Setting the Blast Pattern

Before attempting to set a blast pattern all the integral parts, including the blades/vanes, impeller and control cage/impeller case, should be replaced.

Amperage to the wheel needs to be checked, with a clamp-on ammeter on one of the legs at the motor starter, to assure pulling full load amps.

There are many ways to determine just where the blast pattern is hitting. We usually refer to the concentrated area of the blast pattern as the HOT SPOT. It is called this because a piece of work or metal target plate mounted in line with the blast will become hot when subjected to a 30 second or longer blast. You can actually feel the heat in that area where the impact of the abrasive is hitting heavily or concentrated.

The best way to determine the location of the hot spot is to put a steel plate target in line and on top of the work and blast it for approximately 30 seconds. You can then feel the target to see just where the blast is hitting.

Another way would be to blast the target plate for a longer time (60 seconds) and actually burn in the hot spot. This method is recommended if you’re having problems obtaining your arc heights.

Once the above test is completed the control cage can be moved one way or the other to adjust the hot spot to the proper location. A second check can then be used to confirm the adjustment that you’ve made. Control cages generally are available with different sizes and shapes of openings to suit the machine or application.

If you determine the blast pattern/hot spot is set correctly, you can mark on the control cage adapter where the opening of the control is located to assure that when the worn cage is replaced it can be set in the same location.

Once the control cage has been set correctly, it will continue to deliver the blast to the proper area until wear alters the size of opening or its shape. Wear occurs on any one of the wheel elements—the impeller, control cage/impeller case, or blades/vanes—and can cause the movement of the hot spot.

It’s easy to see how wear on the control cage/impeller case can alter the hot spot because it allows more room for the abrasive to be thrown. Wear on the impeller ribs and control cage/impeller case disturbs the hot spot. Abrasive leaving the worn ribs of the impeller will cause the abrasive to hit the back edge of the respective blades and to land high on the face of the following blades rather than landing on the throwing face of the respective blades. This causes the hot spot to be badly diffused, with a resultant loss in velocity and impact force.

Badly pitted or worn blades offer more resistance to abrasive flow so that the abrasive spends more time on the blades/vanes than it would on a smooth set of blades/vanes. Because of this, badly worn blades/vanes tend to lengthen the hot spot, with a loss in abrasive velocity and impact force.

If you take the time to set the blast pattern/hot spot correctly and mark where the opening in the control cage/impeller case is located you rarely have to repeat checking the blast pattern.

Remember: When wear on one or more of the wheel components requires changing (blades/vanes, control cage/impeller cases, impeller), it’s my recommendation to replace all these parts. The equipment manufacturers can supply you with tune-up kits that contain all the parts required to replace the worn components in your wheels.

Eugene Tarabek is president of Tarabek, Inc., a consulting firm to the shot peening and abrasive blast cleaning industry. We are pleased to have him as a speaker at the EI annual workshops.