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# BEND GUIDELINE

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**VERSION : 2016-07-19**

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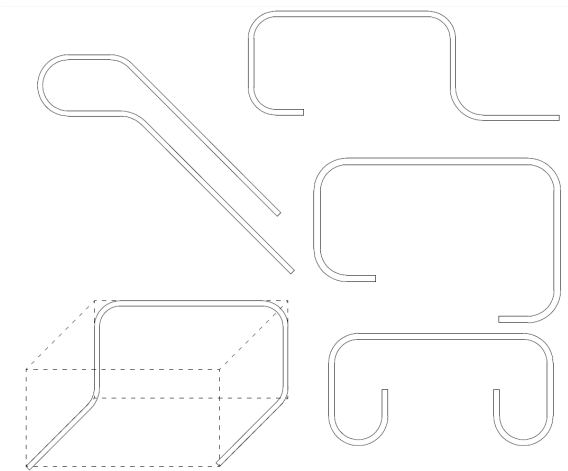
## About this guideline

This document has been prepared to serve as a general reference guide when detailing/designing a concrete structure reinforced with V-ROD. The following pages show some examples of simple and complex shapes (and their dimensions limitations) that can be fabricated in piece.

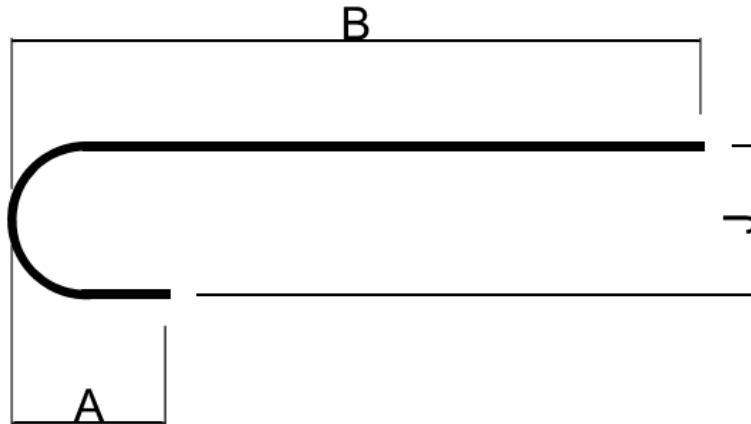
Some general limitations inherent to the technology itself are applicable to the fabrication of bent bars and these are:

- Parts must always keep the same direction (clockwise to counter-clockwise is impossible).
- 3D parts are impossible to fabricate.

To illustrate these limitations, here are a few images of shapes that can't be made in a single piece.



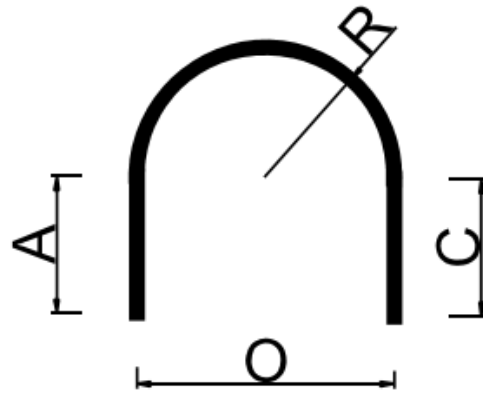
However, these shapes could be obtained by lapping different pieces together. Therefore, even if your piece cannot be made in one piece, do not hesitate to send a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com). Our engineering team will be able to recommend you an assembly that will meet the requirements of the engineering standard in force (such as CAN/CSA S806-10 and ACI 440.1R-15) as well as your own requirements.



**Type 01**

#	DIA (mm)	A & B MAX (mm)	J (mm)
#2	6.4	2524	95
#3	9.5	2524	95
#4	12.7	2556	127
#5	15.9	2587	159
#6	19.0	2619	191
#7	22.2	2619	254
#8	25.4	2683	254

