

LAMPIRAN 1

HASIL PENGUJIAN KOMPOSISI KIMIA STRONSIUM

NO: 1350						
PQE DIVISION - MATERIAL DEV. SUB DEPARTEMENT						
To : PE A - Aluminium Casting Pgs From : Material Development Sub. Dept. Subject : MATERIAL AC8H (SR MODIFIED)	ENGINEERING LABORATORY TEST SUMMARY					
Attention : Mr. Djody Hendro W Date of Request : 20-April-08 Your Reference :	Report No. : A56708 Issue date : 20-April-08					
TITLE : MATERIAL AC8H (SR MODIFIED) INSPECTION RESULT						
Part Name	Material AC8H					
Part Number	-					
Applied Type (Model)	-					
Supplier Name	-					
Sample Quantity	4 pcs					
Additional Information						
The tests/inspections based on the standasd test that we have used for judgment requirements. Include the result of several tests/inspections as follows:						
	ENCLOSED DATA	OBSERVED ITEM	APPLIED TEST	INSPECTION STANDARD	REMARK	RESULT
GENERAL REQUIREMENTS	Encl. 1	Visual Examination, Background, Objectives and Conclusion	visual	Reference	Lab MDEV data	-
	Encl. 2	Material properties	Chemical comp	AC8H	Lab MDEV data	-
Based on the Inspection Data above, the conclusion are : Penambahan Sr 1,5 grm (target Sr 0,0075%) , 3 grm (target Sr 0,015%) , 6 grm (target Sr 0,03%) yang terdeteksi unsur tersebut, sedangkan yang lainnya masih relatif mirip dengan material AC8H tanpa penambahan Sr.						
Comments		Prepared by	Checked by	Approved by		
		Anggriat A.P.	John P. Sinaga	Doddy Setiawan		
The test summary is CONFIDENTIAL and should be used as its necessary to whom it may concern.						
Notification Copy or Circular to	5					
	4					
	3					
	2					
	1					

MATERIAL AC8H (SR MODIFIED) INSPECTION RESULT

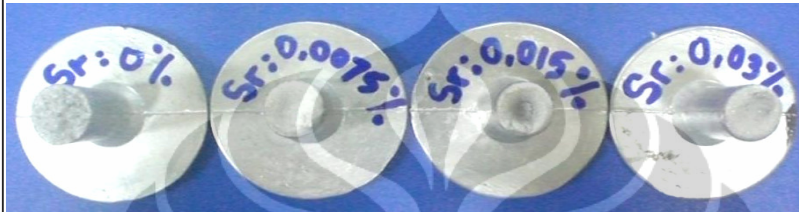
DRW No.: -
Standard Material : AC8H

20-April-08
Anggriat A. P., John P. Sinaga / Mdev-AHM
Report No.: A56708

BACKGROUND

Pihak engineering casting meminta bantuan MDEV untuk menguji komposisi kimia material AC8H yang dimodifikasi dengan penambahan unsur Sr sebanyak 1.5 gr, 3 gr, dan 6 gr.

VISUAL EXAMINATION



OBJECTIVE

Menguji komposisi kimia dari material AC8H yg dimodifikasi dengan penambahan unsur Sr sebanyak 1.5 gr, 3 gr, dan 6 gr.

DISCUSSION & CONCLUSION

Material AC8H yg dimodifikasi dengan penambahan unsur Sr sebanyak 1.5 gr terdeteksi mengandung 0,0068 % Sr sementara untuk penambahan 3 gr Sr terdeteksi mengandung 0,0133 Sr dan pada penambahan 6 gr Sr kadar Sr yang terdeteksi 0,031 % sementara unsur unsur lain tidak berubah signifikan dan masih mengikuti standard material AC 8 H.

Target Sr (%)	Actual Sr (%)
0	0,00072
0,0075	0,0068
0,015	0,0133
0,03	0,031

Bila dilihat kandungan unsur Sr pada paduan yang ditambahkan modifier sudah mendekati target.

Test No. : CC-034808

CHEMICAL COMP.

unit in weight %

Item	Cu	Si	Mg	Zn	Fe	Mn	Cr	Ni	Ti	Sr
AC8H	2,82	11,45	0,77	0,016	0,288	0,032	0,0078	0,018	0,171	0,00072
AC8H #1	2,84	11,51	0,84	0,02	0,282	0,034	0,0068	0,016	0,175	0,0068
AC8H #2	2,78	11,18	0,78	0,023	0,278	0,03	0,0060	0,016	0,159	0,0133
AC8H #3	2,80	11,54	0,78	0,02	0,281	0,032	0,0077	0,017	0,177	0,031
STD HES C 102-08	2,4-3,5	10,5-11,5	0,7-1,3	0-0,1	0,05-0,4	0-0,1	0-0,5	0-0,1	0,2-0,3	----

Remarks :

Test Date : 20-Apr-08
Standard Material : AC8H
Standard Method : #N/A
Test Machine : OE Spectrometer

Prepared by

Anggriat A. P

Checked by

John P. Sinaga

HASIL PENGUJIAN KOMPOSISI KIMIA PHOSPOR

NO: 1351

PQE DIVISION - MATERIAL DEV. SUB DEPARTEMENT

To : PE A - Aluminium Casting Pgs
From : Material Development Sub. Dept.
Subject : MATERIAL AC8H (P MODIFIED)

ENGINEERING LABORATORY TEST SUMMARY

Attention : Mr. Djody Hendro W
Date of Request : 20-April-08
Your Reference :

Report No. : A56709
Issue date : 20-April-08

TITLE : MATERIAL AC8H (SR MODIFIED) INSPECTION RESULT

Part Name	Material AC8H
Part Number	-
Applied Type (Model)	-
Supplier Name	-
Sample Quantity	4 pcs
Additional Information	

The tests/inspections based on the standasd test that we have used for judgment requirements.
 Include the result of several tests/inspections as follows:

	ENCLOSED DATA	OBSERVED ITEM	APPLIED TEST	INSPECTION STANDARD	REMARK	RESULT
GENERAL REQUIREMENTS	Encl. 1	Visual Examination, Background, Objectives and Conclusion	visual	Reference	Lab MDEV data	-
	Encl. 2	Material properties	Chemical comp	AC8H	Lab MDEV data	-

Based on the Inspection Data above, the conclusion are :

Penambahan Phospor 3 grm (target P 0,003%) , 4 grm (target P 0,004%) , 5 grm (target P 0,005%) yang terdeteksi unsur tersebut, sedangkan yang lainnya masih relatif mirip dengan material AC8H tanpa penambahan Phospor.

Comments	Prepared by	Checked by	Approved by
	Anggriat A.P.	John P. Sinaga	Doddy Setiawan

The test summary is CONFIDENTIAL and should be used as its necessary to whom it may concern.

Notification Copy or Circular to	5			
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MATERIAL AC8H (P MODIFIED) INSPECTION RESULT

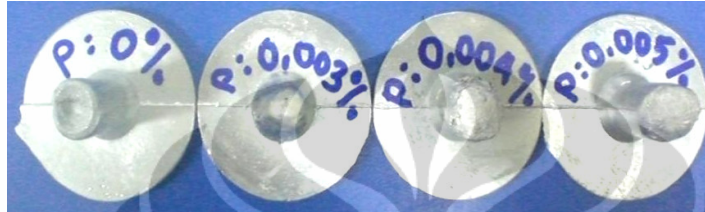
DRW No.: -
Standard Material : AC8H

20-April-08
Anggriat A. P., John P. Sinaga / Mdev-AHM
Report No.: A56709

BACKGROUND

Pihak engineering casting meminta bantuan MDEV untuk menguji komposisi kimia material AC8H yang dimodifikasi dengan penambahan unsur Sr sebanyak 1.5 gr, 3 gr, dan 6 gr.

VISUAL EXAMINATION



OBJECTIVE

Menguji komposisi kimia dari material AC8 H yg dimodifikasi dengan penambahan unsur Phospor sebanyak 3 gr, 4 gr, dan 5 gr.

DISCUSSION & CONCLUSION

Material AC8H yg dimodifikasi dengan penambahan unsur P sebanyak 3 gr terdeteksi mengandung 0,0038%, sementara untuk penambahan 4gr P terdeteksi mengandung 0,0041% dan pada penambahan 5 gr P kadar Phospor yang terdeteksi 0,0046 % sementara unsur unsur lain tidak berubah signifikan dan masih mengikuti standard material AC 8 H.

Target P (%)	Actual P (%)
0	0,0036
0,003	0,0038
0,004	0,0041
0,005	0,0046

Bila dilihat kandungan unsur P pada paduan yang ditambahkan modifier sudah mendekati target.

Test No. : CC-034809

CHEMICAL COMP.

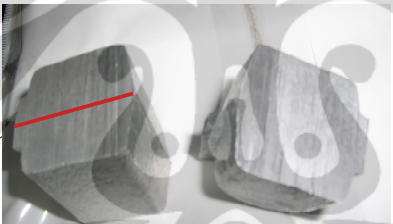
unit in weight %

Item	Cu	Si	Mg	Zn	Fe	Mn	Cr	Ni	Ti	P
AC8H	2,76	11,59	1,04	0,01	0,167	0,016	--	0,0094	0,23	0,0036
AC8H #1	2,76	11,85	1,044	0,01	0,171	0,017	--	0,0095	0,24	0,0038
AC8H #2	2,63	11,39	0,99	0,05	0,16	0,015	--	0,0086	0,24	0,0041
AC8H #3	2,63	11,31	0,98	0,03	0,166	0,015	--	0,0087	0,22	0,0046
STD HES C 102-08	2,4-3,5	10,5-11,5	0,7-1,3	0-0,1	0,05-0,4	0-0,1	0-0,5	0-0,1	0,2-0,3	----

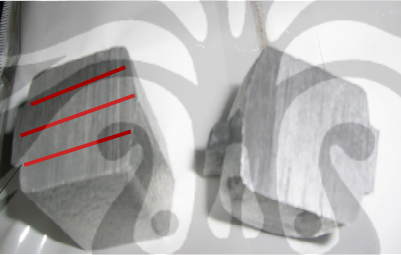
Remarks :	Prepared by	Checked by
Test Date : 20-Apr-08 Standard Material : AC8H Standard Method : #N/A Test Machine : OE Spectrometer	Anggriat A. P	John P. Sinaga

LAMPIRAN 2

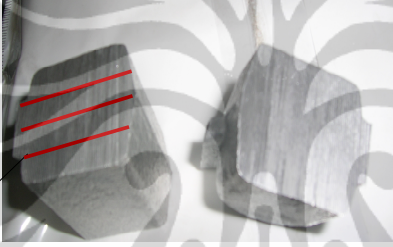
HASIL PENGUJIAN KEKERASAN T6

HARDNESS ROCKWELL TESTING REPORT																																						
REPORT NO.: 012/V/QT/08																																						
PART NAME : SAMPEL UI PART NO : --- TYPE : --- MATERIAL : ACSH, HEAT TREATMENT T6 SUB CONT : INPLANT SAMPLE ACCEPTED : 26- MEI 2008 FINISH ESTIMATED : 30- MEI 2008	METHODE STANDARD : E-18 TESTING M / C : ROCKWELL HARDNESS TESTER SCALA / LOAD : TRIAL / RUTIN : TRIAL REQUEST DEPT : ENGINEERING SAMPLE FINISHED : 30 - MEI 2008 TOTAL TIME :																																					
ILUSTRASI : <div style="text-align: center;">  </div> <p style="text-align: center;">LAJUR PENJEJAKAN IDENTOR</p>																																						
<table border="1" style="margin: auto;"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">Sampel</th> <th colspan="5">Titik</th> <th rowspan="2">Kekerasan (HRB)</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>T6</td> <td>64.3</td> <td>66.3</td> <td>62.1</td> <td>60.9</td> <td>68.2</td> <td>64.36</td> </tr> <tr> <td>2</td> <td>T6</td> <td>63.1</td> <td>62.5</td> <td>64.5</td> <td>66.4</td> <td>63.7</td> <td>64.04</td> </tr> <tr> <td>3</td> <td>T6</td> <td>63.1</td> <td>61.5</td> <td>65.9</td> <td>62.7</td> <td>67.4</td> <td>64.12</td> </tr> </tbody> </table>		No	Sampel	Titik					Kekerasan (HRB)	1	2	3	4	5	1	T6	64.3	66.3	62.1	60.9	68.2	64.36	2	T6	63.1	62.5	64.5	66.4	63.7	64.04	3	T6	63.1	61.5	65.9	62.7	67.4	64.12
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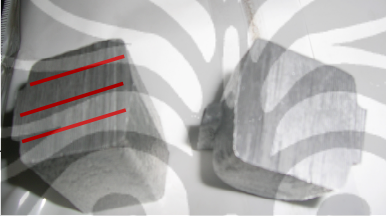
HASIL PENGUJIAN KEKERASAN MODIFIER STRONSIUM

REPORT NO : 22/III/QT/08																																																																																													
HARDNESS ROCKWELL TESTING REPORT																																																																																													
PART NAME : SAMPELUJI PART NO : --- TYPE : --- MATERIAL : ACSH , MODIFIER Sr SUB CONT : INPLANT SAMPLE ACCEPTED : 18- MARET 2008 FINISH ESTIMATED : 24- MARET 2008	METHODE STANDARD : E-18 TESTING M / C : ROCKWELL HARDNESS TESTER SCALA / LOAD : TRIAL / RUTIN : TRIAL REQUEST DEPT : ENGINEERING SAMPLE FINISHED : 24- MARET 2008 TOTAL TIME :																																																																																												
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HASIL PENGUJIAN KEKERASAN MODIFIER PHOSPOR

