- **What are these new AEM Impact Energy Ratings?**
- **Where do the numbers really come from?**
- **Why do we need <u>another</u> hammer testing system?**

For years, the demolition hammer industry has labored to find a impact rating system that everyone could agree upon. It is easy for any hammer operator to make a determination, on the job, and "in the dirt" as to which hammer is getting the job done fastest. It is not practical, however, for every operator to test every model of every brand of hammer on the same job. Experience with one hammer of a particular brand or size will not tell you how the other hammers from that manufacturer will compare to each other, or how they might compete with similar models from another brand. When comparing hammers, it is often useful to line up models on paper, specification to specification. Some manufacturers (Kent, for example) used a rating method based on converting hydraulic horsepower to impact foot-pounds per blow. While this method employed an easily reproducible formula, it made no attempt to adjust the rating for hammer efficiency.

It has been suggested that the "piston mass" and "impact velocity" could be used with a simple physics equation to produce a more accurate determination of hammer impact energy. Unfortunately, that method relies on data that is unusually difficult to obtain. While not published, piston mass could be measured, but the velocity of the piston at the exact moment of impact is essential data, and almost impossible to determine.

Many other methods were suggested, and all had fatal flaws. Manufacturers, dealers, and operators all had to rely on a variety of conflicting rules-of-thumb until the **Association of Equipment Manufacturers**, "AEM", (previously known as CIMA, Construction Industry Manufacturers Association) formed the **Mounted Breaker Manufacturers Bureau**, the "MBMB". Kent was one of the charter members of the MBMB and has supported its work for over ten years. While the impact ratings are different than the ones we have used in the past, our hammers hold the same position of power relative to other hammers rated under the same AEM method. The apparent difference happens because our horsepower method calculated the theoretical maximum that could be expected from the input, and ***the AEM method measures the actual output energy on a test stand.***

Briefly, the AEM Tool Energy Rating System bench tests a production model hammer under controlled conditions. Each hammer is fitted with a special test bit, has strain sensors attached to it, and is tested twenty-five times under the eyes of a AEM certified observer. The average of those tests are an accurate gauge of the impact of that hammer, and are published as the AEM Certified Tool Energy Rating. Only hammers that have been rated and certified, and have had the test results filed with AEM can display the AEM-MBMB decal.

Test results from the AEM-MBMB rating system should **only** be compared to other AEM-MBMB test results. It is important that all test results be published in the same format. Hammers are tested at a specific oil pressure and flow, and at a specific frequency. Just as variations in pressure, flow, and frequency affected the horsepower calculations, those same variations affect the tool energy measurements. The test results include: the flow rate, the operating pressure, the striking rate, and finally the tool energy rating, itself. These figures are usually stated in both US and Metric terms. While hammers can operate within a range of pressures and flows, the results from each test must be averaged to one specific value. The average test values for pressure, flow, and frequency, taken together with the impact rating make up the AEM Certified Test Results, and all of them must be specified when the results are presented. Because the operating pressure is so closely related to the single blow impact energy, there is an additional requirement that the tested pressure must be within 5% and no greater than the published pressure specification.

AEM® Certified Test Results

		KF 1	KF 2	KF 3	KF 4	KF 5	KF 6	KF 9
AEM Tool Energy Rating:	*Ft. Lbs.*	69.3	97.4	162.0	192.1	277.0	475.9	754.8
	Joules	93.9	132.1	219.6	260.4	375.6	645.3	1023.4
Tested Flow Rate:	*GPM*	4.83	7.35	8.96	9.71	11.22	32.08	29.33
	LPM	18.28	27.84	33.92	36.77	42.48	121.44	111.03
Tested Striking Rate:	*BPM*	1282.80	1218.60	1158.60	964.20	771.00	1454.40	867.60
	f/Hz	21.38	20.31	19.31	16.07	12.85	24.24	14.46
Supply Line Pressure:	*PSI*	1969.03	1988.18	1976.86	1983.97	1965.55	2256.64	2108.85
	BAR	135.76	137.08	136.30	136.79	135.52	155.59	145.40
	Kg/CM²	138.44	139.78	138.99	139.49	138.19	158.66	148.27
Maximum Published Pressure:	Bar	140.00	140.00	140.00	140.00	140.00	160.00	150.00

		KF 12	KF 19	KF 22	KF 27	KF 35	KF 45	KF 70
AEM Tool Energy Rating:	*Ft. Lbs.*	1167.0	1548.9	2537.6	2731.8	3298.7	4023.7	5259.6
	Joules	1582.3	2100.0	3440.5	3703.8	4472.4	5455.4	7131.0
Tested Flow Rate:	*GPM*	34.32	27.98	37.89	35.84	55.47	51.00	89.07
	LPM	129.93	105.92	143.42	135.67	209.96	193.07	337.16
Tested Striking Rate:	*BPM*	751.20	458.40	450.60	387.00	345.00	298.20	347.40
	f/Hz	12.52	7.64	7.51	6.45	5.75	4.97	5.79
Supply Line Pressure:	*PSI*	2571.07	2534.24	2556.29	2557.16	2539.03	2553.24	2546.28
	BAR	177.20	174.73	176.25	176.31	175.06	176.04	175.56
	Kg/CM²	180.69	178.18	179.72	179.79	178.51	179.51	179.02
Maximum Published Pressure:	Bar	180.00	180.00	180.00	180.00	180.00	180.00	180.00

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