

1. PURPOSE

PT. PINJAYA LOGAM requested to check the AD12.1 ingots, which may have the tests conducted in 6 items shown in the next section. So, we would like to inform the results of report as below. Method of Testing /Analysis/ Investigation : Visual apperance, Observed fracture surface, Chemical composition, Color check, Microstructure and PoDFA

2. CHECK MATERIAL ITEMS

- 2.1 Visual apperance
- 2.2 Observed fracture surface
- 2.3 Chemical composition

- 2.4 Color check
- 2.5 Microstructure
- 2.6 PoDFA

3. RESULTS

3.1 Visual apperance



Figure 1. Apperance of the AD12.1 ingots.

3.2 Observed fracture surface

Fracture surface of the AD12.1 ingot is rough shown in figure 2.

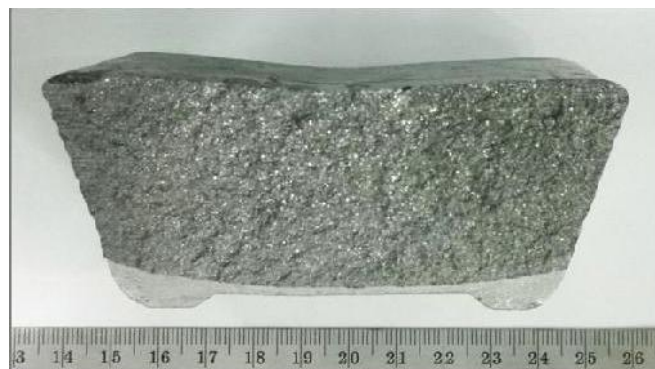
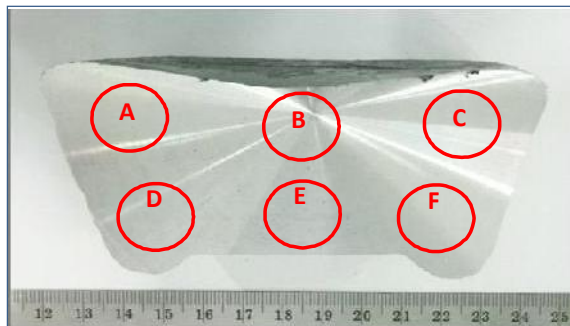


Figure 2. The fracture surface of AD12.1 ingot.

3.3 Chemical composition

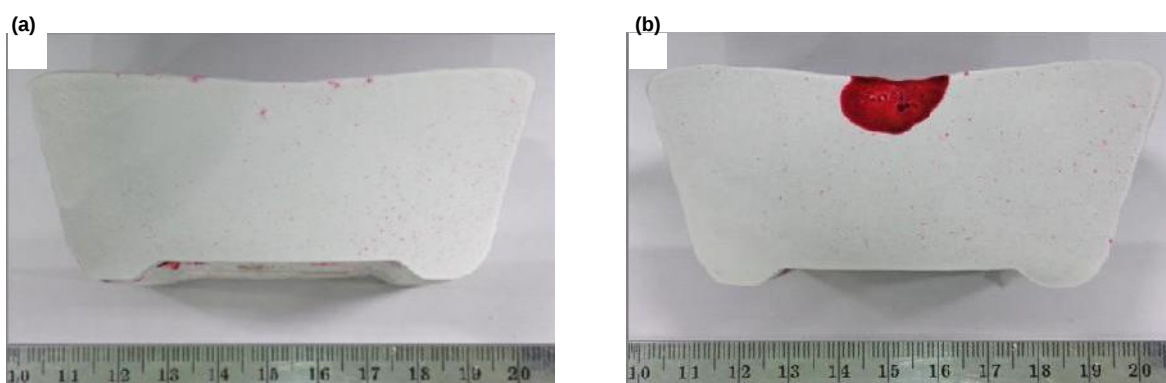
**Figure 3.** The chemical composition check in point A-F of AD12.1 ingot.**Table 1.** The chemical composition analysis results in point A-F of AD12.1 ingot (wt%).

Point check	Elements (wt%)										
	Cu	Si	Mg	Zn	Fe	Mn	Ni	Ti	Pb	Sn	Cr
A	1.738	10.786	0.139	0.864	0.827	0.110	0.045	0.042	0.054	0.013	0.025
B	1.656	10.762	0.134	0.841	0.816	0.113	0.043	0.042	0.049	0.013	0.026
C	1.756	10.520	0.143	0.866	0.828	0.112	0.045	0.041	0.053	0.013	0.025
D	1.662	10.514	0.134	0.842	0.853	0.113	0.043	0.042	0.049	0.013	0.025
E	1.691	11.166	0.137	0.855	0.819	0.109	0.044	0.041	0.054	0.013	0.024
F	1.773	10.724	0.144	0.871	0.844	0.113	0.047	0.041	0.054	0.014	0.027

