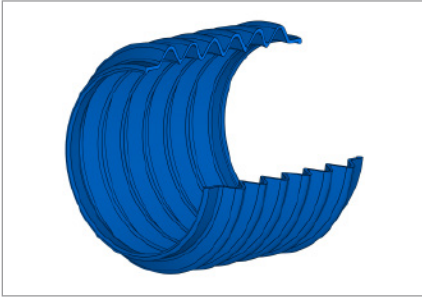


MULTIPLE CONVOLUTION BELLOWS



PRODUCT DESCRIPTION

Bellows are protective elements comprising a moving section and two connection pieces for fastening. They protect axially moving rods and parts of machines against soiling, water spray, dust or the effects of the weather. Depending on their design, they can accommodate movements perpendicular to the axis or a combination of movements (e.g. gear levers).

Bellows are able to follow axial movements within their limits L_{\min} (compressed length) and L_{\max} (extended length). Special loads (non-axial movements, pressure loads etc.) affect the maximum working stroke and the flexibility → Technical Manual.

PRODUCT ADVANTAGES

Depending on the application, bellows and connecting areas can have very different geometrical shapes and dimensions. More than 500 different bellows geometries are available to the user quickly and cost-effectively.

APPLICATION

There are many application cases for bellows, for example, the functional sealing of ball joints, connection of two tube ends, push rods (e.g. in hydraulic and pneumatic applications), axle bearings.

MATERIAL

Material	Hardness
CR	42/50 Shore A
NBR	approx. 45 Shore A

Other materials on enquiry (after clarification of the material-job specification and the type).

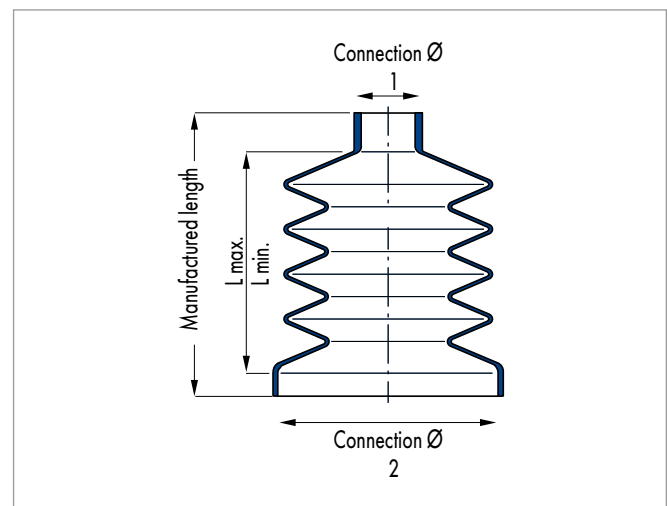
OPERATING CONDITIONS

Material	Temperature	Dynamic loading	Mineral oil and grease resistance
CR	-40 ... +100 °C	very good	sufficient
NBR	-30 ... +100 °C	sufficient	good

The values listed in the table are recommended values.
→ Technical Manual.

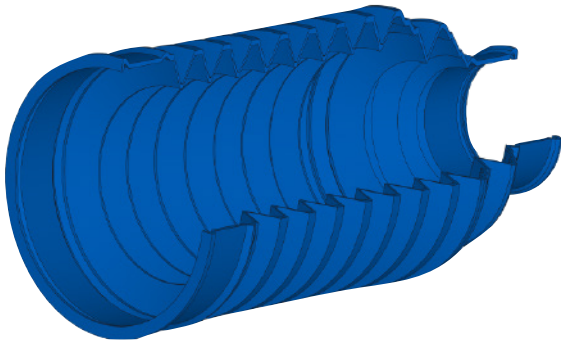
FITTING & INSTALLATION

The moving section of the bellows must not come into contact with any sharp edges. It is imperative that continuous chaffing against moving parts of the machine is avoided. Bellows are not able to absorb major excess pressure or vacuum, as otherwise excessive deformation would occur. To prevent a pressure build-up inside bellows on axial movements, a sufficient ventilation must be provided. Torsional loading of the bellows should be avoided. For further information on installation: → Technical Manual.



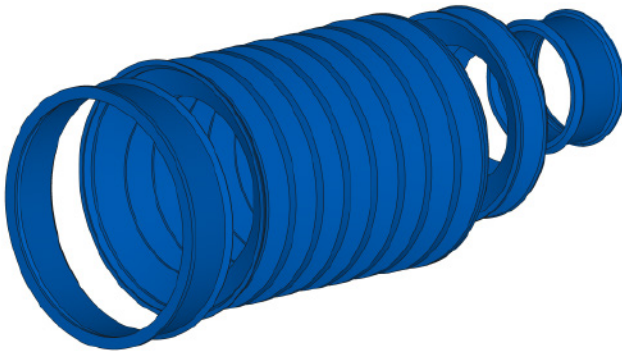
Drawing with dimensions multiple convolution bellows

MODULAR TPE BELLOWS



PRODUCT DESCRIPTION

Modular TPE bellows constitute one part of the FST catalog portfolio. These are multi-convolution bellows made of thermoplastic elastomer, which are constructed according to the toolbox principle. The bellows can be varied in the manufacturing length (85 to 200 mm), the outside diameters (in gradations of Ø50, Ø63, Ø80, Ø100 and Ø125) and the connection areas by using different mold inserts and can thus be adapted precisely to the customer's application. Deviating manufacturing lengths and finer gradations of the outside diameters are possible on request.



Example illustration of a modular TPE bellows

PRODUCT ADVANTAGES

The customer is given the opportunity to create the desired bellows that fit precisely by choosing the right dimensions with our modular tool concept. Connections, convolution area and length are individually selectable, enabling a wide range of applications.

The depth and width of the convolutions and the connection areas are designed by Freudenberg depending on the customer's specifications for the application.

Due to the modular tool concept, different solutions can be realized and allow cost savings for follow-up projects of the customer.

The technical advantages of TPE compared to elastomer bellows lie primarily in its increased service life and ozone resistance.

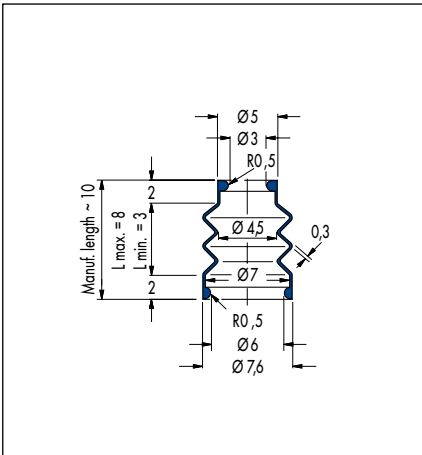
APPLICATION

- cardan joints
- piston rods
- joy sticks
- connection of pipe ends to compensate for backlash
- overrun brakes of trailers

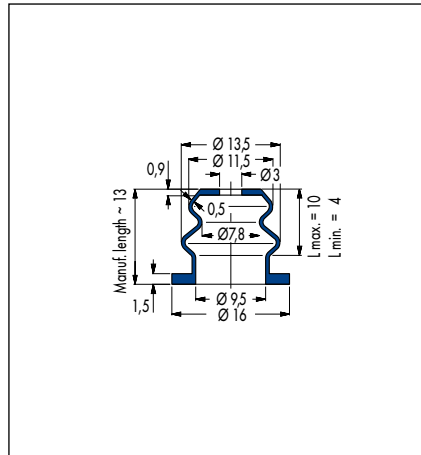
MATERIAL

Material	Temperature	Ozone resistance	Chemical resistance
Thermoplastic elastomer (TPE)	-40 ... +120 °C	high	as usual for polyolefins/thermo-plastics

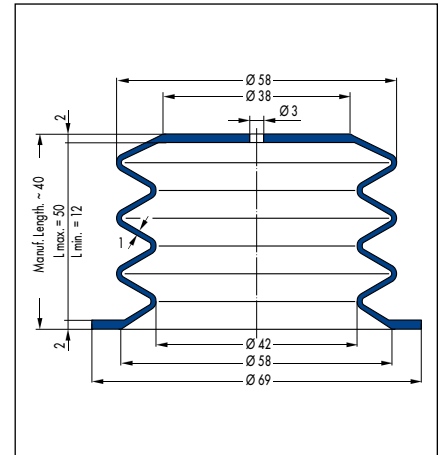
The values listed in the table are approximate values. For more information please refer to the FST technical manual.



