Screening Filters

Screen angle and ruling have a direct effect on moiré. But, the screen angle and ruling combinations that produce good results for one screening method, may not work well for another. This has led to a lot of confusion among users who really don't care what angle and ruling are used, just as long as the printed results are good. To alleviate this problem, Linotype-Hell developed screening filters. This concept, introduced with the RIP 30 in May of 1990, provides a simple method to assure that the proper screen angle and ruling recommendations are used. Since then, each new raster image processor (RIP) introduced by Linotype-Hell has included screening filters.

Note: Two documents from the 1992 Linotype-Hell technical information notebook provide lists of angle and ruling information which are now somewhat out of date. This document replaces those earlier documents. For more detailed information on the screening method used by a particular RIP, please refer to the RIP manual.

Screening filters

When a screening filter is activated, it selects the screen angle and ruling combinations (i.e., the screen set) that are best suited for a particular screening method. This means that if an application requests a screen ruling of 150 lpi (lines per inch), but the best results for a given RIP, imagesetter, and resolution setting are different, then the filter overrides the applications request and gives the closest available recommendation. (The actual values are usually within a few lines per inch of the requested value.)

Linotype-Hell RIPs often have two or more different screening methods. One may be adequate for black and white work, while the other may be more appropriate for color. Once a screening method is turned on, the appropriate filter setting is automatically assigned by the Linotype-Hell Utility. Although it is possible to turn the screening filter off while running a particular screening method, this is a risky proposition, and any work done in such a fashion should be considered experimental.

Not all Linotype-Hell RIPs provide screening filters. (See box below.)

RIP	Screening method(s)[1]	Screening filter
RIP 1	RT Screening®	No filter
RIP 2	RT Screening	No filter
RIP 3	RT Screening	No filter
RIP 4	RT Screening	No filter
BridgIt®	HPS Screening	No filter
RIP 20	RT Screening & HQS Screening®	Filter
RIP 30	RT Screening & HQS Screening	Filter
RIP 40	RT Screening & HQS Screening[2]	Filter
RIP 50	RT Screening & HQS Screening[2]	Filter
RIP 60	RT Screening & IS Technology™[2]	Filter
Vulcan	RT Screening & HQS Screening[2]	Filter

[1] Regarding the acronyms used to describe screening methods, RT stands for Rational Tangent, HPS stands for Harlequin Precision Screening, HQS stands for High Quality Screening, and IS stands for Irrational Screening.

[2] Diamond Screening® is currently available as an option for the RIP 50 and RIP 60. Later it will be available for the RIP 40 XMO and Vulcan. Diamond Screening doesn't require screening filters, but does have requirements regarding addressability. (See *Technology Update: Diamond Screening* for more information.)

Screen sets

The term ‘screen set’ describes the angle and ruling values used for a set of color separations. Screening filters select the proper screen set based on the ballpark values supplied to it by the user’s software application. Though screening filters solve many users problems, it is always handy to know the recommendations that are available for each RIP. While this information is printed in RIP user manuals, the values are subject to change. New values may be added, other values removed or improved.

The screen sets shown on the following pages are organized by RIP and screening methods. For RT Screening, the angles are generally yellow at 0°, magenta at 108.4°, cyan at 161.6°, and black at 45°. For HQS the angles are generally yellow at 0°, magenta at 75°, cyan at 15°, and black at 45°. For IS 10, the angles are generally yellow at 0°, magenta at 45°, cyan at 165°, and black at 105°. For IS 20, the angles are generally yellow at 60°, magenta at 105°, cyan at 165°, and black at 45°. For IS 30, the angles are generally yellow at 7.5°, magenta at 52.5°, cyan at 172.5°, and black at 112.5°. For any of these methods, the color for a given angle may be swapped using the Linotype-Hell Utility (version 6.0 and up).

Regarding the charts

Addressability values are listed in dots per inch (dpi). (Addressability is the more technically accurate term for imagesetter resolution.) Some addressability values on the charts have been rounded down or up. In cases where you see 846 listed in one source and 847 listed in another, rest assured that someone has rounded 846.66666 either up or down. The data in these lists has been sorted by output device first, then by RIP and screening method.

Black & white

Filter settings for black & white also exist, but they are not listed here. The values are quite extensive. The best source for information on these values is to be found in the appropriate RIP manual.

Hi Dot

Higher screen rulings are possible than those shown here using the Hi Dot option. However, this option is only available through Chromacom®.

Writing screen sets into a file

Generally, it is not a good idea to include exact screen angle and ruling values in a file (as is possible with Adobe Photoshop). The reason for this is flexibility. By writing the exact values into the file, you render the file specific to only the screen set for that specific screen ruling, screening method, RIP, imagesetter, and addressability setting. The only time that it is advisable to write the screen set into the file is when the RIP in use does not use a filter. Even then, appropriate use of a printer support file provides a better solution. (See the Linotype-Hell technical information article entitled Printer Support Files for more information.)

Conclusion

In reading the information from the following pages, take special care to note the imagesetter, RIP, screening method, and addressability setting. This will ensure that you have the information you need.

Acknowledgements

Many thanks to the following people from Linotype-Hell for their help in producing this document: Gus Barbuto, Jack Bruger, Jerry Horn, John Knickerbocker, Ken Larsen, and Rich Leuenroth.

