

## R&D efforts

### ► Basic approach

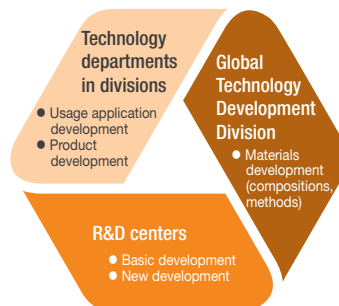
Focusing on R&D for polymer products, the INOAC Group conducts research using the two most valuable resources in the development of advanced technologies—creative engineers and cutting-edge evaluation instruments. We offer superior added value both as a leader of global technology groups and in collaborations with raw materials manufacturers and customers.

### ► R&D centers aligned with the markets

Since we will not be able to keep up with the overwhelming speed of progress overseas in the conventional arrangement of R&D originating from Japan, we are moving and expanding our R&D centers in the US and also establishing an R&D center in China. We will be striving to accurately discern the needs in each region, design material compositions and commercialize products using locally-sourced raw materials, shift to R&D efforts that originate locally, and make ourselves more competitive internationally.

### ► Innovation management system

We have launched a scheme to facilitate timely, efficient transitions from R&D to commercialization by clarifying the roles of technology departments throughout the company and establishing departments to centrally manage information such as market trends, customer needs, and internal ideas and technologies that could turn into new products. In our R&D efforts, we are also incorporating a scheme to establish stage gates and make decisions at the appropriate times on matters such as whether to proceed with efforts and what resources to allocate.



### ► The strength as our foundation

As a general manufacturer of high performance materials—polyurethane, rubber, and plastic—we have strength in being able to leverage technologies and expertise built up over long years of R&D to perform everything from materials compositions and compounds to design and processing, all in one place. We also have the ability to conduct many different types of product development that suit various needs by combining high-performance materials with foaming and molding technology.

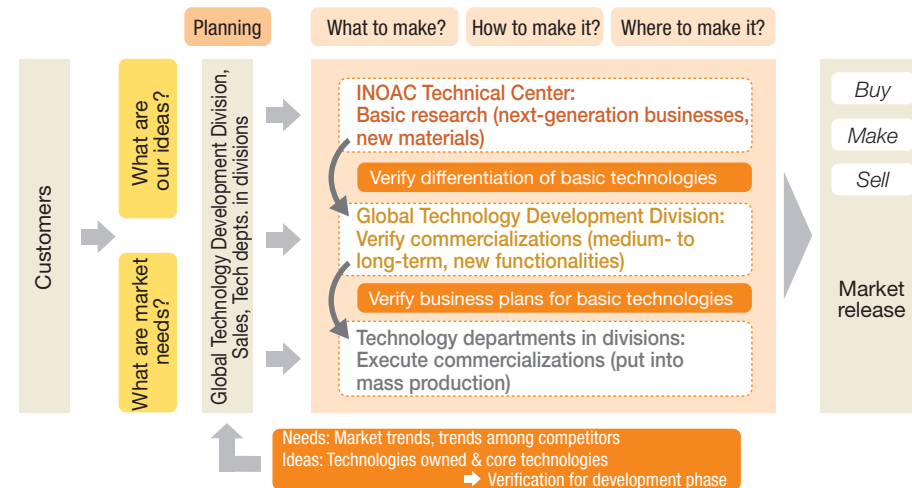
### ► Creating added value

In addition to simply dealing with our customers' needs, we also propose additional and improved functionality as we engage in dialogue to learn more about their usage purposes and applications, problems, and other details. We are dedicating efforts to developing polyurethane- and rubber-centric materials for electric car batteries, a materials market that is expected to grow going forward. For these materials, we suggest specific usage applications and strive to offer the ideas that we have for them while making value-added proposals.



Types of battery materials

### ► Flow from R&D to market release



#### ■ R&D centers



Japan  
INOAC Technical Center Co., Ltd.



China  
Shanghai INOAC Polymer Products Co., Ltd.



North America  
INOAC USA, Inc.



Thailand  
INOAC (Thailand) Co., Ltd.

