FLAKE SIZE AS PER ASTM A247 AND ISO 945

Sample Description

Images of gray cast iron showing different sizes of flakes.

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analysis system can evaluate the flake size class and distribution according to ASTM A247 and ISO 945.

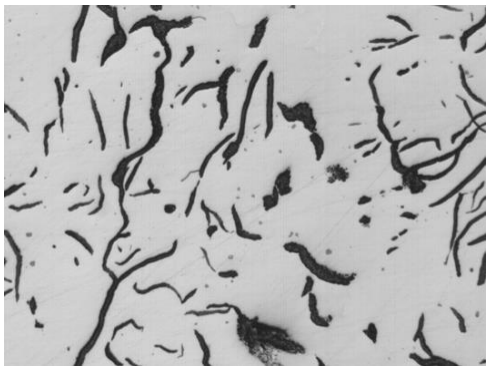


Figure 1: *Typical field for graphite size class evaluation.*

Figure 2: *Typical field for distribution type evaluation.*

Procedure

100X and 25X were used to evaluate the graphite size class and distribution, respectively. All flakes were binarized in blue bitplane. Nodules were separated and assigned in another bitplane. Some artifacts were also removed during the analysis. It is possible that flakes are connected one to another. In such case, the connected flakes were considered as one big flake. Size class and distribution measurements were done on complete flakes.

Equipment

Image Analysis System:	Clemex Vision PE
Magnification:	25X and 100X
Illumination:	Reflected Light

Results

Measurements were performed on each distinct feature from the field of view. Automated statistics and graphs were generated and would be cumulated if analyzing several images. Final results can be printed directly from Clemex Vision. Raw data are linked to their respective objects for validation purpose. Raw data can also be exported in Excel format allowing to build an automated macro to find the size class. The summary of results is presented below.

ASTM A247

Range in mic.	Class	Count	% (area)
> 1280	>	0	0
640 - 1280	1	1	0.04
320 - 640	2	162	3.87
160 - 320	3	2603	27.04
80 - 160	4	8769	39.21
40 - 80	5	12087	21.24
20 - 40	6	9675	6.25
10 - 20	7	7310	1.65
0 - 10	8	10147	0.71

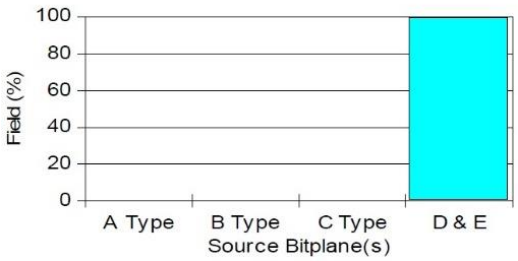
	Mean	Maximum
Length (µm):	53.65	698.76
Equivalent Size Class:	5	1
Count:	50754	

Types	Field %
A	0.00
B	0.00
C	0.00
D & E	100.00

Graphite Size Class

Comment:
Mainly E type.

Graphite Distribution (manual)



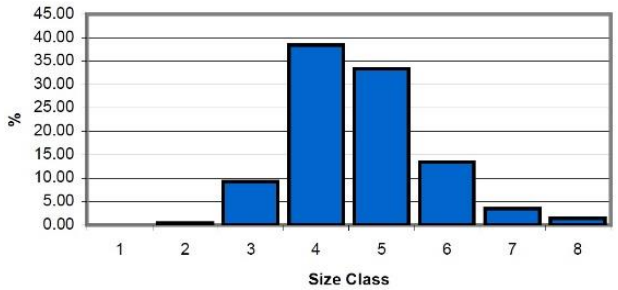
ISO 945

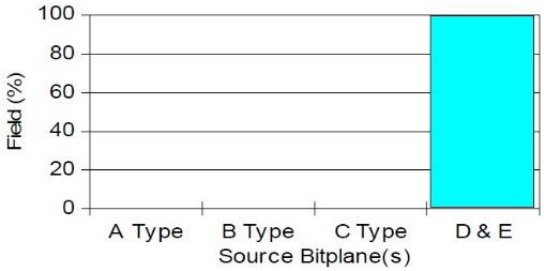
Range in mic.	Class	Count	% (area)
> 1000	1	0	0.00
500 - 1000	2	9	0.43
250 - 500	3	529	9.29
120 - 250	4	5066	38.36
60 - 120	5	10930	33.41
30 - 60	6	11454	13.50
15 - 30	7	8347	3.55
0 - 15	8	14419	1.46

	Mean	Maximum
Length (µm):	53.65	698.76
Equivalent Size Class:	6	2
Count:	50754	

Types	Field %
A	0.00
B	0.00
C	0.00
D & E	100.00

Graphite Size Class



Comment:
Mainly E type.

Graphite Distribution (manual)