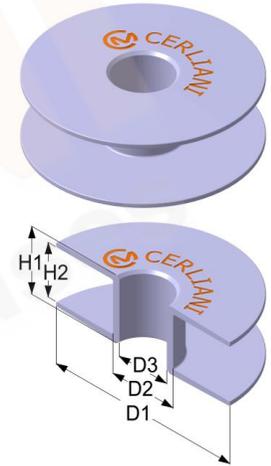


Each hook and each bobbin case can house bobbins only of a well-defined size!

There are, however, many bobbins which are interchangeable between them but of different material (steel, aluminum, polymers) and thus weight, surface finish (gloss or flat), eventual coating (steel bobbins can be burnished or nitrided, those in aluminum can be etched and/or anodized in various colors of which the most common are bronze and gold). In addition, the profiles of the flanges and the stem can differ with the presence of grooves or holes on the flanges. Each bobbin has its advantages and its disadvantages. Here are some examples:

- aluminum bobbins are lighter and less expensive than those of steel, but they last less and can become damaged more easily;
- the presence of holes on the flanges lightens the bobbin, but makes it more expensive and not suitable for use with bobbin braking springs (NBL and MF);
- the bobbin's braking effect through magnets requires the use of steel bobbins;
- thread presence detection systems require bobbins with specific holes on the flanges or reflective diameter of the shaft.

The market carries also prewound bobbins where the thread is wound around a central core (actually a tube) made of plastic or cardboard and very thin cardboard flanges or even without them. These bobbins are discarded once the thread has been used up, but they can hold a greater quantity of thread, both because of their compactness and the reduction of the thickness of the central bobbin shaft and flanges.



There are also "coreless" bobbins on the market. These bobbins are very special, as they are constituted only by prewound thread, turning out to be a compact cylinder of thread where the thread comes out axially from the center, rather than tangentially from the external diameter. These bobbins have the advantage of containing much more thread to equal external dimensions (for both the compactness of the same, and the absence of the traditional bobbin shaft and flanges). However, coreless bobbins require the use of special hooks and bobbin cases: the basket and the bobbin case have not the central shaft and are designed for the thread to exit axially from the bobbin. The thread's axial exiting on such bobbins and the consequent absence of rotation of the bobbin during sewing, also grants an always-constant tension of the bobbin thread during the entire use of the bobbin in the sewing operations. Since the bobbin does not rotate, there is no unwanted unwinding of the thread from the bobbin, due to its inertial rotation, at each fast stop of the sewing operation (a problem that for traditional bobbins requires the use NBL or MF bobbin cases).

As seen, quite a lot of different bobbins are available, but to be used on a hook they must always comply with the designed size of the outer diameter, total height and diameter of the center hole. For this reason, bobbins can be grouped into size families.

Obviously, for each bobbin size family varies the available volume of thread that will be wound onto it!

On the thread volume (expressed in mm<sup>3</sup>) depends the amount of thread (expressed in linear meters) wound on the bobbin, which obviously depends also on the diameter of the thread itself and the compactness with which it is wound, deriving from the tension of the thread during the spooling process. On the amount of spooled thread depends then the autonomy of the sewing machine between one bobbin change and the next. Therefore, the larger the bobbin, the longer the autonomy of the sewing machine! Unfortunately, however, large bobbins require large hooks, with consequent disadvantages in terms of sewing speed (slower) and sewing thread tension (higher). For this reason sewing machines are designed for a specific hook (and thus a certain bobbin size family) and do not use all hooks as large as possible! As always, each application needs the right solution and the right compromise between the various requirements.



The  data sheet of each hook and of each bobbin case shows also the overall dimensions in millimeters ("outside diameter" x "total height") of the relative bobbin size family.