Please direct any questions or comments to: Jim Hamilton, Marketing Department, Linotype-Hell Company, 425 Oser Avenue, Hauppauge, NY 11788
(For subscription information on the Linotype-Hell technical information series, please call 1-800-842-9721.)

December 1993, Part Number 7025

Linotronic 230 with RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
847 dpi	89
1270 dpi	100
1693 dpi	107 133

Note: These RT Screening screen sets also apply to the Linotronic 200SQ.

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
847 dpi	85
1270 dpi	75 90 100
1693 dpi	80 100 120 133

Linotronic 260 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
847 dpi	89
1270 dpi	80 100
1693 dpi	89 107
2032 dpi	107 129
2540 dpi	100 115

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
847 dpi	85
1270 dpi	90 100 110
1693 dpi	100 120 133
2032 dpi	100 120 133 143
2540 dpi	100 110 120 138 150

Linotronic 300 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*	
1270 dpi	100 109	
2540 dpi	100 134 159[3]	[3]Only for jobs using skeleton black

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
1270 dpi	65 75 90 100
2540 dpi	100 110 120 133 138 150 175

Linotronic 330 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1270 dpi			100		109								
1693 dpi	89					134							
2032 dpi				108									
2540 dpi			100			134	159[4]						
3386 dpi								179					

[4]Only for jobs using skeleton black

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
847 dpi			75										
1270 dpi	65		75		90	100							
1693 dpi			75	85		100[5]		120					
2032 dpi						100	110		133				
2540 dpi						100	110	120	133	138	150	175	
3386 dpi						100		120	133			175	200

[5]Available on Linotronic 330s supplied after April of 1992

Linotronic 500 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1693 dpi	89												

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
847 dpi			85										
1693 dpi	80			100			133						

Linotronic 530 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1270 dpi	80												
1693 dpi			89										
2032 dpi				107									
2540 dpi			100				134	159[6]					

[6]Only for jobs using skeleton black

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
847 dpi						85							
1016 dpi			70			85							
1270 dpi	65			75[7]			90	100					
1693 dpi					80			100			133		
2032 dpi						85			110		133		
2540 dpi								100	110	120	133	138	150	175

[7]Available on Linotronic 530s supplied after April of 1992

Linotronic 560 with RIP 20, RIP 30, RIP 40, RIP 50, or Vulcan

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
1270 dpi	80
1693 dpi	89
2032 dpi	107
2540 dpi	100 134 159[8]
3386 dpi	179

[8]Only for jobs using skeleton black

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
847 dpi	85
1016 dpi	70 85
1270 dpi	65 75[9] 90 100
1693 dpi	80 100 133
2032 dpi	85 110 133
2540 dpi	100 110 120 133 138 150 175
3386 dpi	100 120 133 175 200

[9]Available on Linotronic 530s supplied after April of 1992

Linotronic 630 with RIP 40 or RIP 50

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
1219 dpi	60
2438 dpi	60 121
3251 dpi	162

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
1219 dpi	70 75
2438 dpi	100 120 133 150 175
3251 dpi	133 150 165 175 200

Linotronic 630 with RIP 60

IS Technology

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*
1219 dpi	50 60 75 85 100
2438 dpi	50 60 75 85 100 120 133 150
3251 dpi	50 60 75 85 100 120 133 150 165 180 200 230 280

Linotronic 830 or Linotronic 930 with RIP 40 or RIP 50

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*									
1219 dpi	65	70	75							
2438 dpi				100	120	133	150		175	
3251 dpi						133	150	165	175	200

Recorder 3020 PS or Recorder 3030 PS and RIP 60 (vers. 3.0)[10]

IS Technology

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1219 dpi	50	60	75										
2438 dpi	50	60	75		100	120		150					
3251 dpi	50	60		85	100		133		165		200		
3657 dpi		60	75	85		120		150		175		230	
4876 dpi			75	85	100	120		150			200		250 300

[10]A 4.0 version of the filter will add numerous resolution settings as well as new screen sets.

Herkules or Herkules M and RIP 50

HQS Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1270 dpi	65	75		90	100								
1693 dpi		75	85		100		120						
2540 dpi					100	110	120	133	138	150	175		
3387 dpi					100		120	133			175	200	
5080 dpi												200	225 250 And[11]

[11]Goes up to 275, 300, 350.

Herkules or Herkules M and RIP 60

RT Screening

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1270 dpi	50	60	75	85	100								
1693 dpi	50	60	75	85	100	120	133						
2540 dpi	50	60	75	85	100	120	133	150		175	200		
3387 dpi	50	60	75	85	100	120	133	150	165	175	200	230	275
5080 dpi				85	100	120	133	150	165	175	200	230	250 275 And[12]

[12]Goes up to 300, 350, and 400.

IS Technology

ADDRESSABILITY	*SCREEN RULING IN LINES PER INCH*												
1270 dpi	50	60	75	85	100								
1693 dpi	50	60	75	85	100	120	133						
2540 dpi	50	60	75	85	100	120	133	150		175	200		
3387 dpi	50	60	75	85	100	120	133	150	165	175	200	230	250[13] 275
5080 dpi				85	100	120	133	150	165	175	200	230	250 275 And[14]

[13]IS30 Only [14]Goes up to 300, 350 and 400

Note: The screening values in the table reflect the values displayed via the Terminal Emulator program and are therefore approximate. The values shown in this list are approximations. For exact values, please refer to the RIP 60 manual.