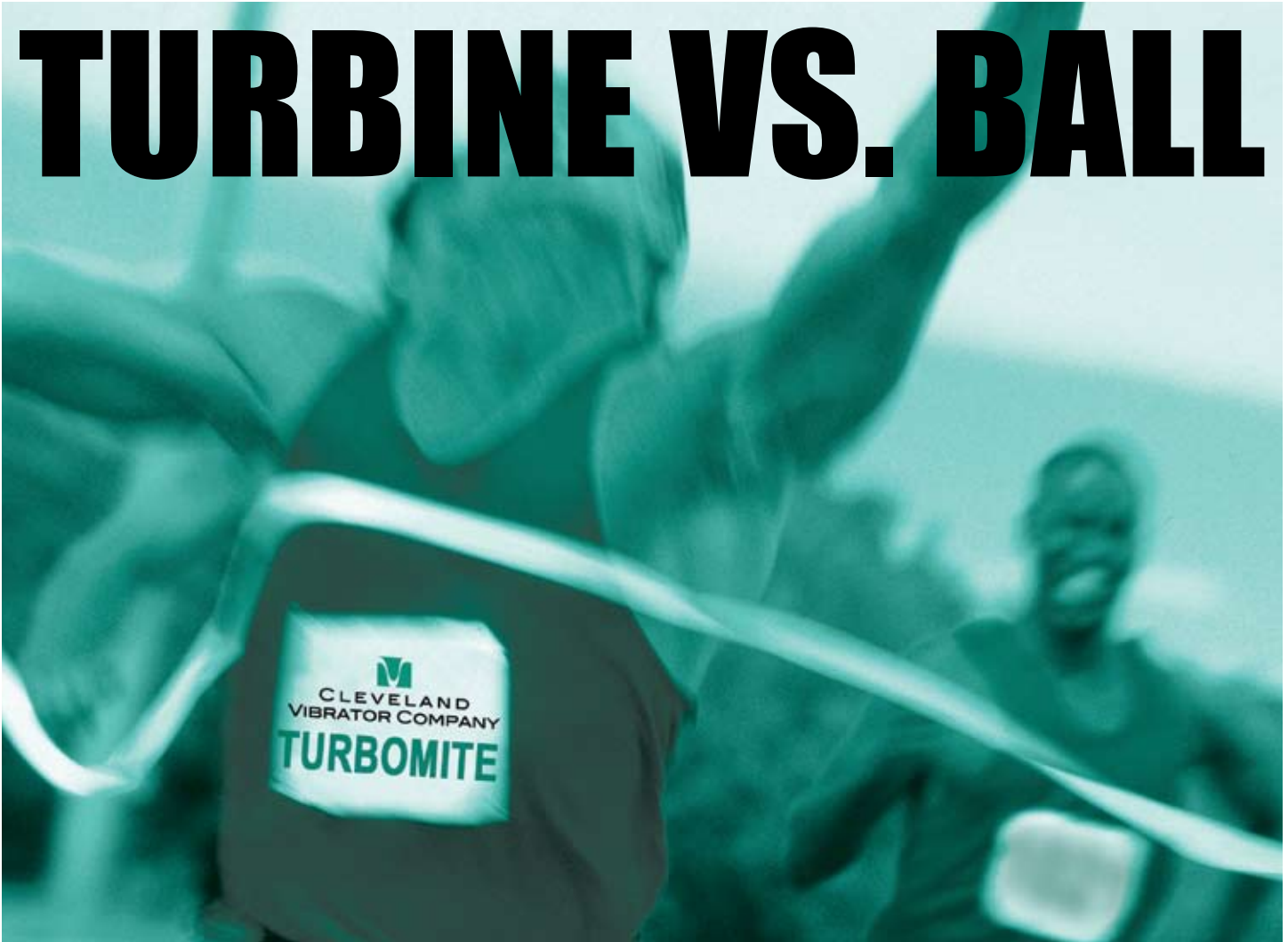




TURBINE VS. BALL



Turbine Vibrators Outlast Ball Vibrators 3:1

While ball style vibrators provide a low-cost, simple solution to material flow or settlement needs, plant engineers are beginning to discover the long-term advantages of turbine vibrators in operational costs and safety. It takes three ball vibrators to last as long as one turbine vibrator. Regardless of industry or application type, Cleveland Vibrator Company CVT pneumatic turbine vibrators generate more force at lower air pressures and with less air consumption than competing models. In fact, to produce the force output equal to a VBB-80 at 80 psi, the CVT-80 runs at 45 psi and consumes 80% less compressed air. Less air consumed translates to less energy used and costs saved.

Advantages of Turbine Vibrators

- **Less Air Consumption:** Turbine vibrators use 65-80% less air than ball vibrators, translating into energy savings.
- **Speed Maintained:** Turbine vibrators operate at the same speed throughout their life, while ball vibrators are susceptible to damages that slow speed over time.
- **Longer Life:** It takes three ball vibrators to last as long as one turbine vibrator.
- **Lower Maintenance:** Turbine vibrator bearings are sealed and do not need lubrication.
- **Lower Noise Levels:** Testing at 60 PSI shows that CVT-80 turbine vibrators operate at 71 dbA, a significantly lower noise level relative to VBB-80 ball vibrators with sound levels recorded at 98-100 dbA.