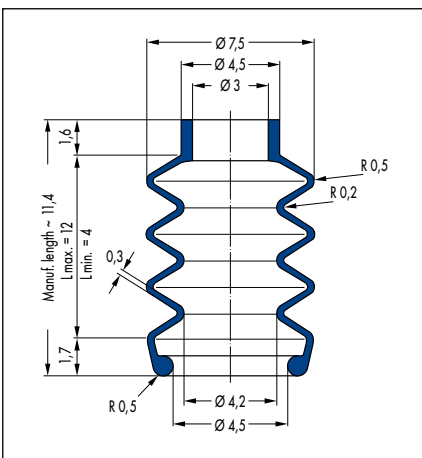
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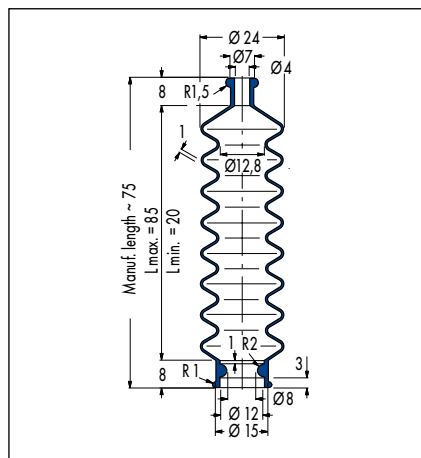
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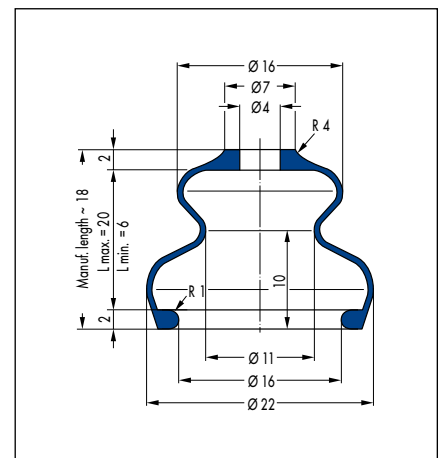
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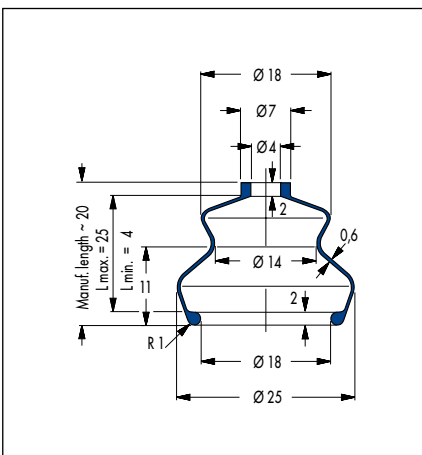
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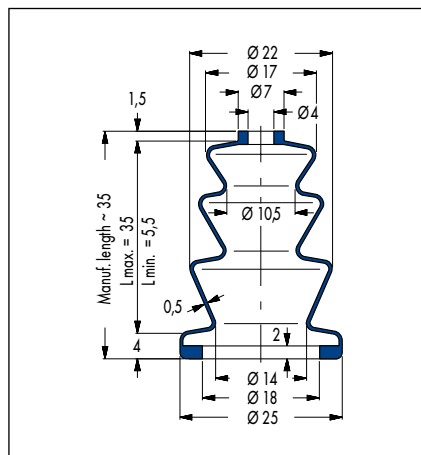
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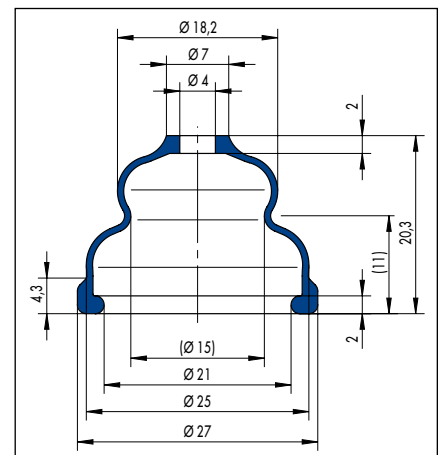
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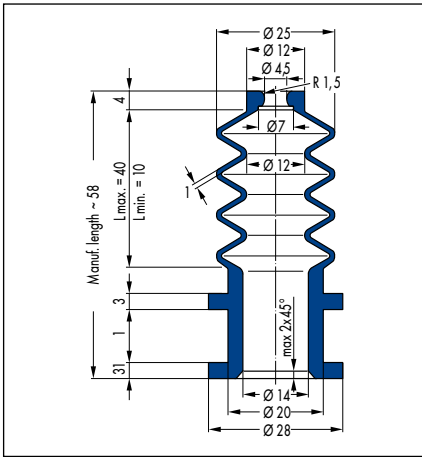
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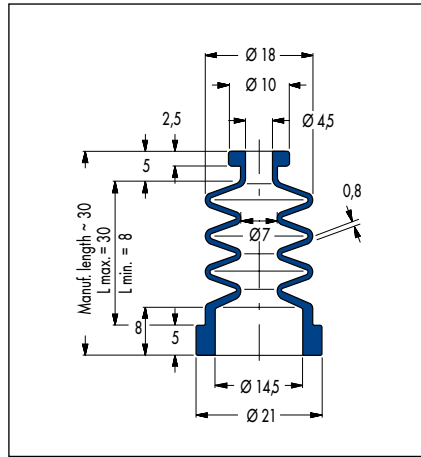
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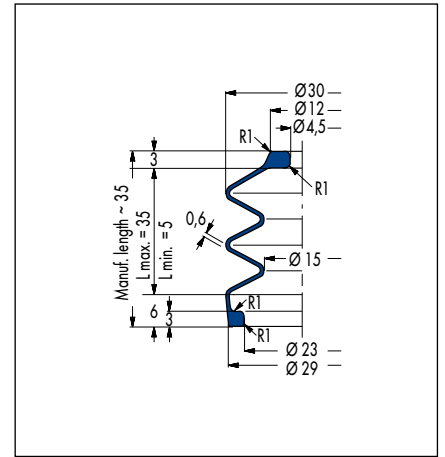
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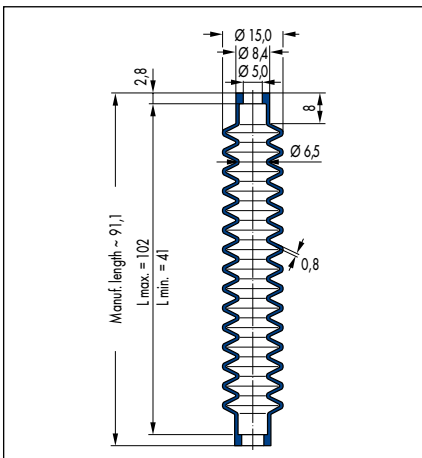
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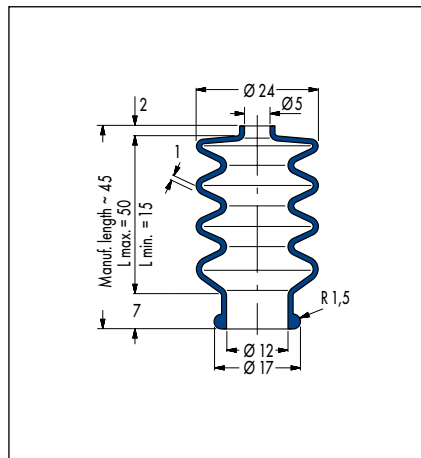
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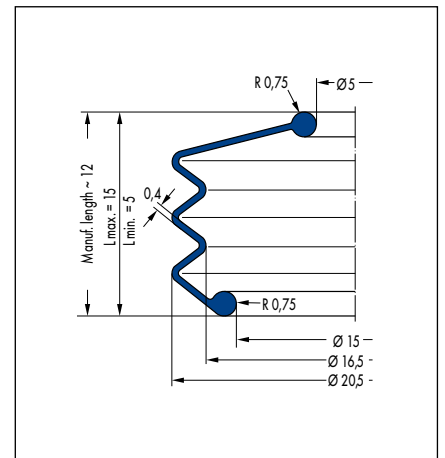
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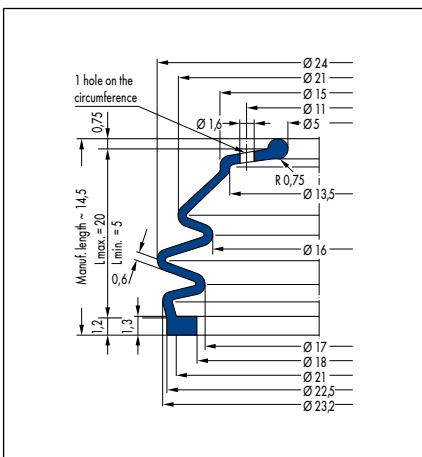
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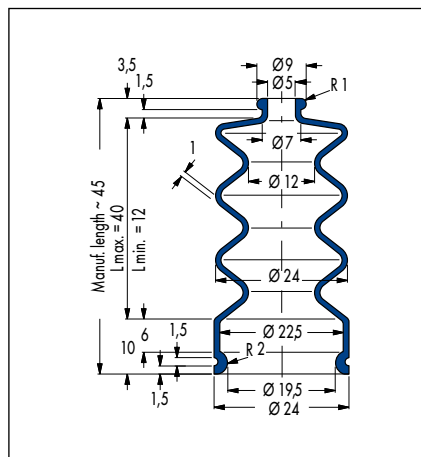
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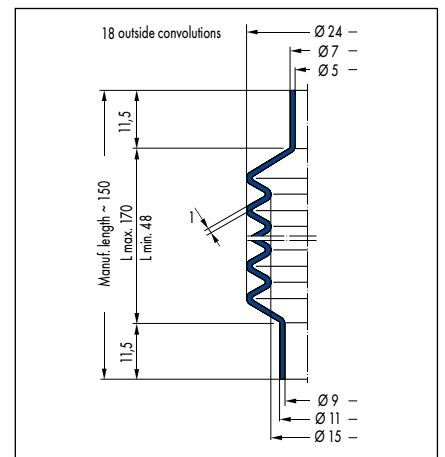
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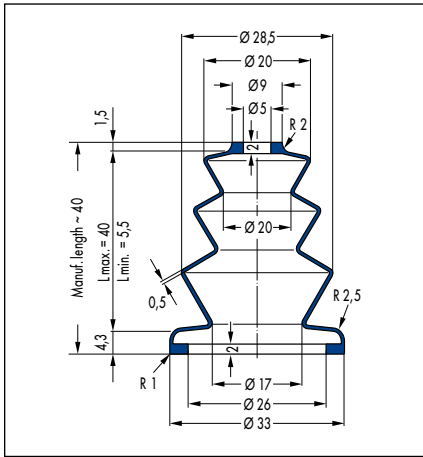
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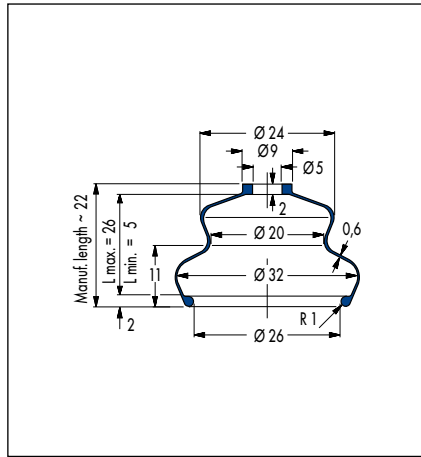
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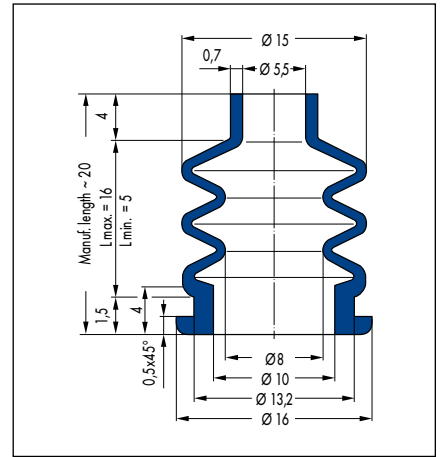
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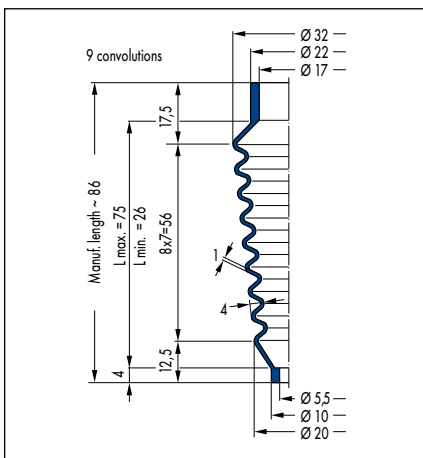
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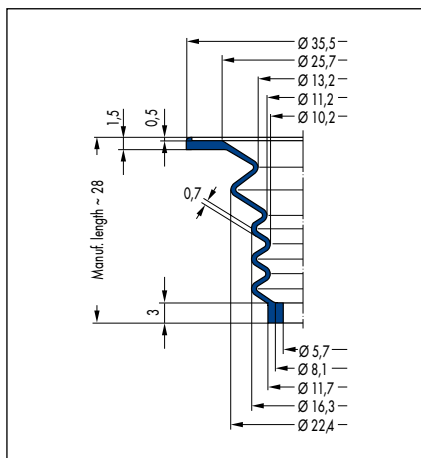
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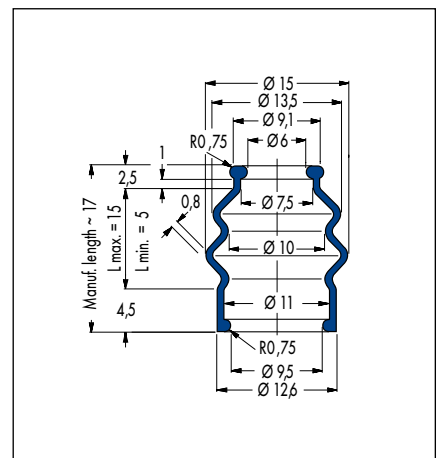
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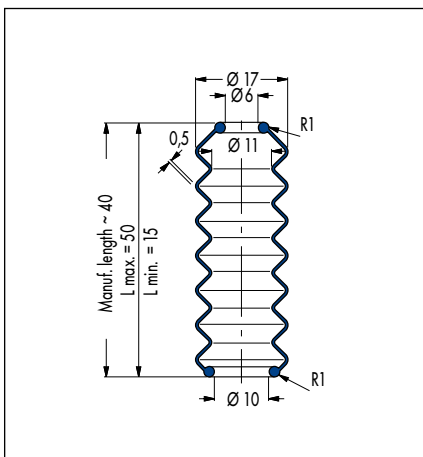
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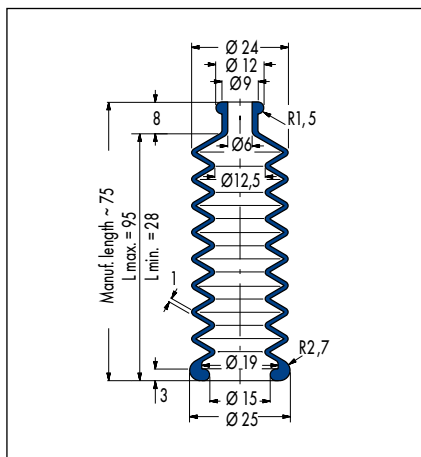
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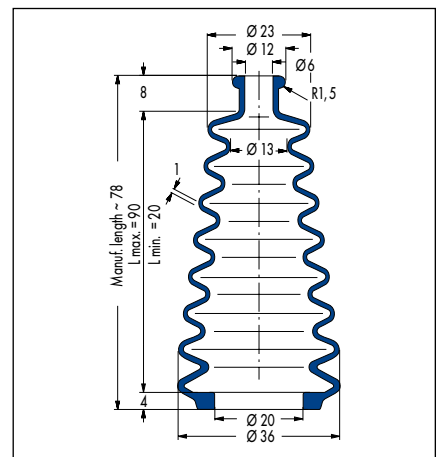
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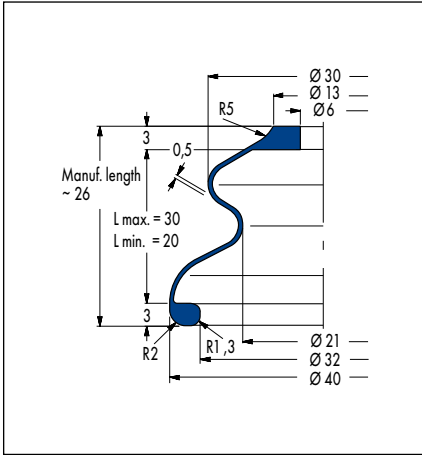
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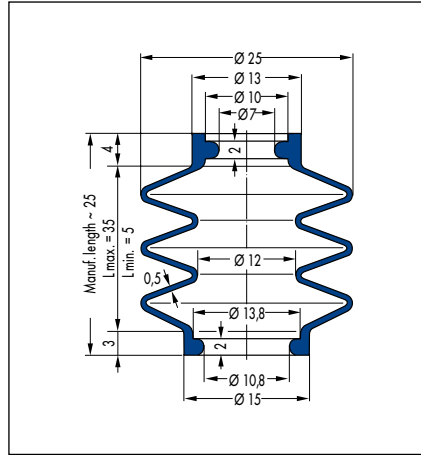
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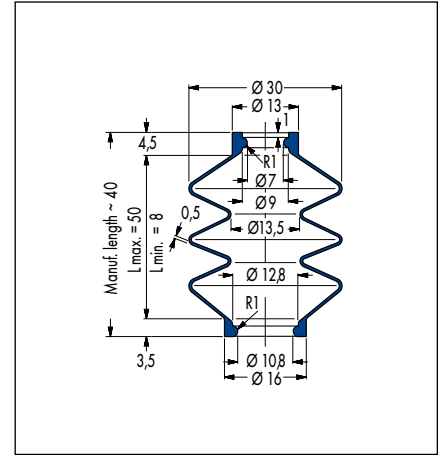
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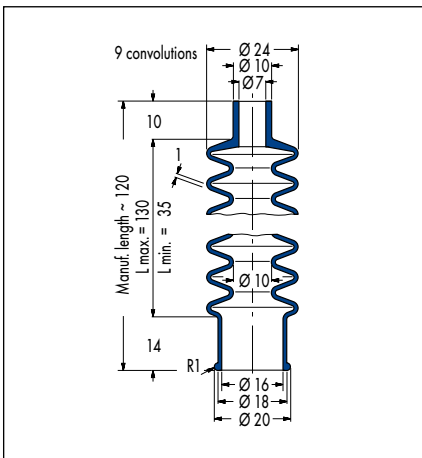
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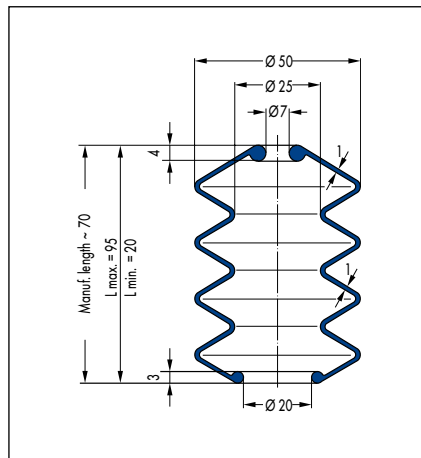
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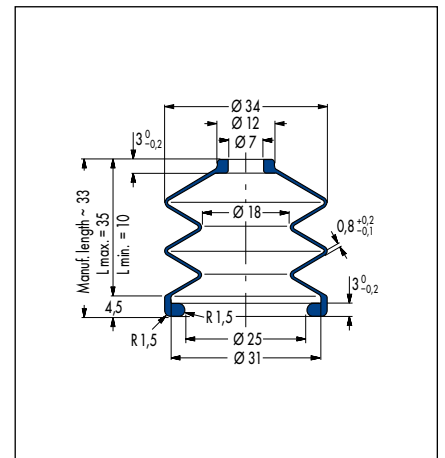
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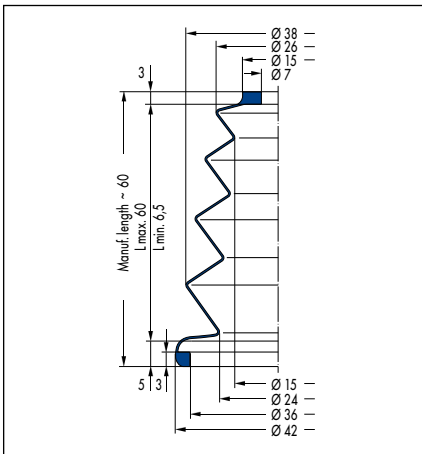
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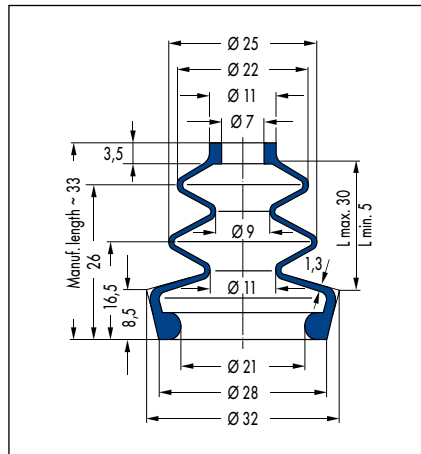
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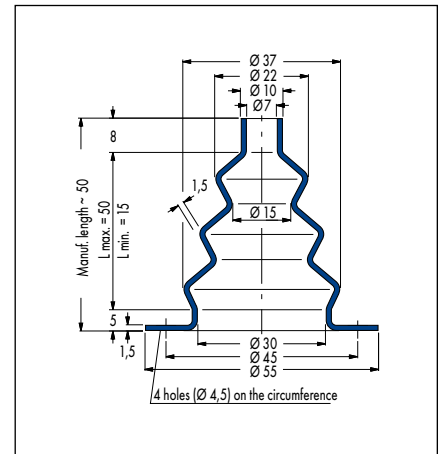
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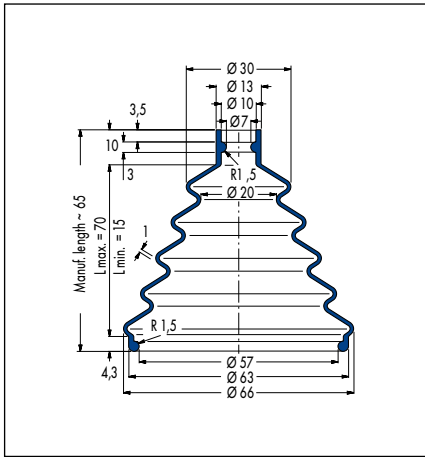
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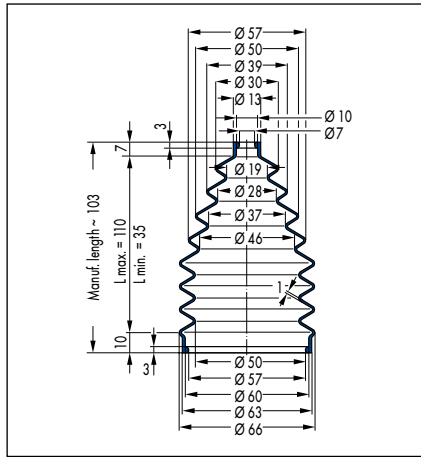
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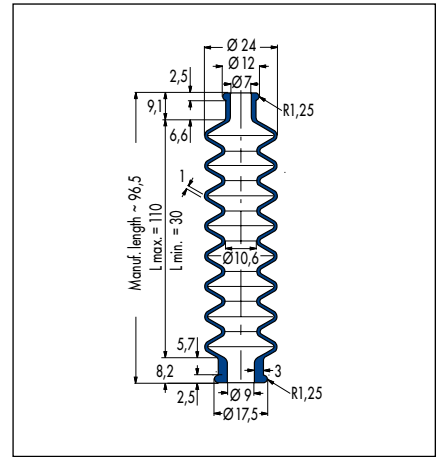
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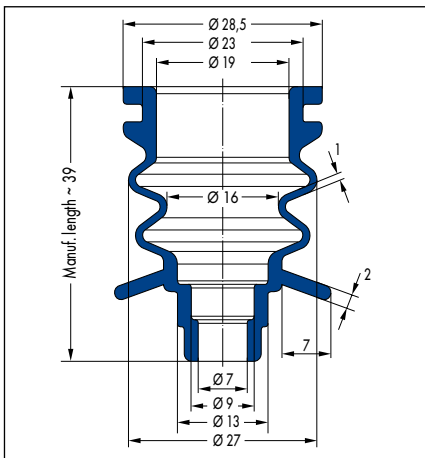
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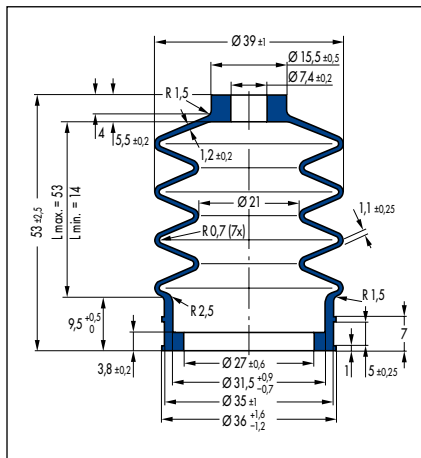
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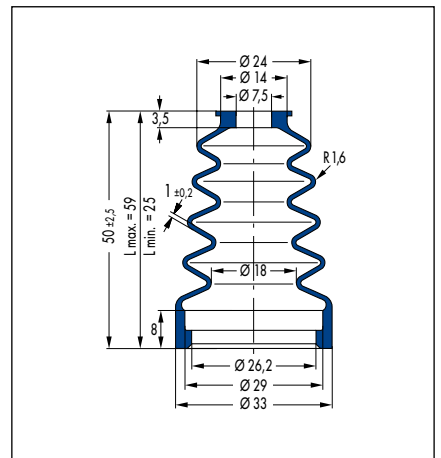
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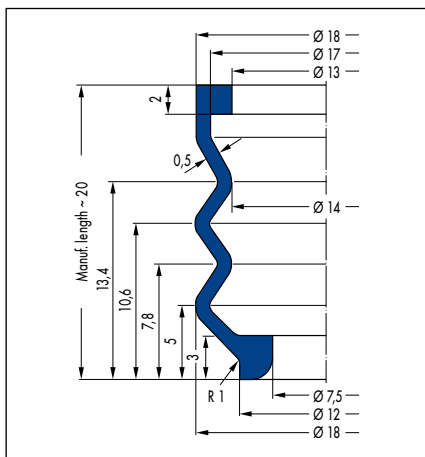
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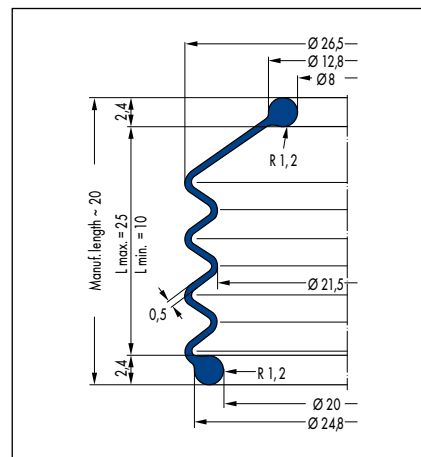
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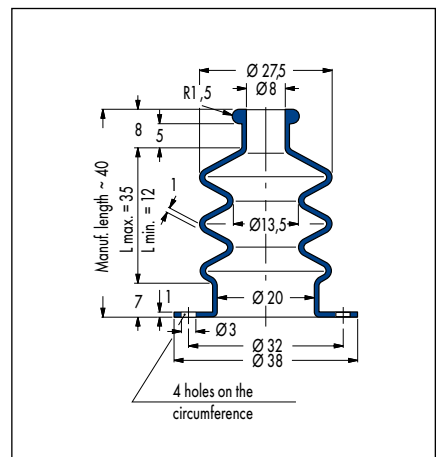
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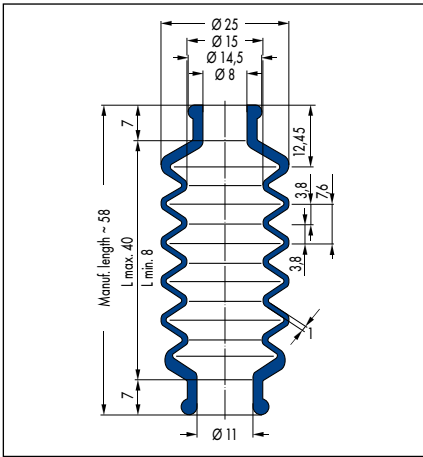
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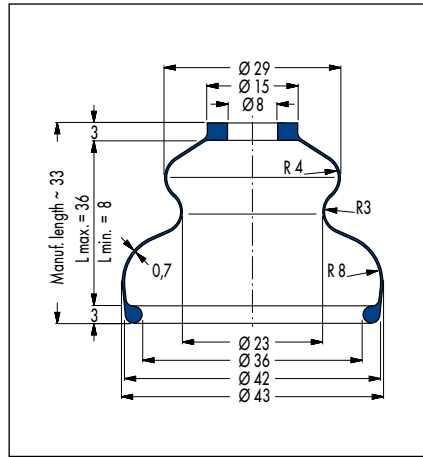
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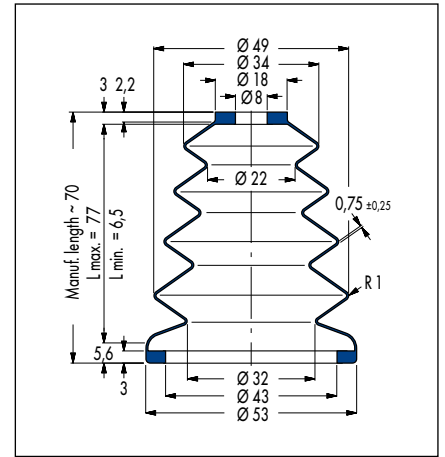
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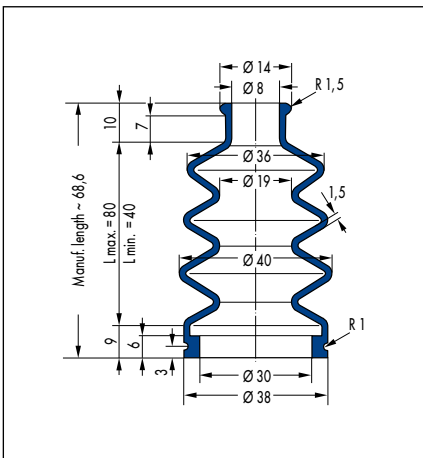
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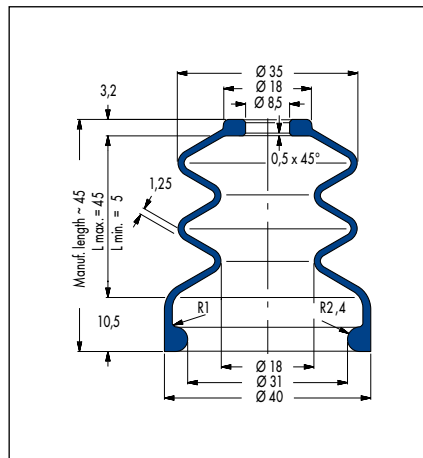
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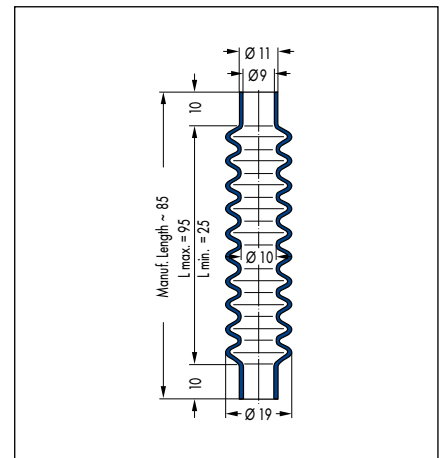
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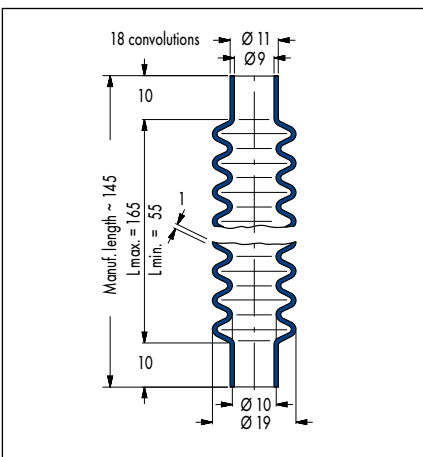
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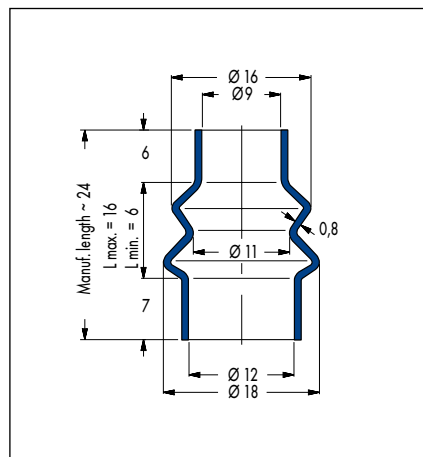
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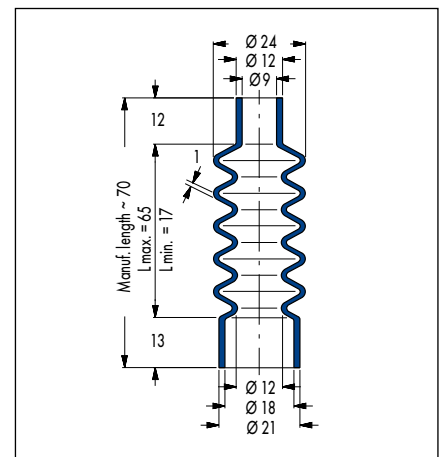
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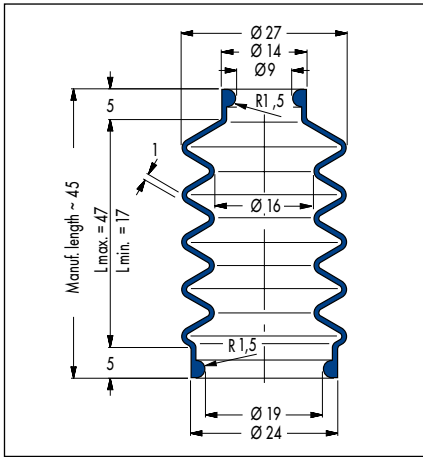
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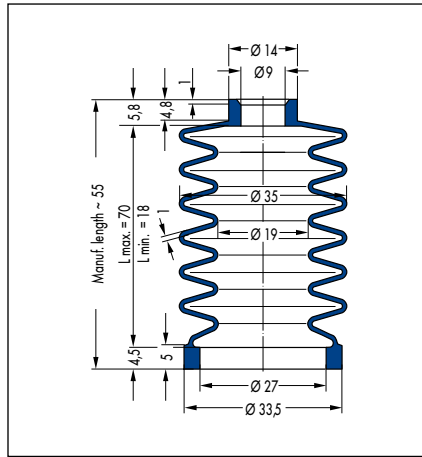
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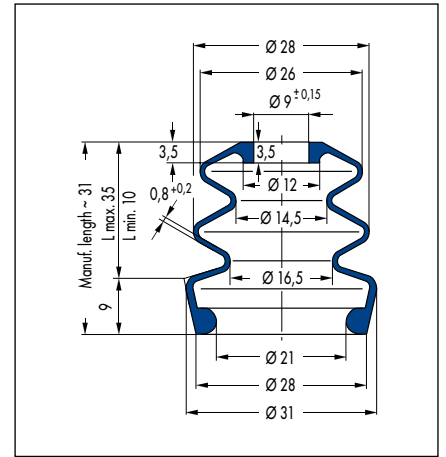
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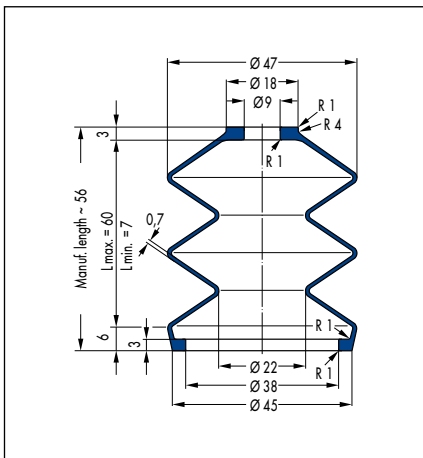
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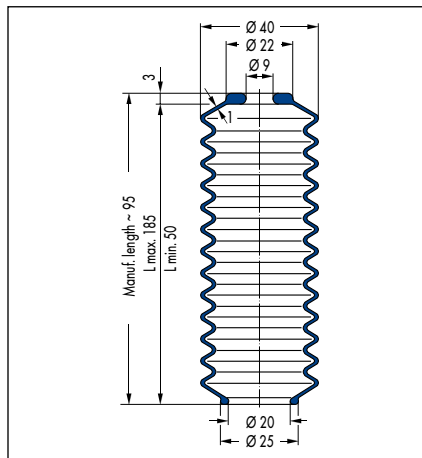
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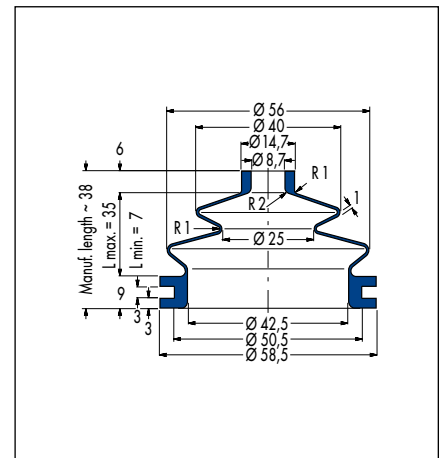
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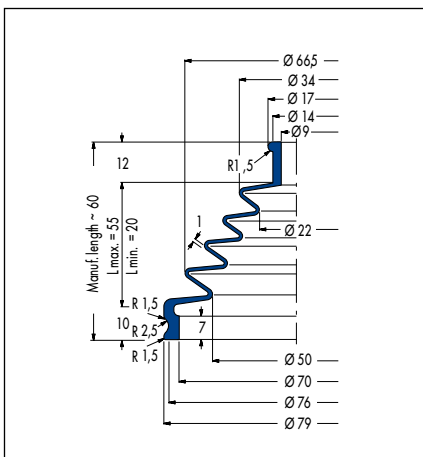
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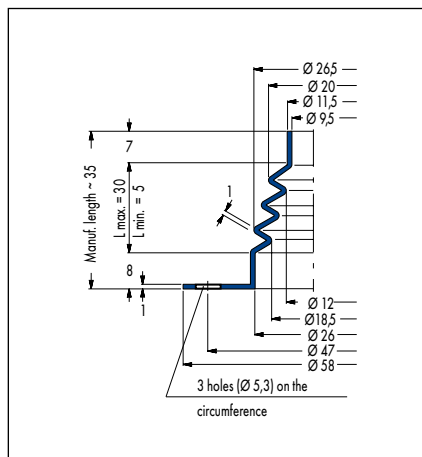
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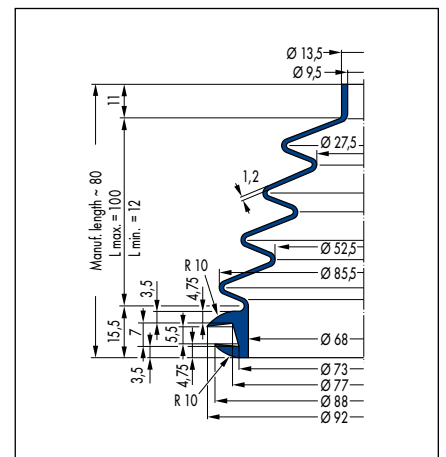
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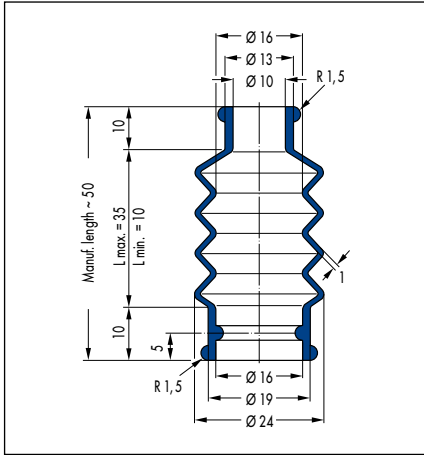
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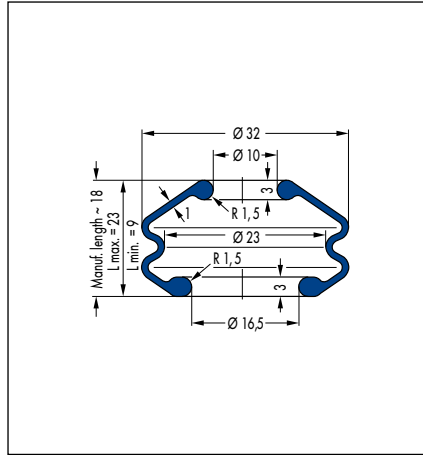
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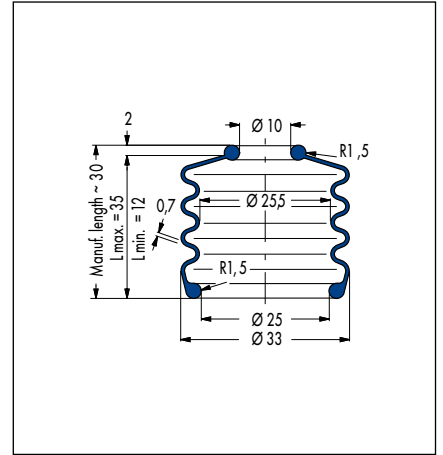
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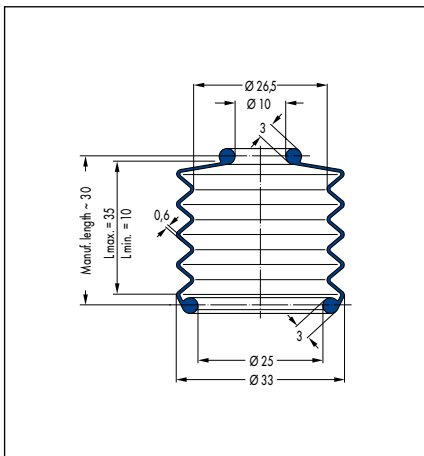
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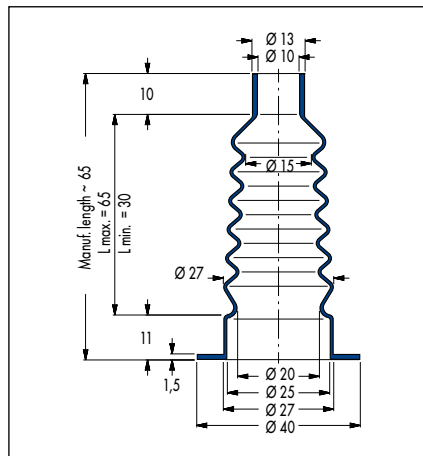
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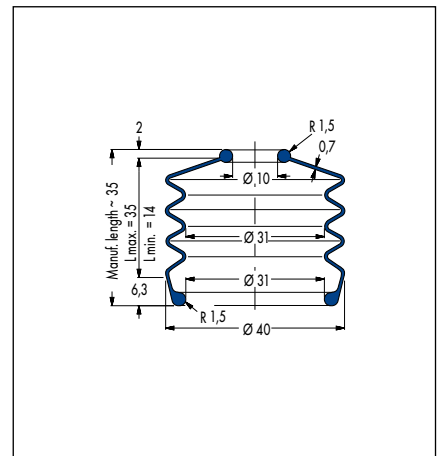
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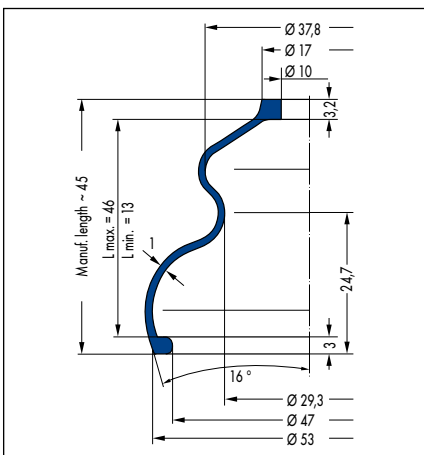
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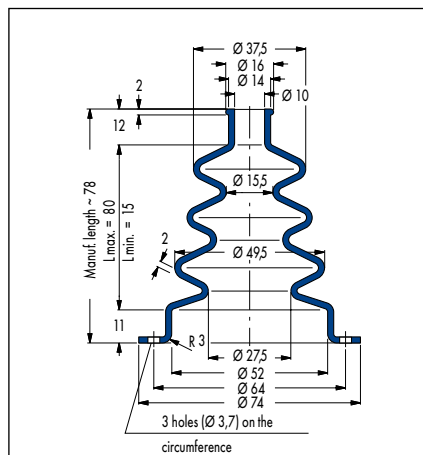
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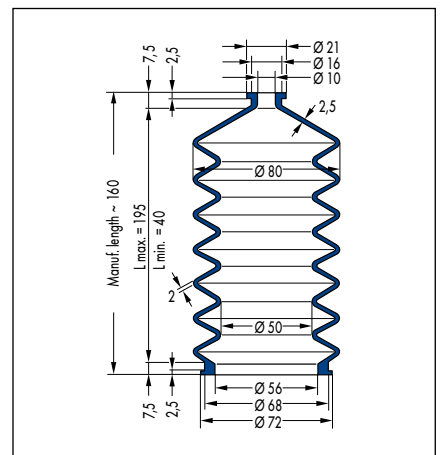
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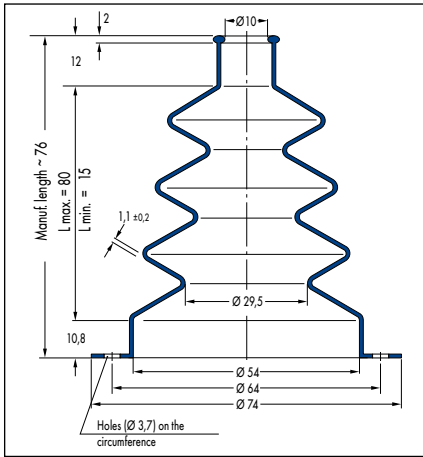
V6-00945, Article No. 413



