

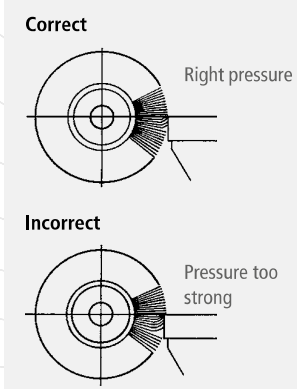


## Producing Quality – brushing the correct way

### Solving problems if brush results are poor

#### Brushing not effective enough:

- Increase peripheral speed by operating a larger diameter brush or by increasing the operating speed (never exceed the maximum RPM rating).
- Use a brush with shorter trim length.
- Use a brush with thicker wire.



#### Brushing too effective:

- Reduce the peripheral speed by using a smaller diameter brush or by decreasing the operating speed per unit time.
- Use a brush with longer trim length.
- Use a brush with thinner wire.

#### Brush leaves burr marks:

- Use a brush with shorter trim length.
- Check the position of the brush and check the position of the object being treated.
- Use a brush with wider face.
- Use a brush with thicker wire.

#### Right pressure

Effective brushing requires gentle pressure so that the wire points are effective (see illustration). Increasing the pressure does not improve results, but only serves to decrease the lifetime of the brush.

#### Peripheral speeds

The maximum safe rotary speed is printed either on the brush or on its package. Never exceed this speed!

### Recommendations for Safe Brush Use

#### Tips for your safety

Always observe appropriate precautions whenever you work with machine-driven brushes.

- All persons in the vicinity of machine-driven brushes must wear protective goggles or face masks.
- Check brushes for damage before starting work.
- Be sure all brushes are properly mounted.

#### For your protection:

Always wear protective clothes!



### Recommended peripheral speeds for Brushing Application

| Application         | Peripheral speed in m/s |         |    |    |         |         |         |    |  |
|---------------------|-------------------------|---------|----|----|---------|---------|---------|----|--|
|                     | 5                       | 15      | 20 | 25 | 30      | 35      | 40      | 45 |  |
| Deburring           |                         |         |    |    | 25 - 35 |         |         |    |  |
| Cleaning Welds      |                         |         |    |    |         |         | 35 - 45 |    |  |
| Removing Scale      |                         |         |    |    |         |         | 35 - 45 |    |  |
| Polishing           |                         |         |    |    |         | 30 - 40 |         |    |  |
| Working on Plastics |                         | 15 - 20 |    |    |         |         |         |    |  |
| Cleaning Surfaces   |                         | 5 - 25  |    |    |         |         |         |    |  |
| Derusting           |                         | 5 - 25  |    |    |         |         |         |    |  |

### Peripheral Speed (v) in m/s

| n [1/min.] | Brush diameter (d) in mm |      |      |      |      |      |      |      |  |
|------------|--------------------------|------|------|------|------|------|------|------|--|
|            | 40                       | 50   | 80   | 100  | 125  | 150  | 175  | 200  |  |
| 1,000      |                          |      | 4.2  | 5.2  | 6.5  | 7.9  | 9.2  | 10.5 |  |
| 1,500      | 3.1                      | 3.9  | 6.3  | 7.9  | 9.8  | 11.8 | 13.7 | 15.7 |  |
| 2,000      | 4.2                      | 5.2  | 8.4  | 10.5 | 13.1 | 15.7 | 18.3 | 20.9 |  |
| 2,500      | 5.2                      | 6.5  | 10.5 | 13.1 | 16.4 | 19.6 | 22.9 | 26.2 |  |
| 3,000      | 6.3                      | 7.9  | 12.6 | 15.7 | 19.6 | 23.6 | 27.5 | 31.4 |  |
| 3,500      | 7.3                      | 9.2  | 14.7 | 18.3 | 22.9 | 27.5 | 32.1 | 36.7 |  |
| 4,000      | 8.4                      | 10.5 | 16.8 | 20.9 | 26.2 | 31.4 | 36.7 | 41.9 |  |
| 4,500      | 9.4                      | 11.8 | 18.8 | 23.6 | 29.5 | 35.3 | 41.2 | 47.1 |  |
| 5,000      | 10.5                     | 13.1 | 20.9 | 26.2 | 32.7 | 39.3 | 45.8 | 52.4 |  |
| 6,000      | 12.6                     | 15.7 | 25.1 | 31.4 | 39.3 | 47.1 | 55.0 | 62.8 |  |
| 8,000      | 16.8                     | 20.9 | 33.5 | 41.9 | 52.4 | 62.8 | 73.3 | 83.8 |  |
| 10,000     | 20.9                     | 26.2 | 41.9 | 52.4 | 65.4 | 78.5 | 91.6 |      |  |
| 12,500     | 26.2                     | 32.7 | 52.4 | 65.4 | 81.8 |      |      |      |  |
| 15,000     | 31.4                     | 39.3 | 62.8 | 78.5 |      |      |      |      |  |
| 17,500     | 36.7                     | 45.8 | 73.3 | 91.6 |      |      |      |      |  |
| 20,000     | 41.8                     | 52.4 | 83.8 |      |      |      |      |      |  |
| 22,500     | 47.2                     | 58.9 |      |      |      |      |      |      |  |
| 25,000     | 52.4                     | 65.4 |      |      |      |      |      |      |  |

$$v = \frac{\text{Brush diameter (d)} \times \pi \times \text{RPM (n)}}{1,000 \times 60}$$

