身着的韩服犹如鲜艳的花朵般,以绿色、粉红色、黄色欣欣绽放。太极图样的鲜红好似渴望独立的明亮,承载未来希望的蓝色无比的光明。能够观赏这幅美丽壁画的地方就位于独立纪念馆内的“独立之桥”下。位于忠清南道天安市的独立纪念馆面积为汝矣岛的两倍,其规模足以胜任大量的观览人次。馆内的民族之塔以高耸身姿展现民族自主自立的坚强意志,而“民族之家”作为东亚最大的屋瓦建筑则传述庄严的光复历史。连接这两处的便是“独立之桥”。独立之桥作为中央路的角色,其下方为巡回馆内的太极列车车站和访客们的休息区。纳路涂料为更强烈地传达独立的意义,携手檀国大学艺术学院服务团,在此处绘制了壁画。

解放之年的企业(成立于光复年)NOROO,与独立纪念馆同在

在馆内绘制壁画是独立纪念馆客户宣传部的创意。2018年(3年前),独立纪念馆首先在正门连接民族之塔的“南伐之桥”上绘制了壁画。因为对于引领未来的新世代来说,独立纪念馆的介绍需要更贴近观众。由纳路涂料赞助全部涂料,由檀国大学艺术学院服务团献艺画作,该场所成为儿童访客最喜爱的地方。



customer PR department of the Independence Hall. Three years ago in 2018, the Independence Hall had painted a mural on “Nambeol Bridge,” which connects the main gate to the Monument to the Nation. This project stemmed from an idea that the Independence Hall needs to be introduced to the new generation of future leaders in a friendlier fashion. Thanks to NOROO Paint’s full sponsorship in providing 100% of the paint needed for the murals and the community service group from DKU College of Arts for volunteering with their artistic talent, this place became a popular spot among children.

“The fun, bright images and photo zones became popular among children and we hope that the area with newly painted murals can also be a fun rest area for visitors, as well as a place to remind people of the true meaning of independence. We also needed to repair the facility,” said Manager Lim Seok-min of the Customer PR department, who once again asked for the cooperation of NOROO Paint. “NOROO Paint was the first one that came to my mind because I had known from various media and news that the company actively partakes in mural projects for the public good, regional growth and win-win partnerships.” NOROO Paint proceeded to sponsor with paint without hesitation this time as well, empathizing with the intentions of the Independence Hall. NOROO Paint is a company founded in 1945, the same year as the liberation, and Lim Guk-jeong, uncle of NOROO’s founder, Han Jeong-dae, had sacrificed his life for the country during the independence movement. Liberation has a special meaning to everyone but it is especially more significant for NOROO Paint that was born in the midst of the liberation and has lived together with Korea’s history.

WATERING MUGUNGHWA WITH NOROO PAINT’S COLORS

Those who are waving the Korean national flag by the newly painted murals greet visitors with the overflowing joy of liberation. A sense of freedom and happiness exude from people wearing hanbok at the Hall. The everlasting mugunghwa are in full bloom on the strong pillars that support the bridge. The wall on opposite sides clearly exhibits the words of dignity that say “Daehan Minguk Manse” (long live Korea), and the Taegeuk pattern amongst different symbols that represent Korea, from Hahoetal masks, Namdaemun, hanbok and Dokdo Island to pine trees, kimchi and Hangeul.



A water-based product (outdoor use) of NOROO Paint called “Q-fit” was used for this mural. A premium, highly durable, non-pollutant, water-based paint for outdoor use, Q-fit boasts its outstanding weather resistant feature to maintain beautiful and vivid colors for a long time. In addition, “Q-fit Clear Coat,” a transparent coating, was applied over the mural to further raise its durability.

The community service group from DKU College of Arts who painted the mural wrote, “Dankook, painting hope at the Independence Hall,” next to the painting. We are able to be hopeful for the future because of our independence history. At the Independence Hall of Korea, we remember the past and dream of the future. The same way mugunghwa blossoms vividly, our dreams will open up the new future and ceaselessly write a history to remember.