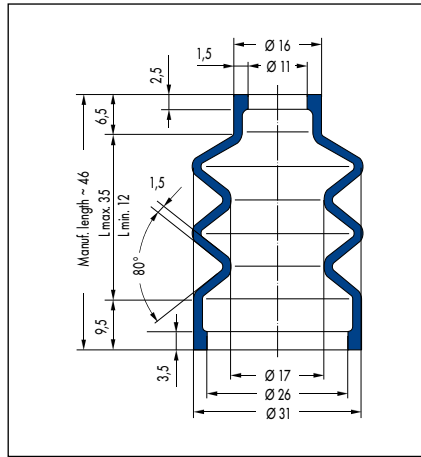
V6-01348, Article No. 429741 (50 CR 879)/
430248 (42 CR 764)



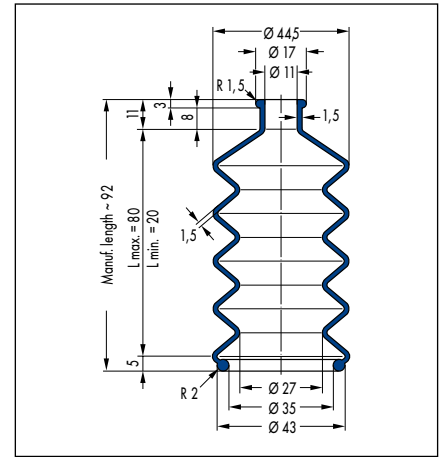
V6-00741, Article No. 456488



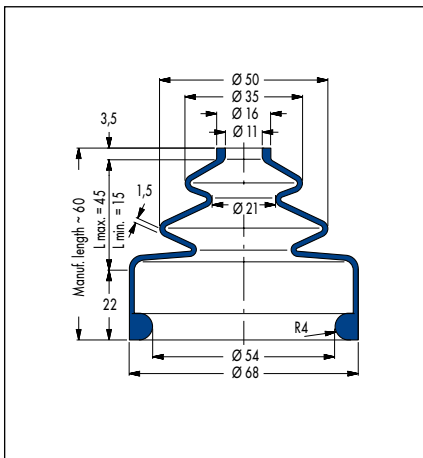
V6-20024, Article No. 49332671



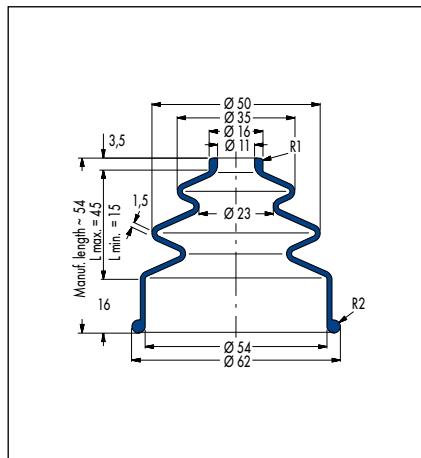
V6-00833, Article No. 400864



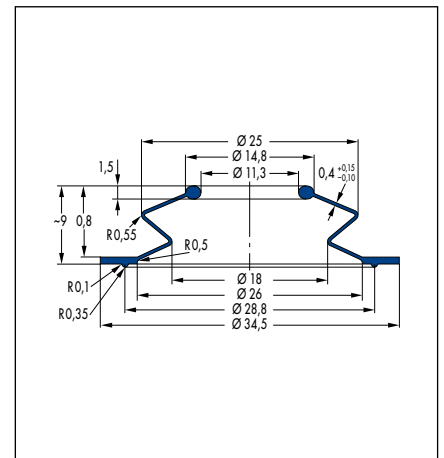
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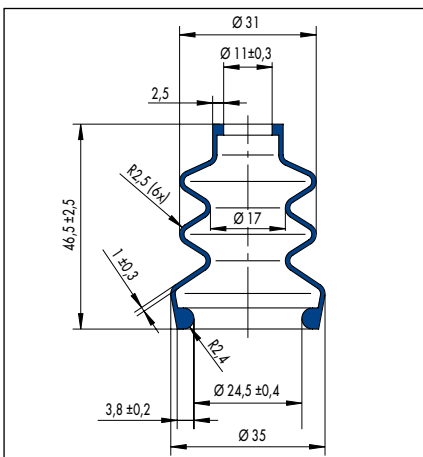
V6-00111, Article No. 434031



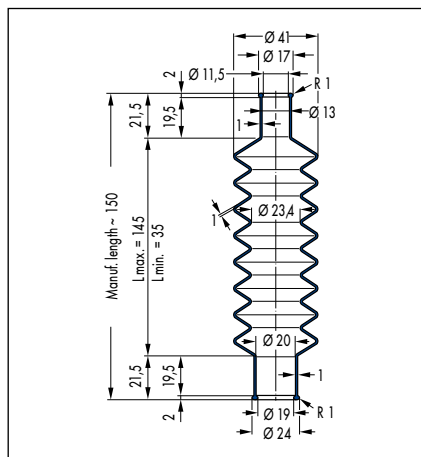
V6-00320, Article No. 440257



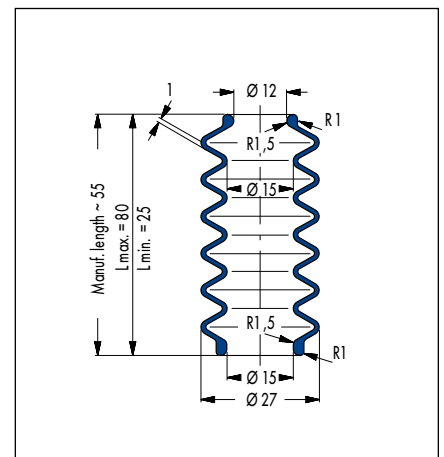
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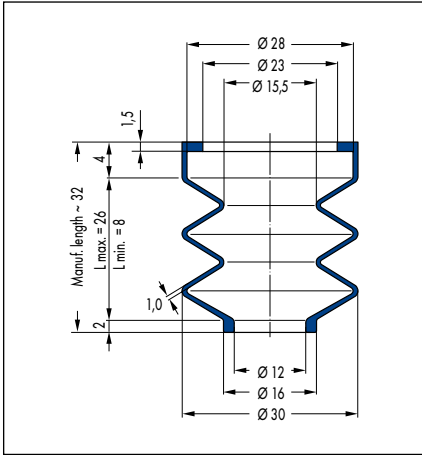
V6-01303, Article No. 49469788



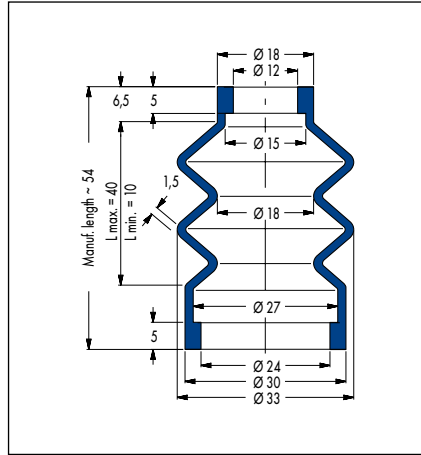
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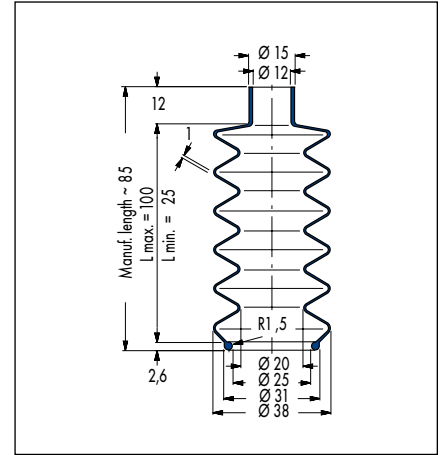
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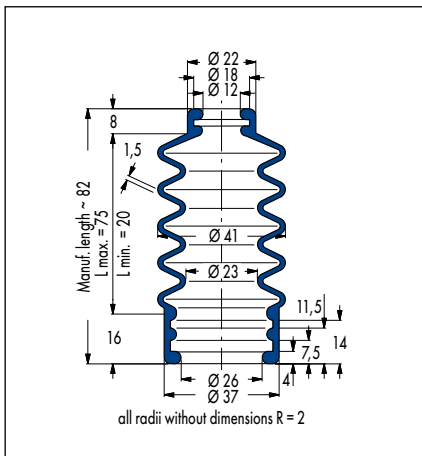
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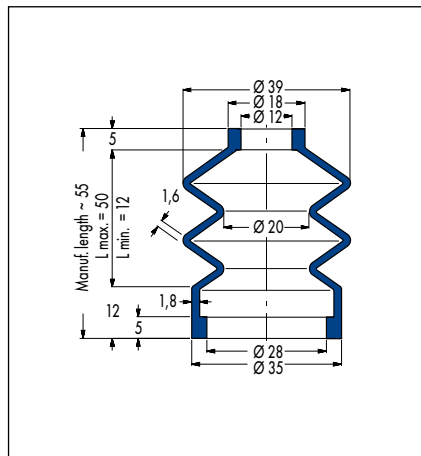
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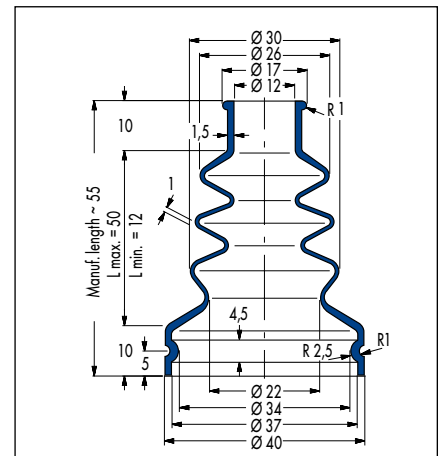
V6-00650, Article No. 428275



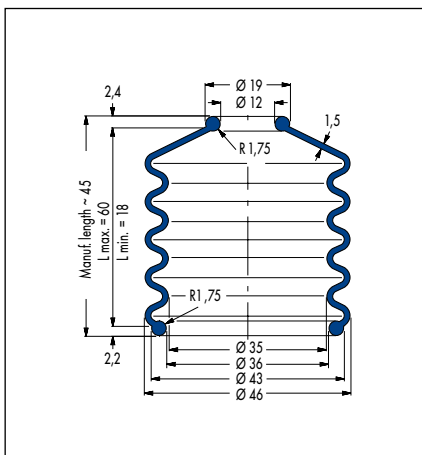
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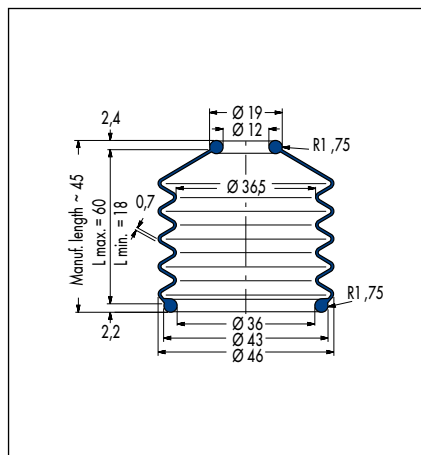
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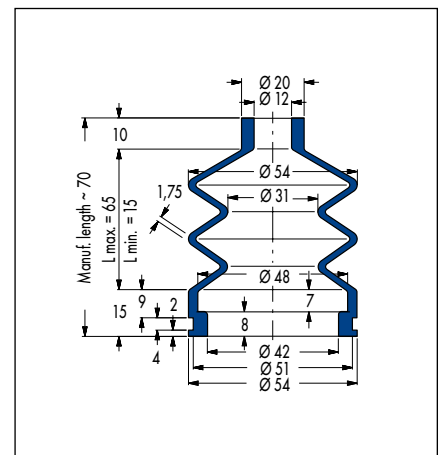
V6-00716, Article No. 427272



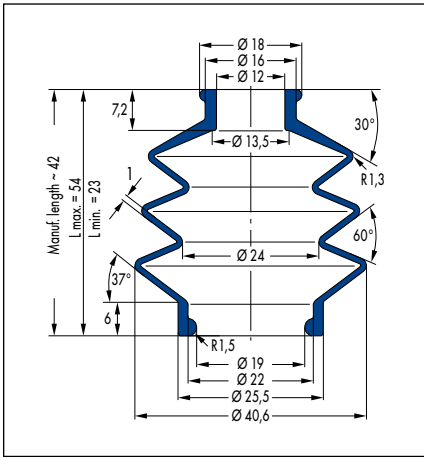
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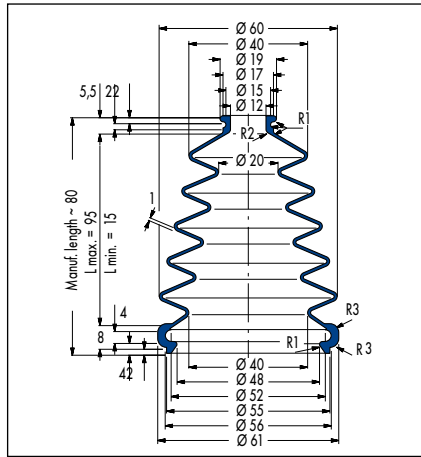
V6-00580, Article No. 66382 (50 CR 879)/
81222 (42 CR 764)