REPORT NO : 23/III/ QT /08																																																																																													
HARDNESS ROCKWELL TESTING REPORT																																																																																													
PART NAME : SAMPEL UII PART NO : --- TYPE : --- MATERIAL : ACSH , MODIFIER Phospor SUB CONT : INPLANT SAMPLE ACCEPTED : 24 - MARET 2008 FINISH ESTIMATED : 31 - MARET 2008	METHODE STANDARD : E-18 TESTING M / C : ROCKWELL HARDNESS TESTER SCALA / LOAD : TRIAL / RUTIN : TRIAL REQUEST DEPT : ENGINEERING SAMPLE FINISHED : 28 - MARET 2008 TOTAL TIME :																																																																																												
ILLUSTRASI : <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center; margin: 0;">LAJUR PENJEJAKAN IDENTOR</p> <table border="1" style="margin: 20px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">Sampel</th> <th rowspan="2">Kandungan phospor</th> <th colspan="5">Titik</th> <th rowspan="2">Kekerasan (HRB)</th> </tr> <tr> <th>1</th> <th>2</th> <th>5</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>O</td> <td>0,0036%</td> <td>47,5</td> <td>46,3</td> <td>47,8</td> <td>45,9</td> <td>48,2</td> <td>47</td> </tr> <tr> <td>2</td> <td>A1</td> <td rowspan="3">0,0038%</td> <td>48,2</td> <td>45,7</td> <td>45,8</td> <td>46,9</td> <td>47,2</td> <td rowspan="3">47,1</td> </tr> <tr> <td>3</td> <td>A2</td> <td>45,3</td> <td>48,1</td> <td>47,3</td> <td>47,6</td> <td>47,1</td> </tr> <tr> <td>4</td> <td>A3</td> <td>48,8</td> <td>47,2</td> <td>46,8</td> <td>47,9</td> <td>45,3</td> </tr> <tr> <td>5</td> <td>B1</td> <td rowspan="3">0,0041%</td> <td>41,6</td> <td>45,7</td> <td>45,8</td> <td>41,9</td> <td>44,2</td> <td rowspan="3">43,2</td> </tr> <tr> <td>6</td> <td>B2</td> <td>45,3</td> <td>42,1</td> <td>42,3</td> <td>40,6</td> <td>42,1</td> </tr> <tr> <td>7</td> <td>B3</td> <td>40,8</td> <td>47,2</td> <td>45,8</td> <td>41,4</td> <td>41,3</td> </tr> <tr> <td>8</td> <td>C1</td> <td rowspan="3">0,0046%</td> <td>34,6</td> <td>37,4</td> <td>35,4</td> <td>39,4</td> <td>38,9</td> <td rowspan="3">35,5</td> </tr> <tr> <td>9</td> <td>C2</td> <td>37,8</td> <td>38,1</td> <td>34,8</td> <td>33,6</td> <td>35,4</td> </tr> <tr> <td>10</td> <td>C3</td> <td>33,8</td> <td>34,2</td> <td>34,2</td> <td>31,9</td> <td>32,7</td> </tr> </tbody> </table>		No	Sampel	Kandungan phospor	Titik					Kekerasan (HRB)	1	2	5	4	5	1	O	0,0036%	47,5	46,3	47,8	45,9	48,2	47	2	A1	0,0038%	48,2	45,7	45,8	46,9	47,2	47,1	3	A2	45,3	48,1	47,3	47,6	47,1	4	A3	48,8	47,2	46,8	47,9	45,3	5	B1	0,0041%	41,6	45,7	45,8	41,9	44,2	43,2	6	B2	45,3	42,1	42,3	40,6	42,1	7	B3	40,8	47,2	45,8	41,4	41,3	8	C1	0,0046%	34,6	37,4	35,4	39,4	38,9	35,5	9	C2	37,8	38,1	34,8	33,6	35,4	10	C3	33,8	34,2	34,2	31,9	32,7
No	Sampel				Kandungan phospor	Titik					Kekerasan (HRB)																																																																																		
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4	A3		48,8	47,2	46,8	47,9	45,3																																																																																						
5	B1	0,0041%	41,6	45,7	45,8	41,9	44,2	43,2																																																																																					
6	B2		45,3	42,1	42,3	40,6	42,1																																																																																						
7	B3		40,8	47,2	45,8	41,4	41,3																																																																																						
8	C1	0,0046%	34,6	37,4	35,4	39,4	38,9	35,5																																																																																					
9	C2		37,8	38,1	34,8	33,6	35,4																																																																																						
10	C3		33,8	34,2	34,2	31,9	32,7																																																																																						
NOTE: <table border="1" style="float: right; margin-top: 20px; border-collapse: collapse;"> <tr> <td style="padding: 2px;">MADE BY</td> <td style="padding: 2px;">APPROVED</td> </tr> <tr> <td style="height: 40px;"></td> <td style="height: 40px;"></td> </tr> <tr> <td style="text-align: center; padding: 2px;">RONAL</td> <td style="text-align: center; padding: 2px;">ALIFZ</td> </tr> </table>		MADE BY	APPROVED			RONAL	ALIFZ																																																																																						
MADE BY	APPROVED																																																																																												
RONAL	ALIFZ																																																																																												
CM - QASLB - 002 - 00 PRINTED :																																																																																													

HASIL PENGUJIAN KEKERASAN T4

REPORT NO :014/ VIQT /08								
HARDNESS ROCKWELL TESTING REPORT								
PART NAME : SAMPEL UII			METHODE STANDARD : E-18					
PART NO : ---			TESTING M / C : ROCKWELL HARDNESS TESTER					
TYPE : ---			SCALA / LOAD : ---					
MATERIAL : ACSH, HEAT TREATMENT T4			TRIAL / RUTIN : TRIAL					
SUB CONT : INPLANT			REQUEST DEPT : ENGINEERING					
SAMPLE ACCEPTED : 23 - MEI 2008			SAMPLE FINISHED : 29 - MEI 2008					
FINISH ESTIMATED : 30 - MEI 2008			TOTAL TIME : ---					
ILISTRASI:								
								
LAJUR PENJEJAKAN IDENTOR								
No	Sampel	Kondisi	Titik					Kekerasan (HRB)
			1	2	3	4	5	
1	A1	T4-0	50.6	49.4	50.3	48.9	51.2	50.1
2	A2		50.2	50.5	50.3	51.4	49.4	
3	A3		48.9	49.6	49.5	51.1	50.8	
4	B1	T4-24	60.3	61.1	58.8	60.2	59.7	60.2
5	B2		60.1	59.2	60.3	61.2	59.8	
6	B3		59.5	60.3	60.7	60.9	61.4	
7	C1	T-48	61.2	60.7	60.1	61.3	60.9	61.1
8	C1		60.3	62.1	58.8	61.2	59.7	
9	C3		61.4	62.3	63.1	60.9	62.5	
10	D1	T-72	64.3	63.5	63.9	62.7	64.1	64.1
11	D2		65.4	63.9	66.5	62.8	64.7	
12	D3		64.7	62.3	63.8	63.9	62.1	
13	E1	T-96	66.2	64.9	64.7	65.6	66.1	65.2
14	E2		65.7	64.5	66.5	64.2	64.8	
15	E3		64.1	65.3	63.9	66.2	65.4	
16	F1	T-120	67.2	65.9	65.3	66.1	66.5	66.4
17	F2		68.3	62.9	66.3	64.1	66.7	
18	F3		68.5	67.9	67.7	64.9	67.2	
NOTE:								
			MADE BY	APPROVED				
			RONAL	ALIF.Z				
CM - QASLB - 002 - 00						PRINTED :		

LAMPIRAN 3

HASIL PENGUJIAN TARIK INGOT AC8H

REPORT NO: 011/ TS-DC/IV/08			
TENSILE STRENGTH TESTING REPORT			
PART NAME : SAMPEL MELTING	METHODE STANDARD : JIS Z 2201 & JIS Z 2241		
PART NO :	TESTING M / C : SHIMADZU		
TYPE :	SCALE / LOAD : --		
MATERIAL : INGOT AC8H	TRIAL / RUTIN : TRIAL		
SUB CONT : INPLANT	REQUEST DEPT : ENGINEERING		
SAMPLE ACCEPTED : 21 APRIL 2008	SAMPLE FINISHED : 24 APRIL 2008		
FINISH ESTIMATED : 24 APRIL 2008	TOTAL TIME : 3 DAY		
ILLUSTRATION :			
STANDARD & RESULT			
STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	19.12	11,95
	2	18.47	13,05
	3		
	4		
	5		
AVERAGE		18.81	12,5
NOTE :			
		MADE BY	CHECKED
		SANIBI	H. ALIF.Z

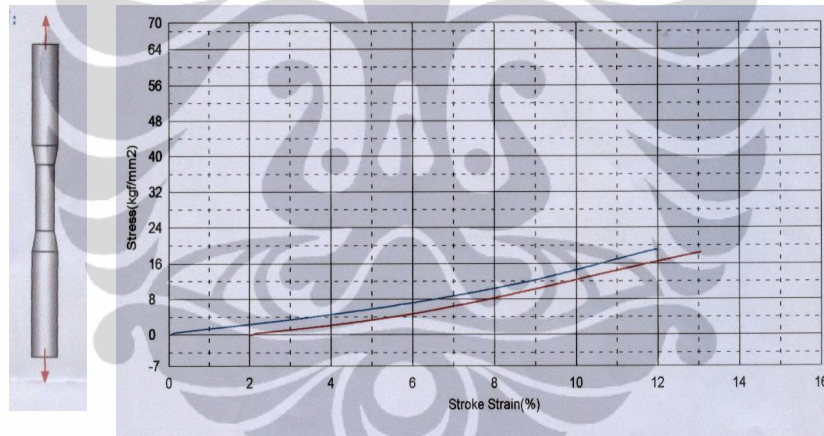
HASIL PENGUJIAN TARIK AC8H : 0,00072 % Stronsium

REPORT NO : 017/ TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,00072 % Sr	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 21 APRIL 2008	SAMPLE FINISHED	: 24 APRIL 2008
FINISH ESTIMATED	: 24 APRIL 2008	TOTAL TIME	: 3 DAY

ILUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	19,34	11,9
	2	18,18	13,1
	3		
	4		
	5		
AVERAGE		18,76	12,50

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIFZ

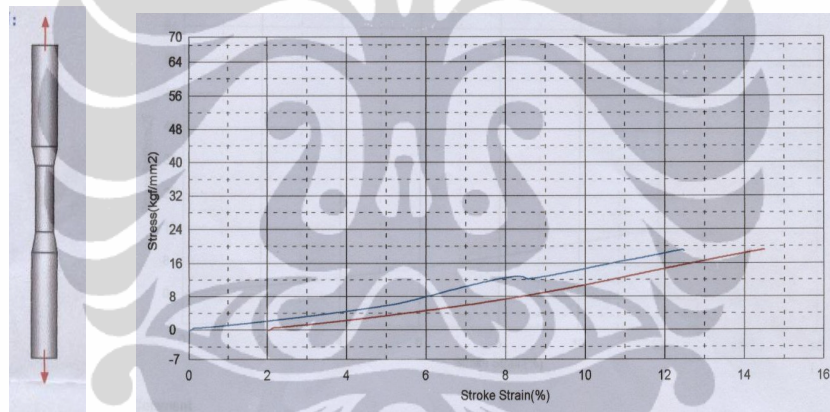
HASIL PENGUJIAN TARIK AC8H : 0,0068% Stronsium

REPORT NO : 012/ TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,0068 % Sr	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 21 APRIL 2008	SAMPLE FINISHED	: 24 APRIL 2008
FINISH ESTIMATED	: 24 APRIL 2008	TOTAL TIME	: 3 DAY

ILUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	19.23	12.50
	2	19.26	14.50
	3		
	4		
	5		
AVERAGE		19.25	13.50

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

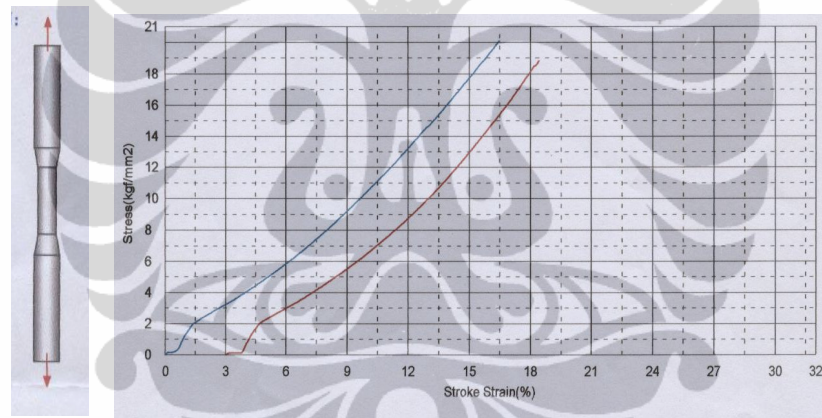
HASIL PENGUJIAN TARIK AC8H : 0,0133 % Stronsium

REPORT NO : 019/ TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,0133 % Sr	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 21 APRIL 2008	SAMPLE FINISHED	: 24 APRIL 2008
FINISH ESTIMATED	: 24 APRIL 2008	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	20,10	16,45
	2	18,85	18,30
	3		
	4		
	5		
AVERAGE		19,48	17,38

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

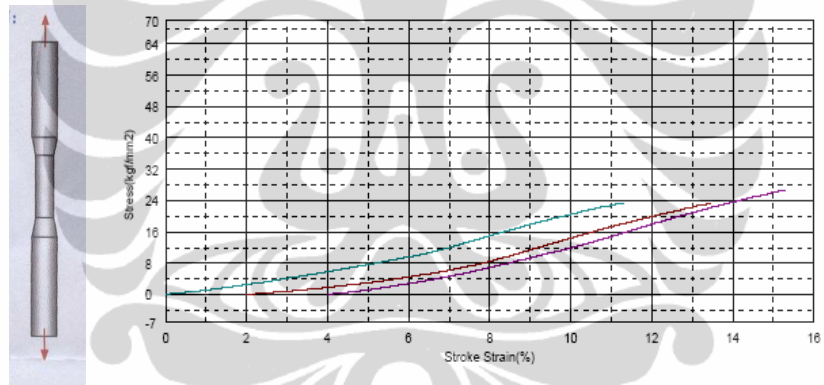
HASIL PENGUJIAN TARIK AC8H : 0,031 % Stronsium