### INOAC Technical Center Co., Ltd.

Our technical center selects topics with a high degree of novelty that go beyond the boundaries of our existing business entities to develop original future-oriented solutions. In order to establish a personnel arrangement that can reflect market needs even more accurately, the center has recently been actively accepting personnel rotations from the Global Technology Development Division and technology departments in divisions. The center has also begun working to build an organizational structure to conduct basic research in line with customer needs.

### Global Technology Development Division

This division ascertains various industry needs and conducts R&D for materials and products to address them. In addition to developing materials, the division also works to establish more in-depth manufacturing (developing production methods) as well as analytical and evaluation technologies. To acquire the intellectual property rights to the results of these development efforts, an Intellectual Property Department has been established within the division's organization. This department contributes to the creation of both tangible and intangible intellectual property. At the same time, to bolster industry-academia collaboration we are sending personnel on assignment to the New Energy and Industrial Technology Development Organization (NEIDO) and working on public relations efforts to promote geothermal heat pipes, with sights set on achieving a carbon neutral society.

## R&D efforts

### ► Intellectual property strategy

As an initiative to acquire patents in product development, we have set a goal of 300 patent applications per year. In the development of our flagship products, we are also working to bolster our competitiveness by owning a concentration of multiple patents for each individual product.

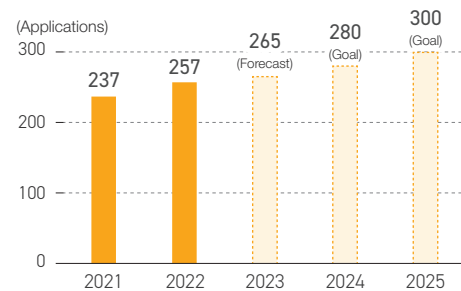
Overseas, we are expanding the presence of our R&D sections globally to address local needs that must be met quickly. We are also establishing a support organization in parallel with this expansion in order to facilitate smooth local patent applications.

### ► Open innovation

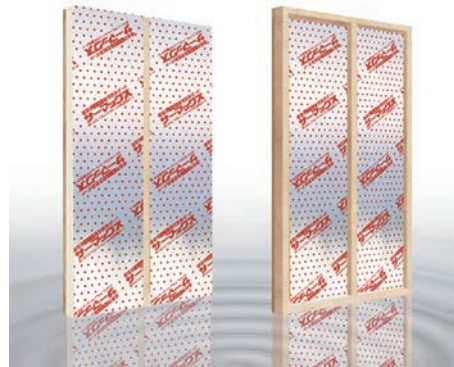
We engage in joint development with universities and other institutions, primarily in medium- to long-term basic development. Taking on new perspectives and mechanisms in more specialized fields of research enables us to bolster our development capability. To manage progress, we hold internal briefing sessions twice per year to verify the progression and direction of our research. Through participation in academic presentations, we are able to further enhance our cutting-edge technologies while at the same time sharing our research findings with society.

One example of our industry-academia collaboration is revelatory research into residential thermal insulation mechanisms. Our high-performance THERMAX thermal insulator is capturing attention as a means to reduce CO<sub>2</sub> and combat global warming. To have this thermal insulator widely deployed in housing and factories, we are working to explore its insulating advantages from the structures of buildings to leverage in making widespread contributions to society. We are also organizing seminars to introduce usage examples to builders and other industrial craftsmen. The seminars are mainly held in the Tohoku region.

Patent applications per year



Development of THERMAX high performance thermal insulator



## Examples of technological development in each business field

### SOFWA® for business in high-performance materials

SOFWA® is an elongated polyurethane rolled sheet foam characterized by high absorbency, capable of absorbing approximately 20 times its own weight at thinness of 2.0 to 5.0 mm. As opposed to purchasing the raw materials from other companies, we compound the raw materials for it by ourselves, from scratch. For medical and hygiene products, SOFWA® shows promise for deployment in usage applications requiring safety and cleanliness such as the absorbers in wound dressings, diapers, and menstrual hygiene products.



### The Facet Care Mattress for business in bedding and furniture



Excessive sinkage in low resilience mattresses can make it difficult to roll over in bed, which also leads to bedsores. For this problem, we developed the Facet Care Mattress with special slits that distribute body weight to prevent bedsores. With a three-layer structure combining different low-resilience polyurethanes, it limits excessive sinkage to make it easier to roll over.

