Copy/paste data col - or - Drag/drop text file - onto - textarea

Number of suspended data(NOT included): 0

Use lower tail data? Check box for yes. ☐

Graph | Clear All | Reload Page

n_C [ ] $+n_S$ [ ] $=n$ [ ]

Weibull	LS	ML
Scale η		
Shape α		
MSE $\Sigma d^2/n_C$		
mean		
CV		
5%tile R_{05}		
$\Omega(R_{05\|75\%})$		

2-parameter Weibull CDF(x) = $1 - e^{-(x/\eta)^{\alpha}}$

LS uses the method of **L**east **S**quares to estimate the 2 parameters of a Weibull distribution of a complete data set or low tail fit. Resistance is regressed on median rank.
See ASTM D5457 Section X2, (X2.5), (X2.6)

ML uses the method of **M**aximum **L**ikelihood to estimate the 2 parameters of a Weibull distribution of a complete data set or low tail fit.
See ASTM D5457 Section X2, (X2.2), (X2.3)

Parameter estimation for lower tail data require minimum failed observations. For sample sizes of **n** = 600 or less, 60 = $\mathbf{n_C}$ with the suspended value $r_S = r[60]$. For sample sizes of 600 < **n**, (0.1 • **n**) = $\mathbf{n_C}$ with the suspended value $r_S = r[0.1 \bullet \mathbf{n}]$.
See ASTM D5457 Sections A1.2.2, X2

MSE $\Sigma d^2/n_C$ is the **M**ean **S**quared **E**rror. **MSE** measures the average of the squares of the errors; that is, the difference between the estimated resistance and observed data.

$\Omega(R_{05|75\%})$ is a data confidence factor on R_{05}, the fifth percentile, with **75%** confidence. See ASTM D5457 Section A1.5

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gram parses, ranks, analyzes, & graphs (Google Charts API) the data.

Wgraph.html developed by Joe Murphy, 25 February 2018, using FireFox ESR 52.6.0 (32-bit). Wgraph.html freely available for personal use.

Copy/paste data col - or - Drag/drop text file - onto - textarea

2014.284
2139.063
2793.259
2898.43
2987.557

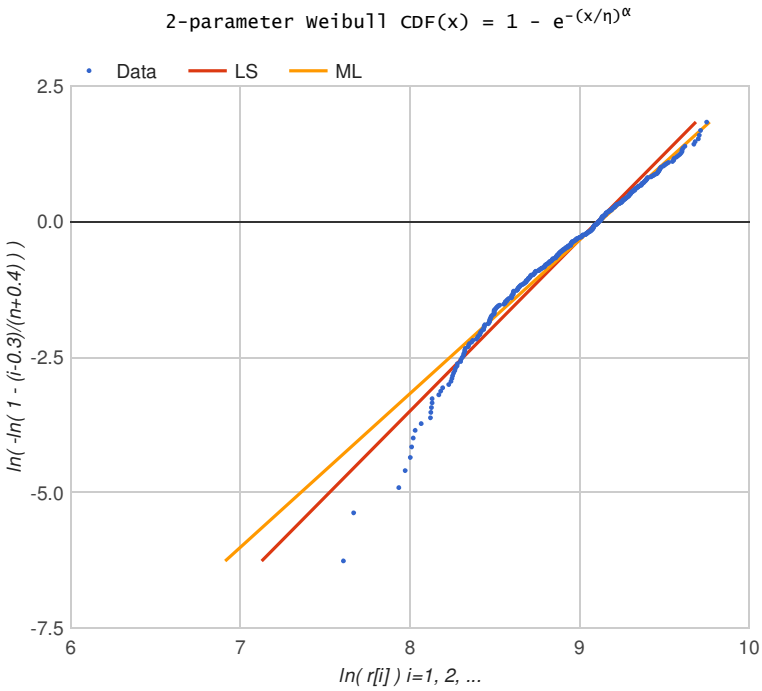
Number of suspended data(NOT included): 0

Use lower tail data? Check box for yes. ☐

Graph | Clear All | Reload Page

n_C 366 $+n_S$ 0 $=n$ 366

Weibull	LS	ML
Scale η	9.016e+3	9.140e+3
Shape α	3.161	2.833
MSE $\Sigma d^2/n_C$	2.112e+5	7.270e+4
mean	8.070e+3	8.142e+3
CV	0.3468	0.383
5%tile R_{05}	3.524e+3	3.204e+3
$\Omega(R_{05\|75\%})$	0.949	0.944