REPORT NO : 018 / TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTINGM / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,031 % Sr	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 21 APRIL 2008	SAMPLE FINISHED	: 24 APRIL 2008
FINISH ESTIMATED	: 24 APRIL 2008	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	23,47	11,25
	2	23,32	13,40
	3	26,76	15,20
	4		
	5		
AVERAGE		24,52	13,28

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

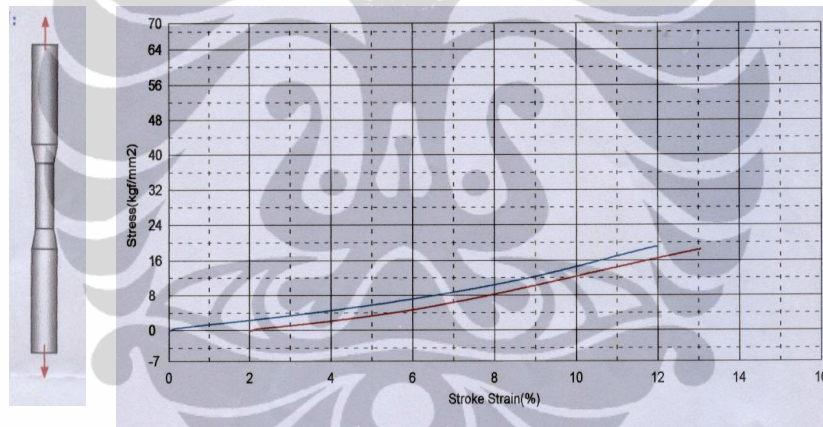
HASIL PENGUJIAN TARIK AC8H : 0,0036 % Phospor

REPORT NO : 031 / TS-DC/ IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: -
MATERIAL	: MODIFIER 0,0036 % P	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 25 APRIL 2008	SAMPLE FINISHED	: 28 APRIL 2008
FINISH ESTIMATED	: 28 APRIL 2008	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	19,10	12
	2	18,55	12,95
	3		
	4		
	5		
AVERAGE		18,83	12,48

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

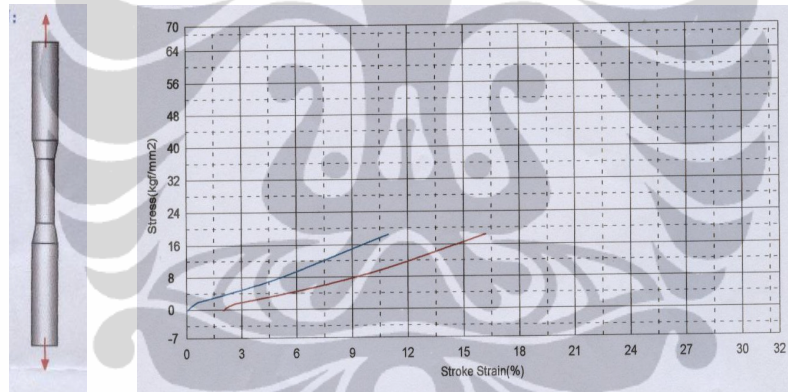
HASIL PENGUJIAN TARIK AC8H : 0,0038 % Phospor

REPORT NO : 032 / TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,0038% P	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 25 APRIL 2008	SAMPLE FINISHED	: 28 APRIL 2008
FINISH ESTIMATED	: 28 APRIL 2008	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	18,41	10,75
	2	18,37	16,25
	3		
	4		
	5		
AVERAGE		18,39	13,50

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF Z

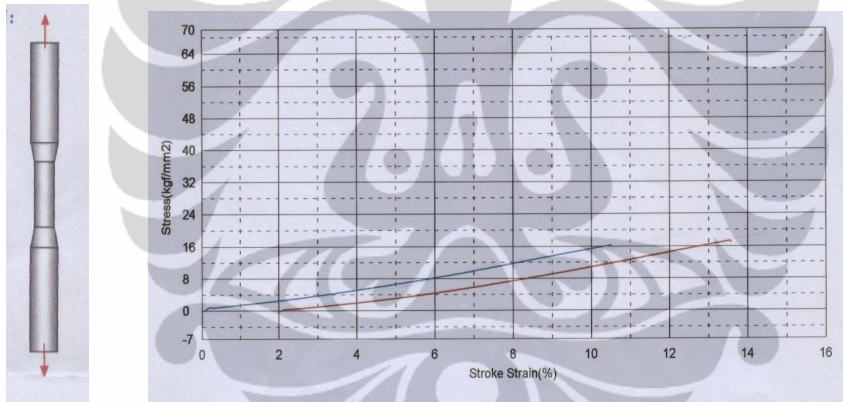
HASIL PENGUJIAN TARIK AC8H : 0,0041 % Phospor

REPORT NO : 033 / TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0,0041 % P	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 25 APRIL 2008	SAMPLE FINISHED	: 28 APRIL 2008
FINISH ESTIMATED	: 28 APRIL 2008	TOTAL TIME	: 3 DAY

ILUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm2	No SPL	TENSILE ST Kgf / mm2	ELONGATION (%)
	1	16,25	10,50
	2	17,31	13,70
	3		
	4		
	5		
AVERAGE		16,78	12,10

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

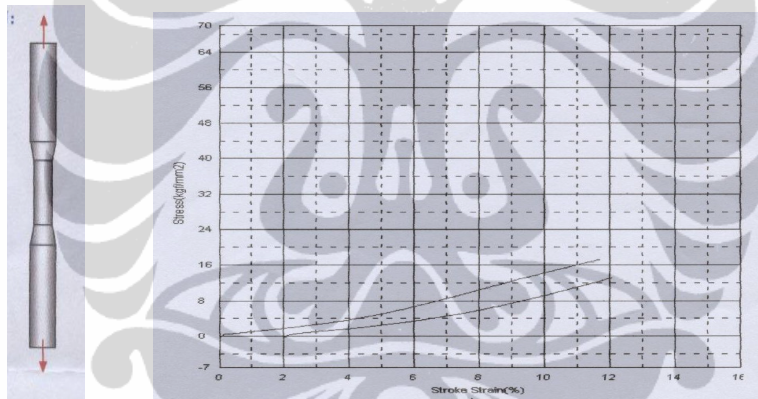
HASIL PENGUJIAN TARIK AC8H : 0,0046 % Phospor

REPORT NO : 034/ TS-DC/IV/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: MODIFIER 0.0046 % P	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 25 APRIL 2008	SAMPLE FINISHED	: 28 APRIL 2008
FINISH ESTIMATED	: 28 APRIL 2008	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	17,32	11,75
	2	13,19	12,00
	3		
	4		
	5		
AVERAGE		15,26	11,88

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

HASIL PENGUJIAN TARIK AC8H T4-0 JAM

REPORT NO : 008/ TS-DC/V/08			
TENSILE STRENGTH TESTING REPORT			
PART NAME : SAMPEL MELTING PART NO : TYPE : MATERIAL : AC8H- T4-0 JAM SUB CONT : INPLANT SAMPLE ACCEPTED : 22 MEI 2008 FINISH ESTIMATED : 23 MEI 2008	METHODE STANDARD : JIS Z 2201 & JIS Z 2241 TESTING M / C : SHIMADZU SCALE / LOAD : -- TRIAL / RUTIN : TRIAL REQUEST DEPT : ENGINEERING SAMPLE FINISHED : 23 MEI 2008 TOTAL TIME : 3 DAY		
ILLUSTRATION :			
STANDARD & RESULT			
STANDARD Kgf / mm ²	No	TENSILE ST	ELONGATION
	SPL	Kgf / mm2	(%)
	1	19,34	12,6
	2	19,45	14,6
	3		
	4		
	5		
AVERAGE		19,40	13,60
NOTE :			
		MADE BY	CHECKED
		SANIBI	H. ALIFZ.

HASIL PENGUJIAN TARIK AC8H T4-24 JAM

REPORT NO : 009/ TS-DC/V/08			
TENSILE STRENGTH TESTING REPORT			
PART NAME : SAMPEL MELTING PART NO : TYPE : MATERIAL : AC8H - T 4-24 Jam SUB CONT : INPLANT SAMPLE ACCEPTED : 23 MEI 2008 FINISH ESTIMATED : 23 MEI 2008	METHODE STANDARD : JIS Z 2201 & JIS Z 2241 TESTING M / C : SHIMADZU SCALE / LOAD : -- TRIAL / RUTIN : TRIAL REQUEST DEPT : ENGINEERING SAMPLE FINISHED : 23 MEI 2008 TOTAL TIME : 3 DAY		
ILLUSTRATION :			
STANDARD & RESULT			
STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	21,30	11,80
	2	22,87	13,50
	3	23,82	17,10
	4		
	5		
AVERAGE		22,66	14,13
NOTE :			
		MADE BY	CHECKED
		SANIBI	H. ALIF.Z

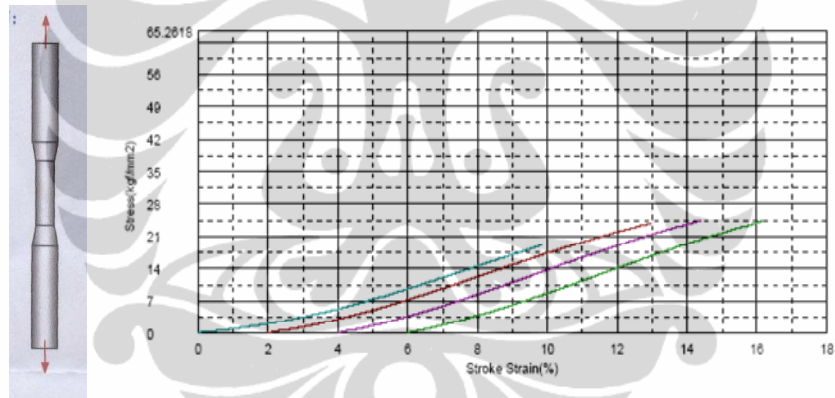
HASIL PENGUJIAN TARIK AC8H T4-48 JAM

REPORT NO : 017/ TS-DC/V/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: -
MATERIAL	: AC8H - T 4-48 Jam	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 24 MEI 2008	SAMPLE FINISHED	: 24 MEI 2008
FINISH ESTIMATED	:	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	19,24	9,80
	2	24,10	13,10
	3	24,70	14,45
	4	24,32	16,30
	5		
AVERAGE		23,09	13,41

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIF.Z

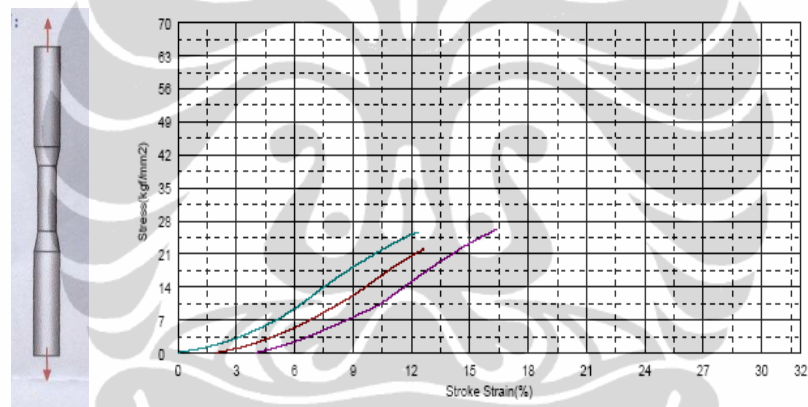
HASIL PENGUJIAN TARIK AC8H T4-72 JAM

REPORT NO : 026/ TS-DC/V/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: AC8H - T 4-72 Jam	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 25 MEI 2008	SAMPLE FINISHED	: 25 MEI 2008
FINISH ESTIMATED	:	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	25,71	12,40
	2	22,05	12,70
	3	26,26	16,40
	4		
	5		
AVERAGE		24,67	13,83

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIFZ

HASIL PENGUJIAN TARIK AC8H T4-96 JAM

REPORT NO : 027/ TS-DC/V/08			
TENSILE STRENGTH TESTING REPORT			
PART NAME : SAMPEL MELTING	METHODE STANDARD : JIS Z 2201 & JIS Z 2241		
PART NO :	TESTING M / C : SHIMADZU		
TYPE :	SCALE / LOAD : --		
MATERIAL : AC8H - T 4-96 Jam	TRIAL / RUTIN : TRIAL		
SUB CONT : INPLANT	REQUEST DEPT : ENGINEERING		
SAMPLE ACCEPTED : 26 MEI 2008	SAMPLE FINISHED : 26 MEI 2008		
FINISH ESTIMATED :	TOTAL TIME : 3 DAY		
ILLUSTRATION :			
STANDARD & RESULT			
STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	25,50	11,80
	2	25,00	13,50
	3	26,24	15,25
	4		
	5		
AVERAGE		25,58	13,52
NOTE :			
		MADE BY	CHECKED
		SANIBI	H. ALIF.Z

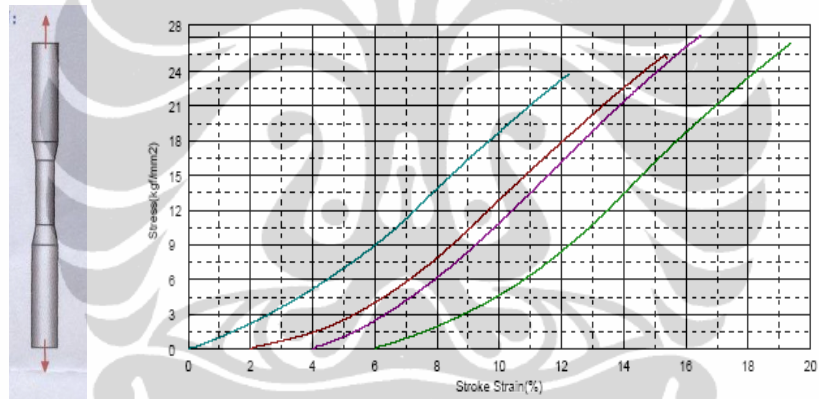
HASIL PENGUJIAN TARIK AC8H T4-120 JAM

REPORT NO : 031/ TS-DC/V/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: AC8H - T 4-120Jam	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 27 MEI 2008	SAMPLE FINISHED	: 27 MEI 2008
FINISH ESTIMATED	:	TOTAL TIME	: 3 DAY

