

TRACKED VS. WHEELED PORTABLE PLANTS

by Paul Smith



Tracked? Wheeled? We take a look at which type of portable plant is the more productive.

About 15 years ago I had this fantastic idea to revolutionize our industry by developing a process to crush rocks with sonic waves.

As fate would have it, I met a couple of ex-Los Alamos physicists who were only too happy to sketch the idea on a bar napkin for me. Soon after, I gained the courage to suggest the idea to one of my mentors. He politely listened to my pitch as if I were the next poor sap about to get ousted on “Shark Tank,” and he then advised me that while possible, the energy costs of crushing rocks with sound waves were far too prohibitive.

The takeaway: Just because you can do something doesn’t necessarily mean you should.

If you’re a producer who’s accustomed to running 100,000 or more tons per year of material at multiple sites with a “portable” wheeled system, my experience has been that many of you have come to the conclusion that “mobile” tracked machinery isn’t right for you. The biggest issue is that the downtime of these machines is too high for larger volume jobs.

Conversely, others are discovering many lucrative smaller-volume projects as bolt-on profit centers to their current businesses. They find self-contained mobile equipment provides leaner solutions as opposed to more conventional portable systems.

How and when does one decide to switch to another system? Because both configurations are generally equipped with similar crushers and screens, we must first look to the “packaging” to help us decide.

WEIGHING DIFFERENCES

Tracked machines are quickly repositioned and operational in minutes. Their user-friendly controls make them easy to operate and don’t require a high level of experience. Also, mobile plants feed one another with clean transitions, eliminating transfer conveyors, and they do not require a large operating footprint. Plus, self-contained power units allow them to work in remote regions regardless of infrastructure.

Transport constraints do make tracked machines more difficult to service, and the engines demand attention. Tracked systems also have 5 to 10 percent less uptime than portable equipment. Portable wheeled systems require more time to position; more conveyors for transfer and stockpiling of material; and if equipped with electric motors, they require wiring to panels and a generator or power line. Therefore, these plants take longer to set up; they require larger operating footprints; and they cannot be easily relocated.

These systems provide many clear benefits, though. Wheeled plants have larger feed hoppers than most tracked plants, and they provide better access for simplified maintenance.

If these comparisons still don’t offer a clear-cut decision for you, then you should weigh the economics. The deciding factors are the absorption of the indirect “burden” costs and the variable cost per ton.

Let’s assume a 15,000-ton pile of surplus aggregate material needs to be processed. I estimate both systems would use the same sized crushers and screens capable of producing 200 tph. I assume energy costs, depreciation and other factors would be a push.

The mobile tracked system can be set up in one hour by three laborers at \$75 each with three haul loads estimated at \$4,000 in freight, totaling an indirect cost of \$4,225. When divided by tons of material, the indirect cost that must be burdened is 28 cents per ton for the tracked system.

I estimate the portable wheeled system requires four days, also with three laborers at \$75. With the increased number of haul loads, I estimate trucking expenses at \$10,200. The indirect costs will be about \$17,400, requiring a \$1.16 burden cost.

The race now begins with the mobile system having an 88-cent-per-ton head start. Let’s assume the portable plant operates at 90 percent uptime because the crusher liners, screen wire, conveyor flashing and hopper liners are easier to access and maintain. Unfortunately for the portable plant, the finish line is only 15,000 tons away. Even if we penalize the mobile system with a pessimistic 20-percent downtime factor, to process the entire pile with tracks still only

requires about 94 hours at 200 tph. The total variable cost for all the hours worked will be about \$21,150, or 71 cents per ton. Add in the indirect spending of 28 cents, and that brings us to 99 cents per ton.

Our portable system, operating at a more optimistic 90 percent uptime, processes the same pile in about 84 hours. Our total variable cost for all of the man hours worked will also be about 10 percent less at \$18,750, or 80 cents per ton. But when we add in the indirect spending of \$1.16, our total is to \$1.96 percent ton – almost twice the mobile system.