### For business in automotive-related products

As a company that has strong relationships with automakers, we are focusing on industry changes such as CASE and MaaS as priority topics. The shift to electric vehicles requires functionalities such as weight reduction, sound absorption, soundproofing, thermal insulation, and heat radiation. Leveraging our strengths in compounding and foaming technologies, we are working dedicatedly to develop products that automakers desire. In addition to establishing the Production Prep Review Panel that handles the function of checking on the progress of production preparation, we are striving to shorten launch times for new products by improving the quality of schematics starting from the initial stages of production preparation, and by setting targets in the design stages and improving quality in the process designs.

## Quality improvement efforts

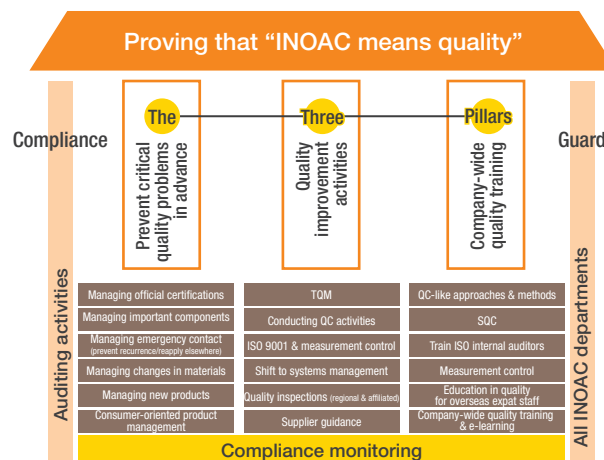
### ► Basic approach

Based on our Quality Policy, we engage in manufacturing that prioritizes our customers and quality. We also strive toward “gratifying quality creation” via thorough quality compliance and ongoing improvements. We have implemented a comprehensive management system based on ISO 9001 to guarantee the quality and safety of products, and to provide products and services that deliver satisfaction. Through collaborations with our customers, we are also pursuing further improvements in quality.

#### Basic Quality Policy

1. Manufacturing that prioritizes our customers and quality
2. Observing laws, regulations, and arrangements with customers
3. Continuously improving to meet the needs of the times

### ► Comprehensive management system for quality assurance



We are constantly working to improve quality through global company-wide collaboration and by various standardizations and ongoing updates to frameworks implemented under regular auditing activities in order to embody the concept of “INOAC means quality.” The three pillars of these efforts are (1) Preventing critical quality problems in advance, (2) Quality improvement activities, and (3) Company-wide quality training.

#### (1) Prevent critical quality problems in advance

##### • Managing official accreditations or certifications

When applying for official accreditations or certifications for our products, we register them with the Global Quality Assurance Division which is in charge of our management system for quality. We verify whether there are any discrepancies between what is written in the applications and the corresponding products, production processes, and related specifications. After registering the products, the division conducts regular audits and ensures ongoing compliance.

##### • Managing important components

In areas such as performance and safety, lists of important components with higher social responsibility are managed in the Global Quality Assurance Division, and critical quality risks are prevented in advance by conducting regular audits. Improvements are also made to quality and to work operations as needed.

##### • Quality emergency contact system

For critical quality issues, we have established a quality emergency contact system to deliver negative information to management within 24 hours of it being communicated from locations.

After information has been communicated, the Global Quality Assurance Division verifies the appropriateness, implementation status, and effects of the recurrence prevention measures.

We also check the operational state of the following year's important components in the global quality management audit.

Our critical quality issues are defined as (1) those which lead to recalls, (2) those which become social problems, (3) those that pose physical danger to individuals, and (4) those with a high level of impact from a department's perspective.

##### • Managing changes in materials

For materials changes with high risk of serious quality issues, we build frameworks in which the Global Technology Development Division and the persons in charge of technology and quality assurance at the departments in charge deliberate over the changes, and internal approval is given by the Global Quality Assurance Division. In change proposals to customers, we have established a robust management structure for eliminating risks of quality issues in advance.

##### • Managing new products

For products created using new technologies, new materials, new processes, or for new usage applications, we strive to prevent serious quality issues in advance through reviews by staff members including our president to determine whether they are ready for market launch.