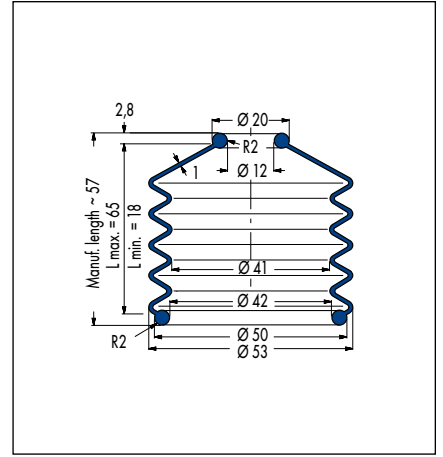
V6-00423, Article No. 435215



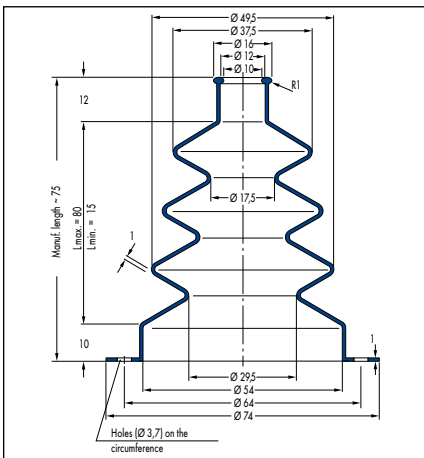
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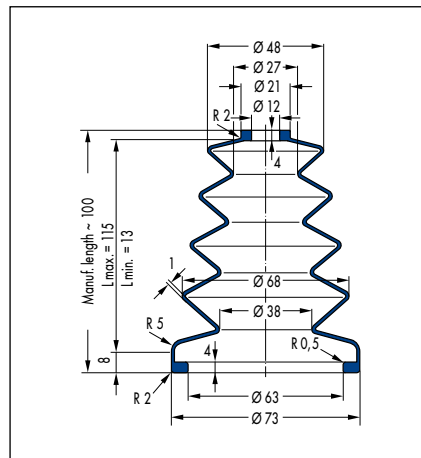
V6-00625, Article No. 438216



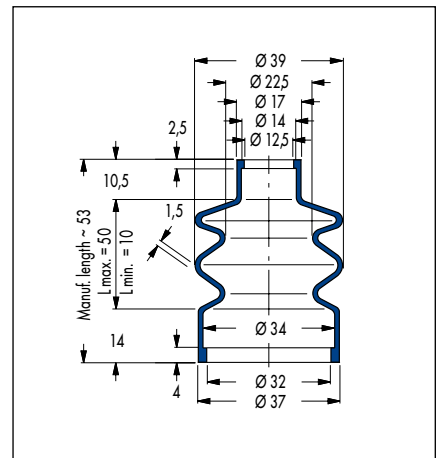
V6-00581, Article No. 438541 (CR)/
438542 (NBR)



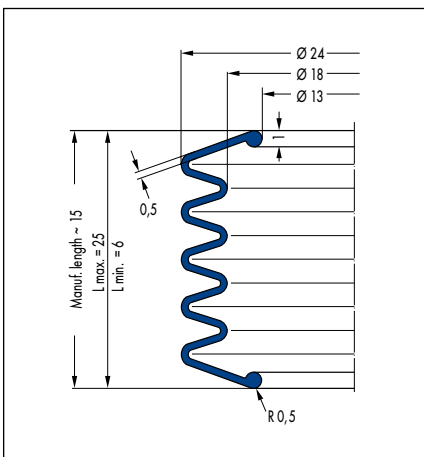
V6-00631, Article No. 426386 (CR)/
508013 (NBR)



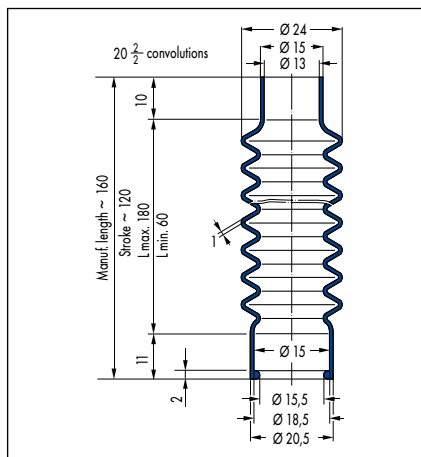
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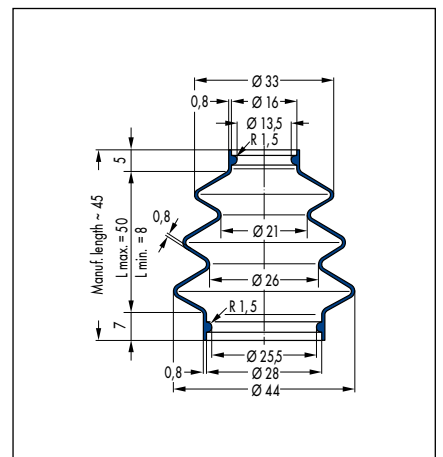
V6-00816, Article No. 434459



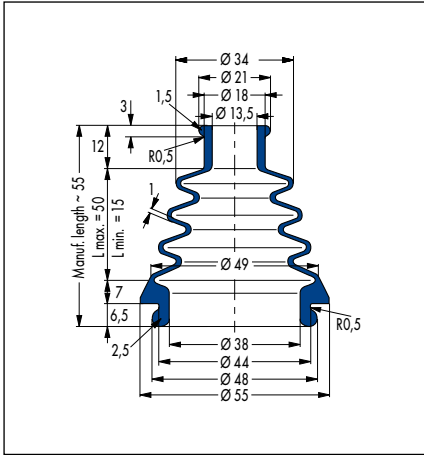
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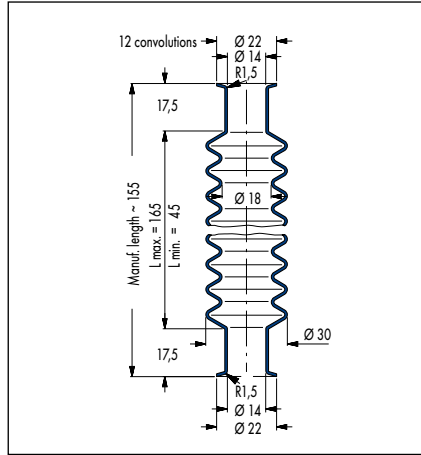
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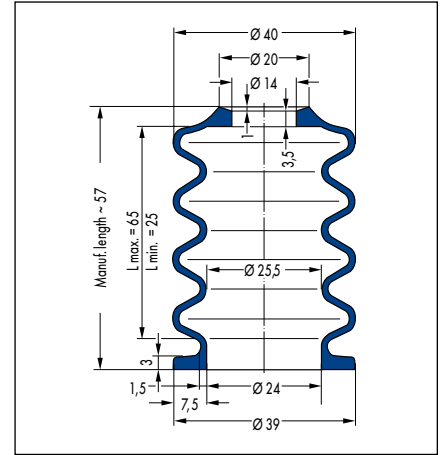
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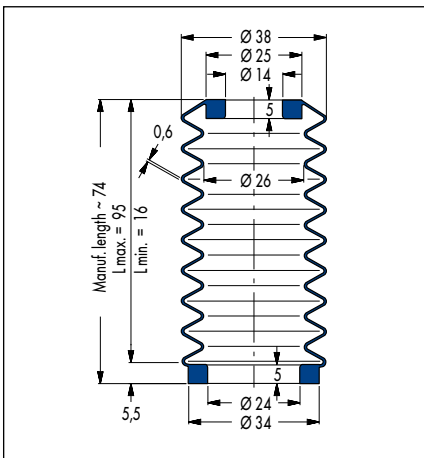
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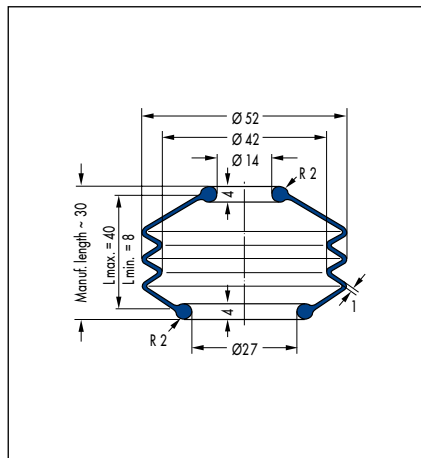
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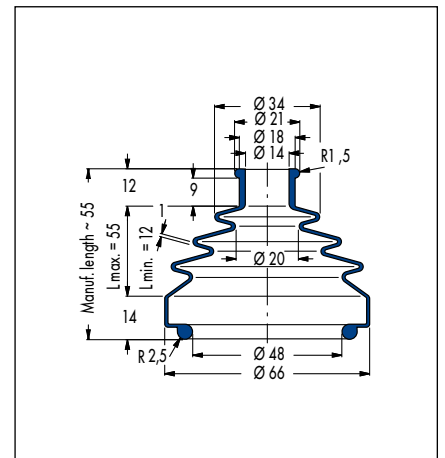
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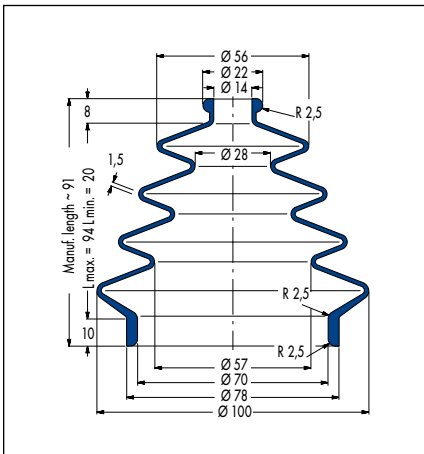
V6-00905, Article No. 428836, 437671 (42 CR 764)



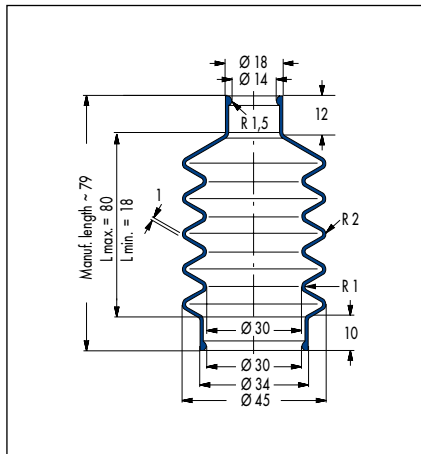
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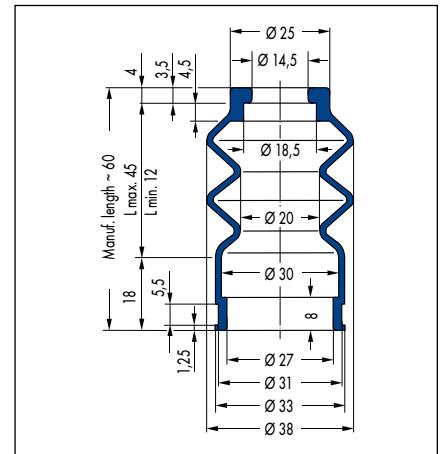
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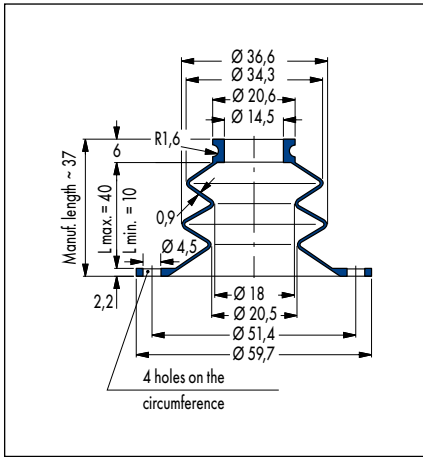
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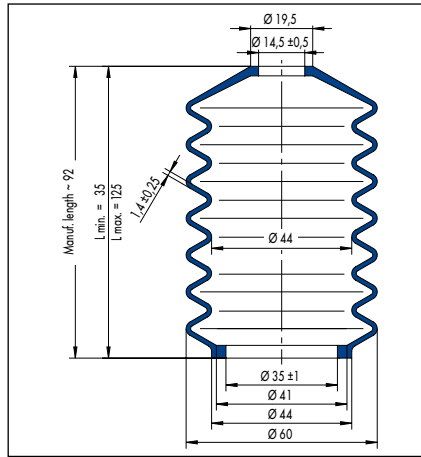
V6-00988, Article No. 385391



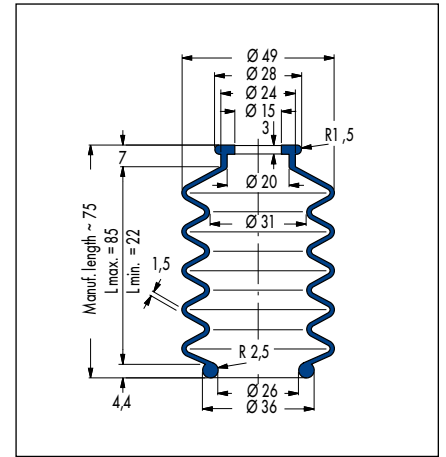
V6-00189, Article No. 440390



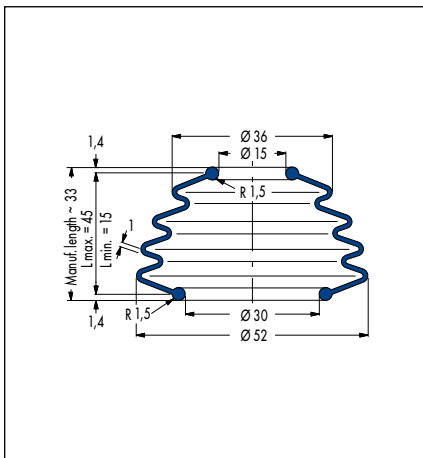
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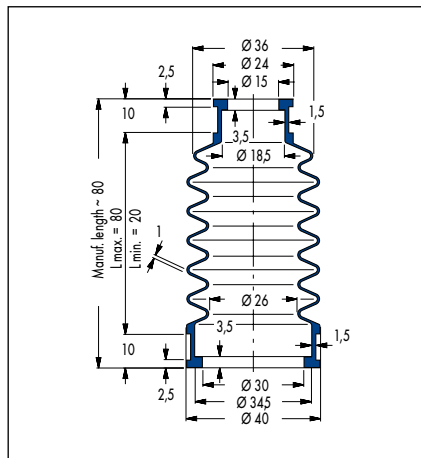
V6-01332, Article No. 49469786



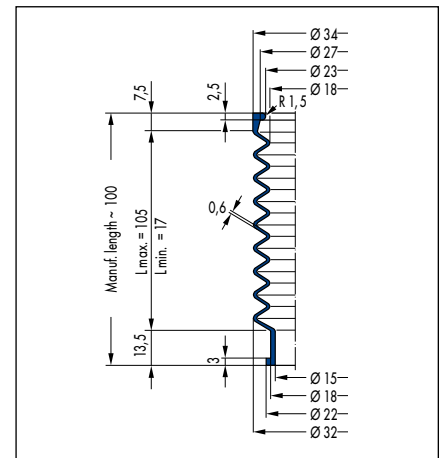
V6-00488, Article No. 426793



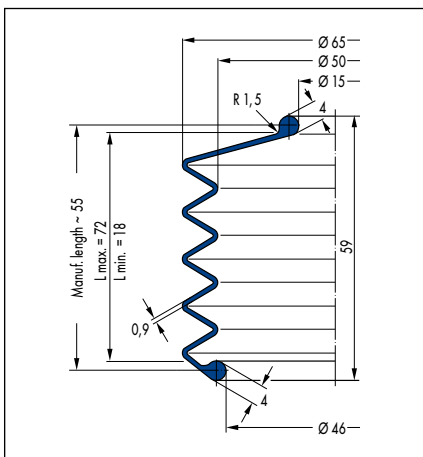
V6-00277, Article No. 435217



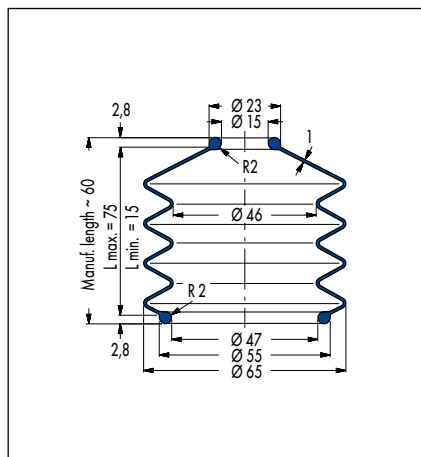
V6-00156, Article No. 436158



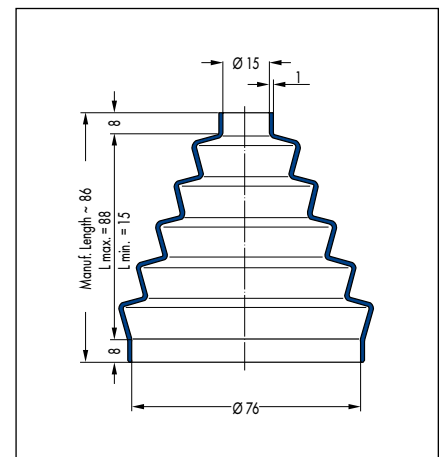
V6-01450, Article No. 452567



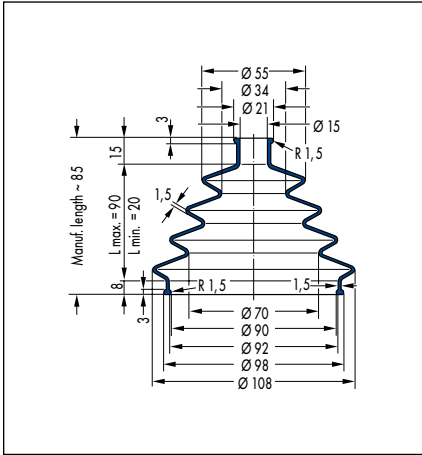
V6-01538, Article No. 434075



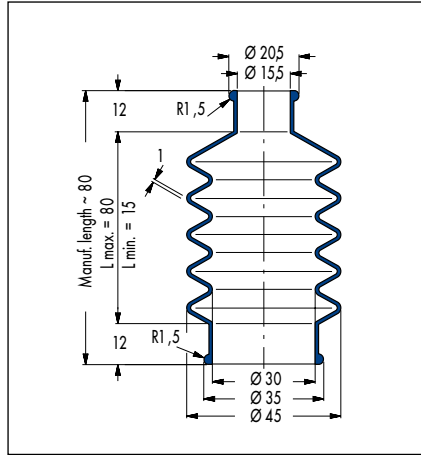
V6-00582, Article No. 49312586 (CR)



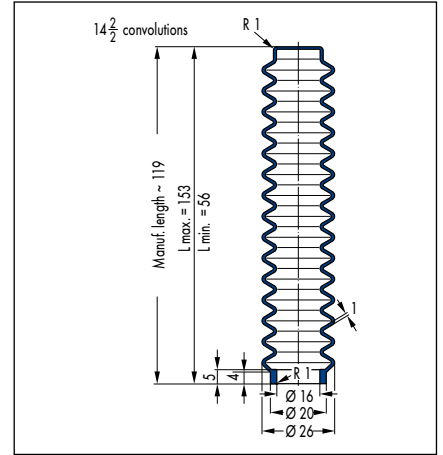
V6-00116, Article No. 439182 (42 CR 764)/
439181 (50 CR 879)



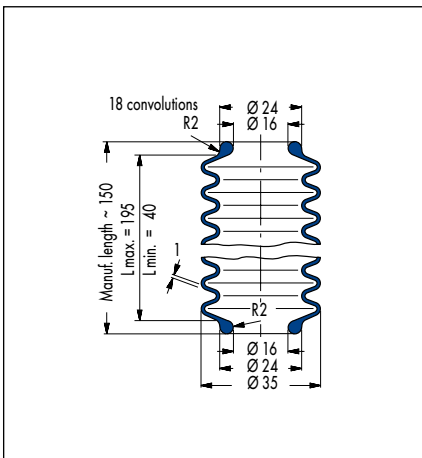
V6-00787, Article No. 29962



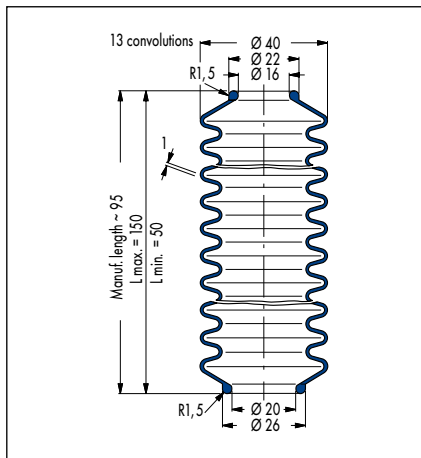
V6-01019, Article No. 438569



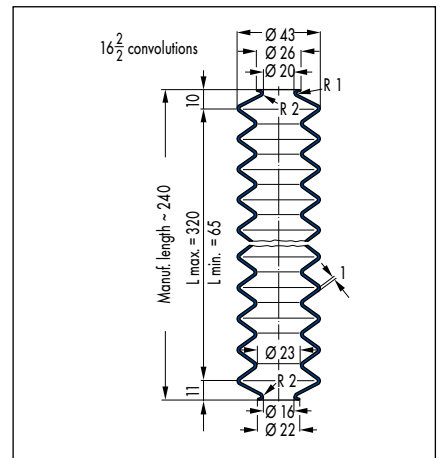
V6-01353, Article No. 82687



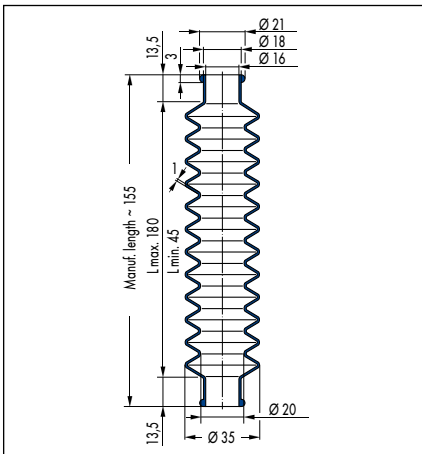
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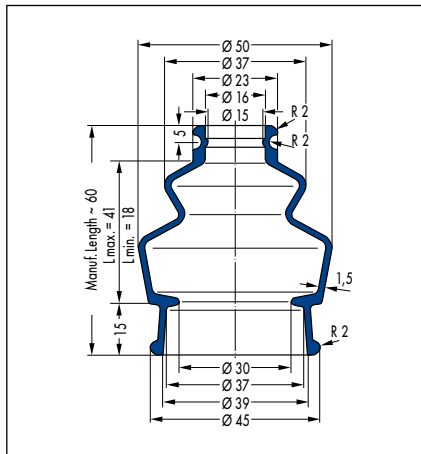
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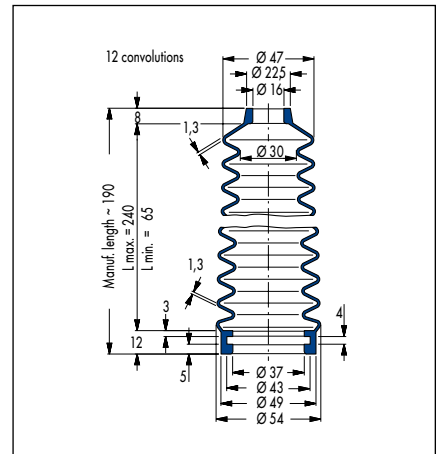
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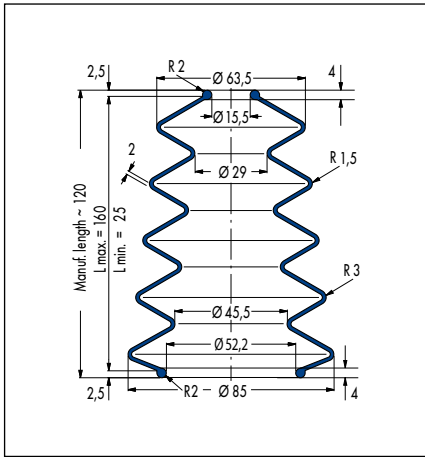
V6-00639, Article No. 400785