The following table compares the various bobbin size families and as percentages are compared the available bobbin

thread volumes that can be spooled onto them.  manufactures only high-quality and special bobbins and only on request. For this reason, there is always a minimum quantity of 500 pieces and there are normally no bobbins in stock

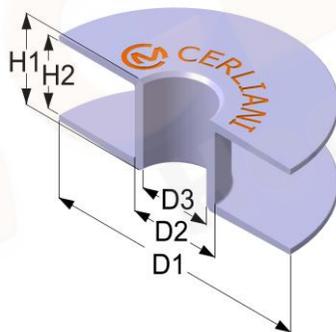
ready for delivery. If you are interested, do not hesitate to contact 's sales department for a customized offer!

# Bobbins

| RING SHUTTLES |         |         |         |         |         |                           |                   |
|---------------|---------|---------|---------|---------|---------|---------------------------|-------------------|
| Bobbin family | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |
| 113.00.0..    | 20.00   | 31.30   | 7.50    | 27.30   | 5.80    | 7,370                     | 100%              |
| 113.00.5..    | 24.40   | 29.00   | 7.50    | 25.60   | 5.80    | 10,839                    | 147%              |

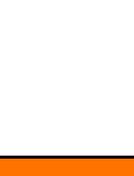
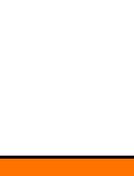
| CB SHUTTLES   |         |         |         |         |         |                           |                   |
|---------------|---------|---------|---------|---------|---------|---------------------------|-------------------|
| Bobbin family | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |
| 116.00.0..    | 20.60   | 11.90   | 8.10    | 9.50    | 6.00    | 2,677                     | 100%              |
| 116.11.0..    | 23.40   | 14.10   | 8.30    | 12.00   | 6.30    | 4,511                     | 169%              |
| 116.11.5..    | 23.60   | 11.70   | 8.00    | 9.30    | 6.30    | 3,601                     | 135%              |

| HORIZONTAL AXIS ROTARY HOOKS |         |         |         |         |         |                           |                   |      |      |
|------------------------------|---------|---------|---------|---------|---------|---------------------------|-------------------|------|------|
| Bobbin family                | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |      |      |
| 131.06...                    | 21.20   | 9.20    | 8.00    | 7.60    | 6.00    | 2,301                     | 100%              |      |      |
| 131.02.4..                   | 21.20   | 9.20    | 9.20    | 7.40    | 6.00    | 2,120                     | 92%               |      |      |
| 131.02.5..                   | 21.75   | 8.90    | 7.60    | 7.50    | 5.80    | 2,446                     | 106%              |      |      |
| 131.03.0..                   | 22.00   | 8.90    | 7.60    | 7.50    | 5.80    | 2,511                     | 109%              |      |      |
| 131.03.5..                   | 22.00   | 12.70   | 8.30    | 11.00   | 5.90    | 3,586                     | 156%              |      |      |
| 131.04.5..                   | 22.00   | 12.80   | 8.00    | 11.40   | 6.00    | 3,760                     | 163%              |      |      |
| 131.24.0..                   | 23.60   | 8.80    | 7.50    | 7.10    | 5.95    | 2,792                     | 121%              |      |      |
| 131.24.5..                   | 24.00   | 12.30   | 8.00    | 10.40   | 5.90    | 4,182                     | 182%              |      |      |
| 131.10.0..                   | 25.80   | 11.00   | 8.00    | 8.70    | 6.00    | 4,111                     | 179%              | 100% |      |
| 131.10.2..                   | 26.00   | 11.20   | 9.50    | 9.00    | 6.00    | 4,140                     | 180%              | 101% |      |
| 131.13.2..                   |         |         |         |         |         |                           |                   |      |      |
| 131.10.3..                   | 25.80   | 11.00   | 8.00    | 9.30    | 6.00    | 4,395                     | 191%              | 107% |      |
| 131.10.5..                   | 30.00   | 11.60   | 9.55    | 9.40    | 7.55    | 5,971                     | 260%              | 145% | 100% |
| 131.10.8..                   | 32.00   | 11.80   | 9.57    | 9.40    | 7.00    | 6,883                     | 299%              | 167% | 115% |
| 131.13.5..                   |         |         |         |         |         |                           |                   |      |      |
| 131.10.520                   | 30.30   | 11.90   |         | 11.90   |         | 8,581                     | 373%              | 209% | 144% |



| Usage   |   |
|---|---|
|  | KK 112.00.025/031 standard ring shuttle |
|   | KK 112.00.050 large ring shuttle        |

