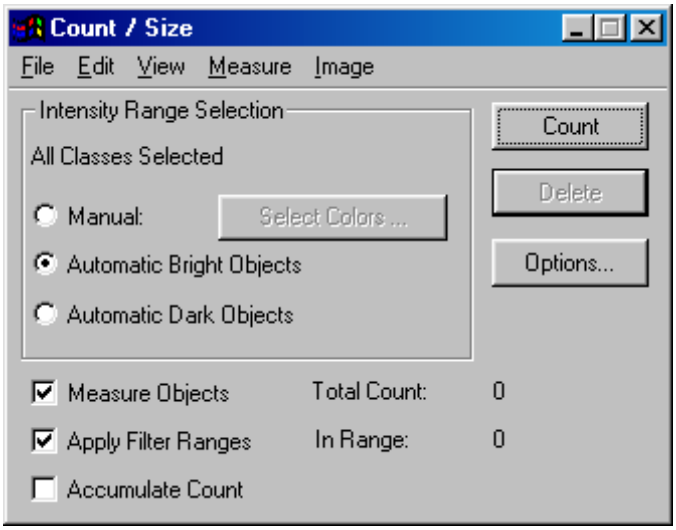
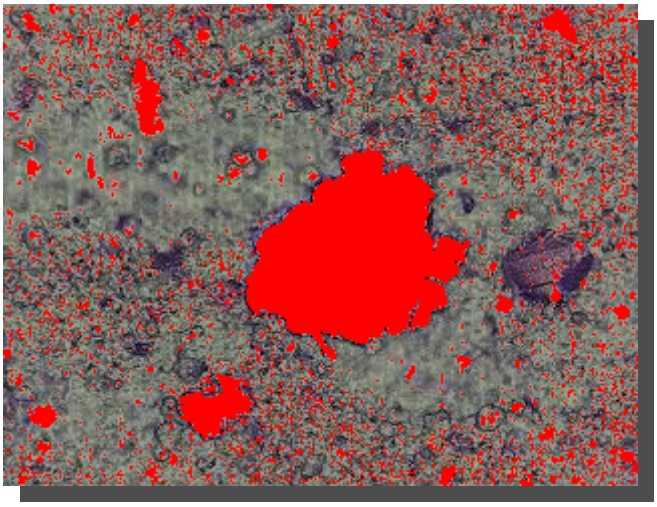
Image-Pro PLUS
The Proven Solution™

Microanalysis: Classifying and analyzing wear metals found in lubrication fluid

After use, metal lubrication fluids contain bits of metal called "wear metal". The efficiency of a lubricant and its effects on machinery can be measured by the amount of wear metal (bright particles in the image) found in the lubricant after a certain period of usage. The less wear metal found in the lubrication, the better the lubrication is performing. The results of microanalysis are used to make recommendations taking into account the age of the equipment, the type of lubrication used, etc.

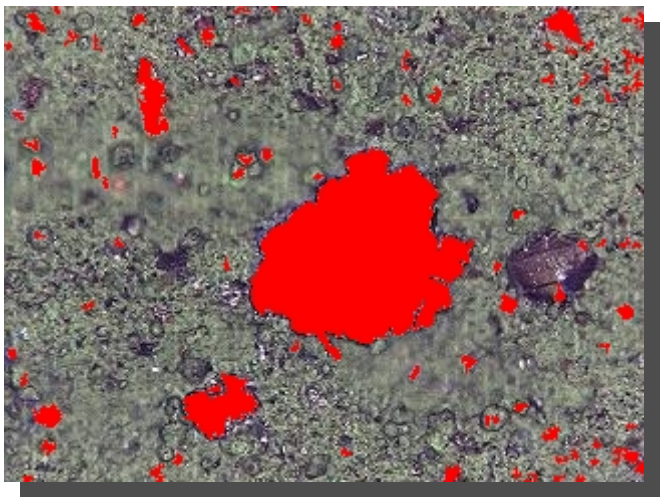
The metal particles in this sample were measured using the ability of Image-Pro to perform an Automatic Bright Object Intensity Range Selection. For many images, this feature serves to promote repeatability by avoiding inter- and intra-user varibility.

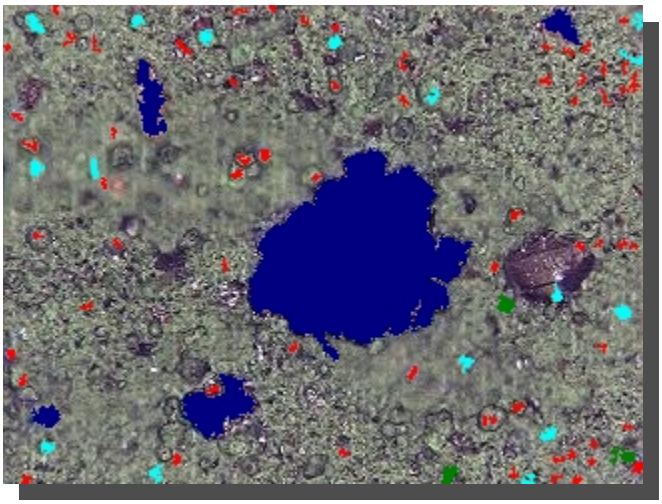




The red overlay indicates the range of intensity values in the sample that Image-Pro will use for measurement. There are also many unwanted small features, possibly debris or noise, that have also been selected. It is easy to set an exclusion range based on the areas of the features.

This is the image after editing the area range to be considered and eliminating the smaller features. This is easily accomplished by manually specifying the desired range or using slider bars on a histogram for any chosen measurement (in this case, Area). Only the objects convered by the red overlay will be measured.





Objects can then be automatically classified into groups of objects with similar measurement characteristics or, as in this case, classified according to measurement intervals defined by the user. Here the user has created four classes of objects based upon specific area criteria. For example, there are five objects in the largest area class, shown in blue on the image and in the data table.

Classification

File View

Class	Objects	% Objects	% Area	Mean Area	Std.dev. Area	Min Area	Max Area	(Range of...
1	29	23.577236	2.9343629	10.482759	.49970368	10	11	0
2	85	69.105690	17.017374	20.741177	9.0944748	12	49	11
3	4	3.2520325	2.2007723	57	1.8708287	55	60	50
4	5	4.0650406	77.847488	1613	2607.6895	116	6817	100

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