



# Wire-to-Water Efficiency

## What is Wire-to-Water?

Systecon Inc. developed Wire-to-Water Efficiency (WWE) to determine pump selection and sequencing for optimal pump package performance. By optimizing the pump package, load requirements are best served and efficient operation can be achieved.

## Calculating WWE

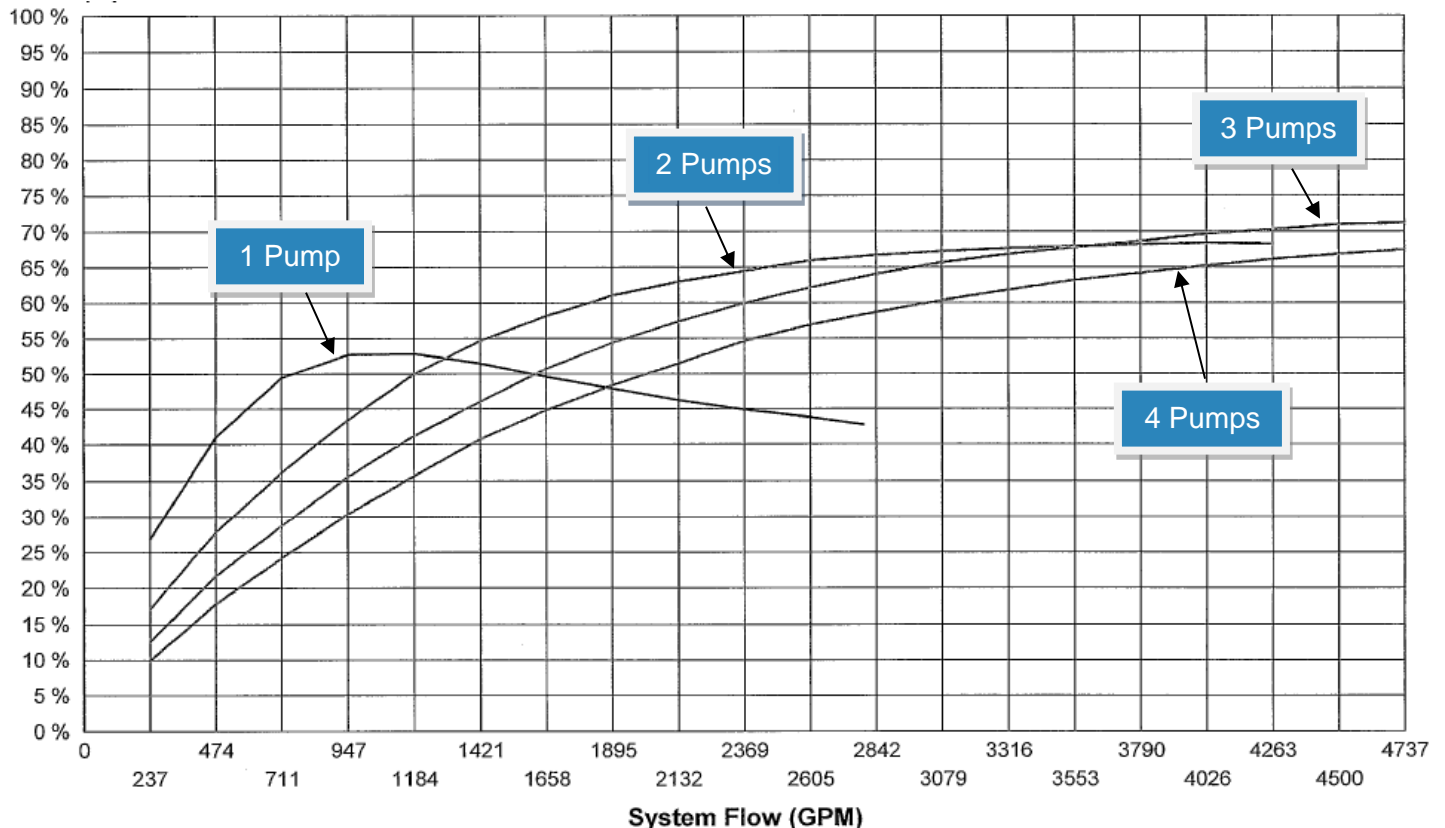
WWE is calculated through the recording of system flow from the system flow meter, system head from the system differential pressure transmitter, and system kW from the system wattmeter. It's calculated during pump and system selection to aid engineers and owners in selecting the best option to fit their project needs.

## How WWE is Used

The WWE Report (see below) shows that operating pumps at their most efficient flow results in optimized performance. The report data is used during Systecon's Performance Testing of the actual pump package to establish sequencing and confirm system operation and efficiency since there may be slight differences between the theoretical WWE Report and real-world pumping system. Systecon's controls will continuously calculate WWE to determine pump sequencing from actual load data.

Using Wire-to-Water Efficiency in a multiple pump, variable speed system allows the system to operate at its most efficient point, which results in proper system flows, reduced energy usage, and reduced wear on pump