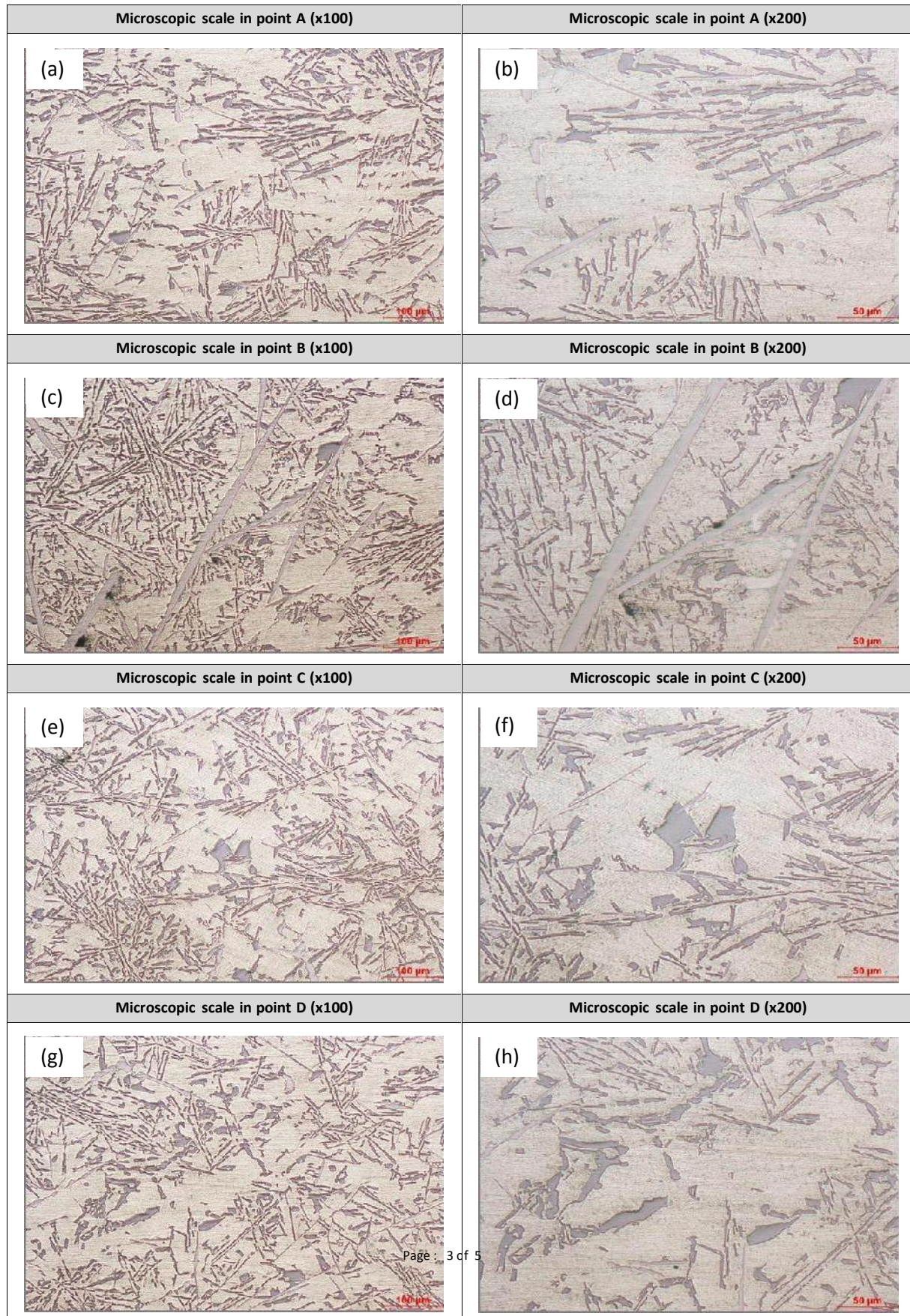
Analysis by ARL-4460 Spectrometer

Reference master SS-383 BW and ADC10-N-DC2

3.4 Color check

**Figure 4.** The color check results of AD12.1 ingots.

3.5 Microstructure



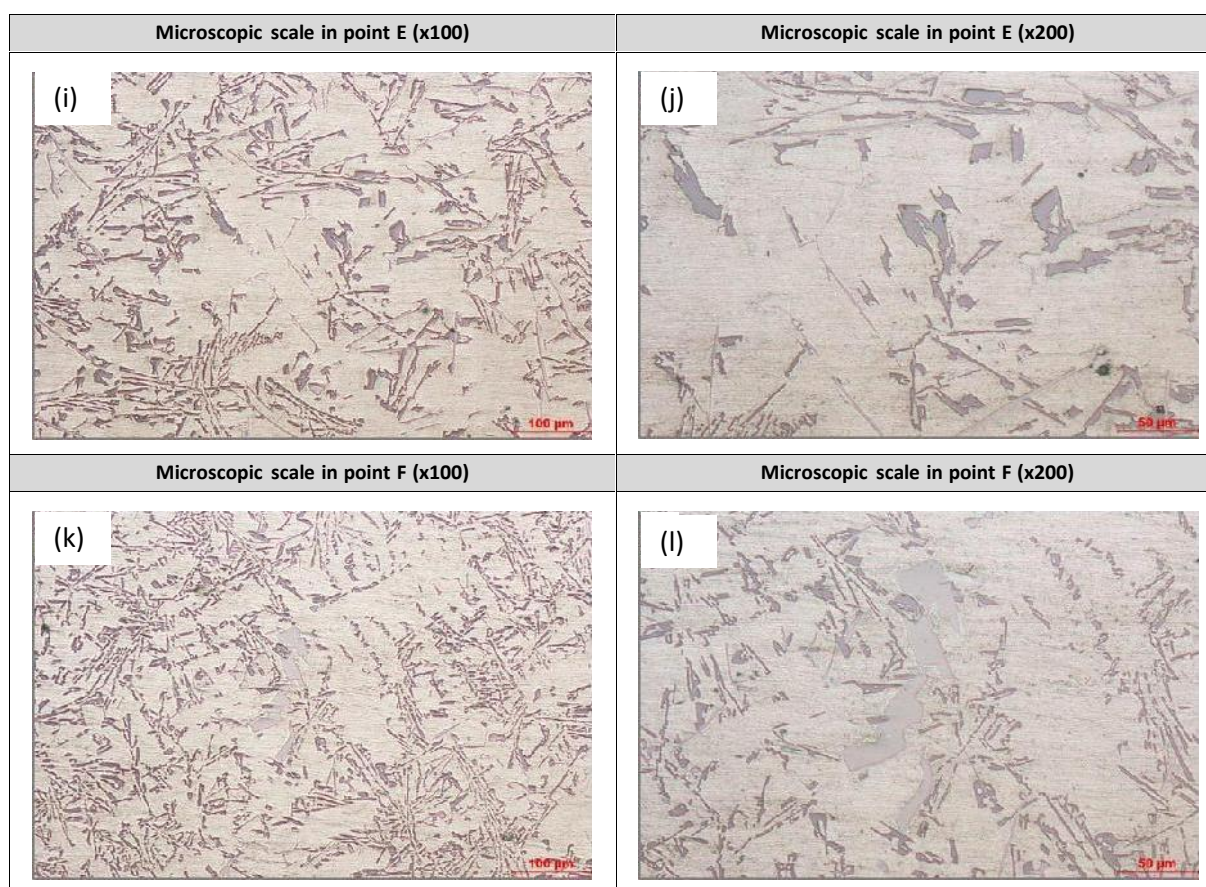


Figure 5. The microstructures of AD12.1 ingot in point A-F, after etching and magnification x100 and x200.

3.6 PoDFA

DAT to check the cleanliness of molten aluminium using PoDFA shown in figure 6, Table 2 shows the evaluation of cleanliness and also the test results shown in Table 3.

How to testing :

As of figure 6, we need to setting all of equipment in melting room and melt the constant weight sample in melting room. After that take the pressure in melting room for push the molten be pass the filter in bottom of crucible. Lastly, calculate output of molten in the drip plate.

Condition for testing :