ILUSTRATION :



STANDARD & RESULT

STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	23,82	12,10
	2	25,45	15,30
	3	27,13	16,40
	4	26,45	19,40
	5		
AVERAGE		25,71	15,80

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIFZ

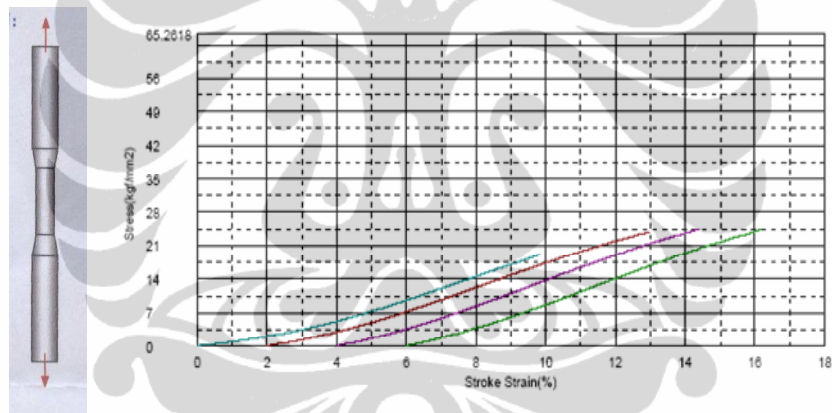
HASIL PENGUJIAN TARIK AC8H T6

REPORT NO : 010/ TS-DC/V/08

TENSILE STRENGTH TESTING REPORT

PART NAME	: SAMPEL MELTING	METHODE STANDARD	: JIS Z 2201 & JIS Z 2241
PART NO	:	TESTING M / C	: SHIMADZU
TYPE	:	SCALE / LOAD	: --
MATERIAL	: AC8H - T 6	TRIAL / RUTIN	: TRIAL
SUB CONT	: INPLANT	REQUEST DEPT	: ENGINEERING
SAMPLE ACCEPTED	: 23 MEI 2008	SAMPLE FINISHED	: 23 MEI 2008
FINISH ESTIMATED	:	TOTAL TIME	: 3 DAY

ILLUSTRATION :



STANDARD & RESULT

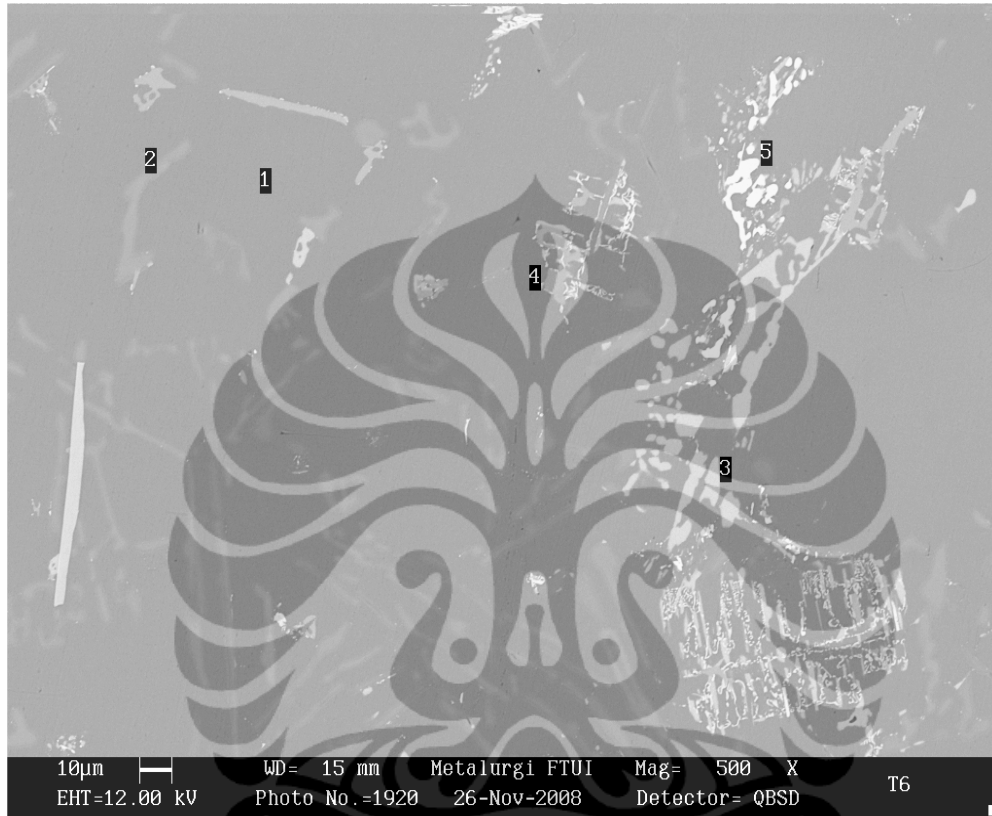
STANDARD Kgf / mm ²	No SPL	TENSILE ST Kgf / mm ²	ELONGATION (%)
	1	19,10	9,90
	2	24,10	12,90
	3	24,50	14,20
	4	24,20	16,20
	5		
AVERAGE		22,98	13,30

NOTE :

MADE BY	CHECKED
SANIBI	H. ALIFZ

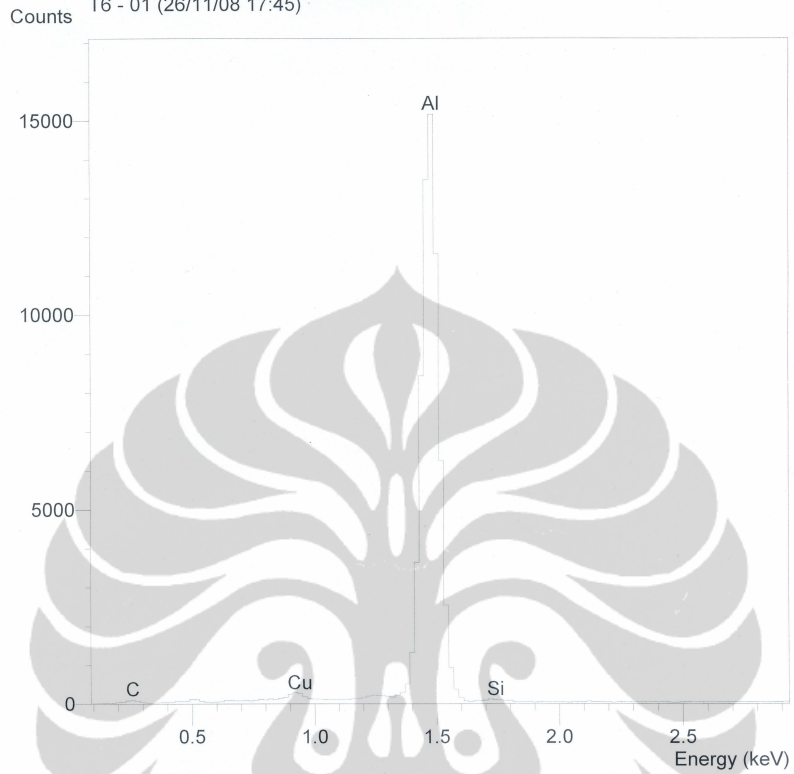
LAMPIRAN 4

HASIL PENGAMATAN SEM & EDS
PROSES PERLAKUAN PANAS T6



No	% Berat unsur					Warna	Indikasi Fasa terbentuk
	Al	Si	Cu	Mg	C		
1	91,89	1,73	5,38	--	1,01	Abu abu tua	Matriks Al-Si-Cu
2	14,46	84,31	--	--	1,22	Abu abu	Si-Primer
3	16,06	16,61	38,57	28,41	0,36	Putih abu	Cu ₂ AlMg ₂ Si
4	84,32	4,18	8,74	1,81	0,95	Abu abu muda	AlCuSiMg
5	30,86	0,26	68,68	--	0,20	Putih	Cu ₂ Al

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T6 - 01 (26/11/08 17:45)



SEMQuant results. Listed at 17:46:39 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum Label: T6 - 01

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

2 peaks possibly omitted: -0.02, 2.98 keV

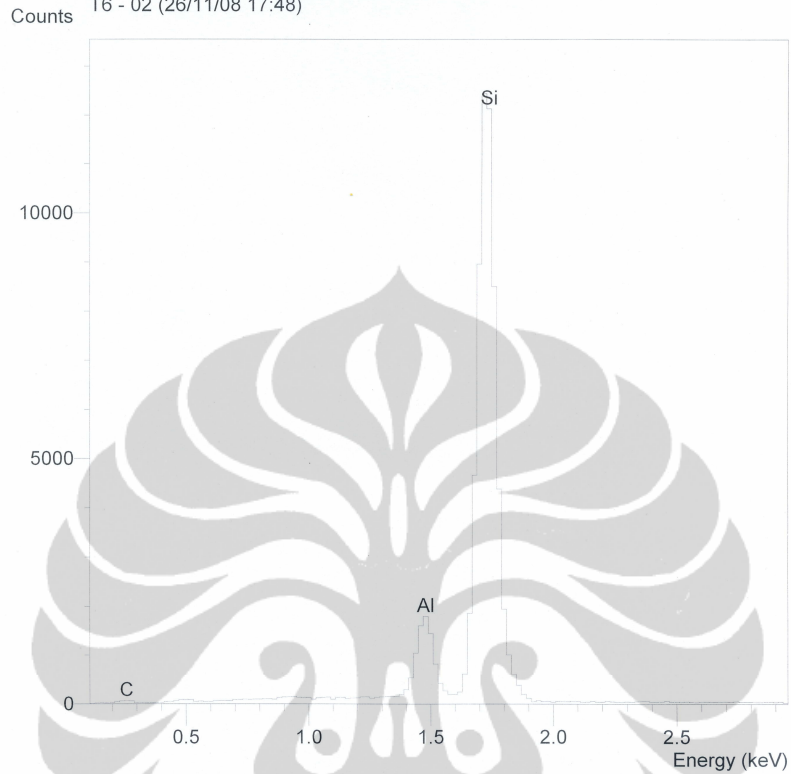
Standards :

C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	1.01	2.31
Al K	ED	91.89	93.67
Si K	ED	1.73	1.69
Cu K	ED	5.38	2.33
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job : Energy Dispersive X-Ray Analysis
T6 - 02 (26/11/08 17:48)



SEMQuant results. Listed at 17:49:33 on 26/11/08
Operator: Baim
Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job: Energy Dispersive X-Ray Analysis
Spectrum label: T6 - 02

System resolution = 59 eV

Quantitative method: ZAF (3 iterations).
Analysed all elements and normalised results.

2 peaks possibly omitted: -0.02, 0.92 keV

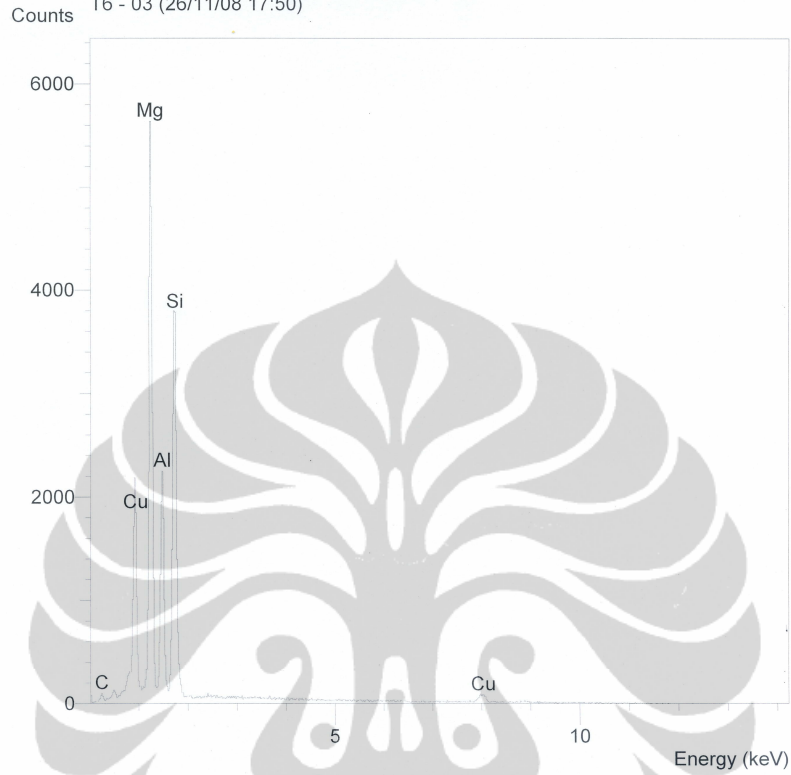
Standards :

C K Carbon Low 13/09/06
Al K CeAl2 03/03/07
Si K Low Carbon Steel 13/09/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	1.22	2.80
Al K	ED	14.46	14.73
Si K	ED	84.31	82.48
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T6 - 03 (26/11/08 17:50)



SEMQuant results. Listed at 17:51:15 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T6 - 03