## WWE Report



**Number Of Pumps Running = 1 Pump**

System Flow	System Head	Water HP	Pump Flow	Ftg. Loss	Pump Head	Pump Speed	Pump Effy	System BHP	Mtr/Drv Effy	Input KW	Wire To Water
237	20.6	1.2	237	0.3	20.9	565	67.9	1.8	40.3	3.4	26.9 **
474	22.2	2.7	474	1.4	23.6	618	79.6	3.5	54.6	4.8	41.0 **
711	24.7	4.4	711	3.0	27.7	688	86.5	5.7	64.2	6.7	49.5 **
947	27.9	6.7	947	5.4	33.3	782	86.9	9.2	72.4	9.5	52.7 **
1184	32.0	9.6	1184	8.4	40.4	892	84.7	14.3	78.8	13.5	52.8 **
1421	36.8	13.2	1421	12.2	49.0	1012	82.2	21.4	83.3	19.1	51.5
1658	42.4	17.7	1658	16.5	58.9	1139	79.9	30.9	86.2	26.7	49.6
1895	48.6	23.3	1895	21.6	70.2	1270	78.0	43.1	88.7	36.2	47.9
2132	55.6	29.9	2132	27.3	82.9	1403	76.5	58.4	90.2	48.3	46.2
2369	63.3	37.8	2369	33.8	97.0	1538	75.2	77.1	91.5	62.9	44.9
2605	71.6	47.1	2605	40.8	112.5	1674	74.2	99.7	92.7	80.3	43.8
2796	78.8	55.7	2796	47.0	125.9	1785	73.5	120.9	92.9	97.1	42.8

**Number Of Pumps Running = 2 Pumps**

System Flow	System Head	Water HP	Pump Flow	Ftg. Loss	Pump Head	Pump Speed	Pump Effy	System BHP	Mtr/Drv Effy	Input KW	Wire To Water
237	20.6	1.2	118	0.1	20.7	536	65.8	1.9	26.0	5.4	17.1
474	22.2	2.7	237	0.3	22.5	584	67.6	4.0	41.8	7.1	27.9
711	24.7	4.4	355	0.8	25.4	633	72.3	6.3	51.6	9.1	36.2
947	27.9	6.7	474	1.4	29.3	687	76.9	9.1	59.2	11.5	43.4
1184	32.0	9.6	592	2.1	34.1	746	80.6	12.7	66.1	14.3	50.0
1421	36.8	13.2	711	3.0	39.9	811	83.1	17.2	71.2	18.0	54.7 **
1658	42.4	17.7	829	4.1	46.5	882	84.8	23.0	75.3	22.7	58.2 **
1895	48.6	23.3	947	5.4	54.0	956	85.8	30.1	79.0	28.4	61.0 **
2132	55.6	29.9	1066	6.8	62.4	1033	86.5	38.9	81.8	35.5	63.0 **
2369	63.3	37.8	1184	8.4	71.7	1112	86.9	49.4	84.1	43.8	64.5 **
2605	71.6	47.1	1303	10.2	81.8	1193	87.1	61.8	86.5	53.3	65.9 **
2842	80.6	57.9	1421	12.2	92.8	1276	87.2	76.4	88.0	64.7	66.7 **
3079	90.3	70.2	1540	14.3	104.6	1359	87.2	93.2	89.3	77.9	67.2 **
3316	100.6	84.3	1658	16.5	117.2	1444	87.2	112.5	90.3	92.9	67.7 **
3553	111.6	100.1	1776	19.0	130.6	1529	87.2	134.4	91.2	109.9	68.0 **
3790	123.2	117.9	1895	21.6	144.8	1614	87.2	159.0	92.0	129.0	68.2
4026	135.5	137.8	2013	24.4	159.9	1700	87.1	186.6	92.7	150.2	68.4
4260	148.2	159.4	2130	27.3	175.5	1785	87.0	216.9	92.9	174.2	68.3

**Number Of Pumps Running = 3 Pumps**

System Flow	System Head	Water HP	Pump Flow	Ftg. Loss	Pump Head	Pump Speed	Pump Effy	System BHP	Mtr/Drv Effy	Input KW	Wire To Water
237	20.6	1.2	79	0.0	20.6	525	66.8	1.8	18.8	7.3	12.6
474	22.2	2.7	158	0.2	22.4	566	65.7	4.1	33.2	9.1	21.7
711	24.7	4.4	237	0.3	25.0	613	67.2	6.7	43.4	11.5	28.8
947	27.9	6.7	316	0.6	28.5	664	69.5	9.8	52.3	14.0	35.6
1184	32.0	9.6	395	0.9	32.9	720	71.8	13.7	59.0	17.3	41.2
1421	36.8	13.2	474	1.4	38.2	780	73.9	18.5	64.5	21.4	46.0
1658	42.4	17.7	553	1.8	44.2	842	75.7	24.4	69.9	26.1	50.7
1895	48.6	23.3	632	2.4	51.0	907	77.2	31.6	74.0	31.9	54.4
2132	55.6	29.9	711	3.0	58.6	974	78.4	40.3	77.2	38.9	57.4
2369	63.3	37.8	790	3.8	67.0	1044	79.3	50.5	80.1	47.1	60.0
2605	71.6	47.1	868	4.5	76.2	1114	80.1	62.5	82.4	56.6	62.1
2842	80.6	57.9	947	5.4	86.0	1186	80.8	76.5	84.6	67.4	64.1
3079	90.3	70.2	1026	6.3	96.6	1258	81.3	92.4	86.4	79.8	65.7
3316	100.6	84.3	1105	7.4	108.0	1331	81.8	110.6	87.7	94.0	66.9
3553	111.6	100.1	1184	8.4	120.1	1405	82.2	131.1	88.7	110.2	67.8
3790	123.2	117.9	1263	9.6	132.8	1478	82.5	154.1	89.7	128.1	68.7 **
4026	135.5	137.8	1342	10.8	146.3	1553	82.8	179.7	90.9	147.5	69.7 **
4263	148.4	159.7	1421	12.2	160.5	1628	83.1	208.1	91.6	169.5	70.3 **
4500	161.9	184.0	1500	13.5	175.4	1703	83.3	239.4	92.4	193.2	71.0 **
4737	176.0	210.5	1579	15.0	191.0	1778	83.5	273.7	92.6	220.4	71.3 **