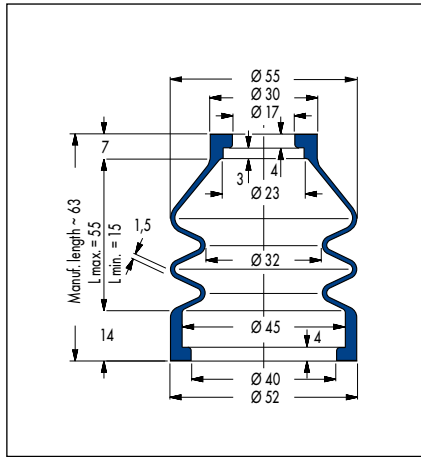
V6-00282, Article No. 440305



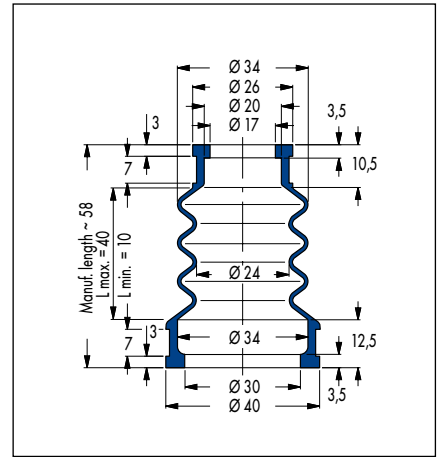
V6-00404, Article No. 428849 (CR)/
428851 (NBR)



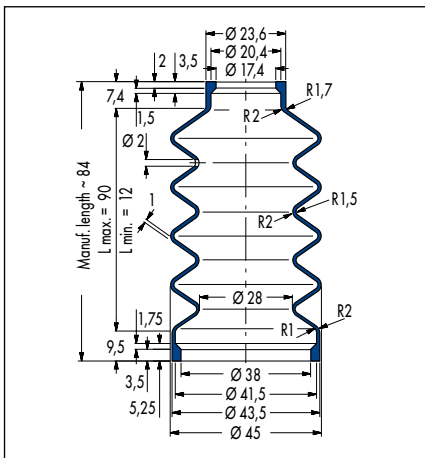
V6-00610, Article No. 426375



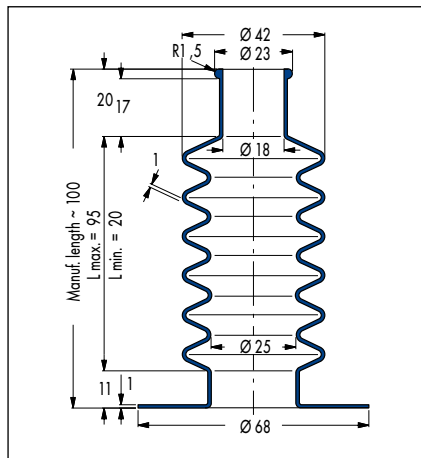
V6-00221, Article No. 428830



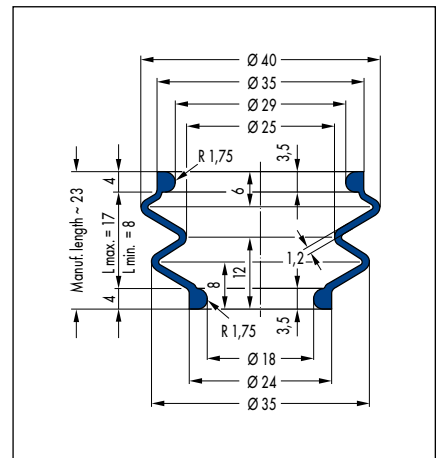
V6-00076, Article No. 433980



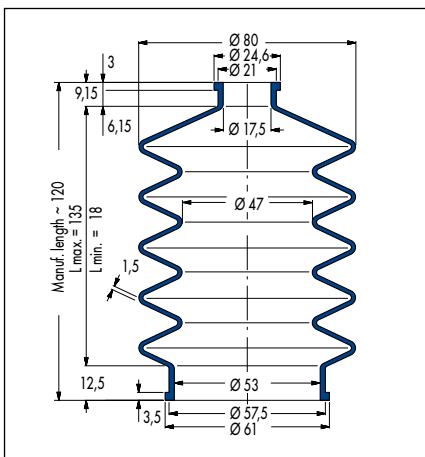
V6-00347, Article No. 501252



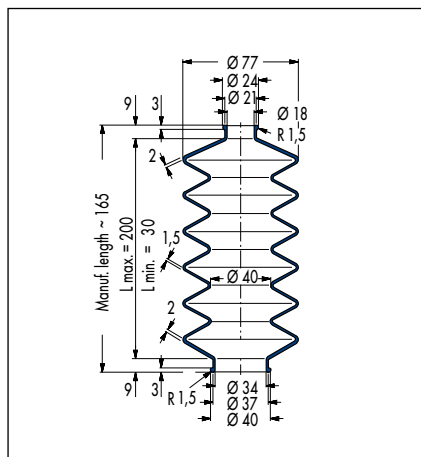
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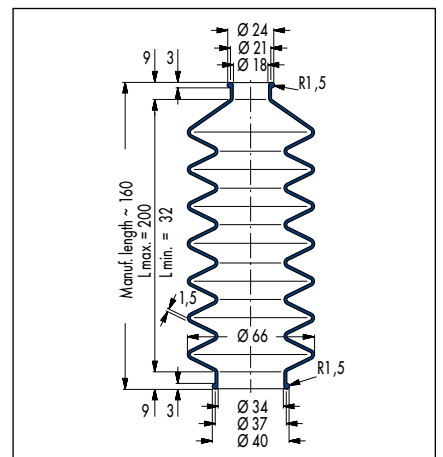
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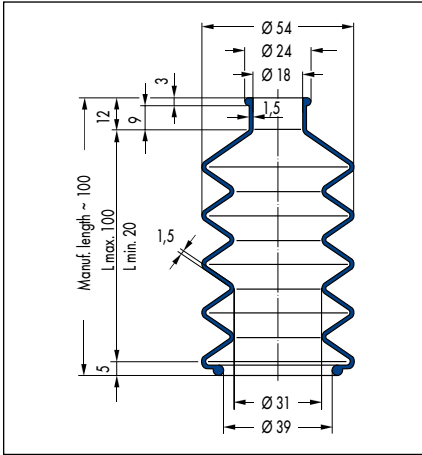
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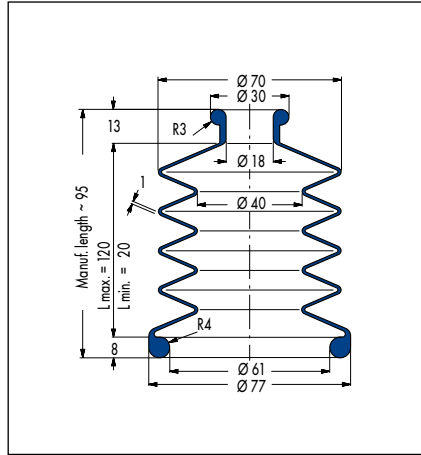
V6-00531, Article No. 453728



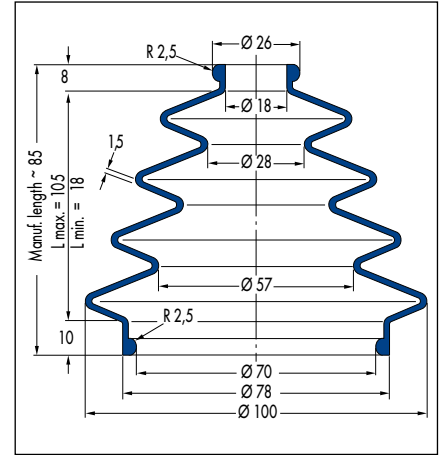
V6-00503, Article No. 440392 (42 CR 764)/
440391 (50 CR 879)



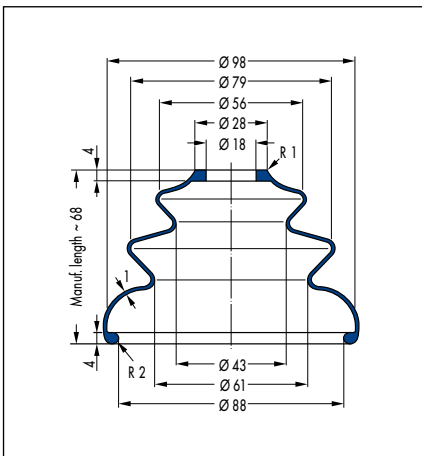
V6-00828, Article No. 11520



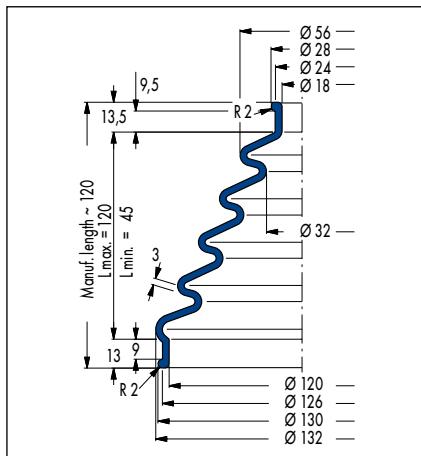
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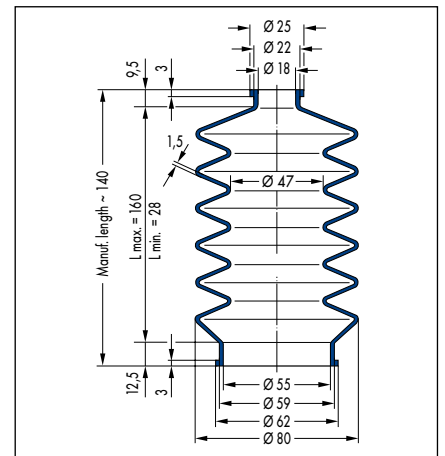
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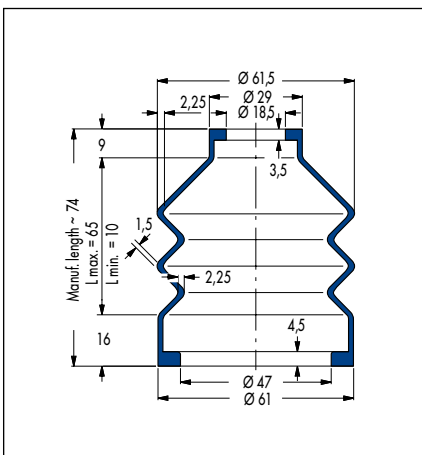
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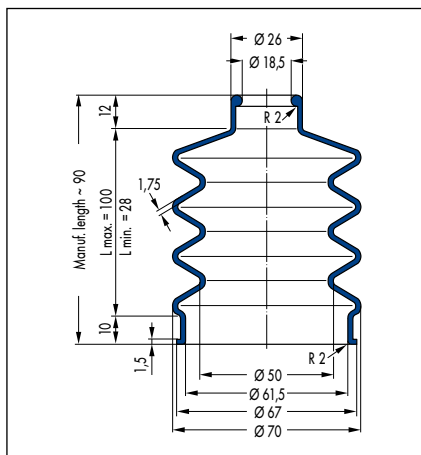
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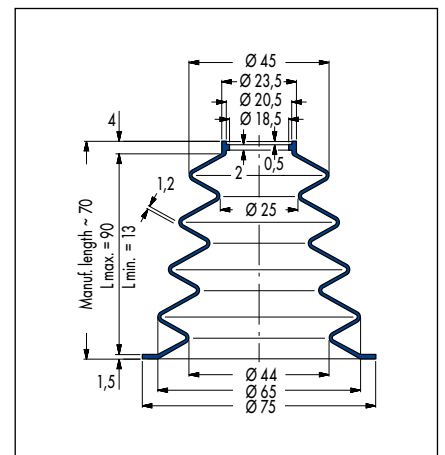
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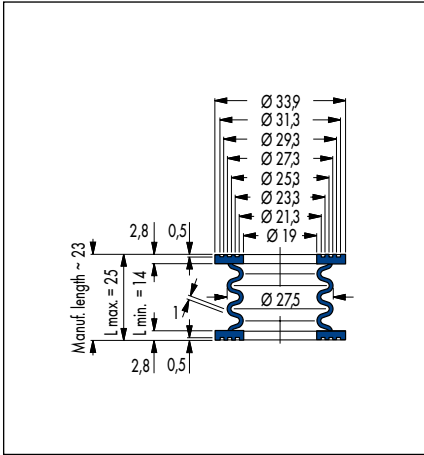
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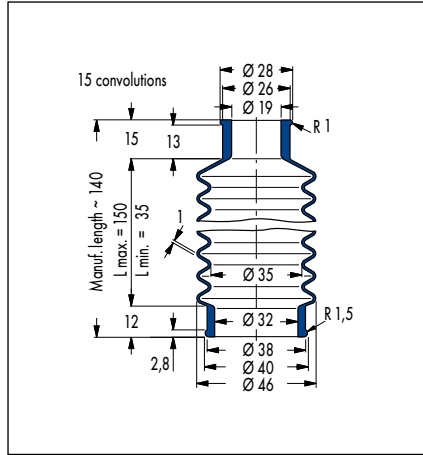
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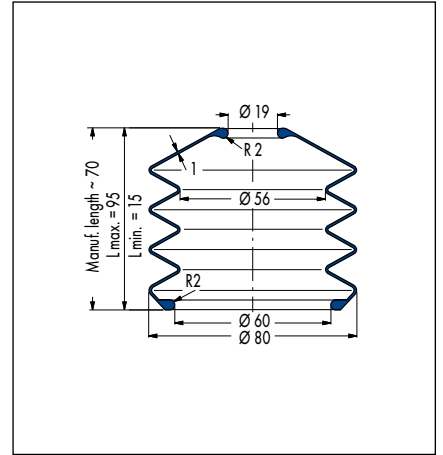
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427271 (45 NBR 670)



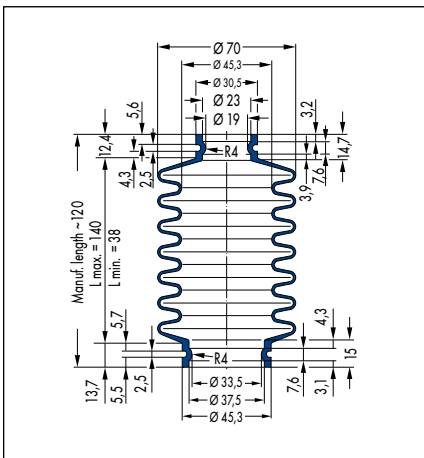
V6-00383, Article No. 430846



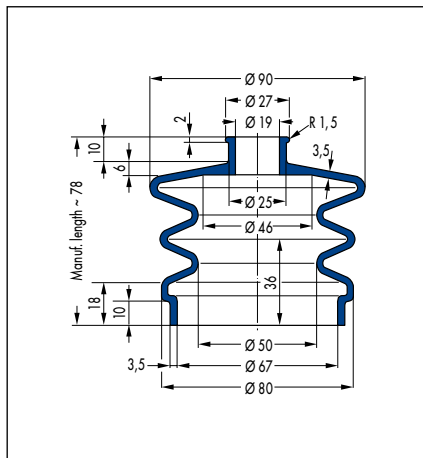
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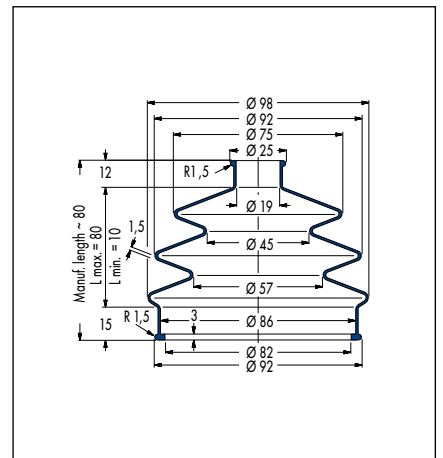
V6-00565, Article No. 434030



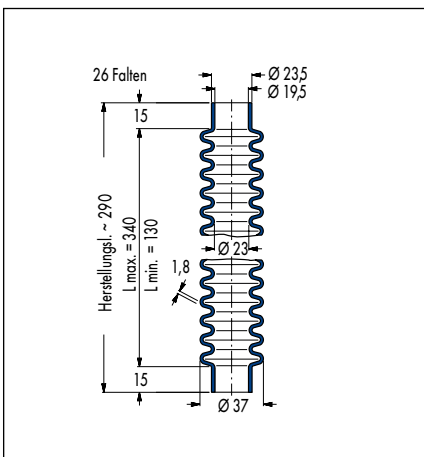
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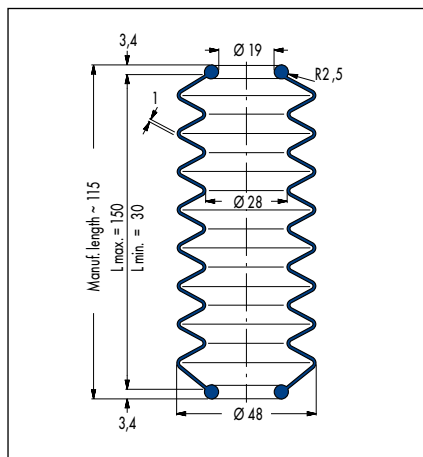
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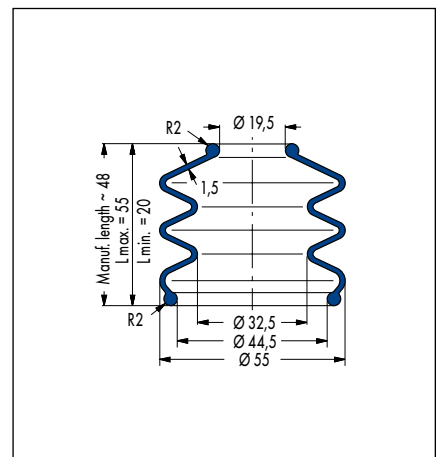
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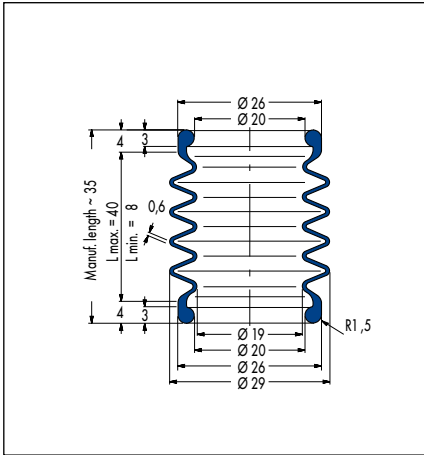
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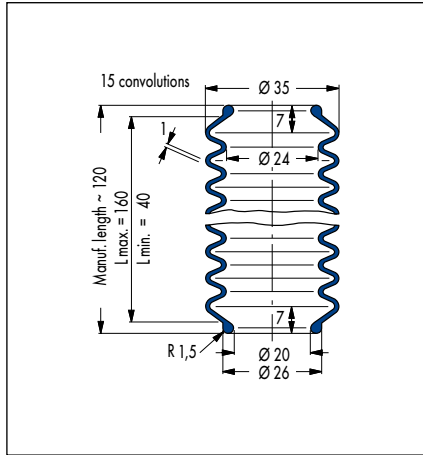
V6-00726, Article No. 426387 (CR)/
429078 (NBR)



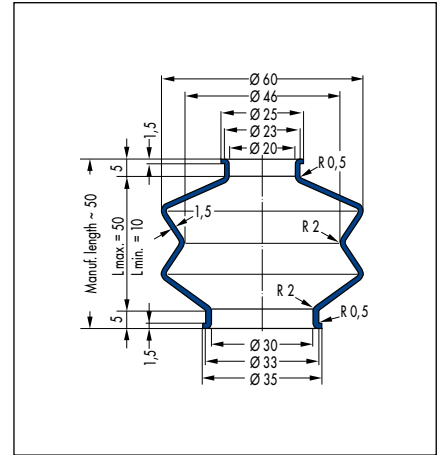
V6-00130, Article No. 437298



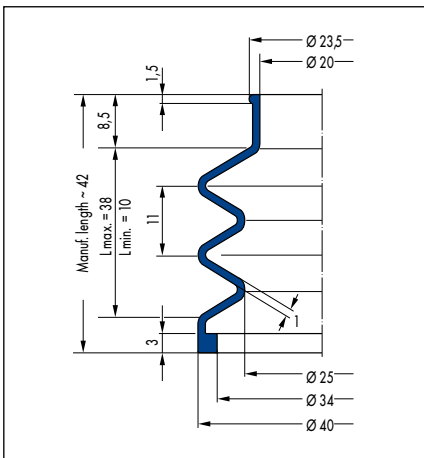
V6-00722, Article No. 336382



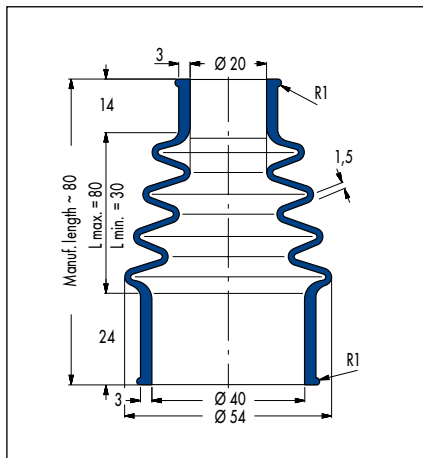
V6-00236, Article No. 449345231 (CR)/ 49344842 (NBR)