“得益于鲜明有趣的图画和拍照区，这里成为儿童人气场所。希望新绘制的壁画也能成为游客享受休息的空间和向大众传递独立意义的参观场所。此外，设施也需要经常维护。”对此，客户宣传部主任林硕民 (Lim Seok-min) 再次向纳路涂料请求协助。“通过各种新闻得知，纳路涂料积极参与地区发展和追求共生的公益壁画事业，因此最先想到了纳路涂料。”

纳路涂料不仅身体力行独立纪念馆的宗旨，也毫不犹豫地为本次壁画赞助涂料。纳路涂料为1945年解放时成立的企业，韩鼎大创业会长的舅舅林国祯即为独立运动中殉国的烈士。尽管光复对所有人来说皆具有个别独特的意义，但对于作为一路见证解放后韩国历史发展的纳路涂料来说，其意义更是非比寻常。

通过纳路涂料的色彩绽放木槿花

在新绘制的壁画中，挥舞太极旗的烈士们以光复的喜悦迎接游客。从身着韩服的烈士们身上可感受到解放感和幸福感。在支撑大桥的坚固支柱上，绽放着永不凋零的木槿花。迎面的墙上则绘有河回假面、南大门、韩服、独岛、松树、辛奇、韩文等代表韩国的各种象征物，其中清晰可见的庄严字样——“大韩独立万岁”和太极图样。

本次壁画使用了纳路涂料的外部水性涂料“Q-fit”。Q-fit为耐候性强、有助于长期保持鲜艳色彩的高耐水性、低污染高级外墙水性涂料。壁画上还添加了透明面漆“Q-fit CLEAR COAT”，进一步提高壁画耐久性。

绘制壁画的檀国大学艺术学院服务团也在壁画旁边写下了“檀国，于独立纪念馆描绘希望”的字样。我们之所以能够期待未来，可说是得益于独立的历史。在独立纪念馆，铭记昨日，梦想明日。就像生机盎然的木槿花一样，我们的梦想将开创崭新的未来，继续写下亘古悠久的历史。



NEWS BRIEFING



NOROO PAINT & COATINGS CO., LTD.

MANAGEMENT-LABOR DECLARATION CEREMONY FOR OVERCOMING THE COVID-19 CRISIS AND PROMOTING ESG MANAGEMENT

NOROO Paint & Coatings (“NOROO”) held a management-labor declaration ceremony for overcoming the COVID-19 crisis and promoting environmental, social, and governance (ESG) management on September 16. At this ceremony, the company agreed on and announced a declaration that outlines the following: (1) active participation in the prevention of COVID-19 and its spread to ensure employee health and safety at work; (2) effort to achieve management goals by forming a sense of unity amid the difficult business environment and enhanced competitiveness and productivity; (3) mutual cooperation to raise the company's future values and achieve sustainable growth through social contributions, environmental protection, and ethical management; and (4) continued development of management-labor relations centering on communication, shared growth, and peaceful resolution based on the recognition of the importance of cooperation and mutual faithfulness.

“This declaration is meaningful in the sense that we vow to continue our win-win relationship by recognizing the importance of our cooperation at the crossroads of paradigm amid the COVID-19 pandemic, raging climate change, and carbon neutrality,” said Hong Soon-chol, the head of the union. “We continue to discuss and practice our management activities so that we can fulfill our corporate social responsibility while ensuring employee health and safety at work. We will not only cooperate to overcome the COVID-19 crisis but also continue to work closely with the union to be a leader in industry development,” CEO Cho Sung-kug added.

Earlier on September 1, the management and the union signed the “non-conflict wage agreement for 23 consecutive years.” Through this declaration, the management and the union jointly announced that they will both make concessions to overcome the COVID-19 crisis so that they can strengthen awareness of social responsibility in each department and strive to realize sustainable management through practices in the ESG sector.