System resolution = 60 eV

Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

1 peak possibly omitted: -0.02 keV

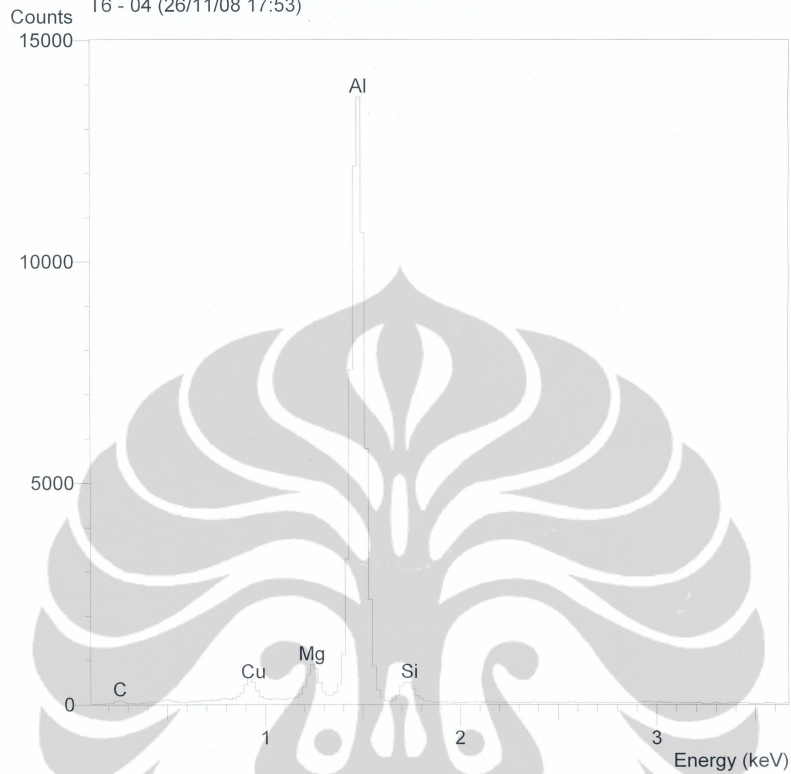
Standards :

C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.36	0.99
Mg K	ED	28.41	39.06
Al K	ED	16.06	19.89
Si K	ED	16.61	19.77
Cu K	ED	38.57	20.29
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T6 - 04 (26/11/08 17:53)



SEMQuant results. Listed at 17:55:07 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T6 - 04

System resolution = 60 eV

Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

1 peak possibly omitted: 2.98 keV

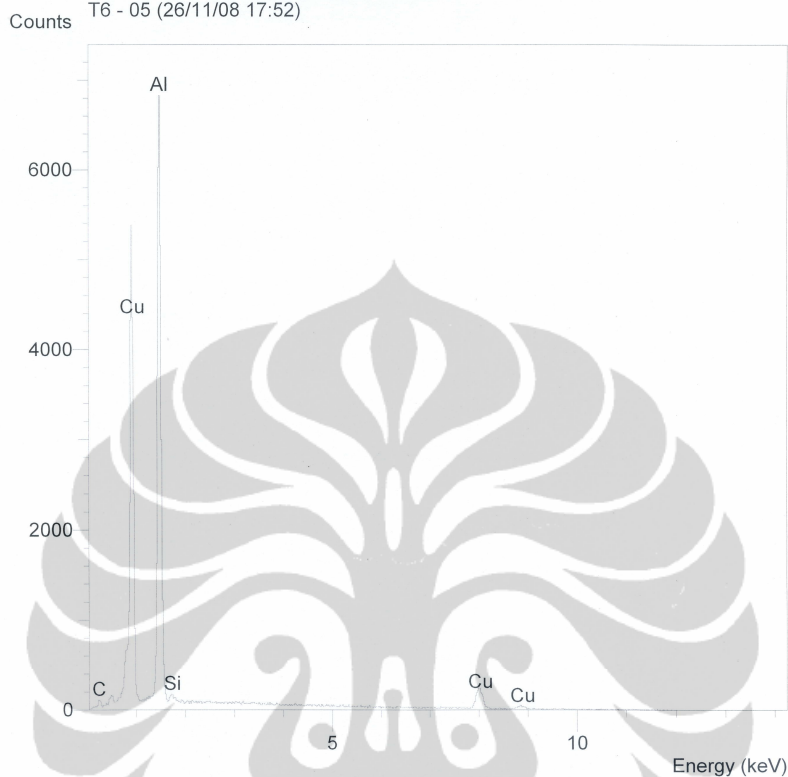
Standards :

C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.95	2.22
Mg K	ED	1.81	2.09
Al K	ED	84.32	87.66
Si K	ED	4.18	4.18
Cu K	ED	8.74	3.86
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T6 - 05 (26/11/08 17:52)



SEMQuant results. Listed at 17:53:23 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T6 - 05

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

1 peak possibly omitted: -0.02 keV

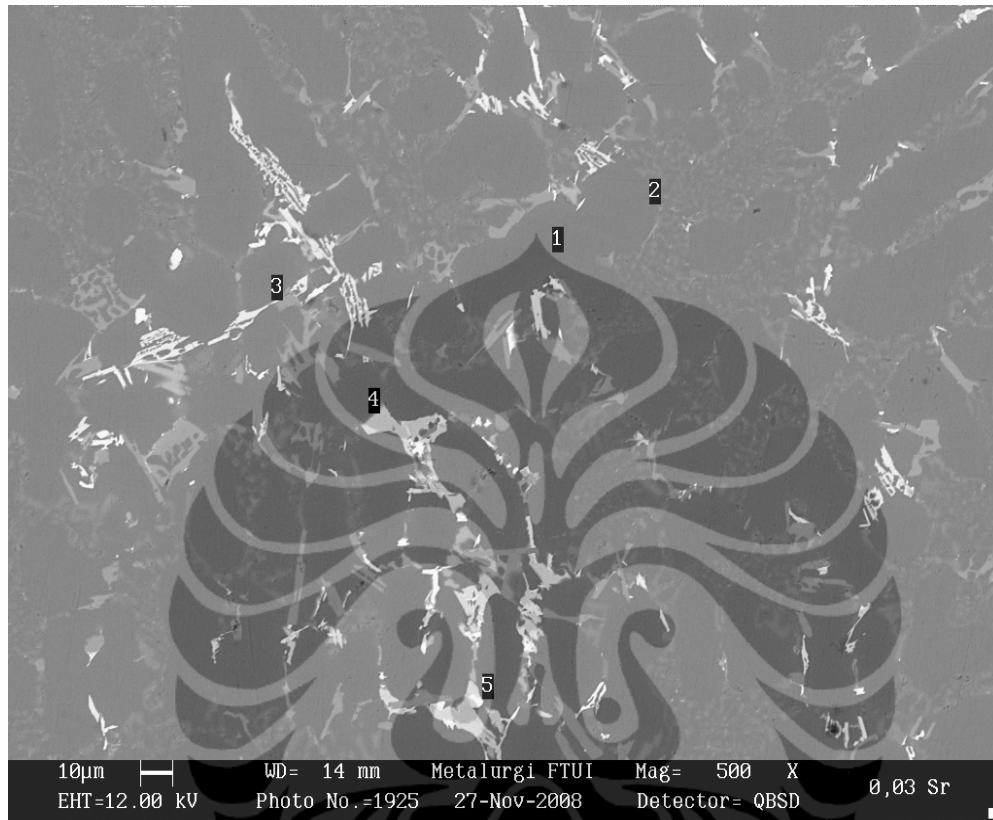
Standards :

C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.20	0.73
Al K	ED	30.86	50.83
Si K	ED	0.26	0.41
Cu K	ED	68.68	48.03
Total		100.00	100.00

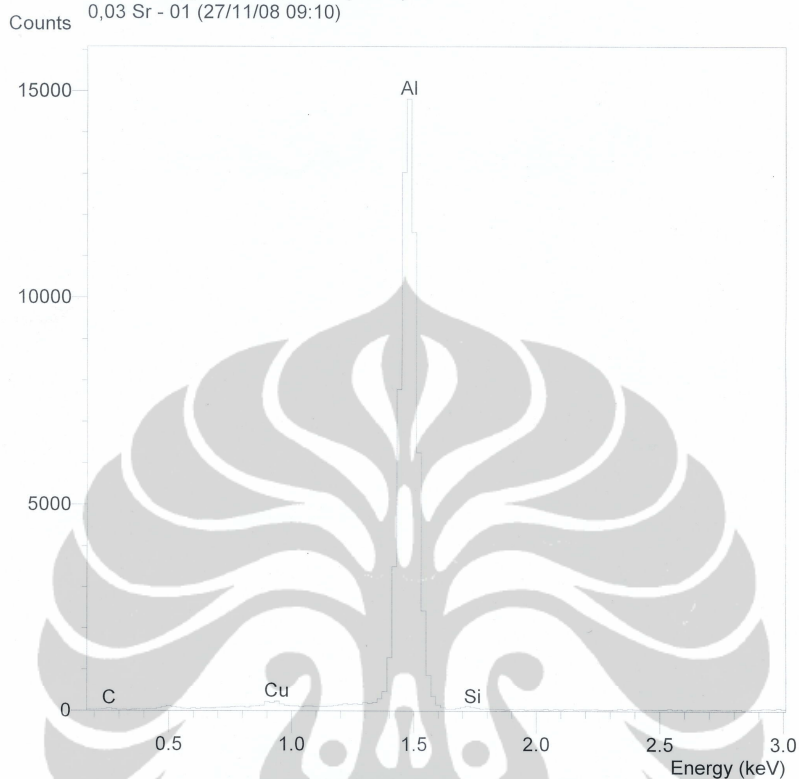
* = <2 Sigma

HASIL PENGAMATAN SEM & EDS
 PROSES PENAMBAHAN MODIFIER 0,031 % Sr



No	% Berat unsur					Warna	Indikasi Fasa terbentuk
	Al	Si	Cu	Mg	C		
1	90,82	1,71	6,24	--	1,22	Abu abu tua	Matriks Al-Si-Cu
2	9,25	89,16	--	--	1,59	Abu abu	Si-Primer
3	19,10	15,62	37,54	27,03	0,71	Abu abu muda	Cu ₂ AlMg ₂ Si
4	40,95	12,09	29,84	15,92	1,20	Putih	AlCuSiMg
5	36,91	0,63	62,19	--	0,26	Putih	Cu ₂ Al

Operator : Baim
Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job : Energy Dispersive X-Ray Analysis
0,03 Sr - 01 (27/11/08 09:10)



SEMQuant results. Listed at 09:11:30 on 27/11/08
Operator: Baim
Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job: Energy Dispersive X-Ray Analysis
Spectrum label: 0,03 Sr - 01

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
Analysed all elements and normalised results.

2 peaks possibly omitted: -0.02, 2.98 keV

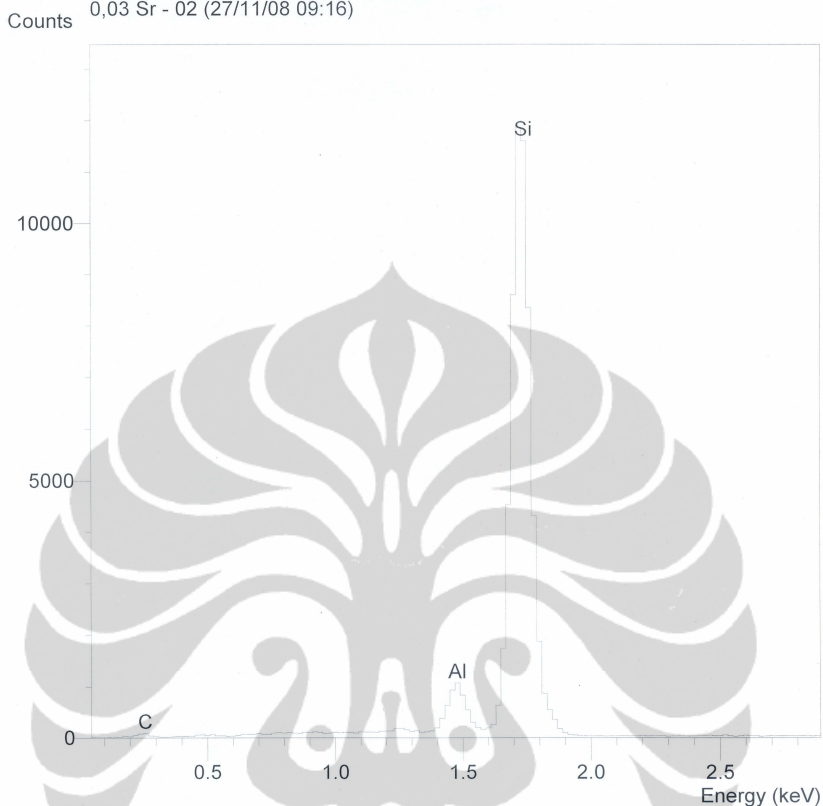
Standards :

C K Carbon Low 13/09/06
Al K CeAl2 03/03/07
Si K Low Carbon Steel 13/09/06
Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	1.22	2.80
Al K	ED	90.82	92.81
Si K	ED	1.71	1.68
Cu K	ED	6.24	2.71
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 0,03 Sr - 02 (27/11/08 09:16)



SEMQuant results. Listed at 09:17:08 on 27/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: 0,03 Sr - 02

System resolution = 59 eV

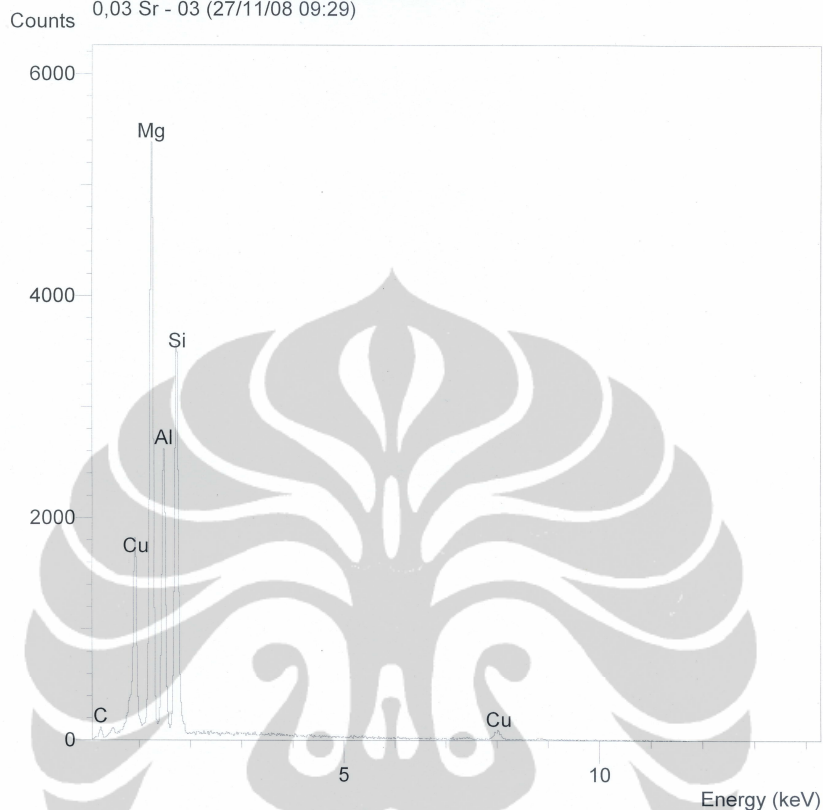
Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	1.59	3.62
Al K	ED	9.25	9.39
Si K	ED	89.16	86.99
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 0,03 Sr - 03 (27/11/08 09:29)