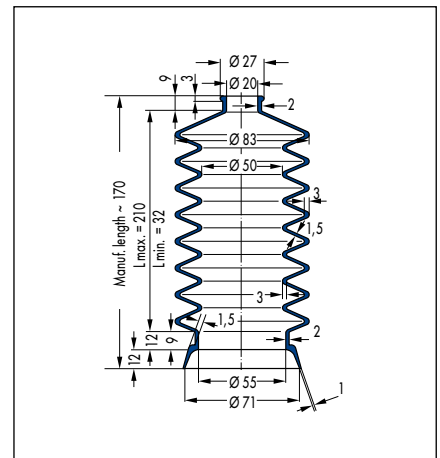
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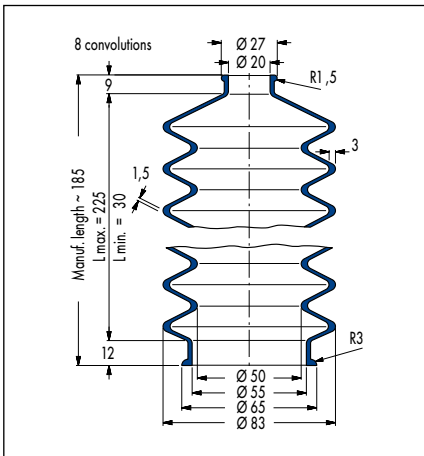
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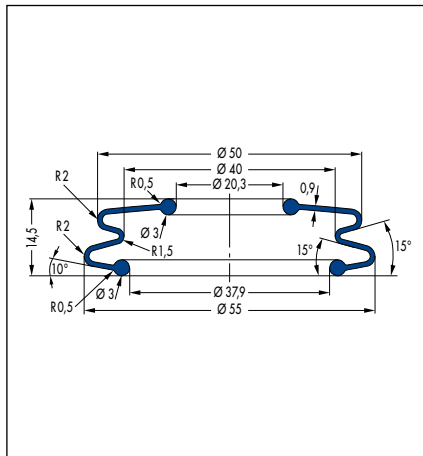
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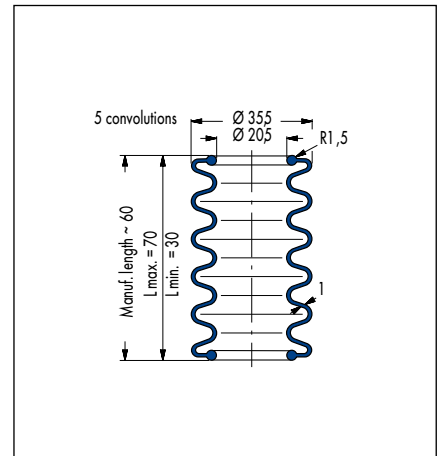
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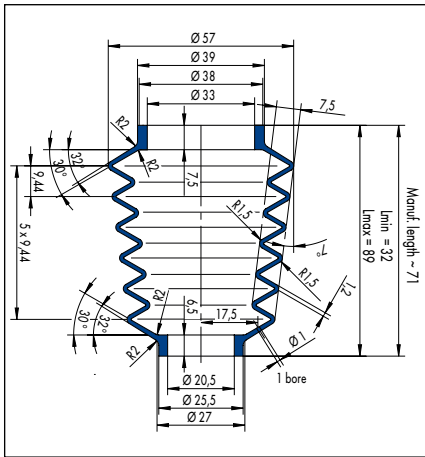
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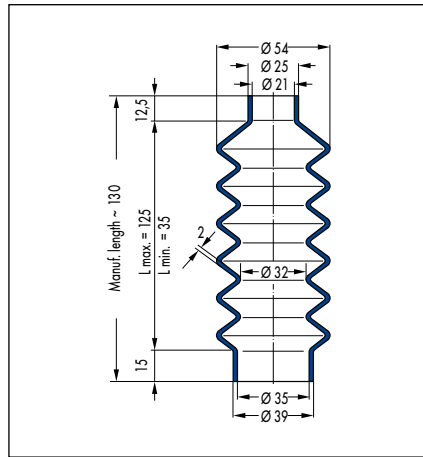
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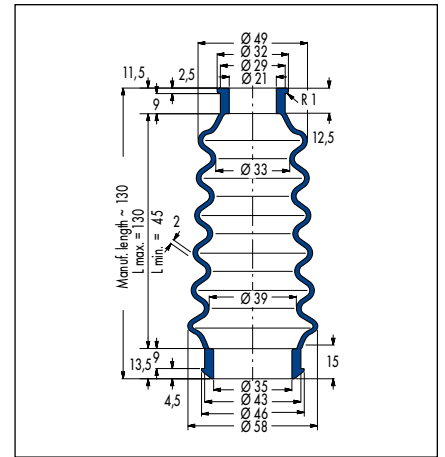
V6-00302, Article No. 440318



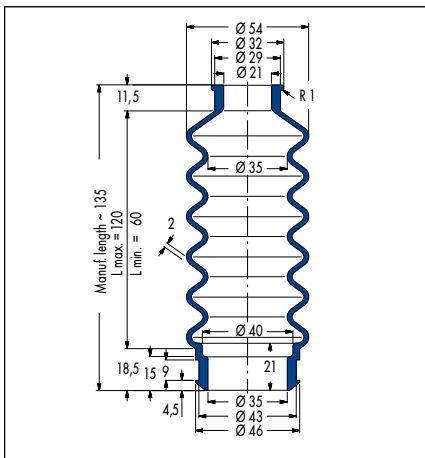
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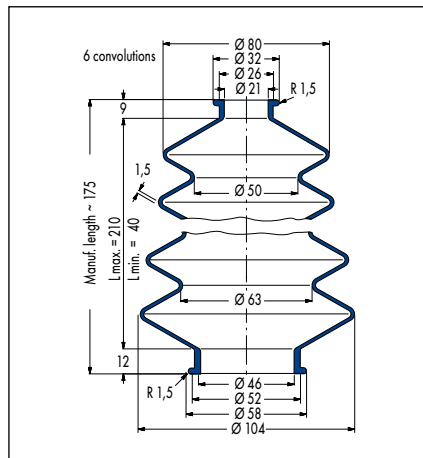
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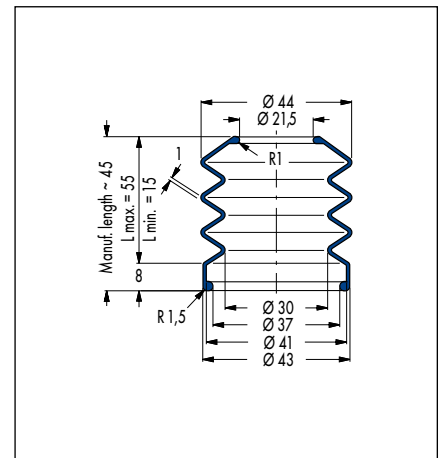
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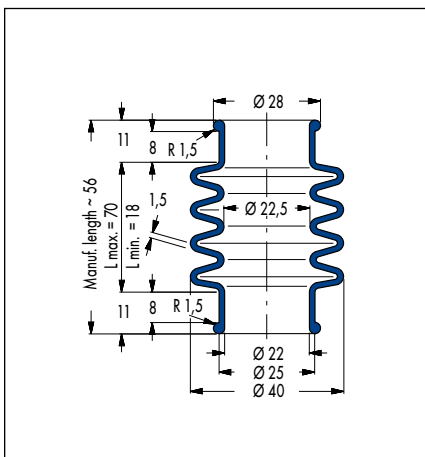
V6-00305, Article No. 426323



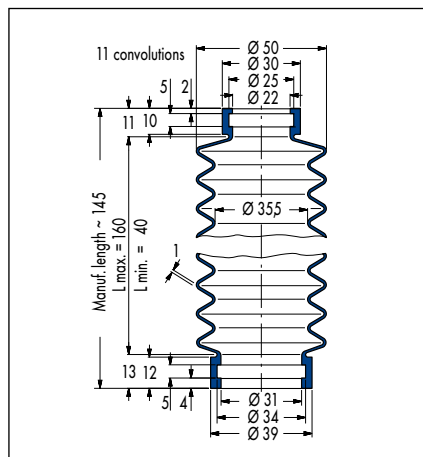
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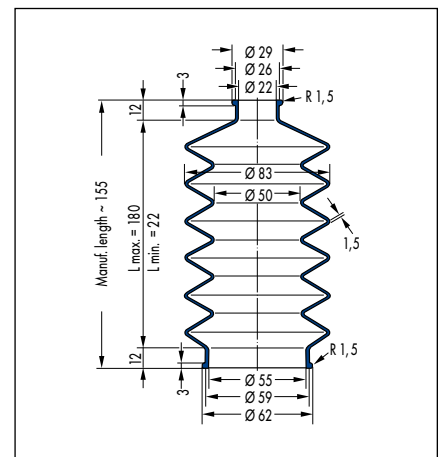
V6-00570, Article No. 436744



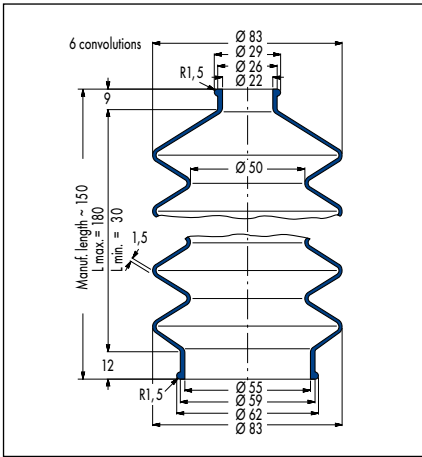
V6-00227, Article No. 439167



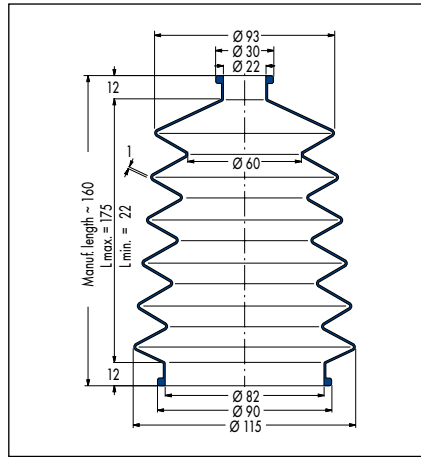
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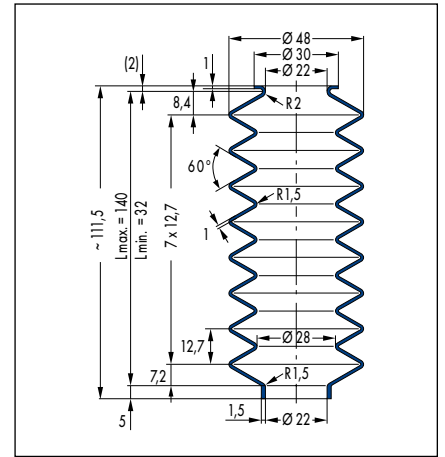
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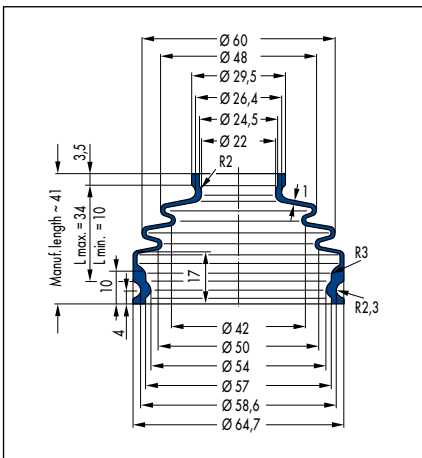
V6-00095, Article No. 438519



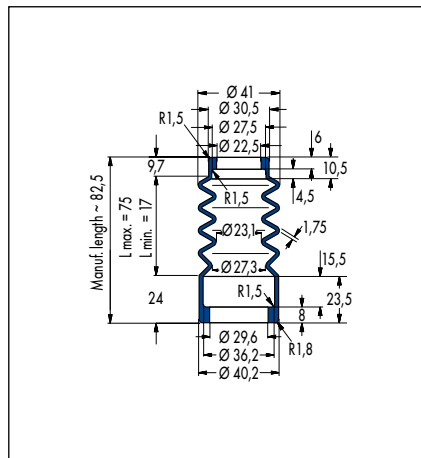
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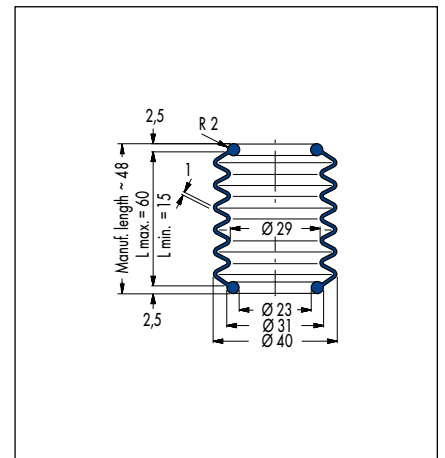
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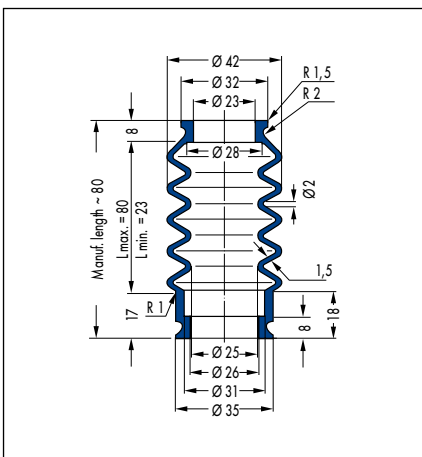
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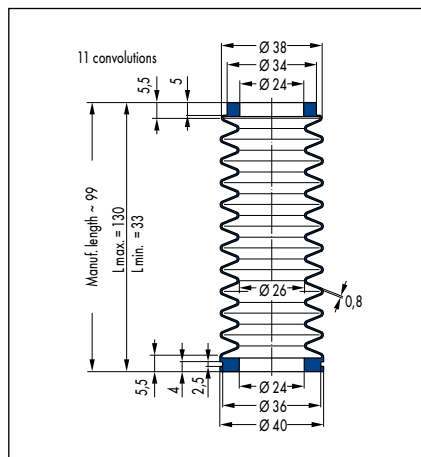
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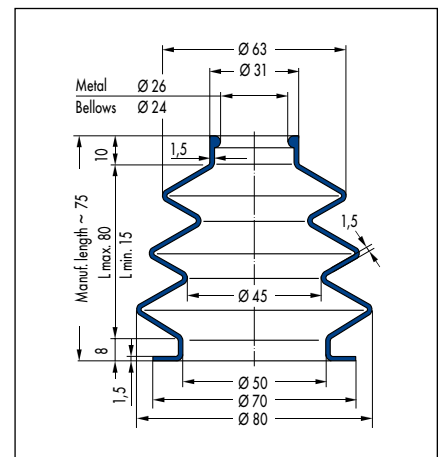
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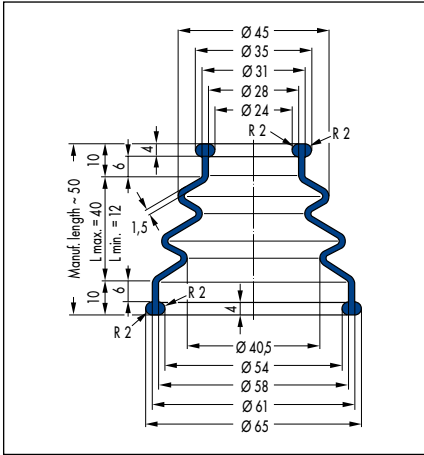
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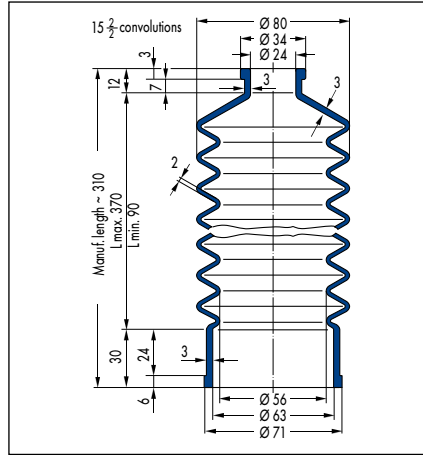
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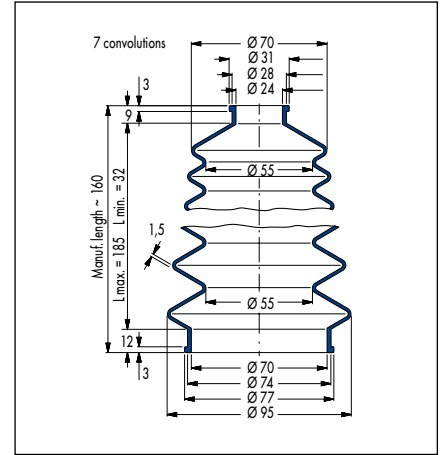
V6-00826, Article No. 456489



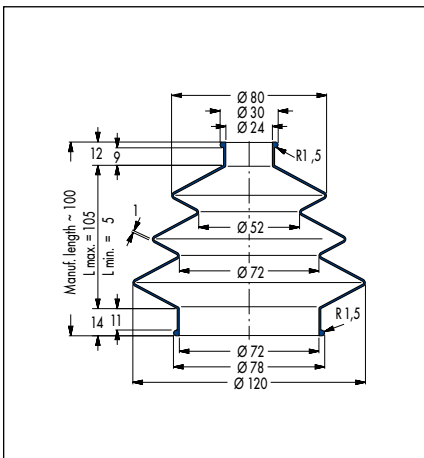
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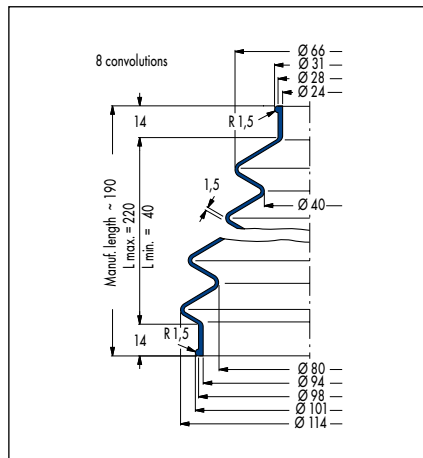
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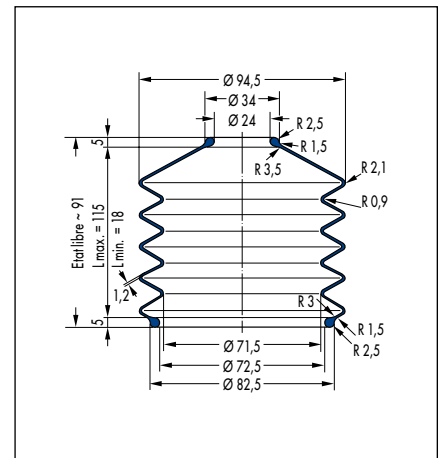
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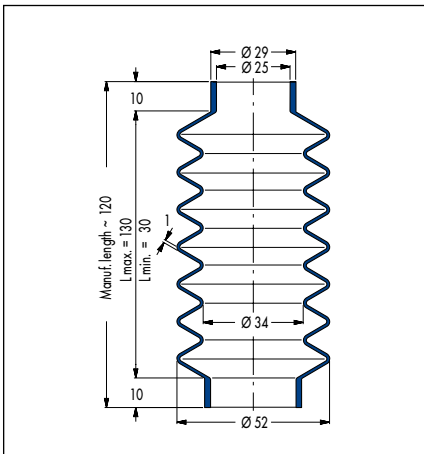
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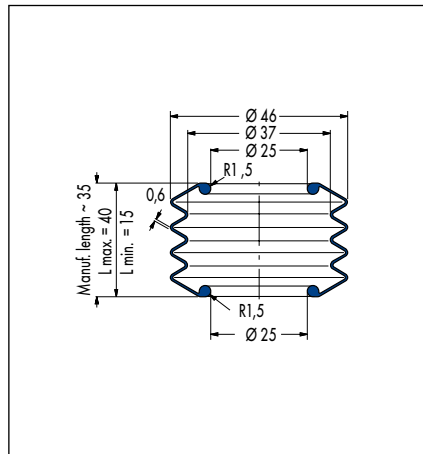
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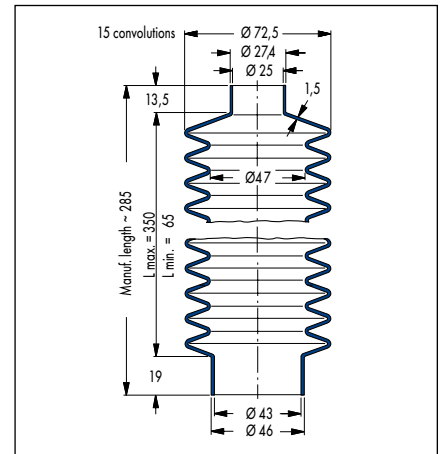
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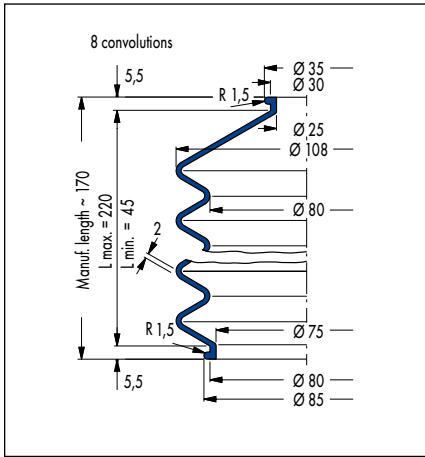
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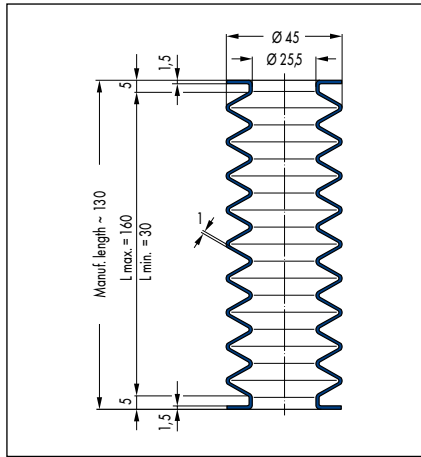
V6-00462, Article No. 440279 (CR)/
440283 (NBR)



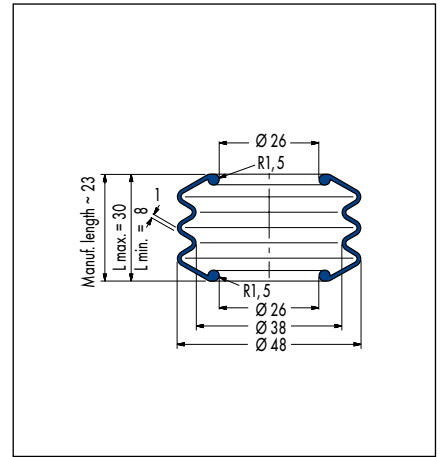
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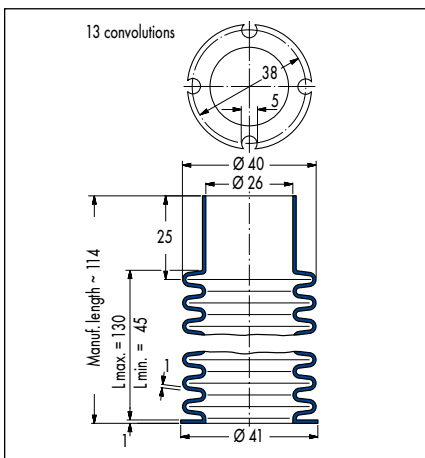
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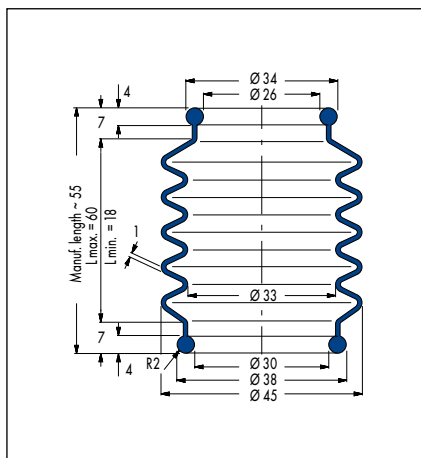
V6-00966, Article No. 350974



