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Why New is Better

THE GLOBAL ECONOMY is a dangerous place, but it also offers great opportunity.

Competitive pressures keep rising and entire industrial sectors have relocated to markets with lower costs. The surface preparation business has been global for two decades, shrinking in North America, Europe and Japan, but growing nicely elsewhere is the world, especially in the Asia-Pacific zone. The US automotive industry sources most of its castings from Mexico, Brazil, and India. Thailand is producing more cars than Canada or France. Singapore is a global maintenance hub for aircraft and engine maintenance and repair.

Costs Must Shrink. Period!

There is no safe haven for any industrial operation, including shot blasting and shot peening. Remaining cost effective is mandatory to merely stay in business while beating the competition in price is a sure path for growth and profits. Shot blasting and shot peening costs are therefore in the spotlight and deserve the full attention of upper management.

In the summer issue of *The Shot Peener*, we scrutinized the impact of abrasives on shot blasting costs. The conclusion was that the biggest impact of abrasive media was on consumption and energy and it had no significant influence on other items such as labour, wear parts, maintenance, waste disposal, and machine depreciation. Make no mistake, it is obvious that media made with similar production processes and chemistry that exceeds SAE specifications with a narrow standard deviation on hardness in state-of-the-art facilities by well-established manufacturers performs better and triggers a lower operating cost than media that barely meets SAE specs and made in a plant with processing equipment of dubious capability. But when the abrasives are from the "same quality league," it is unrealistic to expect a substantial variation in performance and industrial costs. The difference between two media of the same quality league is slim.

I do not rule out that future stunning innovations in mass-produced metallic abrasives will break the brick wall of performance that we've faced in the last several decades. These new medias will take the entire surface preparation to a new frontier. In the meantime, handsome cost reductions can be achieved with the new generation of blasting machines.

The Numbers Tell the Story

Metallic abrasives consumption is mainly related to the Apparent Steel Usage (ASU) (2/3) and to the automotive industry (1/3). Steel is transformed into plates, structures, pipes, castings, etc., requiring a shot-blasting process at some point. (See chart on page 40.)

When we look at this big global picture between 2004 and 2012, we observe the global ASU surged by 47% and the number of vehicles produced grew by 30%, while the metallic abrasives consumption increased by 16%. On a yearly basis, the average discrepancy between the growth of the metallic abrasives and the shot-blasting outlets is 2.6%.

If we make the same comparison, excluding China which is possibly distorting the comparativeness of these statistics (in other words, the ability to compare apples to apples), we observe ASU developed by 11% and the number of vehicles produced grew by 10%, while the metallic abrasives consumption increased by 6%. On a yearly basis, this average discrepancy between the growth of the metallic abrasives and the shot-blasting outlets is 0.5%.

A short comment on China: The quality improvement of the Chinese metallic abrasives partly offsets the growth consumption trend and this blurs the market evaluation. New Chinese shot blasting machines are also more effective and productive than many older Western machines.

Why This Discrepancy?

The answer is **productivity**. The key technical characteristics of steel abrasives (which comprise 90% of metallic abrasives) have remained the same over the past decades. There were no leaps in quality nor in their production process and composition. Conversely, a shot blasting machine made in the in the past five years has improved tremendously compared to one manufactured 10 or 20 years ago. The new machines are computer driven and have high-speed wheels, innovative nozzles, improved wear-resistant parts, simpler maintenance requirements, finely tuned separators, and more.

Why Productivity has Increased

It is clear that the speed of blasting is a key factor of productivity and has a direct impact on cutting costs (less fixed and variable costs per part). This is precisely what new machines achieve: Higher output and enhanced productivity along with better industrial control, especially in maintaining and recycling the operating mix. The new generation of turbines cut maintenance costs even more because of the fast

and secure changing of their blades. The same phenomenon takes place with new cars. We enjoy a higher mile-per-gallon of fuel in a new car than one only a few years older. This is observed in all industrial processes.

If we can assume that there is a stable production of products such as cars, ships, railcars and pipes, the abrasives consumption goes down by 0.5% each year (outside China). As the annual replacement rate of new machines is about 4% (an average life of 25 years), this translates into:

1) Year one: 100% of the machines generate an index of 100 in abrasives consumption.
2) Year two: 96% of the previous machines are in operation, generating an index of consumption of 96; 4% of the machines are replaced; the total index of consumption is 99.5 (yearly gain of productivity of 0.5%).

This means that 4% of the machines generate 3.5% of the consumption. In other words, these new machines consume 12.5% less than the old ones (0.5 divided by 4).

The two perspectives, one with and one without China, stress that the more new machines, the more the consumption of abrasive drops. Conversely, a low rate of machine replacement means stable consumption patterns. Many Shot Peener readers observed this phenomenon when American or European foundries and forges relocated to emerging countries where new machines were installed in new facilities and their consumption of abrasives shrunk significantly.

Conclusion

- The shot-blasting machines industry is instrumental in raising the industrial productivity of the surface preparation sector.
- New shot-blasting machines can cut abrasive consumption by a two-digit figure.
- Shot-blasting machines manufacturers should be pro-active and push their customers to buy new machines based on a fast return on investment driven by a cost reduction.

WORLD, INCLUDING CHINA		2004	2012	8 Years Growth	Annual Growth
Metallic Abrasives (All Applications)	000's metric tons	1,330	1,450		
Granite Sawing	000's metric tons	215	160		
Metallic Abrasives in Shot Blasting	000's metric tons	**1,115**	**1,290**	**15.70%**	**1.84%**
Vehicle Global Production - Source: OICA[1]	000's units	64,496	84,208	30.56%	3.39%
Apparent Steel Use (ASU) - Source: Worldsteel.org	000's metric tons	973,999	1,432,182	47.04%	4.93%
Combined Growth of Shot-Blasting Applications	**2/3 ASU, 1/3 Automotive**			**41.54%**	**4.43%**
Discrepancy Between the Growth of Metallic Abrasives and the Growth of the Outlets				**25.84%**	**2.59%**

WORLD, EXCLUDING CHINA		2004	2012	8 years Growth	Annual Growth
Metallic Abrasives for Shot Blasting	000's metric tons	1,115	1,290	15.70%	
Metallic Abrasives in China	000's metric tons	190	308		
Metallic Abrasives Market, Excluding China	000's metric tons	**925**	**982**	**6.16%**	**0.75%**
Vehicle Global Production Excluding China Source: OICA[1]	000's units	59,262	64,936	9.57%	1.15%
Apparent Steel Use (ASU), Excluding China Source: Worldsteel.org	000's metric tons	698,180	772,122	10.59%	1.27%
Combined Growth of Shot-Blasting Applications	**2/3 ASU, 1/3 Automotive**			**10.25%**	**1.23%**
Discrepancy Between the Growth of Metallic Abrasives and the Growth of the Outlets				**4.09%**	**0.48%**

1) OICA stands for Organisation Internationale des Constructeurs d'Automobiles. This International Organization of Motor Vehicle Manufacturers was founded in Paris in 1919.