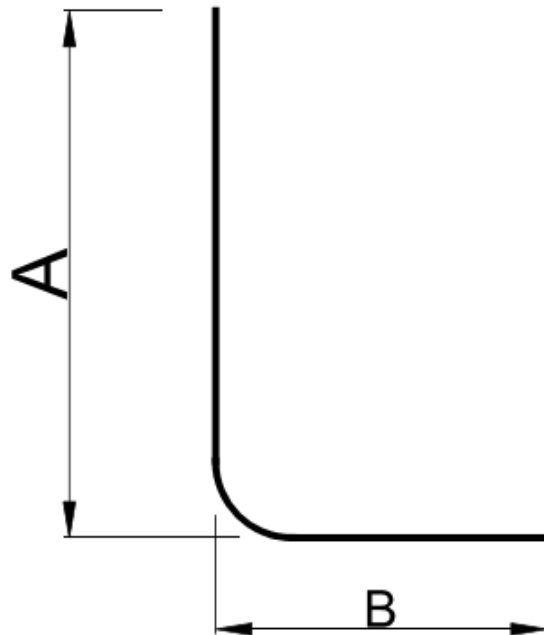
*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*



**Type 10**

		A & C	O	R
#	DIA (mm)	MAX (mm)	(mm)	EXT (mm)
#2	6.4	2524	95	48.6
#3	9.5	2524	95	48.6
#4	12.7	2556	127	63.5
#5	15.9	2587	159	79.4
#6	19.0	2619	191	95.3
#7	22.2	2619	254	127
#8	25.4	2683	254	127

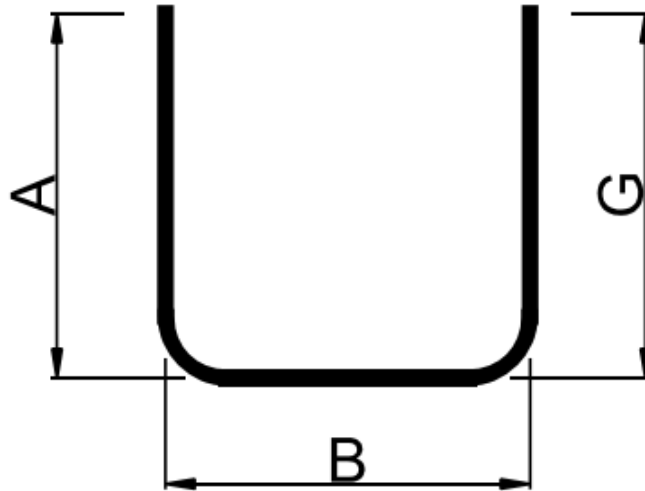
*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*



**Type 02**

		A	B
#	DIA (mm)	MAX (mm)	MAX (mm)
#2	6.4	1876	1746
#3	9.5	1876	1746
#4	12.7	1908	1778
#5	15.9	1940	1810
#6	19.0	1972	1842
#7	22.2	1972	1842
#8	25.4	2035	1905

*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*



**Type 02**

**Table 1**

		A & G	B	
#	DIA (mm)	MAX (mm)	MIN (mm)	MAX (mm)
#2	6.4	1746	225	1876
#3	9.5	1746	225	1876
#4	12.7	1778	257	1908
#5	15.9	1810	289	1940
#6	19.0	1842	321	1972
#7	22.2	1842	321	1972
#8	25.4	1905	284	2035

If the “A” or “G” dimension exceed the maximum dimension shown in **table 1**, maximum and minimum dimensions need to be modified as per **table 2**



Table 2

		A & G	B	
#	DIA (mm)	MAX (mm)	MIN (mm)	MAX (mm)
#2	6.4	1876	470	1746
#3	9.5	1876	470	1746
#4	12.7	1908	502	1778
#5	15.9	1940	533	1810
#6	19.0	1972	565	1842
#7	22.2	1972	565	1842
#8	25.4	2035	629	1905