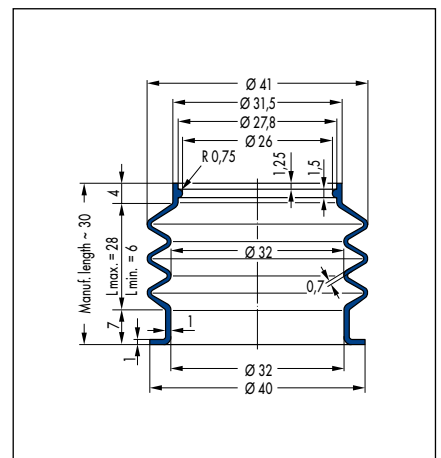
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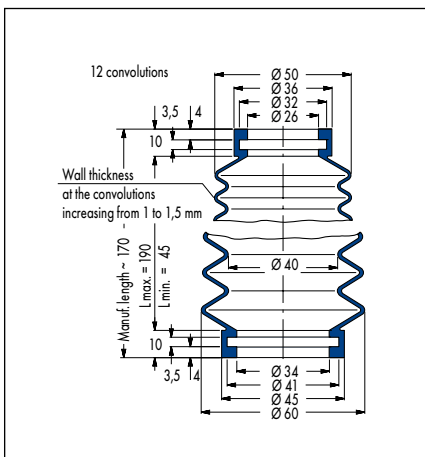
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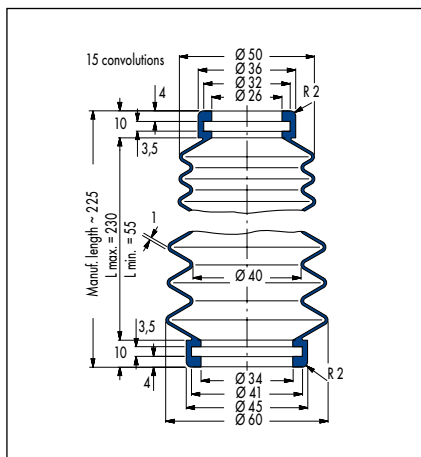
V6-00592, Article No. 426382



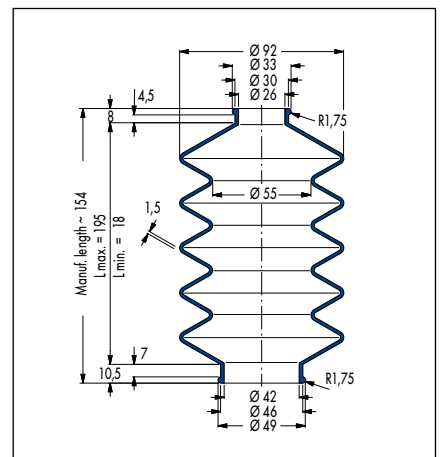
V6-00835, Article No. 452564



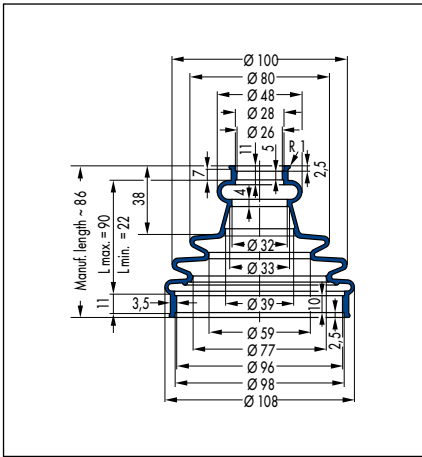
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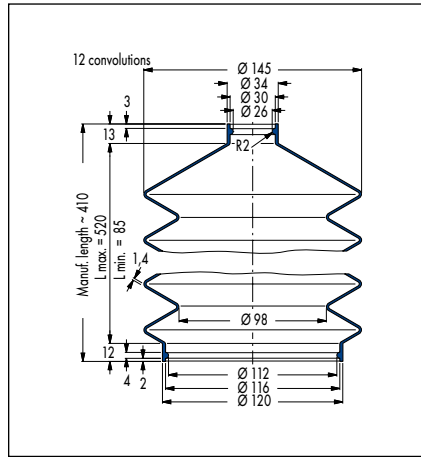
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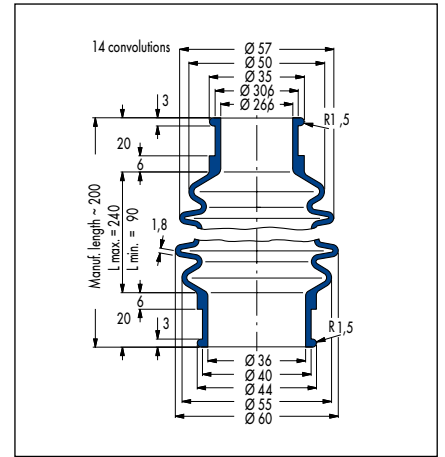
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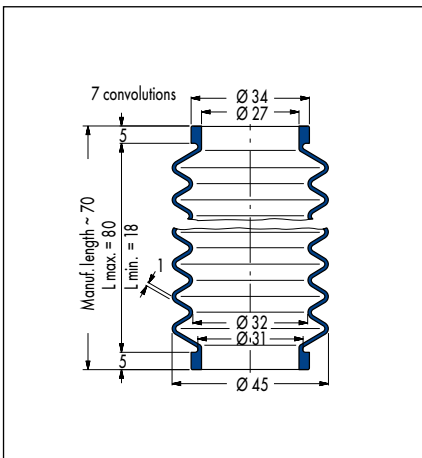
V6-01755, Article No. 451384



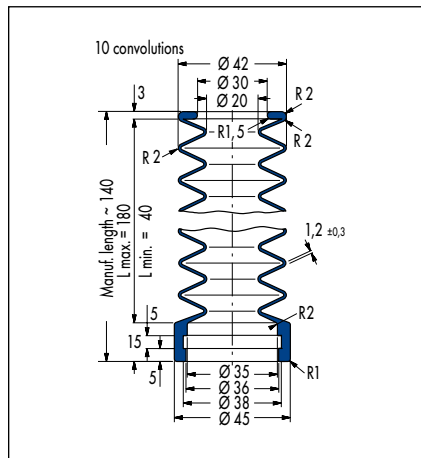
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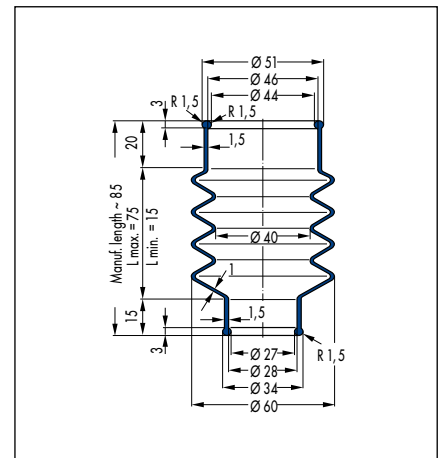
V6-00324, Article No. 440316



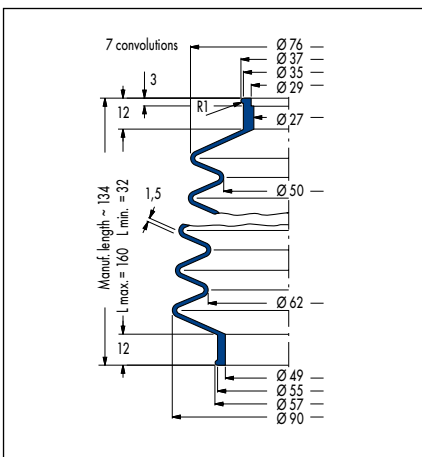
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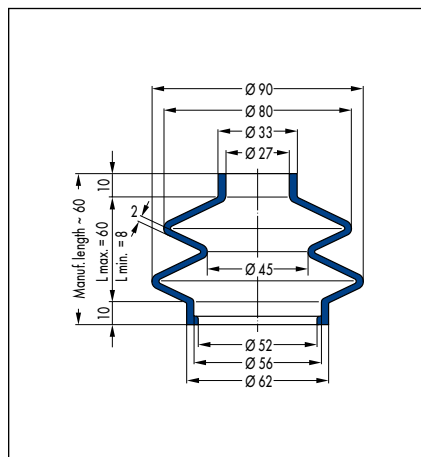
V6-00259, Article No. 439441



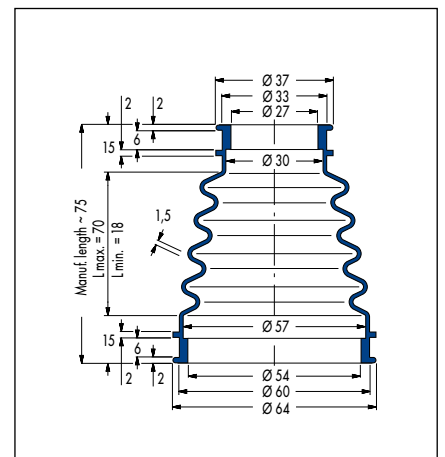
V6-00363, Article No. 432594 (CR)/
60034466 (NBR)



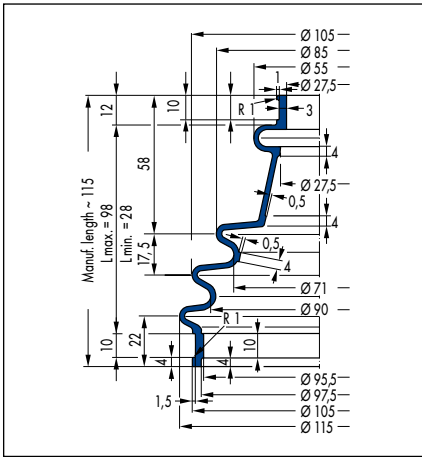
V6-00106, Article No. 430856 (NBR)/
430857 (CR)



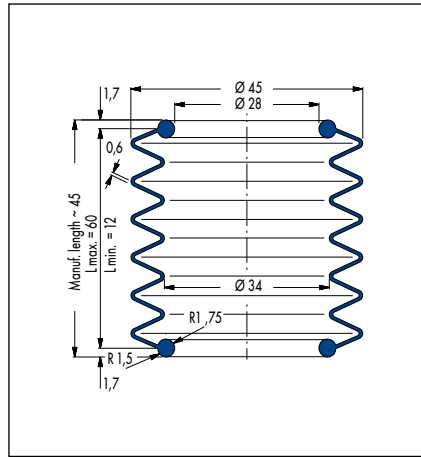
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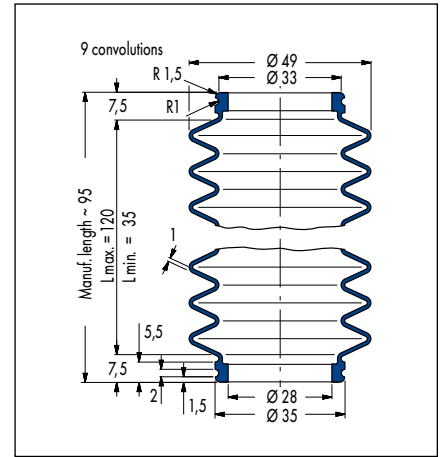
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49059820 (NBR)



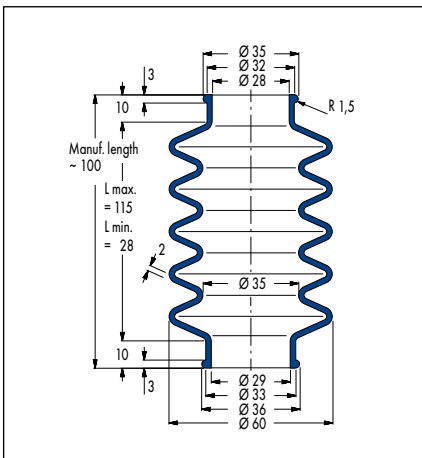
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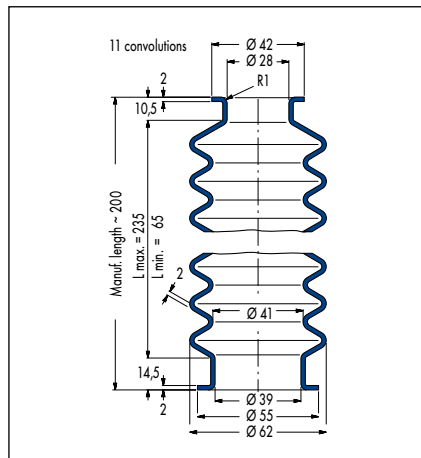
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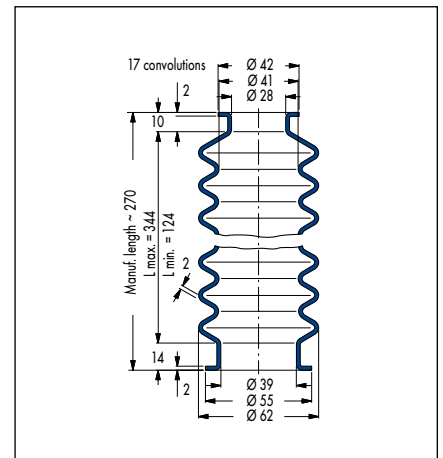
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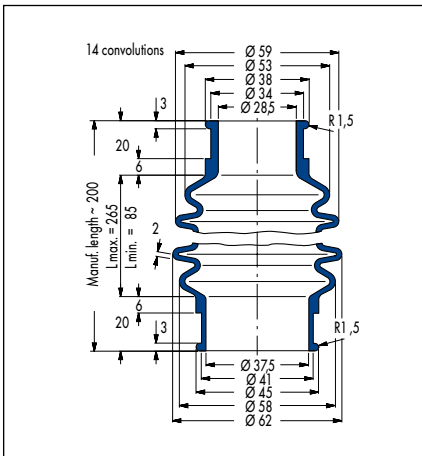
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49067648 (NBR)



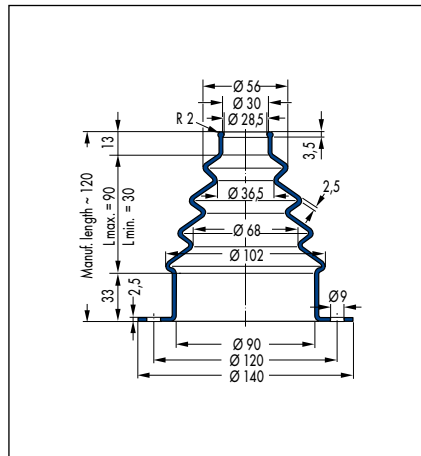
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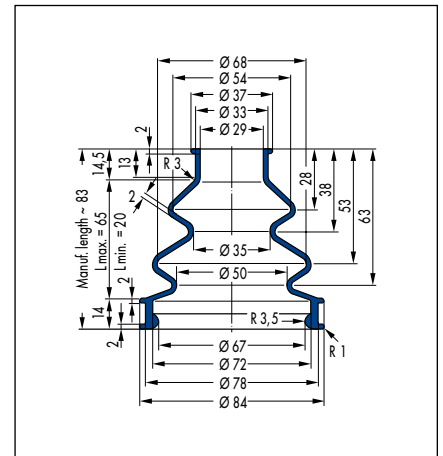
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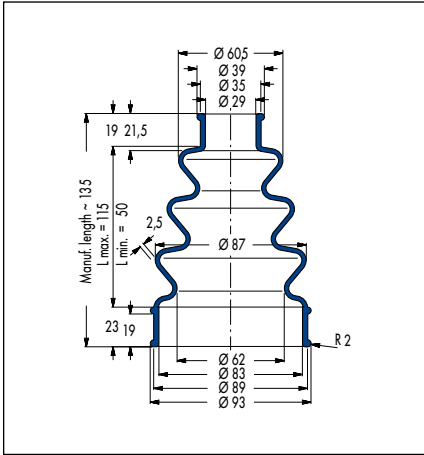
V6-00325, Article No. 426794



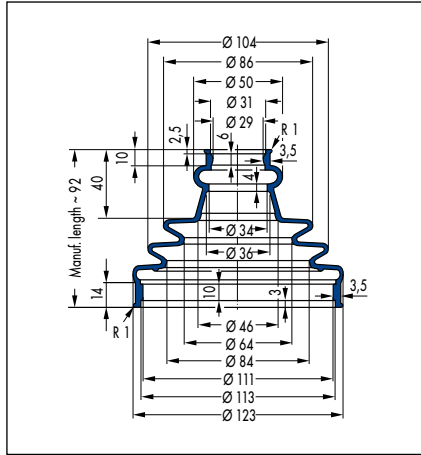
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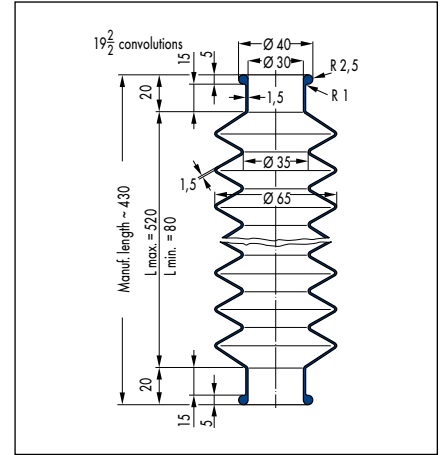
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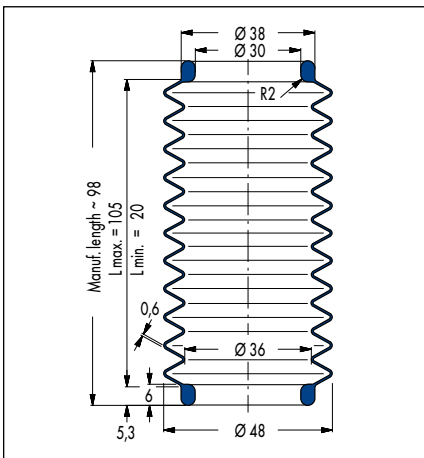
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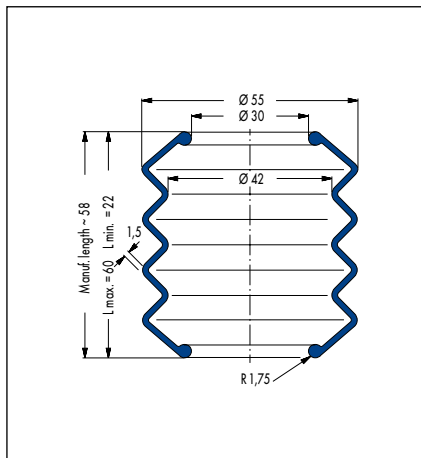
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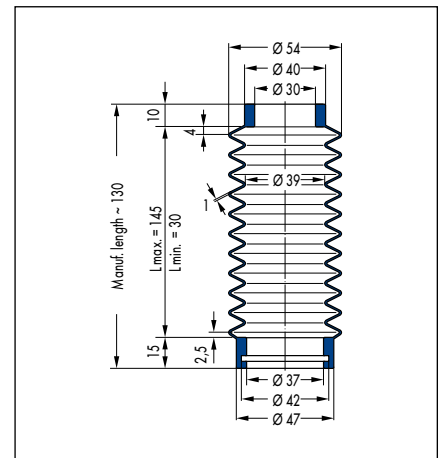
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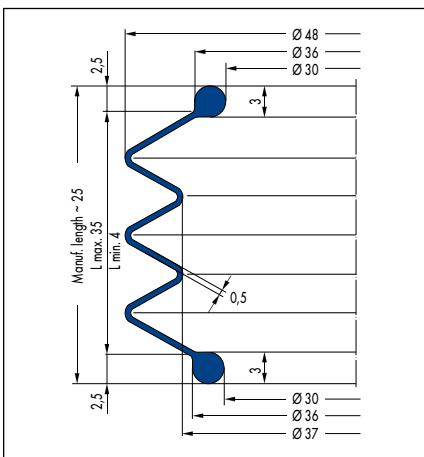
V6-00904, Article No. 375419