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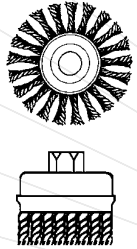


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### Treatment of welding seams

This task demands tough and aggressive brushing. You will get the best results by using **knotted wheel brushes and/or cup brushes**. Hard-to-reach places can be treated with **knotted end brushes or conical brushes**.

Recommended speed: 35 - 45 m/s  
\*RPM 6,000 - 12,000



### Undersealing: coarse brushing with electric drills

A **knotted wheel brush** is best suited for this task. Because this type of brush is self-cleaning, it will not clog. It can also be used for all tasks that require aggressive brushing.

Recommended speed: 5 - 25 m/s  
\*RPM 3,000 - 15,000



### Treating hard-to-reach places

An **end brush** allows you to penetrate narrow apertures. Centrifugal force spreads its knots, thus enabling the **end brush** to clean recessed joints and interior surfaces.

Recommended speed:  
5 - 35 m/s (depending on usage)  
\*RPM 3,000 - 15,000



### Treatment of metals

Use a **knotted brush**; **knot conical brushes** are most widely applicable. These brushes are also appropriate for treating edges, grooves and surfaces. They can also be used to clean concrete surfaces.

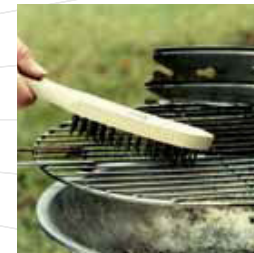
Recommended speed: 35 - 45 m/s  
\*RPM 9,000 - 12,000



### Automotive work

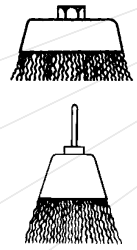
Insert a **brush with a shank** into your electric drill and you are well-equipped to perform repairs on your automobile. Removing rust and old paint or polishing (with abrasive nylon) is quick and easy.

Recommended speed:  
5 - 25 m/s (Treating Surfaces)  
35 - 45 m/s (Polishing)  
\*RPM 3,000 - 15,000



### Universal tool

When you cannot use or would prefer not to use a machine, simply reach for a **hand brush!** Be sure to choose a brush with the correct type of bristles. A thick wire is used for rough applications, a thin wire for gentle polishing.



### Treatment of surfaces: removing rust, paint, etc.

Use **cup brushes** for larger surfaces. **Wheel or conical brushes** are the proper tools for smaller surfaces and for treating hard-to-reach places. Use **cup or wheel brushes with a shank** in electric drills.

Recommended speed: 20 - 35 m/s  
\*RPM Angle Grinder 6,000 - 12,000  
Shank Brushes 3,000 - 15,000



### Removing tempering colour on stainless steel welds

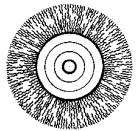
With **shank wheel brushes and wheel brushes with crimped stainless steel wire** you can easily remove tempering colour on stainless steel welds. Compared to working with chemicals washing and drying is not necessary.

Recommended speed: 30 - 40 m/s  
\*RPM 10,000 - 15,000

### Please note:

Brushes with shank are available for drilling machines (RPM max. 4,500) or as high advanced tool with RPM up to 20,000. Generally a higher rotary speed improves the brushing result.

Thick wires (Ø 0.50 – 0.80 mm) are applicable for rough and aggressive applications, thin wires (Ø 0.10 – 0.35 mm) for fine applications.



### Deburring

Smoothing burrs on cut edge is best done with **brushes equipped with crimped wire**. Use a **wheel brush** in conjunction with a bench grinder; **wheel brushes with a shank** are appropriate for use in electric drills.

Recommended speed: 25 - 35 m/s  
\*RPM 1,000 - 6,000



### Cleaning, polishing and texturing with abrasive nylon

**Abrasive nylon brushes** have abrasive grit integrated in their plastic bristles. This type of brush is ideal for cleaning or polishing delicate surfaces. It is also the right brush to use for wooden or plastic surfaces.

Recommended speed: 5 - 20 m/s  
\*RPM 1,000 - 4,500

- Steel wire:** for treating metal surfaces
- Knotted steel wire:** especially hard and aggressive
- Crimped steel wire:** soft and flexible, degree of aggressiveness varies with the diameter of the wire
- Stainless steel wire:** for cleaning rust-resistant surfaces
- Brass wire:** for cleaning delicate or brass surfaces
- Polishing nylon:** for polishing, grinding and texturing soft and moderately hard materials

Further information on filling materials you find at [www.lessmann.com](http://www.lessmann.com)