

## Inappropriate Conduct concerning the Quality of Heat-Resistant Steel Casting Anchors for Refractories

AGC Plibrico Co., Ltd.

It has been discovered that AGC Plibrico Co., Ltd. (hereinafter, “the Company” or “we”) performed inappropriate conduct, specifically relating to the Heat-Resistant Steel Casting Anchors it sold, which had an adverse effect on quality control and, as a result, some of the chemical composition of the anchors did not meet the numerical values shown in the specifications. Below is an overview and background of this inappropriate conduct, along with the Company’s future responses.

We would like to express our most sincere apologies for any inconvenience that may have been caused to all concerned parties, including the customers who purchased these products.

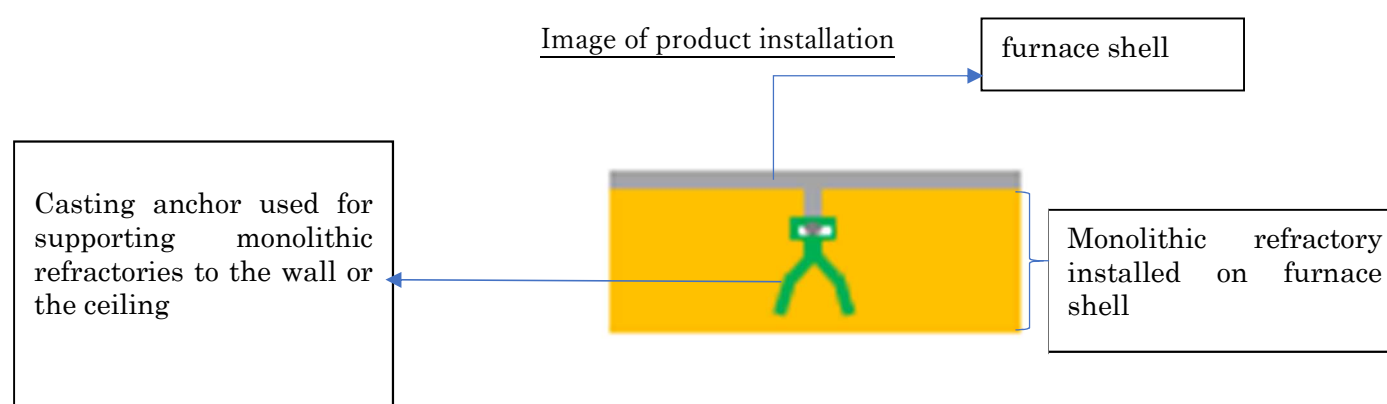
### 1. Overview

#### (1) Inappropriate conduct

Applicable products: A total of 26 Heat-Resistant Steel Casting Anchors for refractories (material: SCH13 or SCH22)

Use: Metal support for monolithic refractories installed on furnace shells of steel plants, waste incineration plants, oil refinery plants, etc.

Details: From around 2005, our employee in charge of purchasing created a material test report on Heat-Resistant Steel Casting Anchors refractories (hereinafter, Casting Anchors) purchased and sold from Alloy Stainless Inc. (hereinafter, ALLS), based in Gunma Japan, but no longer in business. This report was not based on actual test results but was submitted to our customers. In 2006, there was also an incident where quality non-conformity was recognized, but no corrective action has been confirmed.



#### (2) Non-conforming product

In order to verify the chemical composition and mechanical properties of ALLS’s products, we arranged for an external organization to conduct an inspection of approximately 50 products held in our inventory. This investigation revealed that some composition of our products did not meet required specifications as outlined below.

Chemical composition	SCH13		SCH22	
	Standard value	Measured value	Standard value	Measured value
Cr (Chromium)	24-28%	17-23%	23-27%	20-22%
C (Carbon)	0.20-0.50%	0.44-0.79%	0.35-0.45%	0.56-0.58%
Ni (Nickel)	11-14%	11-18%	19-22%	11-15%

\* All stocks purchased after 2015

As a result of subsequent investigations, it was concluded that it is possible non-conforming products may have been shipped after 2005, when material test reports were no longer submitted by ALLS. We estimate that the number of customers we shipped to during this period is 88, and the number of pieces shipped is approximately 100,000.

We outsourced manufacturing to ALLS until 2017, when ALLS went out of business, and then we continued to ship remaining inventory until November 2019.

Following these results, we conducted simulations based on our knowledge of the customer’s use conditions in order to confirm the safety of non-conforming products, and specifically to determine if there was a possibility that the refractories could fall due to the anchors in question. Based on the results of these simulations, we do not believe that the refractory material will fall due to the anchors. As an example, under the conditions of a furnace temperature of 950°C, the stress generated on the anchor was extremely small. After 100,000 test hours in these conditions, the stress was 1/100 or less of the breaking strength of SCH13. Therefore, we have concluded that this stress will not lead to fracture, even if the strength reduction due to the out-of-specification values is taken into account.

## 2. Actions taken since the discovery of this matter

Early November 2019: This matter was discovered by a report from the person in charge to their supervisor  
After learning of this situation, we immediately stopped shipping the product  
We then started to identify the shipping destinations and proceeded to investigate the situation and circumstances surrounding it.  
We then engaged a third party to conduct a chemical composition analysis of the inventory.

Late November 2019: We received the results of chemical composition analysis

Early December 2019: We started conducting simulations to verify safety

After mid-December 2019: We completed the simulations and gathered the results

Late December: We started issuing apologies and explanations to customers

## 3. Status of response to customers

After learning of this situation, we identified the customers who we had shipped the products to from 2005 onwards, then provided explanations to all customers in Japan.

We will continue to communicate with and respond to those customers in good faith.

## 4. Cause of this matter

We believe that the primary cause of this matter was our lack of awareness of quality control and the lack of an effective quality control system. Specifically:

- Lack of quality control function in our purchasing department
- Lack of education on quality control for employees
- Insufficient management of manufacturing processes and product quality at manufacturing contractors
- Failure of checking function by other departments

## 5. Measures to prevent recurrence

We will strive to prevent recurrence by ensuring the following:

- 1) Re-educating all employees in quality control to raise quality awareness
- 2) Strengthening quality control system
  - Implementing quality control over outsourced products by Quality Control staff
  - Reviewing internal audit items and methods
  - Increasing the number of internal audit staff.
- 3) Enhancing management of manufacturing contractors
  - Reviewing purchasing management rules and regulations
  - Enhancing acceptance inspection of outsourced products
  - Conducting regular audits of manufacturing contractors

Once again, we would like to convey our sincere apologies to all parties concerned for any inconvenience that may have been caused to all concerned parties, including the customers who purchased these products.

©Please direct inquiries regarding this matter to: AGC Plibrico Co., Ltd Email : [api.info@agc.com](mailto:api.info@agc.com)

<https://www.plibrico.co.jp/>

<For your reference>

Company overview of AGC Plibrico Co., Ltd.

Headquarters:	4-1-23 Shiba, Minato-ku, Tokyo, Japan
Established:	1954
Company Representative:	President Motohiko Ishibashi
Capital:	JPY 360 million (100% owned by AGC Ceramics Co., Ltd.)
Main businesses:	Manufacture and sale of monolithic refractories, design and construction of industrial furnaces, etc.