SEMQuant results. Listed at 09:30:36 on 27/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: 0,03 Sr - 03

System resolution = 60 eV

Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

1 peak possibly omitted: -0.02 keV

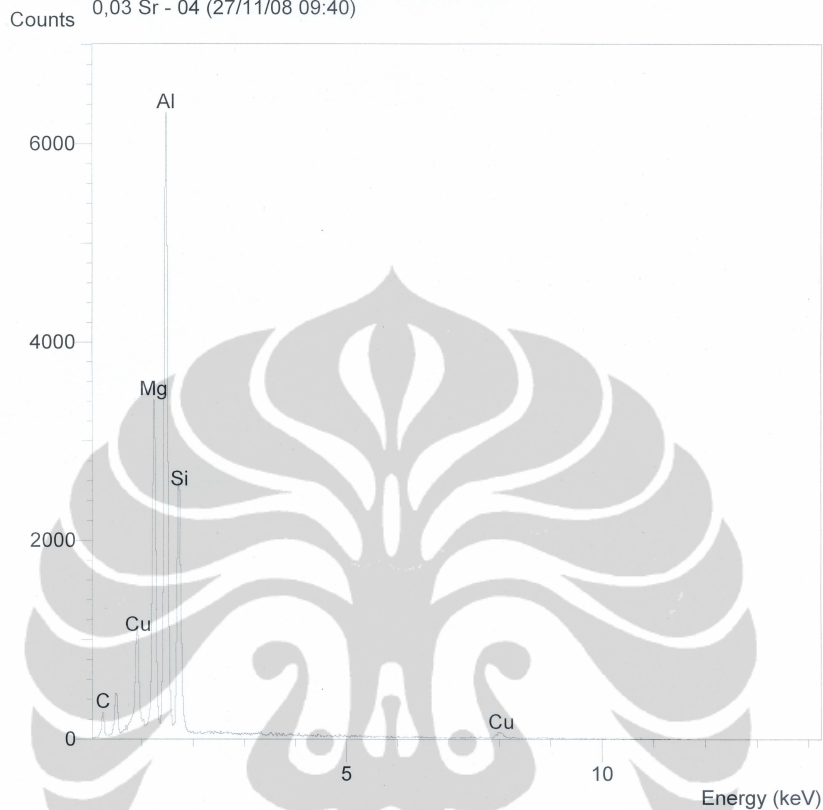
Standards :

C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.71	1.96
Mg K	ED	27.03	36.75
Al K	ED	19.10	23.40
Si K	ED	15.62	18.37
Cu K	ED	37.54	19.52
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 0,03 Sr - 04 (27/11/08 09:40)



SEMQuant results. Listed at 09:41:54 on 27/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: 0,03 Sr - 04

System resolution = 60 eV

Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

1 peak possibly omitted: 3.28 keV

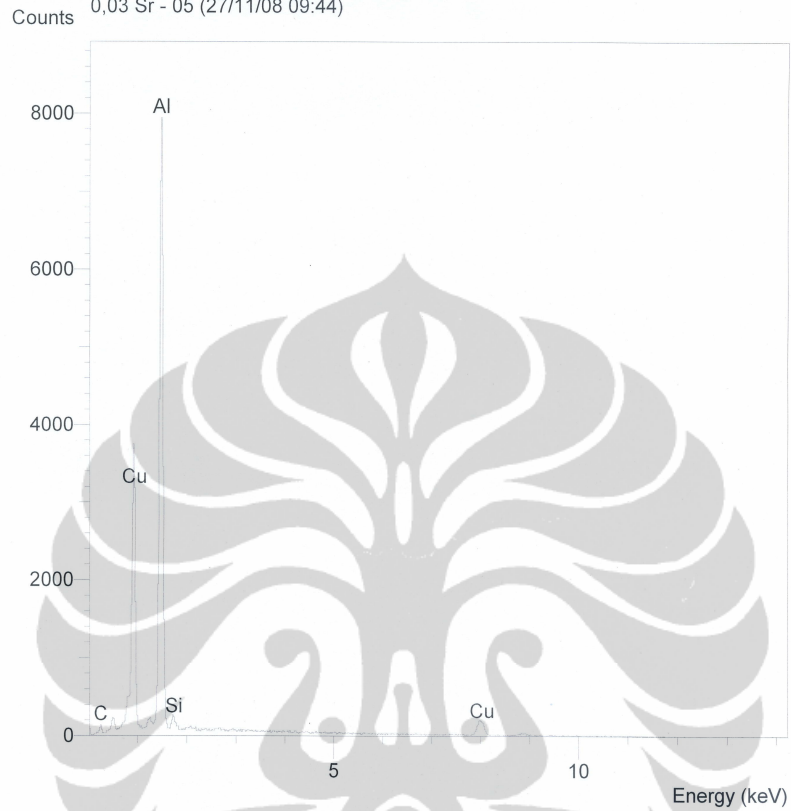
Standards :

C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	1.20	3.15
Mg K	ED	15.92	20.64
Al K	ED	40.95	47.84
Si K	ED	12.09	13.56
Cu K	ED	29.84	14.81
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 0,03 Sr - 05 (27/11/08 09:44)



SEMQuant results. Listed at 09:45:37 on 27/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: 0,03 Sr - 05

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

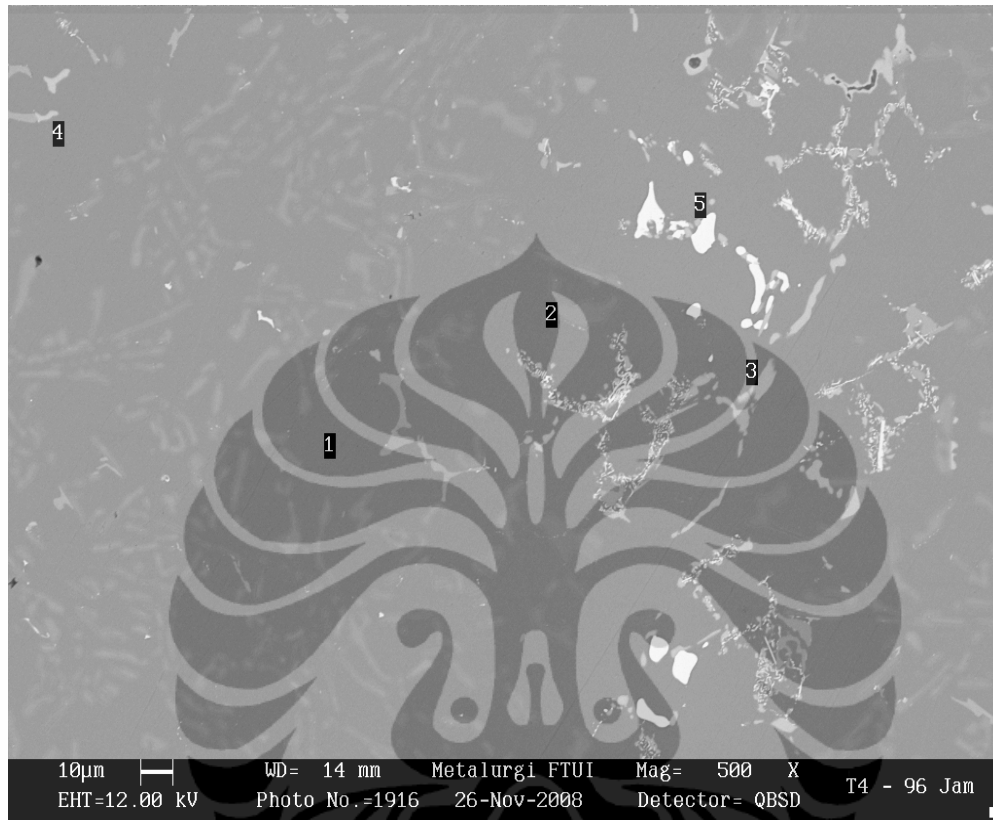
1 peak possibly omitted: -0.02 keV

Standards :
 C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.26	0.92
Al K	ED	36.91	57.21
Si K	ED	0.63	0.94
Cu K	ED	62.19	40.93
Total		100.00	100.00

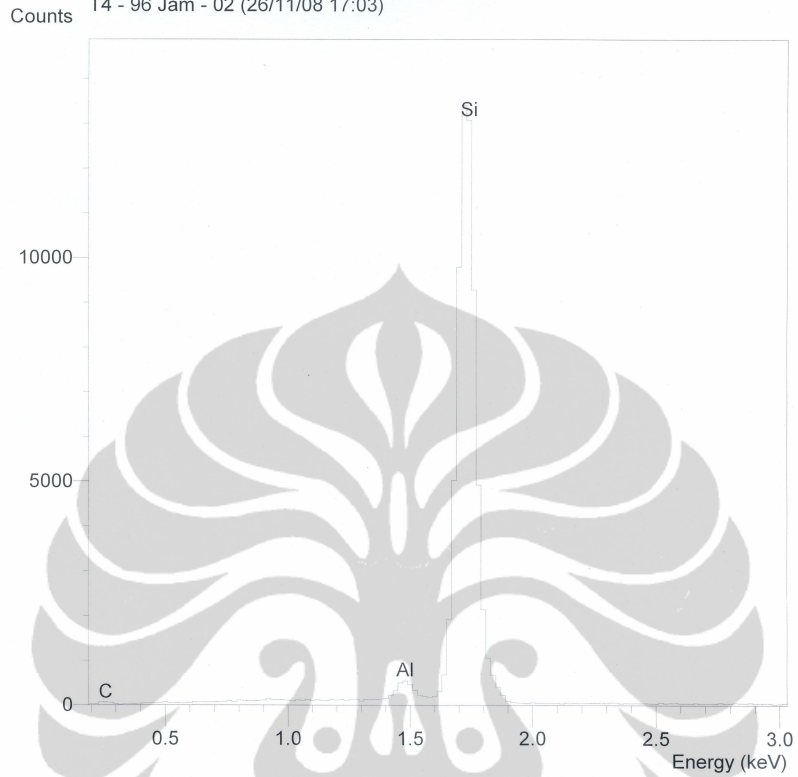
* = <2 Sigma

HASIL PENGAMATAN SEM & EDS
 PROSES PERLAKUAN PANAS T4 - 96 JAM



No	% Berat unsur					Warna	Indikasi Fasa terbentuk
	Al	Si	Cu	Mg	C		
1	91,85	1,81	5,44	--	0,90	Abu abu tua	Matriks Al-Si-Cu
2	3,68	95,06	--	--	1,26	Abu abu	Si-Primer
3	16,55	16,67	38,55	27,80	0,43	Abu abu muda	Cu ₂ AlMg ₂ Si
4	64,27	8,34	17,56	9,03	0,80	Abu abu muda	AlCuSiMg
5	32,12	0,31	67,36	--	0,20	putih	Cu ₂ Al

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 96 Jam - 02 (26/11/08 17:03)



SEMQuant results. Listed at 17:04:50 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 96 Jam - 02

System resolution = 59 eV

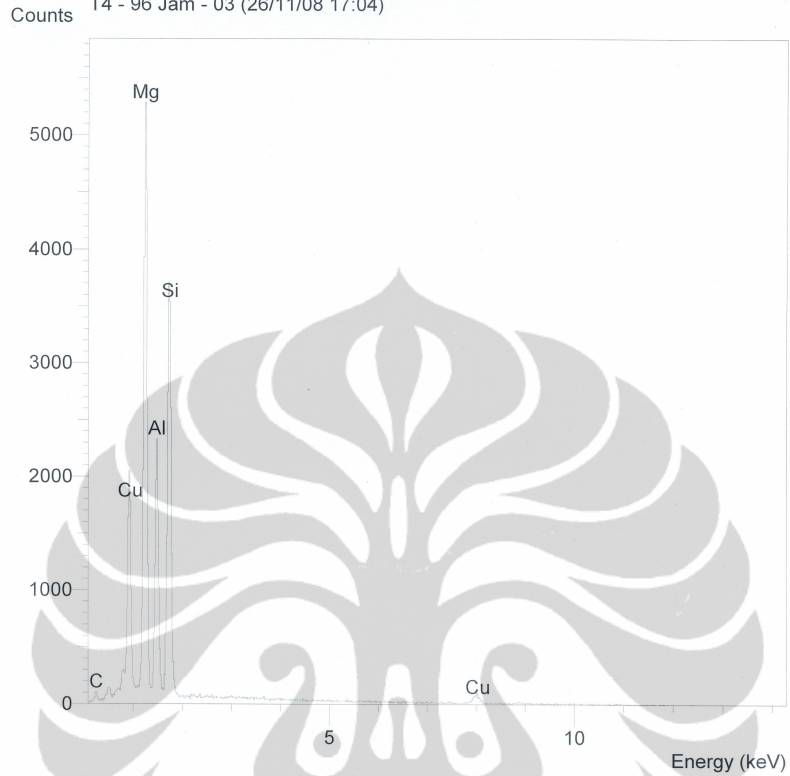
Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	1.26	2.89
Al K	ED	3.68	3.76
Si K	ED	95.06	93.35
Total		100.00	100.00

* - <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 96 Jam - 03 (26/11/08 17:04)



SEMQuant results. Listed at 17:06:05 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 96 Jam - 03