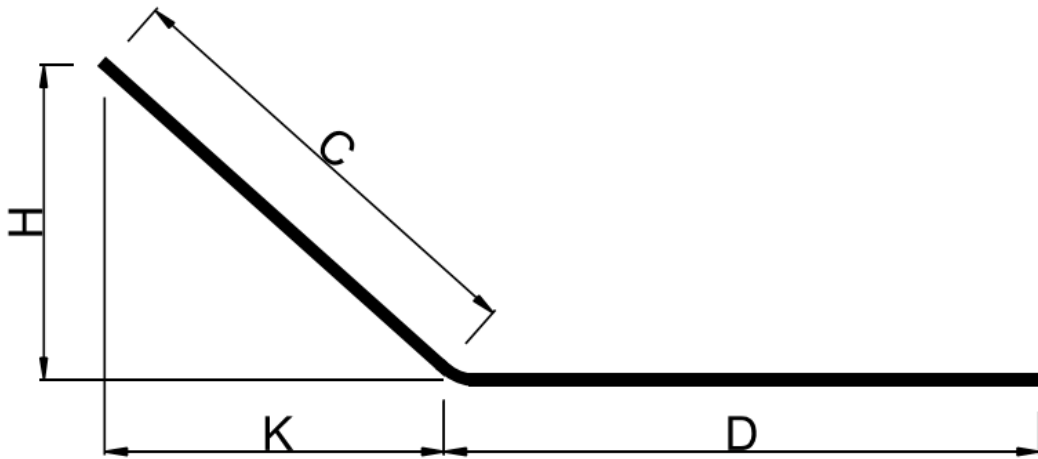
If the “B” dimension is smaller than the minimum dimension shown in **table 1**, maximum dimensions for “A” and “G” need to be modified as per **table 3**

Table 3

		A & G	B	
#	DIA (mm)	MAX (mm)	MIN (mm)	MAX (mm)
#2	6.4	1063	133	225
#3	9.5	1063	133	225
#4	12.7	1095	165	257
#5	15.9	1127	197	289
#6	19.0	1159	229	321
#7	22.2	1222	229	321
#8	25.4	1222	292	284

*Other combinations of “A”, “B” and “G” may be possible. Bigger shapes may be available upon request.*

*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*



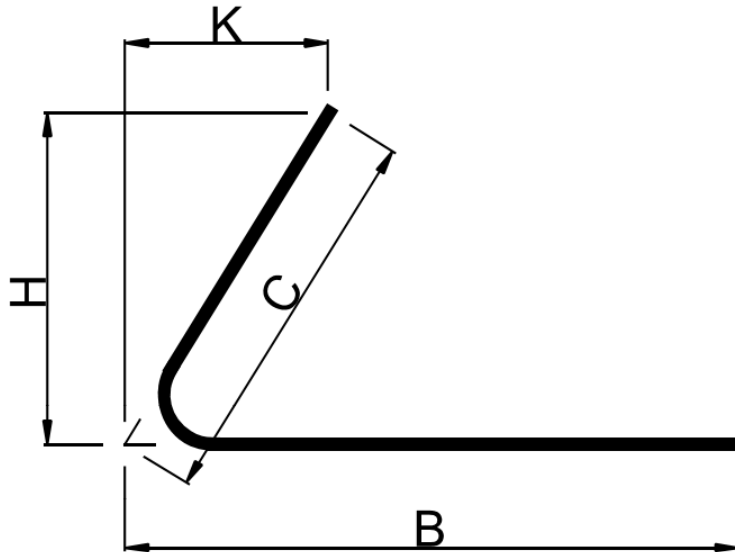
### Type 03

		D + K	H
#	DIA (mm)	MAX (mm)	MAX (mm)
#2	6.4	1876	1746
#3	9.5	1876	1746
#4	12.7	1908	1778
#5	15.9	1940	1810
#6	19.0	1972	1842
#7	22.2	1972	1842
#8	25.4	2035	1905