纳路涂料股份有限公司

为克服新冠病毒危机并激活ESG经营 举办劳资共同宣言仪式

9月16日，纳路涂料与工会携手举办了旨在克服新冠病毒危机并激活ESG经营的劳资共同宣言发布仪式。宣言内容包括：为保障职员健康和安全的工作环境，积极预防并防止新冠病毒的扩散；理解艰难的经营环境，并凝聚所有力量，努力通过加强竞争力及提高生产效率来实现经营目标；通过社会贡献、环境保护、伦理经营等提高企业未来价值，同时通过相互合作成为可永续发展的企业；认识劳资合作的重要性，以互信诚信的原则为基础进行沟通并持续发展共生和睦的劳资关系等。

工会委员长洪淳哲表示“在新冠肺炎疫情长期化、急剧变化的气候危机及碳中和模式转换的背景下，此次宣言旨在认识劳资合作的重要性，并持续维持和发展信赖共生的关系。”赵成国代表则表示“公司将竭尽全力与工会进行讨论并将其践行到实践中，从而保障员工的健康和安全的工作环境，以及履行企业社会责任。同时，不仅在疫情当下，即使疫情过后劳资双方也会积极合作应对环境，共同引领产业发展。”

在此之前，劳资双方已于9月1日完成“23年连续无纠纷工资协议签署”。通过此次宣言，劳资双方表示“为克服新冠肺炎疫情危机，劳资将各退一步，并加强公司内部各部门的社会责任意识，努力通过ESG实现可持续经营。”

LAUNCH OF MULTI-FUNCTIONAL PREMIUM PAINT “SOON & SOO SAFE” FOR THE INTERIOR OF HIGH-END BUILDINGS

NOROO launched “Soon & Soo Safe,” a premium water paint for expert painters, strengthening its activities in the painting market for high-end buildings. Soon & Soo Safe has better properties than the level 1 water paints for interior spaces. Made with special emulsion resin and colors, it has enhanced anti-fouling property, detergency, and water repellency. Thanks to these properties, it is easy to remove surface fouling, such as graffiti, with excellent



tensile strength; thus having crack resistance unlike any existing level 1 paints for interior spaces. With this, it prevents fine cracks on the painted surface and maintains the pristine condition of the coat.

In addition, Soon & Soo Safe acquired the Healthy Building Material (HB) certification, the highest grade, and the Korea Eco-Label, offering the users peace of mind. The HB certification is an organizational standard certificate that evaluates and grades the organic compounds emissions of construction materials. The Korea Eco-Label certification proves that the product has improved its “environmental impact” compared to other products with the same purpose. Soon & Soo Safe has maximized the antibacterial and anti-mold functions, and it has also passed the non-heavy metal test. Another strength is that it does not use hazardous plasticizers or BTX (benzene, toluene, xylene). This high-quality paint for interior finishes offers excellent colors with subtle feeling of velvet, suggesting a premium and excellent look. It applies well on any material—from concrete to cement, mortar, plasterboards, and wallpapers—finishing the interior of any building with a premium look. This product has been launched as an interior design material for public facilities such as studio apartments, shopping complex, schools, and hospitals and residential facilities such as premium apartment complexes and multi-unit houses. It comes in 4 L and 18 L.

The marketing manager of NOROO announced that they will broaden consumers' options in the market and enhance consumer convenience with the launch of Soon & Soo Safe, which meets the requirements of anti-fouling property and durability for public areas, eco-friendliness for spaces used by the elderly and infirm, and high quality for premium residential facilities.