System resolution = 60 eV

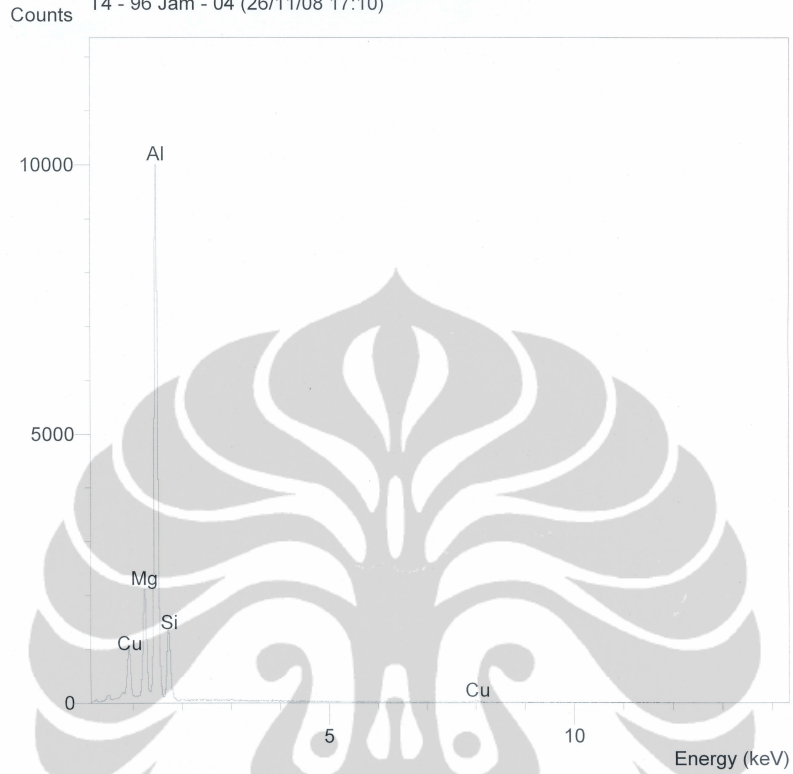
Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.43	1.20
Mg K	ED	27.80	38.20
Al K	ED	16.55	20.49
Si K	ED	16.67	19.83
Cu K	ED	38.55	20.27
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 96 Jam - 04 (26/11/08 17:10)



SEMQuant results. Listed at 17:11:04 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 96 Jam - 04

System resolution = 60 eV

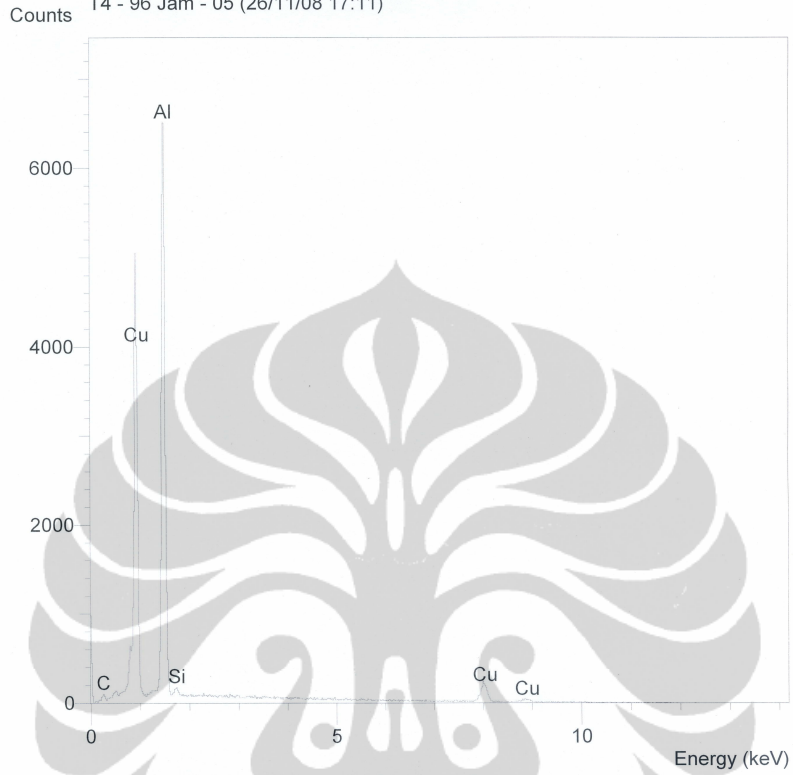
Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.80	1.96
Mg K	ED	9.03	10.95
Al K	ED	64.27	70.20
Si K	ED	8.34	8.75
Cu K	ED	17.56	8.14
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 96 Jam - 05 (26/11/08 17:11)



SEMQuant results. Listed at 17:12:48 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 96 Jam - 05

System resolution = 60 eV

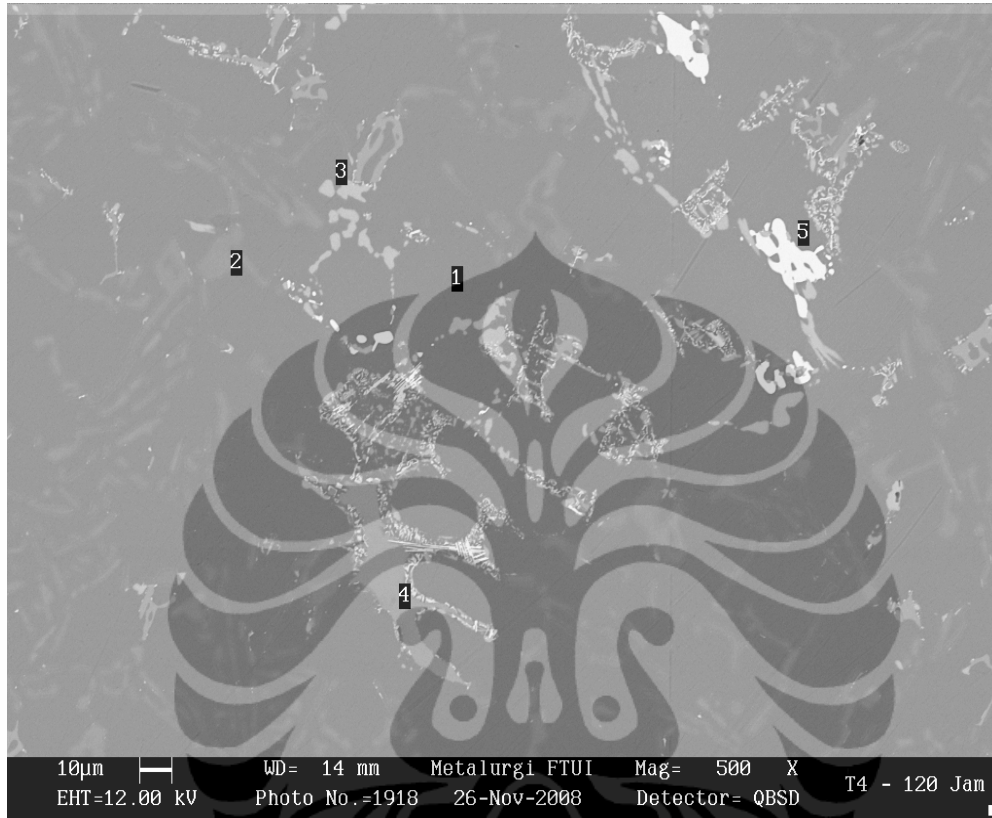
Quantitative method: ZAF (.3 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.20	0.73
Al K	ED	32.12	52.25
Si K	ED	0.31	0.49
Cu K	ED	67.36	46.53
Total		100.00	100.00

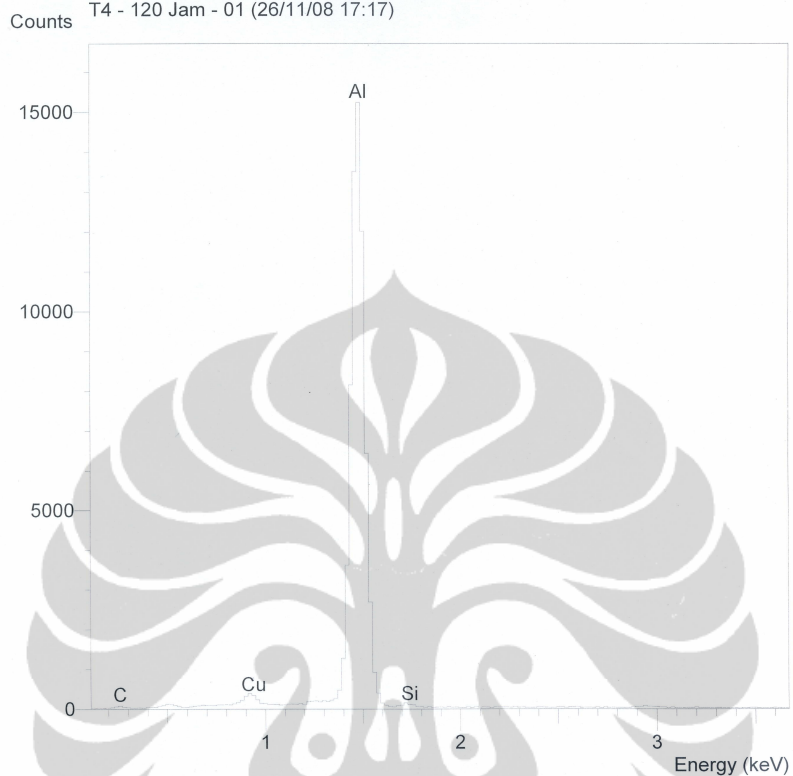
* = <2 Sigma

HASIL PENGAMATAN SEM & EDS
 PROSES PERLAKUAN PANAS T4 - 120 JAM



No	% Berat unsur					Warna	Indikasi Fasa Terbentuk
	Al	Si	Cu	Mg	C		
1	88,43	1,46	9,21	--	0,90	Abu abu tua	Matriks Al-Si-Cu
2	24,72	74,31	--	--	0,97	Abu abu	Si-Primer
3	16,43	16,26	39,26	27,42	0,63	Abu abu muda	Cu ₂ AlMg ₂ Si
4	84,62	3,44	10,68	0,49	0,77	Abu abu muda	AlCuSiMg
5	31,74	0,33	67,69	--	0,24	putih	Cu ₂ Al

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 120 Jam - 01 (26/11/08 17:17)



SEMQuant results. Listed at 17:18:50 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 120 Jam - 01

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

2 peaks possibly omitted: -0.02, 2.96 keV

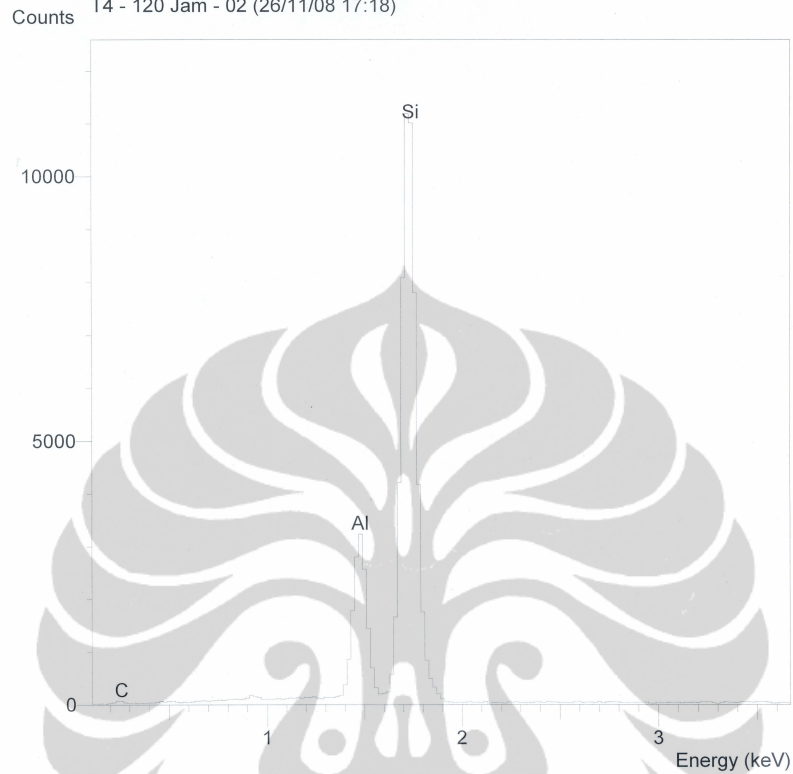
Standards :

C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.90	2.10
Al K	ED	88.43	92.35
Si K	ED	1.46	1.46
Cu K	ED	9.21	4.08
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 120 Jam - 02 (26/11/08 17:18)



SEMQuant results. Listed at 17:20:11 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 120 Jam - 02

System resolution = 59 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

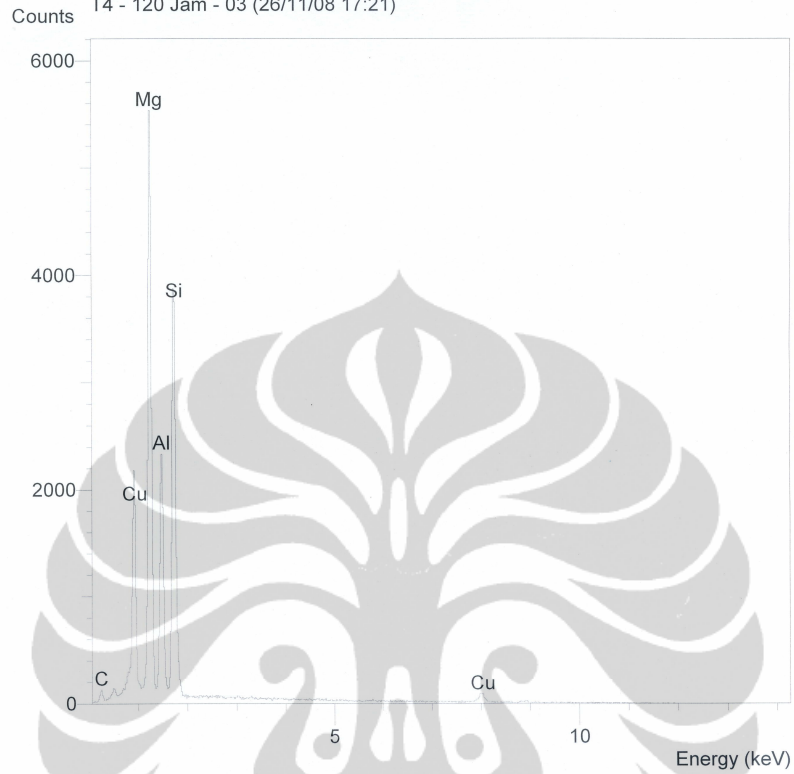
2 peaks possibly omitted: -0.02, 0.90 keV