Copy/paste data col - or - Drag/drop text file - onto - textarea

2014.284
2139.063
2793.259
2898.43
2987.557

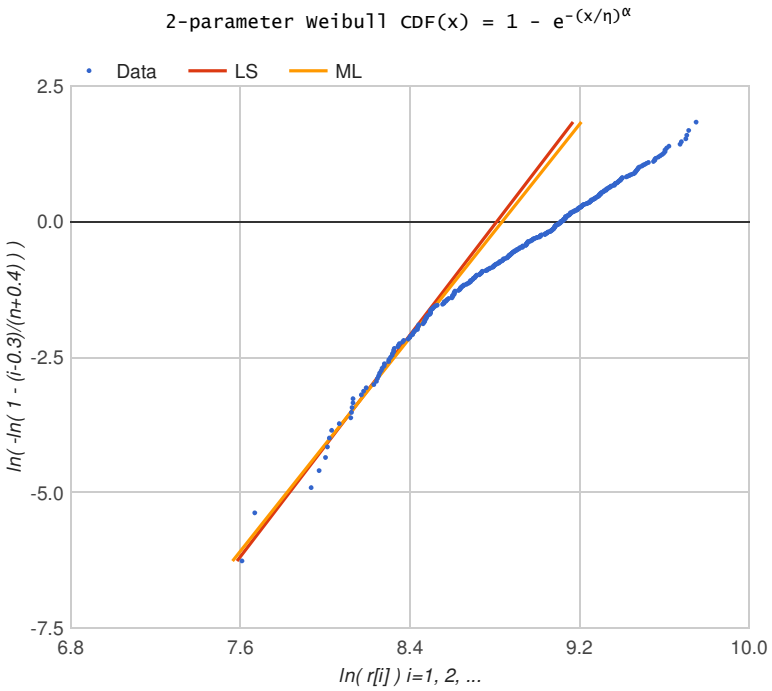
Number of suspended data(NOT included): 306

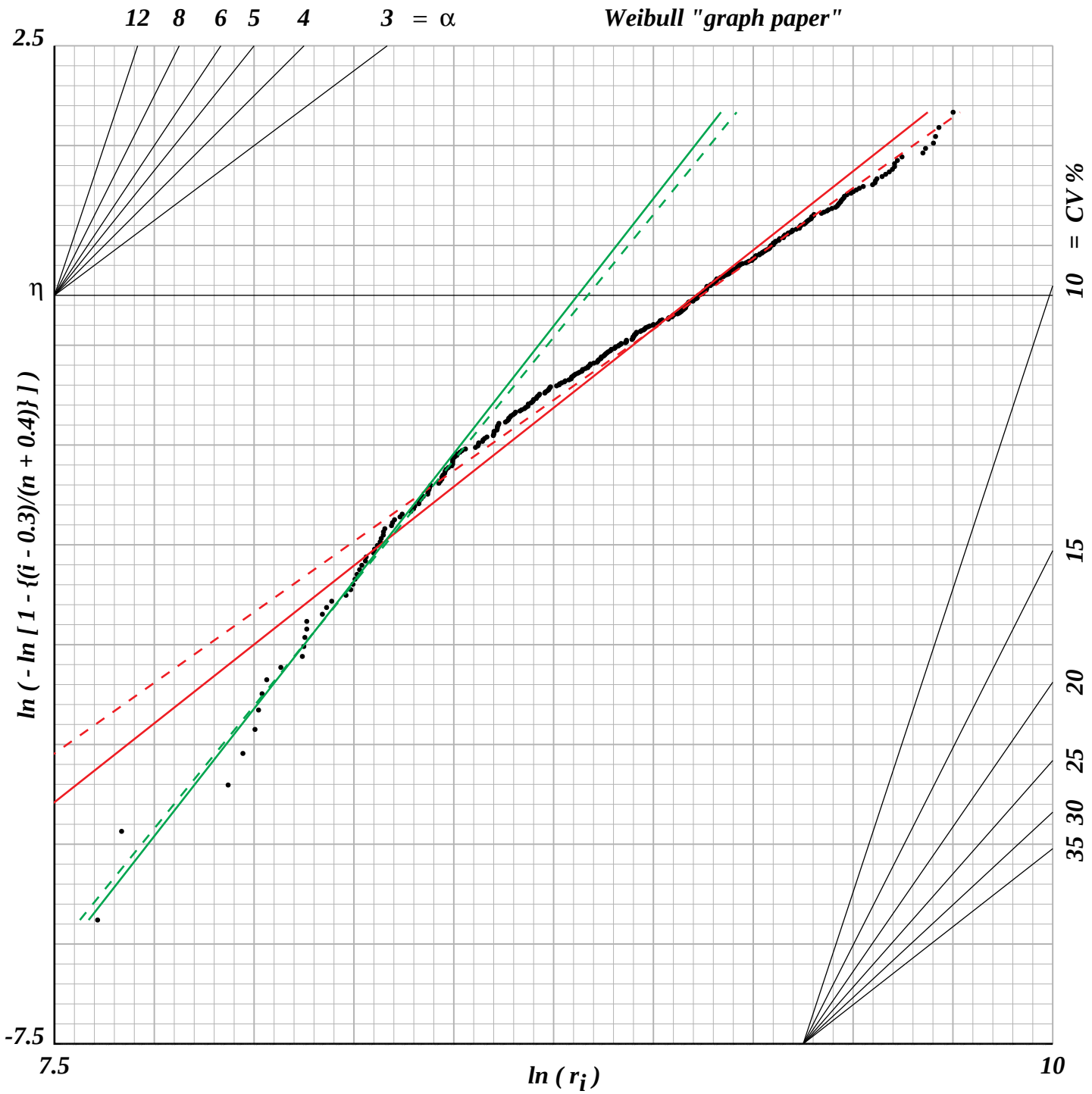
Use lower tail data? Check box for yes. ☑