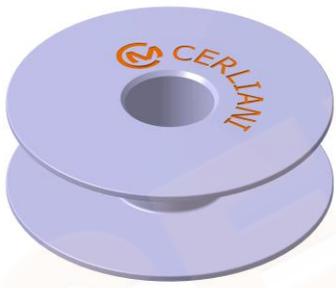
|   |   |
|---|---|
|  | KH 115.00...; KP 115.00... standard shuttle       |
|  | KH 115.10...; KP 115.11... large shuttle          |
|   | KH 115.10.008/009 shuttle for Juki AMS-205 series |

|   |   |
|---|---|
|    | KH 130.01...; KH 130.05...; KP 130.06... standard rotary hook                                 |
|    | KH 130.02...; KP 130.06...406-408 rotary hook for Bernina household machines                  |
|   | KH 130.02.500; KP 130.06.390 rotary hook for PFAFF household machines                         |
|   | KH 130.03-04...; KP 130.06... standard rotary hook for PFAFF machines                         |
|   | KH 130.03.057/070-130.04.075/093; KP 130.06.373 standard rotary hook for PFAFF G-series       |
|   | KH 130.04.029/035/050/055; KP 130.06.264/273/356 "Dickbauch" rotary hook for Durkopp machines |
|  | KH 130.23.000/009/013; KP 130.24.000/005 large rotary hook for PFAFF 418-series               |
|  | KH 130.23.050/052/054; KP 130.24.050 X-large rotary hook for PFAFF 418-G-series               |
|  | KH 130.09...; KP 130.10... large rotary hook "CENTURION"                                      |
|  | KH 130.09...; KP 130.10... large rotary hook "CENTURION" for Durkopp & Pfaff machines         |
|   | KH 130.09.168DC20; KP 130.10.061 large rotary hook "CENTURION" for KSM machines               |
|   | KH 130.09.5...; KP 130.10.5... 3-times large rotary hook                                      |
|   | KH 130.09.8...; KP 130.10.8... 4-times large rotary hook                                      |
|   | KH 130.09.521/534/537/545; KP 130.10.520/535 3-times large rotary hook with Coreless bobbin   |

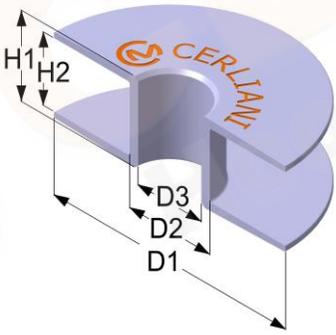
| WHEELER & WILSON TYPE ROTARY HOOKS |         |         |         |         |         |                           |                   |
|------------------------------------|---------|---------|---------|---------|---------|---------------------------|-------------------|
| Bobbin family                      | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |
| 131.14.0..                         | 25.20   | 7.60    | 7.50    | 5.40    | 5.65    | 2,455                     | 100%              |
| 131.14.1..                         | 25.20   | 7.60    | 8,00    | 6.00    | 5.72    | 2,691                     | 110%              |
| 131.14.5..                         | 22.00   | 7.40    | 7.40    | 6.20    | 6.00    | 2,090                     | 85%               |



| VARIOUS HOOKS |         |         |         |         |         |                           |                   |
|---------------|---------|---------|---------|---------|---------|---------------------------|-------------------|
| Bobbin family | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |
| 131.30.10..   | 20.70   | 8.30    | 8.50    | 7.10    | 7.20    | 1,987                     | 100%              |
| 131.30.15..   | 22.00   | 7.45    | 7.60    | 6.00    | 6.00    | 2,009                     | 101%              |
| 131.30.01..   | 33.00   | 12.50   | 9.00    | 10.10   | 7.00    | 7,996                     | 403%              |
| 131.30.05..   | 34.50   | 15.00   | 9.50    | 12.30   | 7.00    | 10,626                    | 535%              |
| 131.30.00..   | 35.50   | 15.00   | 9,00    | 12.00   | 6.55    | 11,114                    | 559%              |