推出高级建筑室内用多功能优质涂料 “纯&秀 SAFE”

纳路涂料推出涂装专用优质水性涂料“纯&秀SAFE”，正在加强面向高级建筑涂装市场的攻略。纯&秀SAFE是比水性室内1级涂料更具卓越水性的优质市内水性涂料，通过使用特殊树脂乳液和颜料，提高了耐污染性、洗涤性和防水性，因此，更易于去除墙面上的涂鸦等污染。特别是其优秀的抗张力（受拉力时抵抗破坏的能力）具备现有室内1级涂料中没有的裂缝抵抗性能，故

可防止墙面产生微裂纹，长久维持首次涂装时的状态。

此外，纯&秀SAFE还获得HB标志最优秀等级、环境标志认证，因此可放心使用。HB标志是评价建筑材料的有机化合物释放强度并赋予等级的团体标准认证标志，环境标志认证则是指与相同用途的其他产品相比，改善“产品的环境性”时所赋予的认证。同时，本产品将抗菌、抗霉性能提升至最高水平，在不含对人体有害的重金属方面也获得验证。未添加有害塑化剂和BTX（苯、甲苯、二甲苯）也是其特点。

本产品是室内装饰高级涂料，色彩感也相当卓越，涂料颜色带有隐约的丝绒光泽感，可演绎出高贵完美的效果。在混凝土、水泥砂浆、石膏板、壁纸等表面也能均匀涂色，打造有品味的装饰效果。本产品不仅用于商务公寓、商业街、学校、医院等各种公共设施及其他商业设施，还可用于高级公寓园区、别墅式住宅等居住设施，容量分为4L、18L两种类型。

纳路涂料营销组负责人称“我们推出的纯&秀SAFE可满足许多人对于各种设施上的使用需求，如公共设施所要求的耐污染性和耐久性、老弱者设施所要求的环保性、高级居住设施等所要求的高质量及多功能性等，在市场上拓宽了消费者选择范围，并提高了顾客便利性。”

WATER-SOLUBLE CAR PAINT WITH THE MOST NUMBER OF COLORS AVAILABLE “WATER-Q FACTORY PACKAGING (F/P)” RENEWAL LAUNCHED

NOROO launched the renewal version of “Water-Q F/P,” a water-soluble car paint brand. Water-Q F/P products have the same colors as newly manufactured automobiles. They are completed with color mixture in the factory and delivered to customers. NOROO has been upgrading the range of colors for this product since 2018. This year, the company added more colors for this brand to have 250 colors—the largest in Korea.

A car paint is used to restore damaged vehicles, so their colors and usability are critical. Water-Q F/P products do not require special color blending technique or tools but offer the same color as the vehicle, allowing the users to finish the touch up without leaving a trace. NOROO analyzed the colors of various popular car models in Korea and overseas and came up with the 2021 lineup.

NEWS BRIEFING



The company plans to add new colors every year. Another strength of this product is that it has superior storage safety to other competitors' products. Not only blended paint but also paint blended with thinner can be used again after long-time storage, saving both cost and environmental impact. NOROO has also launched Water-Q, a water-soluble car coloring system. In accordance with the government's restriction on volatile organic compounds in car paints, the company launched a water-soluble car coloring system that meets all domestic environmental regulations. With the combined knowledge of NOROO, an OEM paint supplier to domestic automakers, and the management know-how from selling the existing "HiQ Coloring System," Water-Q offers consistent color qualities and excellent color matching. It not only has superior usability such as shorter painting and drying time but also offers a better price than other competitors. There is also a dedicated team that provides swift solutions when problems occur during blending or painting. In addition, "Color-Q," NOROO's automatic color adjustment system, finds the closest color to the car color and automatically provides adjusted blending as well to suit the target color best. This can create colors that are not included in Water-Q F/P products or small color differences from a different production year.

An official from NOROO said, "Water-Q F/P holds the most number of available colors in the Korean market. It also offers superior color matching to our competitors' products and better storage safety. With these, the product increased the productivity of car repairers, and it is getting good reception in the field. We will continue to enhance the eco-friendliness of car paints and develop products that meet consumer demands."