Graph | Clear All | Reload Page

n_C 60 $+n_S$ 306 $=n$ 366

Weibull	LS	ML
Scale η	6.703e+3	6.874e+3
Shape α	5.111	4.921
MSE $\Sigma d^2/n_C$	5.542e+3	6.098e+3
mean	6.162e+3	6.306e+3
CV	0.2245	0.232
5%tile R_{05}	3.749e+3	3.759e+3
$\Omega(R_{05\|75\%})$	0.968	0.967





_____	least squares	*CV = 35%, 23%*
_ _ _ _ _	maximum likelihood	*CV = 38%, 23%*

Red -- $n_c = n = 366$, complete data set, $n_s = 0$

Green -- $n_c = 60$, suspend upper *306* data, $n_s = 306$

2p Weibull statistics of data from file MOR_2X10.DAT

N = 366 observed data

Nc	%D	$\bar{R}$/r05	CV	Shape	Scale	Ω(75)	r05		AveSumSqu
366	100	2.290	.347	3.161	9.016E+03	0.949	3.524E+03	LS	2.112E+05
366	100	2.542	.383	2.833	9.140E+03	0.944	3.204E+03	ML	7.271E+04
329	90	2.215	.335	3.286	8.856E+03	0.951	3.587E+03	LS	1.470E+05
329	90	2.507	.378	2.873	9.109E+03	0.945	3.239E+03	ML	6.364E+04
292	80	2.155	.325	3.395	8.705E+03	0.953	3.629E+03	LS	1.329E+05
292	80	2.480	.374	2.904	9.085E+03	0.945	3.267E+03	ML	6.846E+04
256	70	2.092	.315	3.521	8.527E+03	0.955	3.668E+03	LS	1.204E+05
256	70	2.390	.362	3.018	8.966E+03	0.947	3.350E+03	ML	6.801E+04
219	60	2.021	.302	3.684	8.298E+03	0.956	3.705E+03	LS	1.077E+05
219	60	2.406	.364	2.996	8.989E+03	0.947	3.336E+03	ML	7.972E+04
183	50	1.929	.285	3.928	7.972E+03	0.959	3.743E+03	LS	6.816E+04
183	50	2.234	.338	3.253	8.642E+03	0.951	3.468E+03	ML	5.605E+04
146	40	1.837	.267	4.223	7.611E+03	0.962	3.767E+03	LS	4.240E+04
146	40	2.163	.327	3.379	8.472E+03	0.953	3.517E+03	ML	5.412E+04
109	30	1.742	.247	4.605	7.193E+03	0.965	3.774E+03	LS	1.761E+04
109	30	1.926	.285	3.936	7.796E+03	0.959	3.666E+03	ML	2.306E+04
73	20	1.658	.228	5.027	6.781E+03	0.968	3.755E+03	LS	5.789E+03
73	20	1.801	.260	4.358	7.358E+03	0.963	3.722E+03	ML	1.420E+04
60	16	1.644	.225	5.111	6.703E+03	0.968	3.749E+03	LS	5.542E+03
60	16	1.677	.232	4.921	6.875E+03	0.967	3.759E+03	ML	6.099E+03

For instructions Run 2Weibull without any arguments

Nc is number of complete data

%D is percent of distribution with complete data
(the rest is treated as suspended data)
(minimum is 60 complete values!)

$\bar{R}$ is average of fitted 2 parameter Weibull distribution

r05 is fifth percentile of fitted 2p Weibull distribution

CV is coefficient of variation of 2p Weibull distribution

Shape is Weibull shape parameter ...
Scale is Weibull scale parameter ...

Ω is the data (75%) confidence factor (see ASTM D-5457)

LS is AveSumSquares of a straight line on Weibull graph (Weibull space)

ML is AveSumSquares of maximum likelihood estimation (real space)