Melting temperature	770 ° C
Pressure	0.09 MPa

ANALYSIS / TESTING REPORT

Report No.

RP130805-01

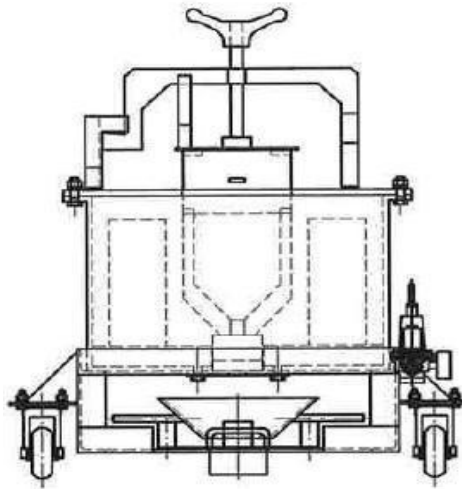


Figure 6. PoDFA instrument.

Table 2. Criteria for evaluation of cleanliness

Rank	Criteria (%)	Cleanliness	Comment
A	< 1.00	Clean	Can casting (very good)
B	1.00 - 1.50	A little dirty	Should do treatment molten aluminium before casting
C	> 1.50	Dirty	Need to do treatment molten aluminum before casting

Table 3. Aluminium ingot cleanliness testing results

Alloy Name	Sample No.	Test material weight	Filtration weight	Redial weight	Redial Rate (%)	Average (%)	Rank
		(g)	(g)	(g)			
AD12.1 ingots	N-1	4,018.8	3,972.4	46.40	1.15%	1.13%	B
	N-2	3,995.5	3,951.6	43.90	1.10%		

The aluminium ingot cleanliness testing results found that the ingot have B rank, it's means aluminium ingot are little dirty, So should do treatment molten aluminium before casting.