推出具有韩国国内最多色彩的汽车修补漆水性调色漆成品

“WATER-Q F/P (Factory Packaging)”翻新产品

纳路涂料推出汽车修补漆水性涂料品牌“WATER-Q F/P”翻新产品。WATER-Q F/P是将与新车相同的颜色直接产品化,在工厂完成调色后出货的产品。纳路涂料自2018年起便持续更新该产品颜色,2021年拥有了多达250种色彩,成为韩国国内企业之首。

修补漆用于修复受损车辆,因此颜色和效率至关重要。WATER-Q F/P即使在没有专业调色技术或设备下,也能表现出与现有车辆相同的颜色,实现无痕涂色。纳路涂料分析韩国海内外人气车型的多种颜色后制定了2021年的色调系列,并计划每年新增颜色。本产品的另一项优点是卓越的保存稳定性,这是其他竞争对手公司无法堪比的。不仅是混合多种颜色的涂料,混合稀释剂的涂料也可在长期保管后再次使用,可大幅减少对费用和环境的影响。

此外,修补漆水性调色系统“WATER-Q”也全新上市。根据政府加强修补漆挥发性有机化合物(VOCs)规制,纳路涂料推出了符合韩国国内所有环境规制的水性修补漆现场调色系统。纳路涂料具有汇集韩国国内汽车制造商OEM涂料的技术实力,并且通过运营现有“Hi-Q调色系统”积累了丰富的管理经验,WATER-Q具有均匀的颜色外观和优秀的搭配性优点。WATER-Q不仅在涂装及干燥时间等效率上超群,价格也较竞争公司合理,整体性价比相当卓越。本产品还有在调色和涂色中出现问题时可迅速解决的“专属支援组”,可使消费者放心大胆地使用。此外,本产品也使用纳路涂料的颜色自动校正系统“Color-Q”,可找出与测定现有车辆的颜色值最相似的配色,并自动提供更适合目标颜色的颜色校正组合。使用WATER-Q F/P产品,可调整尚未推出的颜色或根据车龄产生的细微颜色偏差进行涂装。

纳路涂料相关人士表示“与其他公司相比,拥有韩国国内最多颜色的WATER-Q F/P以优秀的颜色搭配性和效率及保存稳定性,增加了汽车工业企业的生产效能,并在作业现场获得了良好评价。我们计划继续开发提高修补漆的环保性并满足顾客需求的产品。”



These are Vice Heads An Yoon-soo and Lee Won-ki from the Construction Technology Team 1 and the Resin Research Team, respectively, who developed the white bio paints, PANTONE Wood & Metal and Eco Bio Urethane Lining, that received the "USDA Certified Biobased Product" certification from the US FDA for the first time in Korea. Their bright smiles seem to show us the joys of the day when the certification was issued.

韩国首款获得“美国农业部生物基认证(USDA Certified Biobased)”的白色生物涂料“PANTONE WOOD & METAL与ECO BIO URETHANE LINING涂料”,以及开发该涂料的建筑技术1组与树脂研究组的安胤琇次长和李元纪次长。两位明朗的笑容似乎再次传递着获得认证结果当天的喜悦。

Vice Head Kim Moon-woo from the Construction Technology Team 1 and Section Chief Oh Sang-jin from the Marketing Team, who have been working hard to launch new products faster for consumers than any other companies, continue to make new products. We can hardly wait to see the new products that will follow "Q-fit Master," the first multi-functional anti-oxidant water paint for outer walls, and the advancement that they will bring.

为加速推出面向消费者的新产品而奔波的建筑技术1组金文佑次长和营销组吴尚振课长正在持续筹备新产品。业界首款可防止外墙老旧的多功能水性涂料“Q-fit MASTER”,期待即将问世的新产品及其带来的发展。



NOROO

NOROO Magazine | Vol. 60 (not for sale)

Class: Informational publication(Quarterly) • Registration number: Anyang Ba00022 • Registration date: March 15, 2019
Date of publication: November 5, 2021 • Published by: Noroo Holdings Co., Ltd • Publisher: Kang Tae-jun • 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