Comments from Japan to the document by Dr. Henry Holroyd on November 16th 2022

<div align="right">Committee for standardization of HFCV, Japan</div>

(Consist of 10 experts from academia, OEMs, parts suppliers, government-affiliated organizations, etc.)

<div align="right">January 25th, 2023</div>

We have deep concern on his misunderstandings, and we strongly believe that HG-SCC testing method is definitely effective to screen suitable aluminum materials for the use in high-pressure hydrogen gas container. His misunderstandings are as follows.

1. The actual K_{IAPP} values (K value to be applied during HG-SCC test) for the testing of fourteen Al-Mg-Si alloys (26 test pieces) including industrially produced 6061 alloy with T6 temper are ranging from 14.3 to 19.6 MPa$\sqrt{m}$ [Itoh et al.: 2020] far below 85% (25.5 MPa$\sqrt{m}$) of the typical K_{IC} value (30 MPa$\sqrt{m}$) Dr. Holroyd quoted.

Table 3. Summary of the test results for the specimens No. 4–18

Specimen	Test piece	K_{IApp} (MPa$\sqrt{m}$)	Δa (mm)
4	a	16.5	0
5	a	19.0	0
5	b	19.0	0
7	a	19.6	>1mm
7	b	19.6	>1mm
9	a	19.6	0.005*
9	b	19.6	0
10	a	14.4	0
10	b	14.4	0.018
10	c	14.3	0.197*
11	a	15.9	0.017*
11	b	15.9	0.103*
12	a	18.1	0.020*
13	a	18.9	>1mm
13	b	18.7	0.839*
14	a	18.8	0.000*
14	b	18.8	0.063
15	a	18.8	0
15	b	18.8	0
15	c	18.6	0.164
16	a	17.8	0.698
18	a	18.0	0.341*
18	b	18.0	0
18	c	17.9	0
17	a	18.7	0.002*
6061**	a	15.4	0

* Measured on the surface
** Industrially produced material

Itoh et al.: 59th Annual Conference of Metallurgists, The Canadian Institute of Mining, Metallurgy and Petroleum, (2020), Paper 820411.
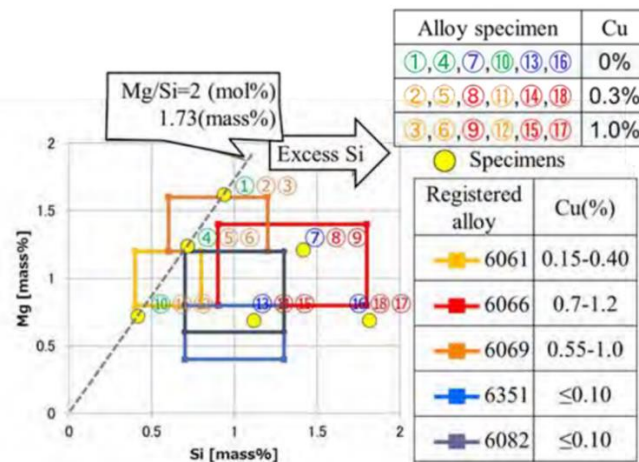
2. No data has shown that industrially produced 6061-T6 sheets fail HG-SCC test.

Results of HG-SCC test of 6061-T6 sheets

Testing lab.	Number of test pieces	Yield stress, $\sigma_{0.2}$ (MPa)	K_{IAPP} ($= 0.056\sigma_{0.2}$) (MPa$\sqrt{m}$)	Crack extension, Δa (mm)	Judgement*
A	9	322	18.0	0.00~0.06	Pass
B	2	297	16.6	0.00	Pass
* When Δa is not more than 0.16 mm, the material is judged to pass the HG-SCC test.					

Request from Japan

As described above, Dr. Henry Holroyd's misunderstandings are crucial. He is urging unnecessary concerns. Hence, we strongly request to reject his document.