Standards :
 C K Carbon Low 13/09/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.97	2.23
Al K	ED	24.72	25.15
Si K	ED	74.31	72.62
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 120 Jam - 03 (26/11/08 17:21)



SEMQuant results. Listed at 17:23:10 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 120 Jam - 03

System resolution = 60 eV

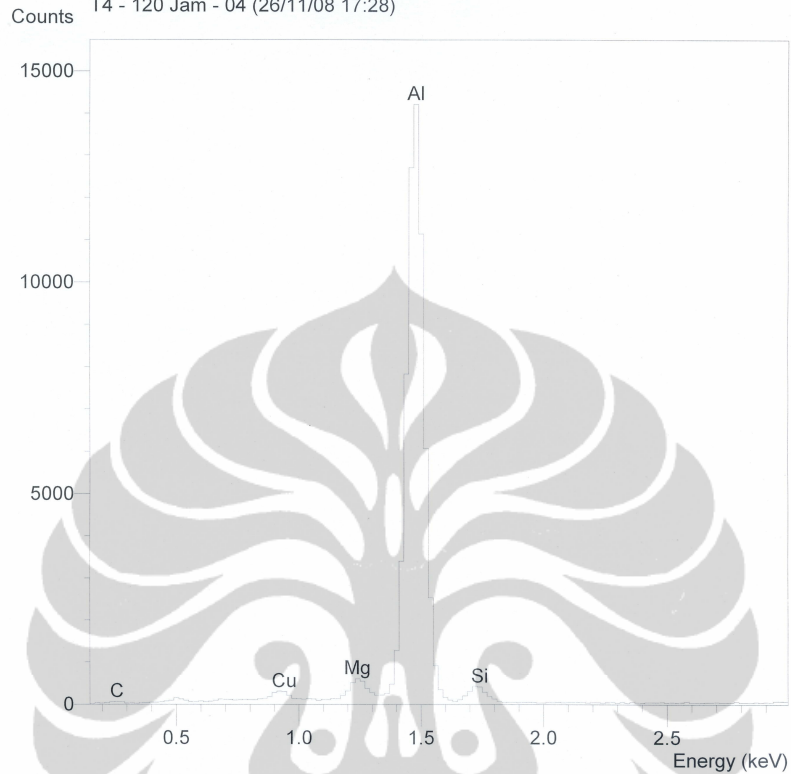
Quantitative method: ZAF (4 iterations).
 Analysed all elements and normalised results.

Standards :
 C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.63	1.76
Mg K	ED	27.42	37.77
Al K	ED	16.43	20.39
Si K	ED	16.26	19.39
Cu K	ED	39.26	20.69
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
 Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job : Energy Dispersive X-Ray Analysis
 T4 - 120 Jam - 04 (26/11/08 17:28)



SEMQuant results. Listed at 17:29:59 on 26/11/08
 Operator: Baim
 Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
 Job: Energy Dispersive X-Ray Analysis
 Spectrum label: T4 - 120 Jam - 04

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
 Analysed all elements and normalised results.

2 peaks possibly omitted: -0.02, 2.98 keV

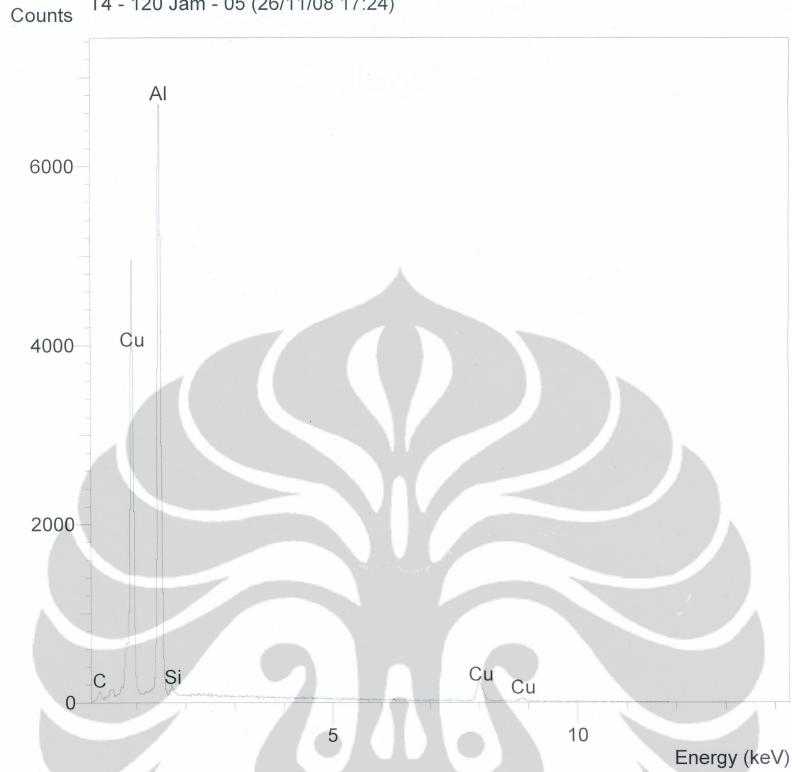
Standards :

C K Carbon Low 13/09/06
 Mg K MagOxide 22/03/06
 Al K CeAl2 03/03/07
 Si K Low Carbon Steel 13/09/06
 Cu K Copper 22/03/06

Elmt	Spect. Type	Element %	Atomic %
C K	ED	0.77	1.82
Mg K	ED	0.49	0.57
Al K	ED	84.62	89.33
Si K	ED	3.44	3.49
Cu K	ED	10.68	4.79
Total		100.00	100.00

* = <2 Sigma

Operator : Baim
Client : Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job : Energy Dispersive X-Ray Analysis
T4 - 120 Jam - 05 (26/11/08 17:24)



SEMQuant results. Listed at 17:25:58 on 26/11/08
Operator: Baim
Client: Dept. Teknik Metalurgi dan Material Universitas Indonesia
Job: Energy Dispersive X-Ray Analysis
Spectrum label: T4 - 120 Jam - 05

System resolution = 60 eV

Quantitative method: ZAF (3 iterations).
Analysed all elements and normalised results.

Standards :

C K Carbon Low 13/09/06
Al K CeAl2 03/03/07
Si K Low Carbon Steel 13/09/06
Cu K Copper 22/03/06

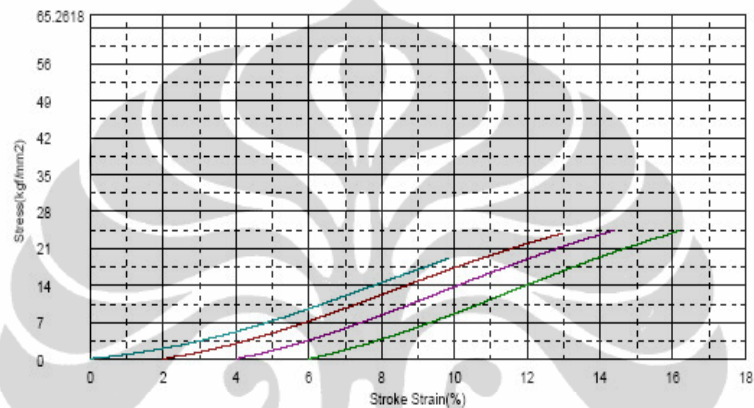
Elmt	Spect.	Element	Atomic
	Type	%	%
C K	ED	0.24	0.87
Al K	ED	31.74	51.75
Si K	ED	0.33	0.52
Cu K	ED	67.69	46.86
Total		100.00	100.00

* = <2 Sigma

LAMPIRAN 5

HASIL PERHITUNGAN KETANGGUHAN T6

PERHITUNGAN KETANGGUHAN
SAMPEL : T6



Nilai ketangguhan Aluminium AC8H T6 didapat dengan cara menghitung luas area dibawah grafik pengujian tarik.

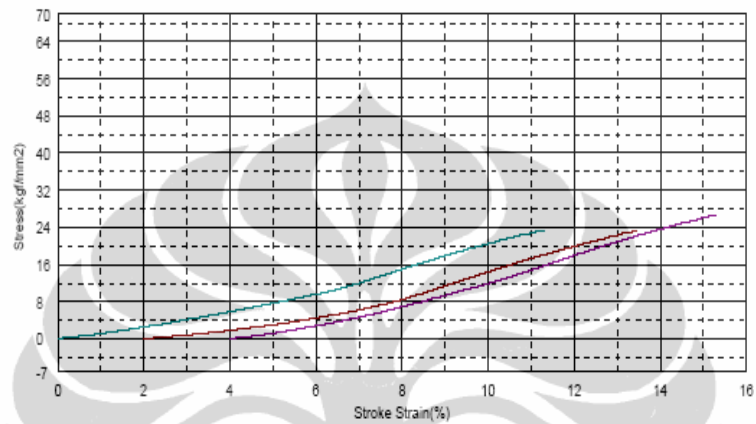
Dari hasil pengujian tarik untuk sampel T6 (lampiran 3), nilai Rata-rata Tensile strength : 22,98 kgf/mm² dan elongation = 13,30 %. Pada perhitungan luas area dibawah grafik kita ambil nilai : 22,98 sebagai tinggi dan nilai 13,30 sebagai panjang alas.

Sehingga secara besaran luas area dibawah grafik pengujian adalah :

$$(22,98 \times 13,30) / 2 = 152,81 \text{ mm}^2$$

HASIL PERHITUNGAN KETANGGUHAN MODIFIER 0,031% Sr

PERHITUNGAN KETANGGUHAN
SAMPEL : MODIFIER 0,031% Sr



Nilai ketangguhan Aluminium *modifier* 0,031% Sr didapat dengan cara menghitung luas area dibawah grafik pengujian tarik.

Dari hasil pengujian tarik untuk sampel *modifier* 0,031% Sr (lampiran 3), nilai Rata-rata Tensile strength : 24,52 kgf/mm² dan elongation = 13,28 %. Pada perhitungan luas area dibawah grafik kita ambil nilai : 24,52 sebagai tinggi dan nilai 13,28 sebagai panjang alas.

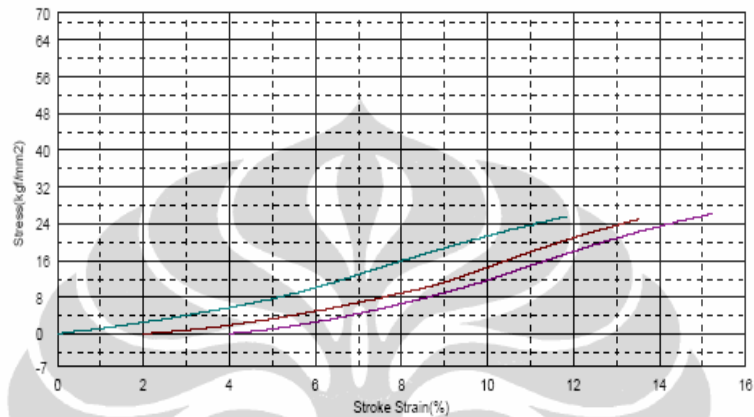
Sehingga secara besaran luas area dibawah grafik pengujian adalah :

$$(24,52 \times 13,28) / 2 = 162,81 \text{ mm}^2$$

HASIL PERHITUNGAN KETANGGUHAN AC8H T4-96 JAM

PERHITUNGAN KETANGGUHAN

SAMPEL : T4-96 jam



Nilai ketangguhan Aluminium AC8H T4-96 jam didapat dengan cara menghitung luas area dibawah grafik pengujian tarik.

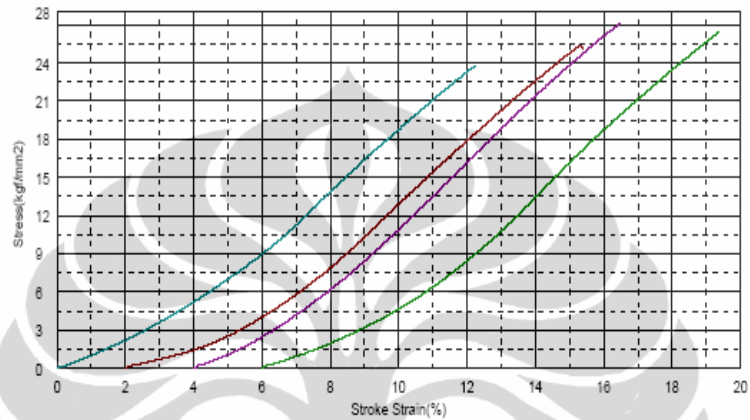
Dari hasil pengujian tarik untuk sampel T4-96 jam (lampiran 3), nilai Rata-rata Tensile strength : 25,58 kgf/mm² dan elongation = 13,52 %. Pada perhitungan luas area dibawah grafik kita ambil nilai : 25,58 sebagai tinggi dan nilai 13,52 sebagai panjang alas.

Sehingga secara besaran luas area dibawah grafik pengujian adalah :

$$(25,58 \times 13,52) / 2 = 172,92 \text{ mm}^2$$

HASIL PERHITUNGAN KETANGGUHAN AC8H T4-120 JAM

PERHITUNGAN KETANGGUHAN
SAMPEL : T4-120 jam



Nilai ketangguhan Aluminium AC8H T4-120 jam didapat dengan cara menghitung luas area dibawah grafik pengujian tarik.

Dari hasil pengujian tarik untuk sampel T4-120 jam (lampiran 3), nilai Rata-rata Tensile strength : 25,71 kgf/mm² dan elongation = 15,80 %. Pada perhitungan luas area dibawah grafik kita ambil nilai : 25,71 sebagai tinggi dan nilai 15,80 sebagai panjang alas.

Sehingga secara besaran luas area dibawah grafik pengujian adalah :

$$(25,71 \times 15,80) / 2 = 203,11 \text{ mm}^2$$