# LONG VS SHORT BAR MAGAZINES


*Manufacturers and subcontractors that produce turn-milled components from bar stock need to take special care when choosing a bar feeder, as it has a big impact on ensuring high productivity and minimising waste, leading to maximisation of profitability.*

*The choice is normally between a magazine for feeding long bar of around three to four metres or a short bar loader that handles stock about one metre in length (although hybrid versions for handling intermediate lengths are also available).*

*This White Paper discusses the relative merits of both long and short bar magazines and argues in favour of the former wherever possible.*

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The first point to note is that sliding-head lathes are always supplied with a long bar feeder, as the machines are designed for long periods of unattended production, especially overnight. 24/7 running is the norm. The short bar feed discussion therefore focuses on the fixed-head lathe only.

First, one needs to decide in which lengths round or hexagonal bar, whether ferrous, non-ferrous or plastic, should be bought in order to maximise turned parts output and minimise bar wastage.

Stock length is often chosen according to its diameter. Bar over 32 mm is generally used solely on fixed-head turn-mill centres, although some sliding-head lathes can accommodate stock slightly larger than that these days.

Larger diameter bar is frequently sourced in one-metre lengths and fed from short magazines, as the headstock houses almost the entire bar length, so any tendency for it to whip is eliminated.

It follows that the speed potential and dynamics of a lathe can be fully realised and both accuracy and surface finish are optimised. A short loader takes up only about half the area on a shop floor that a full-length model occupies, so extra space is available for accommodating additional lathes or other machine tools.

Another advantage of a short bar magazine is that there is no gripper, so each remnant is small. It is pushed easily out of the front and ejected, avoiding the delay of extracting the remnant from the back of a full length


magazine, thereby maximising spindle up-time.

For high volume production, however, if space on the shop floor allows, long bar magazines are preferred for feeding stock up to 80 mm diameter. Despite the higher initial cost, long ghost shift and overnight production runs are

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possible, lowering labour cost per part produced. Return on investment can be rapid. A worry may be that large bars are heavy - up to 180 kg - but modern barfeed designs facilitate loading the stock safely.

On a short bar feeder, the guide channel does not support the bars, so the spindle liner must be replaced for each material size.

With a full length bar magazine, the closed guide channels allow machining of a wide range of bar diameters using the same channel. Switching to another configuration takes just a few minutes.

Especially when material below 32 mm diameter is being fed into either fixed-head or sliding-head lathes, longer bar magazines are preferred. When turning diameters between 20 and 32 mm, a 3.7-metre or 4.2 metre bar feeder is the system of choice, as it allows extended periods of unattended running.

Material loss is limited, as the average remnant as a percentage of bar length is proportionally lower than for shorter stock.

For bar in the diameter range 12 to 20 mm, manufacturers sometimes choose a 3.1- or 3.2-metre magazine, as there is less tendency for, say, a 3-metre bar to whip and cause vibration, although this should not be an issue with modern, robustly built magazines.

Although average rest pieces are longer as a percentage of stock length than for a 4-metre bar, smaller diameters mitigate the amount of material loss.

For feeding bar less than 12 mm in diameter, a magazine like the Iemca Elite 220 is often preferred, as it has the ability to be swapped quickly from gravity feed of larger bar to walking-beam advancement of small stock down to 2 mm diameter. The unit features a bar pusher with dual bearings to complement the high performance of Swiss-type machines, with their rapid acceleration and high rotational speeds.

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## Long Bar Magazines

### Advantages

- Runs up to 4.2 m bar – longer unmanned production
- Lower material costs through remnant saving
- Remnant retract – reduces possible damage to machine
- No requirement to prepare material before production
- Bar is supported from front and rear
- Faster payback period
- Guide channel sets cover a range of bar diameters. Less requirement to change over equipment

### Disadvantages

- More floor space required
- Higher initial investment

## Short Bar Magazines

### Advantages

- Smaller footprint
- Basic controls – simple to use
- Lower initial investment

### Disadvantages

- High material costs through need to cut up longer bars – more remnants wasted
- No control of bar
- Remnant pushes through into machine – possible damage
- Liners need to be changed more frequently for individual bar sizes
- Set-up times are longer
- Payback period is longer
- Shorter 'lights-out' production capability

Job set-up values can be stored in a library in the control to be reused for quick changeover when running repeat jobs.

In general, handling very large and very small diameter bars is most difficult and requires investment in the best bar feeders. Stock of medium size can be handled satisfactorily by budget magazines.


When selecting a supplier, factors to take into account should include speed of set-up, reliability in operation, low noise and vibration even when turning hexagonal stock, operator-friendliness, the availability of Industry 4.0-compliant models and a high level of after-sales support.

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