#### Audit members

President, Global Technology Development Division, Global Quality Assurance Division, persons in charge of technology, quality assurance, and sales in the applicable departments

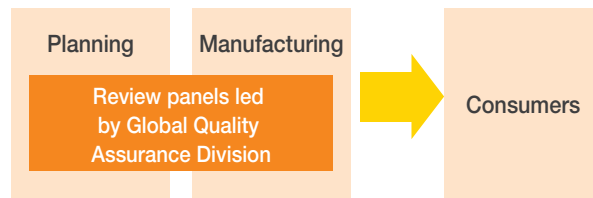
#### Audit areas

Material quality, product characteristics, product performance, structure, exterior, comparison with similar products, product safety, production safety, quality risks

## Quality improvement efforts

### • Consumer-oriented management of products

For the products that we design, manufacture, and provide directly to consumers, we employ a framework in which development starts after holding review panels led by the Global Quality Assurance Division starting from the planning stages and going through an approval process based on strict validation of risks, so that consumers can use the products safely and with confidence. Even after that, we continue ensuring quality in coordination with the departments in charge of everything all the way through post-mass production inspections.



### (2) Quality improvement activities

#### • Conducting TQM activities

Under the leadership of our president, all of our employees in all departments work together in all stages with the aim of providing gratifying products and services that satisfy our customers.

At full speed, we are working to improve our people, organizational, development, and manufacturing capabilities with all-inclusive participation as the foundation as we grow our personnel, create jobs, and expand frameworks in an effective, efficient manner.

#### • QC group activities

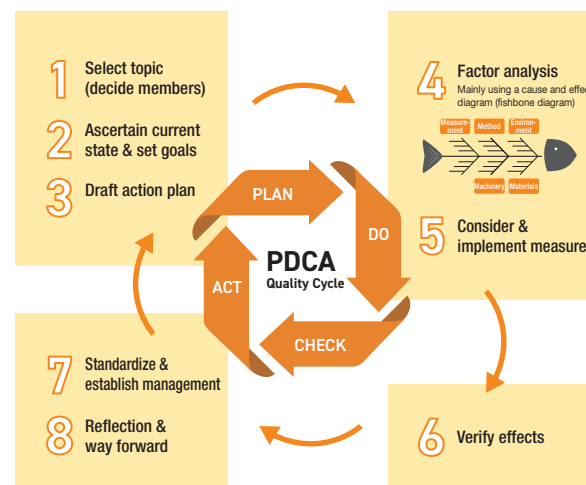
We have been carrying out QC (quality control) group activities for small groups to voluntarily gather on the topic of quality improvement since around 1965. These activities

have since expanded worldwide. Starting in 1985, INOAC has held the World QC & Improvement Competition on a global scale in order to share quality control activities taking place throughout the group of companies.

Since 2020 we had been refraining from holding the activity's presentations in one venue due to the COVID-19 pandemic, but finally in FY 2023 we started inviting teams from overseas again and held another world competition with a total of 13 teams—with three teams from Japan joining 10 teams from seven other countries.

With simultaneous interpretation streamed online, we are making this into a competition that bolsters the momentum of QC improvements in activities at all locations both domestic and international. We will continue developing human resources who can contribute to our customers and to society through this competition.

### Steps of QC group activities



### (3) Company-wide quality training

#### • Human resource development initiatives

We conduct mandatory training for new employees for acquiring the basic knowledge on quality which is important to the manufacturing industry. In addition, we also work toward increasing our employees' knowledge pertaining to quality with the required curriculum designated for each level on our hierarchy.

In FY 2023 we also began to incorporate e-learning, and we have opened our Quality Library where anyone can review the same lesson content at any time of the day.

Beyond that, we also offer encouragement and support for taking the QC Kentei written exam as part of our push to raise levels throughout the company.

#### • Global quality management audits

In order to prevent any serious quality problems in advance that could threaten the loss of social trust and credibility, we conduct global management quality audits of critical quality components and processes at our production sites in Japan and abroad and of all quality management systems.

#### Applicable locations

Locations in Japan and in Thailand, Vietnam, Indonesia, South Korea, Taiwan, and China

#### Applicable products

Production processes and plants such as those that make INOAC's main materials such as resin, rubber, polyurethane, and of processed components and mattress products