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Air Piston Vibrators • Turbine Vibrators • Rotary Electric Vibrators
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Vibratory Feeders • Vibratory Screeners • Vibratory Conveyors
Tailored On Demand



Pneumatic Turbine and Ball Vibrator Comparison

Air Consumption is Related to Energy Costs

As the U.S. Department of Energy reports in their Compressed Air Tip Sheet #3, August 2004, the management of compressed air is directly related to energy costs. With the value often placed on a cubic foot air from \$0.15 to \$0.30, air consumption can be one of the most significant expenses for a plant. The difference in the amount of air consumed by an industrial vibrator can make a difference in energy cost savings.


Example:

If the difference between a CVT turbine vibrator and a VBB ball vibrator is 10.5 cfm, this value when multiplied by three additional factors can find for the dollars saved in energy costs over a given period of time.

$$\text{Cost Savings} = \text{cfm} \times \text{kW/cfm} \times \# \text{ hours} \times \$/\text{kWh}$$

At a 10.5 cfm difference, where the requirement for compressed air generation is at 18 kilowatts (kW)/100 cfm for 2,080 operating hours per year at an aggregate electric rate of \$0.05, the difference in cost is \$192.56. Further, ball vibrators are more prone to wear over time, leading to greater frequency of add-on replacement costs.

Estimated Energy Costs for 1 Year (2,080 hours)



CVT-80
3.5 cfm, 45 psi/1.4 bar: \$65.52



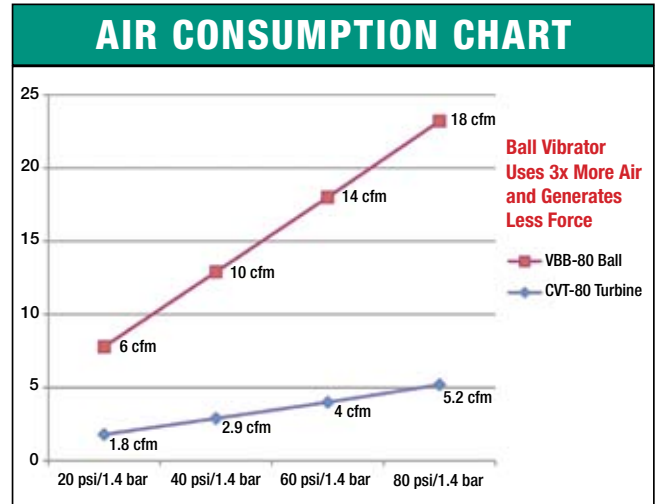
VBB-80
14 cfm, 60 psi/1.4 bar: \$262.08

Cleveland Vibrator Turbine Vibrator Technologies Consume Less Air

Increase your force with less air consumption with our powerful Turbomite vibrator lines, including our steel, plastic, high temperature and miniature models. Turbomite vibrators generate as much as four times the force than competitive models while using less air and less energy as a result. Turbomite turbine vibrators are directly interchangeable with our line of ball vibrators and are below OSHA standards for noise levels. Their rugged, ductile bodies require no lubrication, giving rise to enhanced efficiencies and a longer product life. Turbomite turbine vibrators are ideally suited for a variety of applications, from pharmaceuticals to food processing and other environments where bulk material handling proficiencies are paramount.

About Cleveland Vibrator Company

Since 1923 Cleveland Vibrator Company has been designing, manufacturing and supplying vibratory products and offering services to meet material handling needs. Our diverse products and knowledge ranges from the precise challenges of fine powder screening to the most rugged equipment feeder and conveyor applications. In addition to our breadth of capabilities, we differentiate ourselves with a unique focus on quality, integrity and customer service that has made us a partner with more than 15,000 organizations around the world throughout our 88 year history. Our comprehensive line of industrial vibrators includes unique air-piston vibrators, rotary electric vibrators, electromagnetic vibrators, turbine vibrators and ball vibrators used for bins, hoppers, railcars, foundry applications; rollover and core machine vibrators and more – in many sizes and varieties. Cleveland Vibrator fabricated products include air and electric powered vibratory feeders, screeners, ultrasonic screeners, conveyors and tables for light, medium, and heavy duty industrial applications.



The CVT turbine vibrator saves energy relative to the VBB ball vibrator. The VBB-80 ball vibrator consumes three times (3x) the amount of air consumed (cfm) by the CVT-80 turbine vibrator when operating at the same standard operating levels (psi).

PRODUCT COMPARISON CHART		
	CVT-80 Model	VBB-80 Model
20 psi/1.4 bar		
Speed	1,930 vpm	7,000 vpm
Force	20.5 lbf, 91 N	159 lbs, 72 kg
Air Consumption	1.8 cfm, 51.6 lpm	6 cfm, 170 lpm
40 psi/1.4 bar		
Speed	6,135 vpm	7,700 vpm
Force	207.4 lbf, 920.9 N	192 lbs, 87 kg
Air Consumption	2.9 cfm, 82.1 lpm	10 cfm, 283 lpm
60 psi/1.4 bar		
Speed	8,750 vpm	8,400 vpm
Force	421.8 lbf, 1,872.8 N	228 lbs, 103 kg
Air Consumption	4 cfm, 113.5 lpm	14 cfm, 396 lpm
80 psi/1.4 bar		
Speed	10,255 vpm	9,000 vpm
Force	579.4 lbf, 2,572.5 N	262 lbs, 119 kg
Air Consumption	5.2 cfm, 147.9 lpm	18 cfm, 510 lpm

The information contained in the charts in this technical reference guide is the result of decades of field experience. For additional information, visit www.clevelandvibrator.com.