| VERTICAL AXIS ROTARY HOOKS |         |         |         |         |         |                           |                   |      |      |
|----------------------------|---------|---------|---------|---------|---------|---------------------------|-------------------|------|------|
| Bobbin family              | D1 [mm] | H1 [mm] | D2 [mm] | H2 [mm] | D3 [mm] | Volume [mm <sup>3</sup> ] | Volume comparison |      |      |
| 131.08.0..                 | 22.00   | 10.30   | 7.75    | 8.10    | 5.90    | 2,697                     | 100%              |      |      |
| 131.13.1..                 | 22.00   | 10.20   | 7.75    | 8.10    | 6.00    | 2,697                     | 100%              |      |      |
| 131.08.1..                 | 26.00   | 11.20   | 9.50    | 9.00    | 6.00    | 4,140                     | 154%              |      |      |
| 131.11.0..                 | 21.80   | 10.40   | 7.80    | 8.65    | 6.05    | 2,815                     | 104%              |      |      |
| 131.11.2..                 | 21.90   | 10.30   | 7.00    | 8.70    | 6.00    | 2,942                     | 109%              |      |      |
| 131.13.2..                 | 26.00   | 11.20   | 8.00    | 9.40    | 6.00    | 4,518                     | 168%              | 100% |      |
| 131.13.5..                 | 32.00   | 11.80   | 9.572   | 9.40    | 7.00    | 6,883                     | 255%              | 152% |      |
| 131.15.0..                 | 28.00   | 11.70   | 8.05    | 9.20    | 6.10    | 5,197                     | 193%              | 115% | 100% |
| 131.15.5..                 | 28.90   | 12.00   | 7.90    | 9.30    | 6.05    | 5,645                     | 209%              | 125% | 109% |



| Usage   |  |
|---|--|
|  | KH 130.12...; KP 130.14... WW hook for Pfaff machines                |
|   | KH 130.12...; KP 130.14... WW hook for Singer and Japanese machines  |
|   | KH 130.12.500; KP 130.14.500 WW hook for Bernina and Refrey machines |

|   |  |
|---|--|
|  | KH 130.30.101; KP 130.30.120 hook for Baratto machines |
|   | KL 130.30.150/.163/.174 hook for Strobel machines      |
|   | KH 130.30.016; KP 130.30.021 hook for Mammut machines  |
|   | KL 130.30.050 hook for Singer 132K machines            |
|   | KL 130.30.000 hook for Resta machines                  |

|   |   |
|---|---|
|   | KH 130.08...; KP 130.08... standard vertical hook for Pfaff machines  |
|   | KH 130.13.1...; KP 130.13.1... vertical hook for Durkopp 380-series   |
|   | KH 130.08...; KP 130.08... large vertical hook for Pfaff machines   |
|   | KL 130.11... / KH 130.16... / KP 130.17... / KK 130.18... standard vertical hook for Singer and Japanese machines                 |
|   | KL 130.11.170/190 vertical hook for Minerva machines R190; R290   |
|   | KH 130.08...; KP 130.08... large vertical hook for Durkopp series 167; 268; 269   |
|   | KH 130.13.0...; KP 130.13.0... large vertical hook for Durkopp series 491; 294; 295   |
|   | KL 130.13.2...; 130.13.3... large vertical hook for Durkopp series 467; 667   |
|   | KL 130.13.5... X-large vertical hook for Durkopp series 767; 867  |
|  | KL 130.15... / KH 130.19... / KP 130.20... / KK 130.21... large vertical hook for Singer and Japanese machines                    |
|   | KL 130.15.050/061. / KH 130.19.035/040 / KP 130.20.020 / KK 130.21.035/040 X-large vertical hook for Singer and Japanese machines |