*Bigger shapes may be available upon request.*

*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*

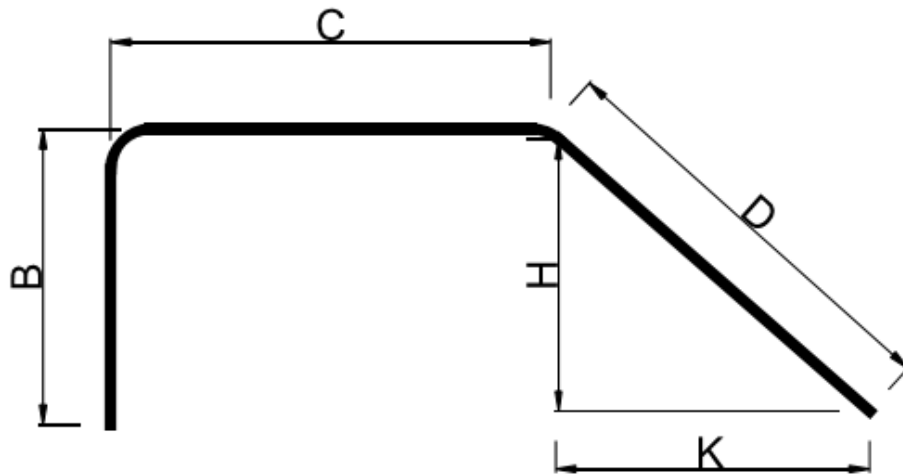




**Type 35**

		K & B	H
#	DIA (mm)	MAX (mm)	MAX (mm)
#2	6.4	1876	1746
#3	9.5	1876	1746
#4	12.7	1908	1778
#5	15.9	1940	1810
#6	19.0	1972	1842
#7	22.2	1972	1842
#8	25.4	2035	1905

*In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*

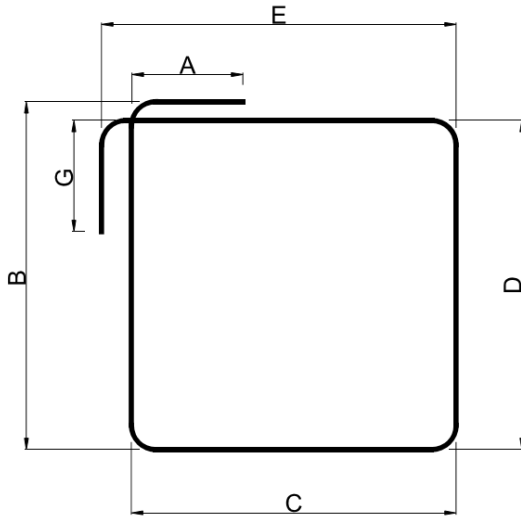


**Type 12**

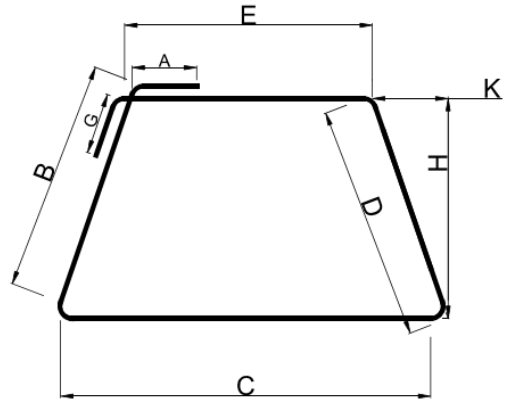
#	DIA (mm)	C + K		C	K	B	H
		MIN (mm)	MAX (mm)	MAX (mm)	MAX (mm)	MAX (mm)	MAX (mm)
#2	6.4	482	1978	1876	925	1746	873
#3	9.5	482	1978	1876	925	1746	873
#4	12.7	5140	2009	1908	925	1778	889
#5	15.9	546	2041	1940	925	1810	905
#6	19.0	578	2073	1972	925	1842	921
#7	22.2	578	2073	1972	925	1842	921
#8	25.4	591	2136	2035	925	1905	952

*Other combinations may be possible. Bigger shapes may be available upon request.*

*If the dimensions of your bent bar doesn't fit in the previous table, please check with Pultrall by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com).*



**Type T02**



**Type T14**

**Table 4**

#	DIA (mm)	B & D		C&E	
		MIN (mm)	MAX (mm)	MIN (mm)	MAX (mm)
#2	6.4	225	1876	470	1746
#3	9.5	225	1876	470	1746
#4	12.7	257	1908	502	1778
#5	15.9	289	1940	533	1810
#6	19.0	321	1972	565	1842
#7	22.2	321	1972	629	1842
#8	25.4	384	2035	629	1905

If the “D” or “B” dimension is smaller than the minimum dimension shown in **table 1**, maximum dimensions need to be modified as per **table 2**



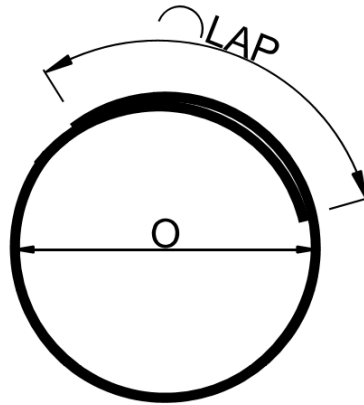
Table 2

#	DIA (mm)	B & D		C&E	
		MIN (mm)	MAX (mm)	MIN (mm)	MAX (mm)
#2	6.4	124	1063	133	470
#3	9.5	124	1063	133	470
#4	12.7	156	1095	165	502
#5	15.9	187	1127	197	533
#6	19.0	219	1159	229	565
#7	22.2	283	1222	229	629
#8	25.4	283	1222	292	629

*In order to minimize the cost of per piece of stirrups, we recommend, if possible, that “A” be half of the “E” dimension and “G” be half of the “B” dimension*

*Other combinations may be possible. Bigger shapes may be available upon request.*

*If the dimensions of your bent bar doesn't fit in the previous tables, please check with Pultrall by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com).*

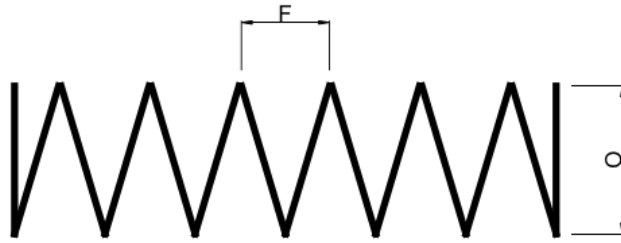


### Type T03

We currently are able to produce circular stirrups with an internal diameter “O” equal to one of the following dimensions:

O (mm)		
150	160	185
205	225	230
245	250	285
290	304.8	420
460	560	680
965	1070	1225
1320		

*It is possible to fabricate circular stirrups with other “O” dimensions than the one shown in the previous table. However, a surcharge will be applicable. In case of doubt about the possibility of fabricating the desired bend, please inquiry by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com)*



### Type SP1

We currently are able to produce spirals with an internal diameter "O" equal to one of the following dimensions:

O (mm)		
150	160	185
205	225	230
245	250	285
290	304.8	420
460	560	680
965	1070	1225
1320		

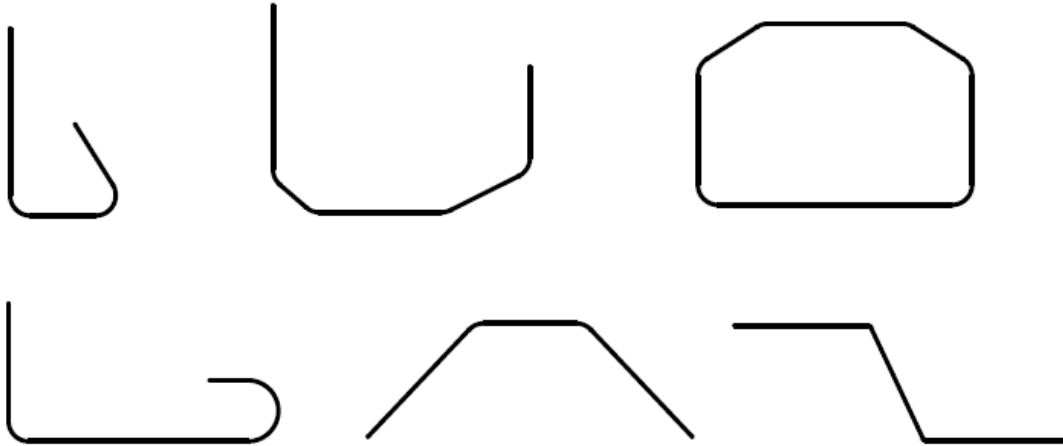
*It is possible to fabricate circular stirrups with other "O" dimensions than the one shown in the previous table. However, a surcharge will be applicable.*

*All our spirals are produced as a "slinky" and need to be stretched to the required pitch "F". Maximum pitch "F" depends on the spiral dimensions and diameter.*

*Tapered spirals are also available upon request. The "shape" of the spiral can also "squared" instead "circular".*

*Please, ALWAYS send a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com) for any spirals request.*

**OTHER SHAPES ARE AVAILABLE UPON REQUEST:**



*Please check with Pultrall by sending a sketch along with dimensions and required quantities at [service@pultrall.com](mailto:service@pultrall.com).*