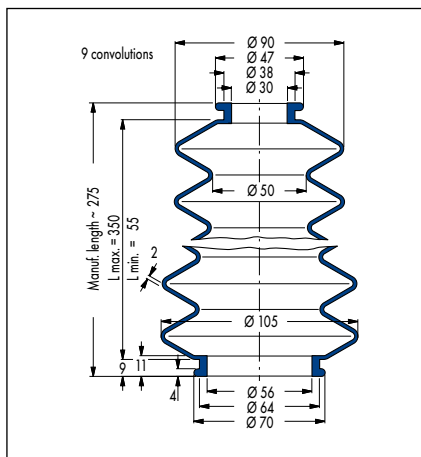
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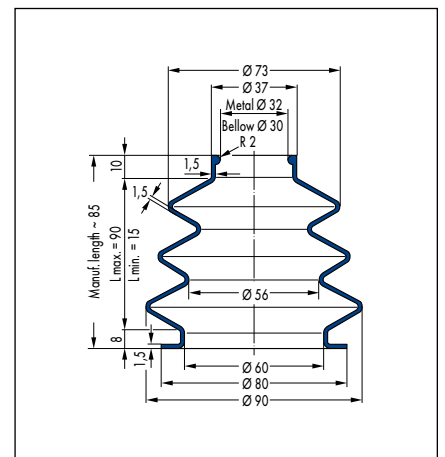
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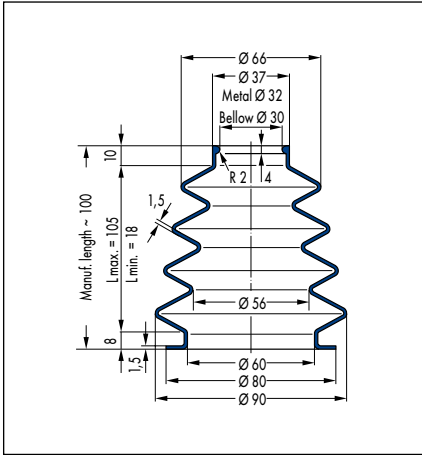
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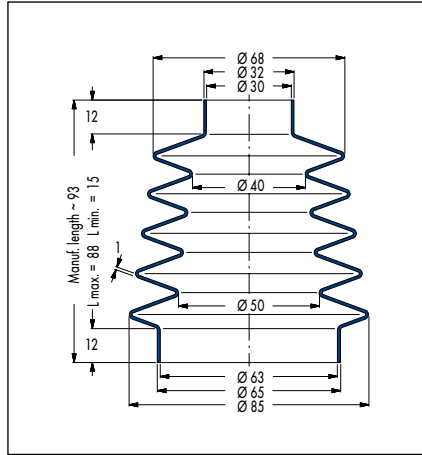
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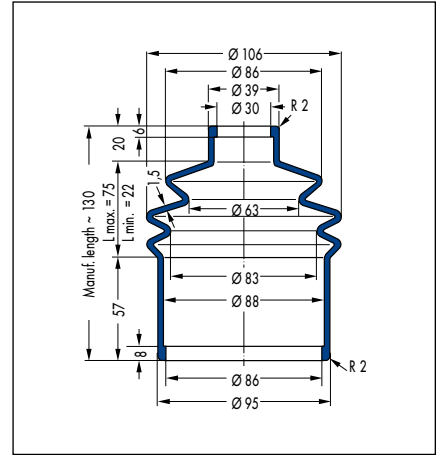
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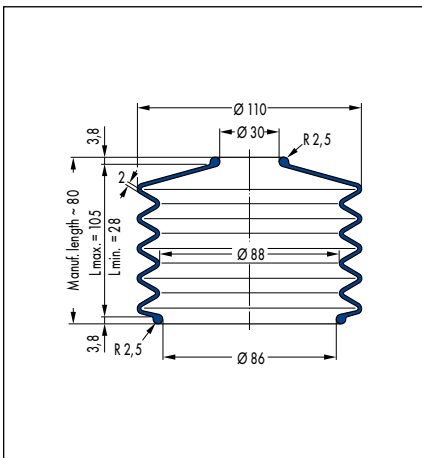
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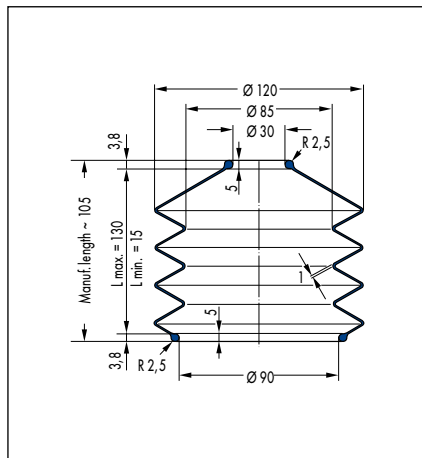
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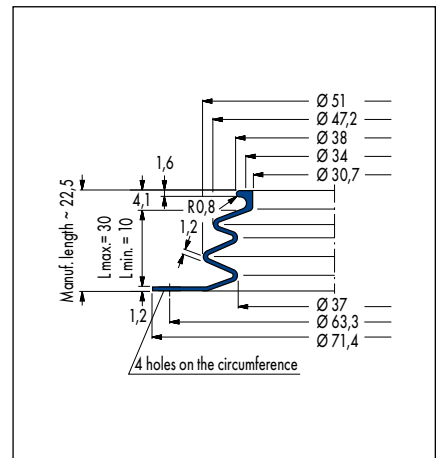
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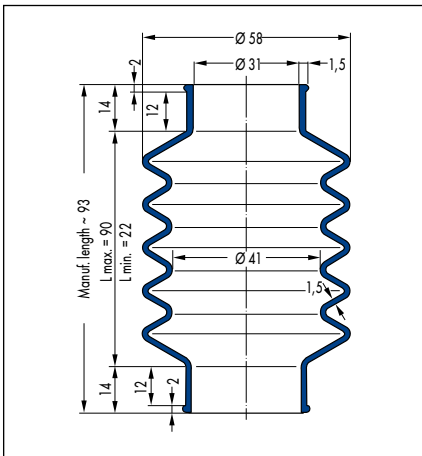
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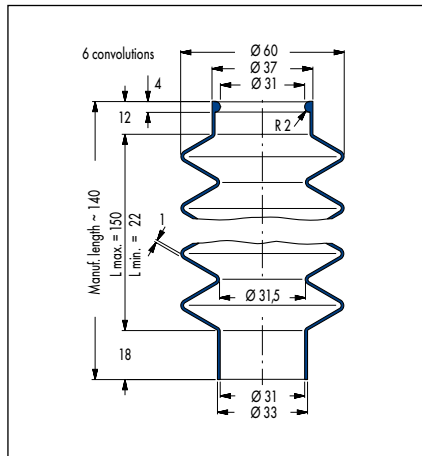
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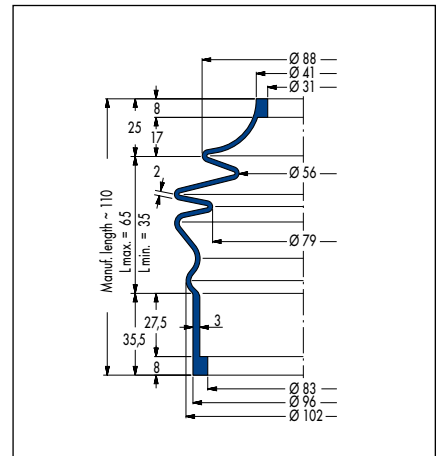
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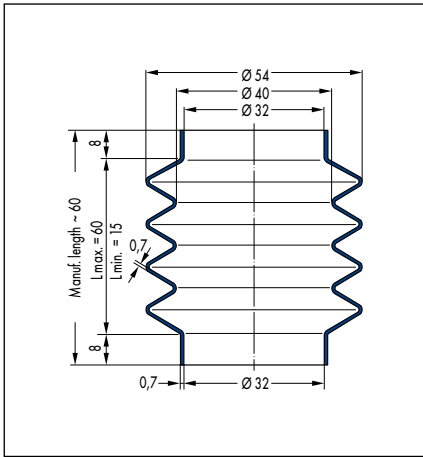
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49046170 (60 CR 176307)



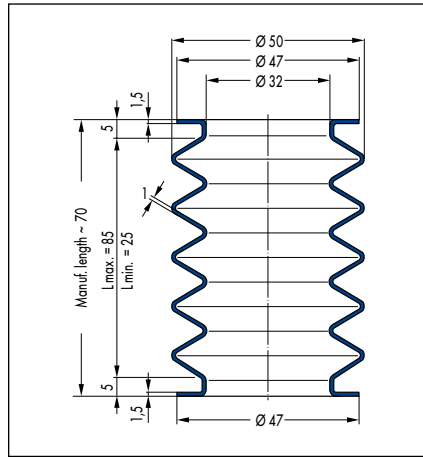
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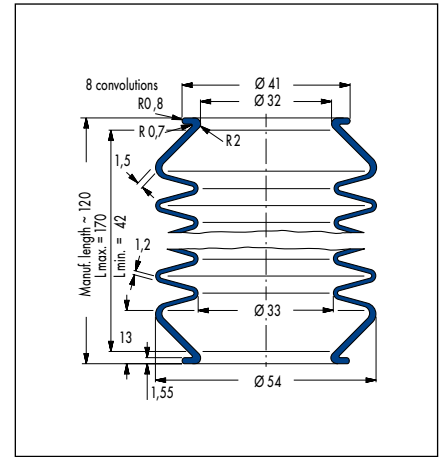
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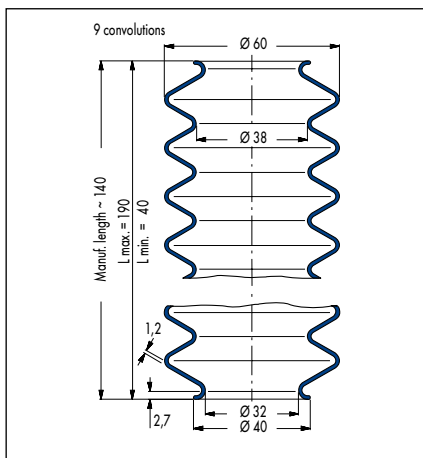
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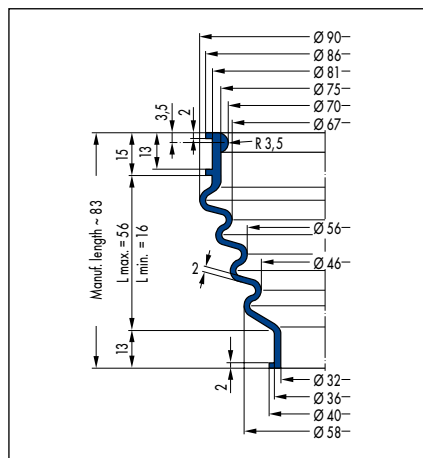
V6-00965, Article No. 453784



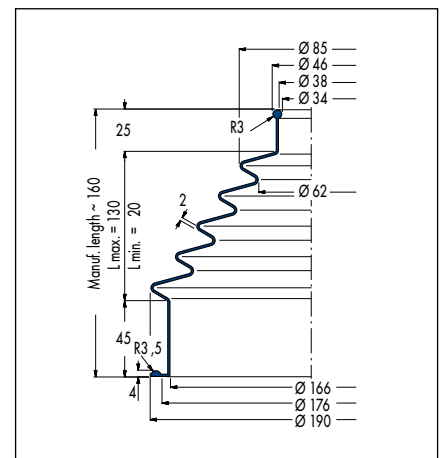
V6-00209, Article No. 439186



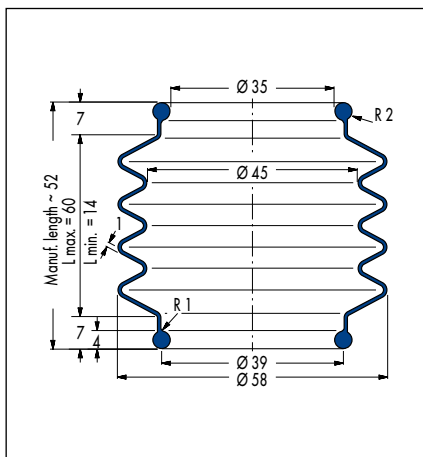
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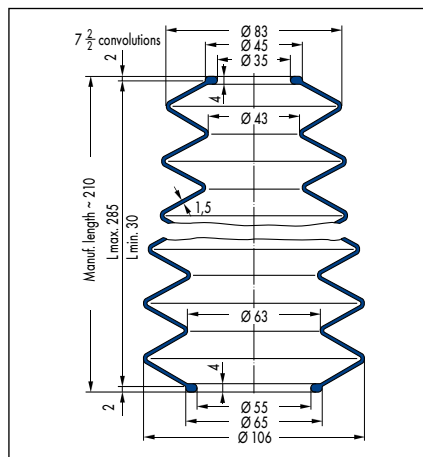
V6-01431, Article No. 454267



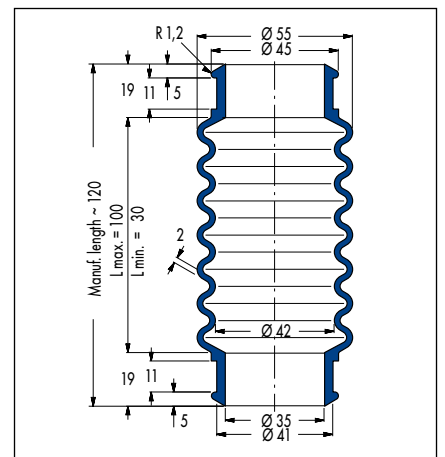
V6-00925, Article No. 454474



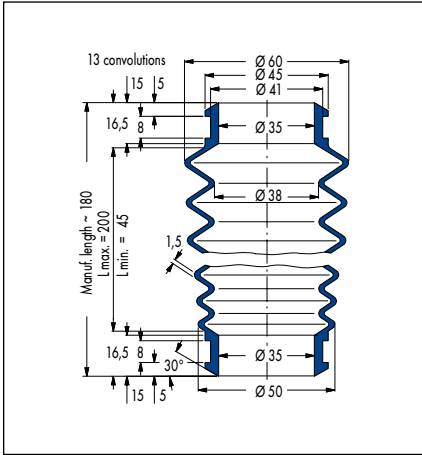
V6-00659, Article No. 424147



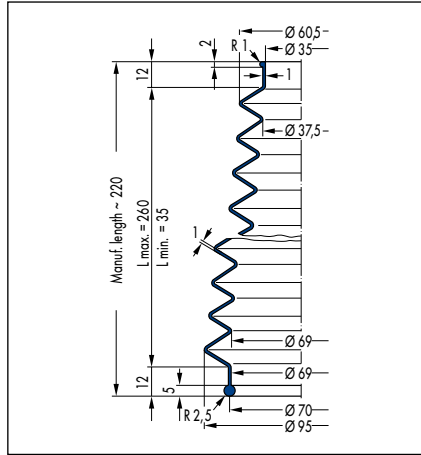
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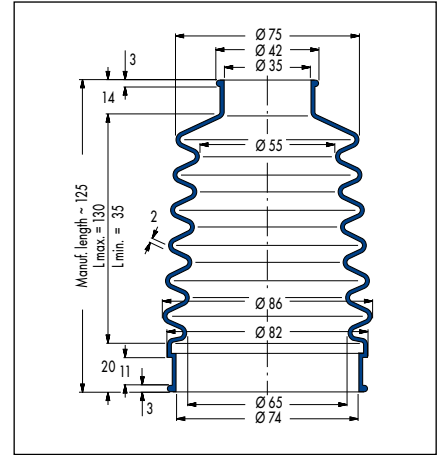
V6-00281, Article No. 427264



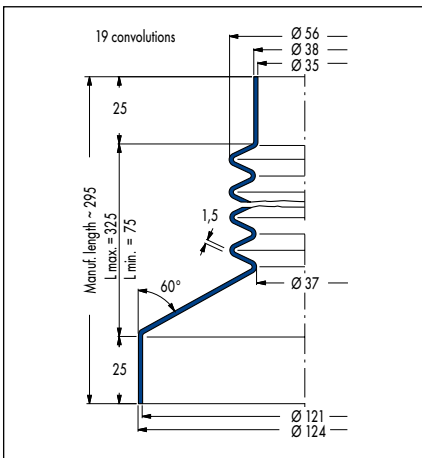
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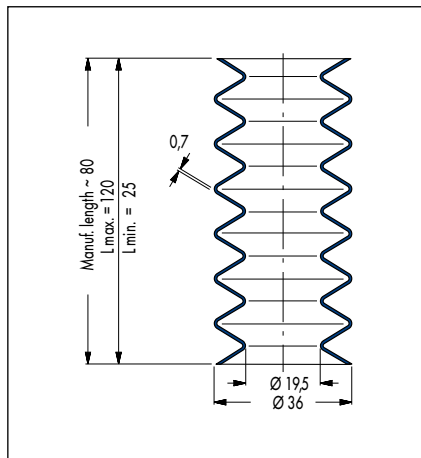
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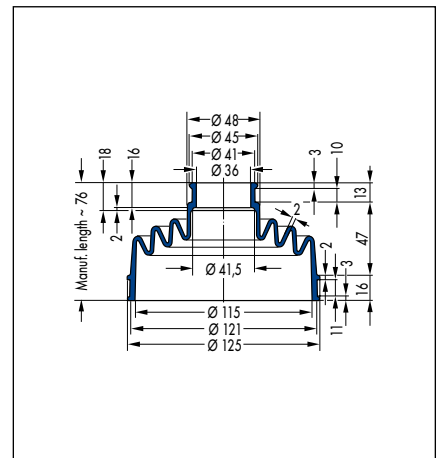
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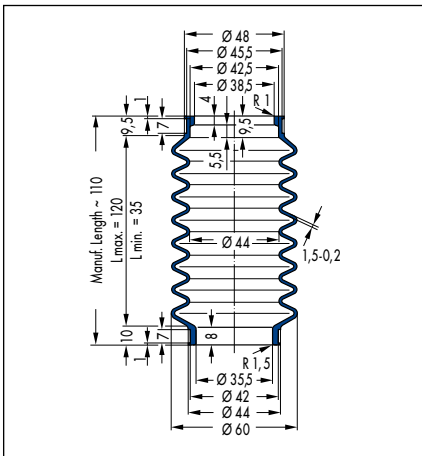
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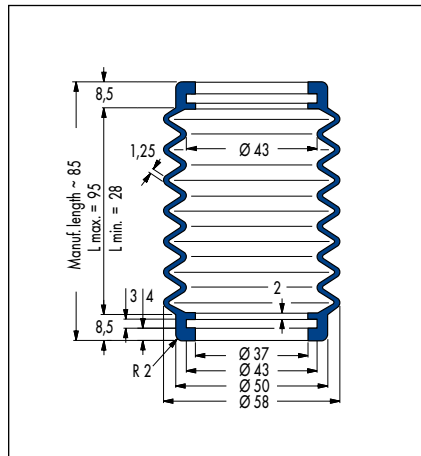
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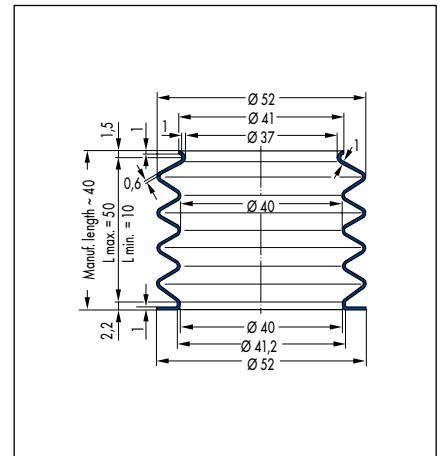
V6-00419, Article No. 507686



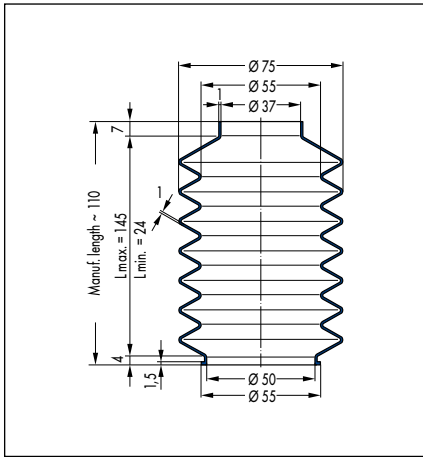
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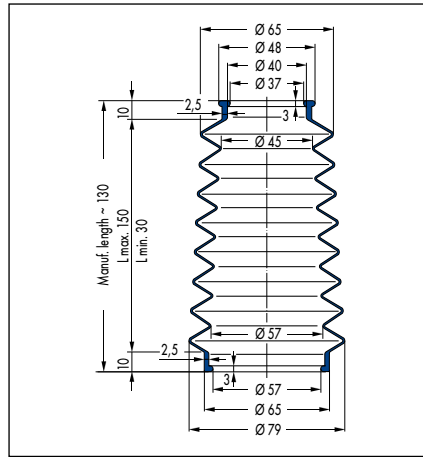
V6-00308, Article No. 427265



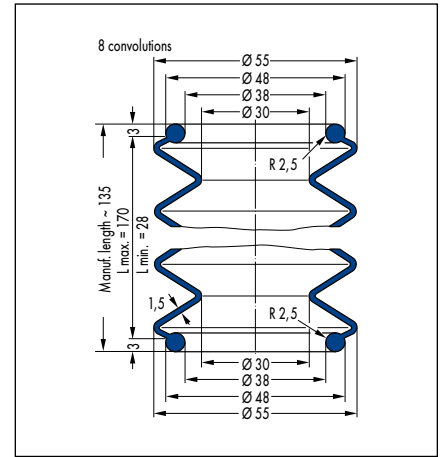
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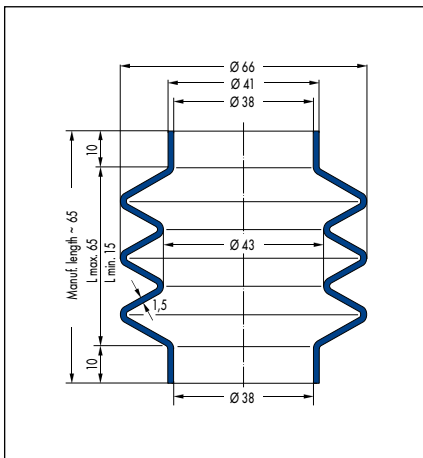
V6-00790, Article No. 29965



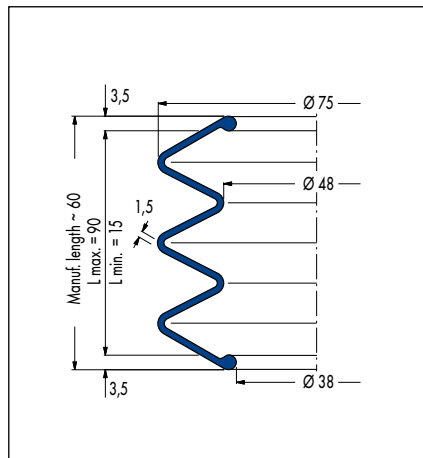
V6-00823, Article No. 400862



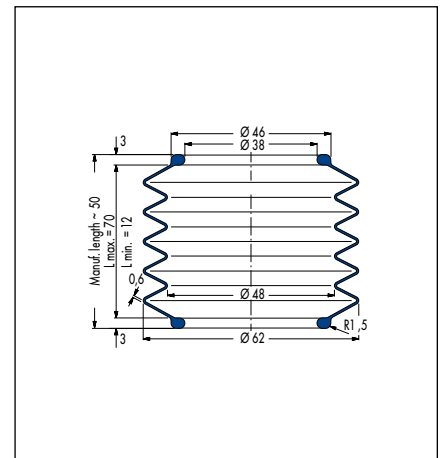
V6-00297, Article No. 501137



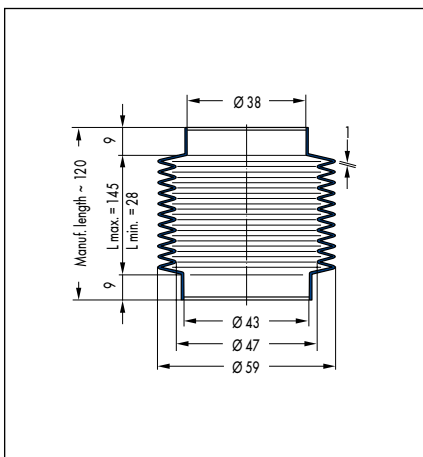
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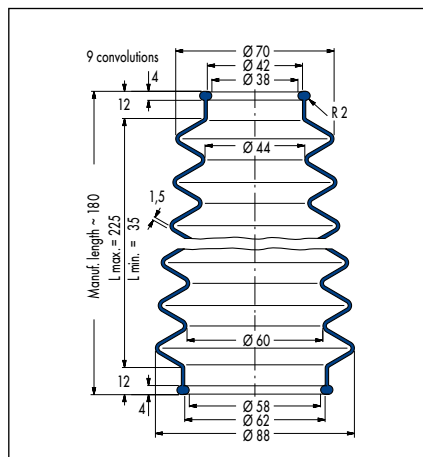
V6-00429, Article No. 431588



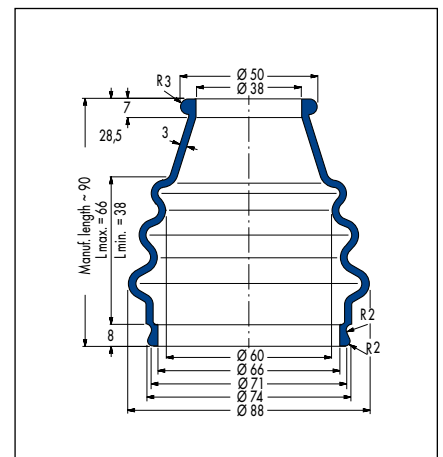
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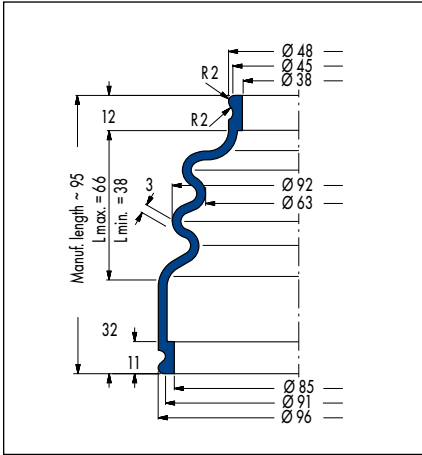
V6-00230, Article No. 439434



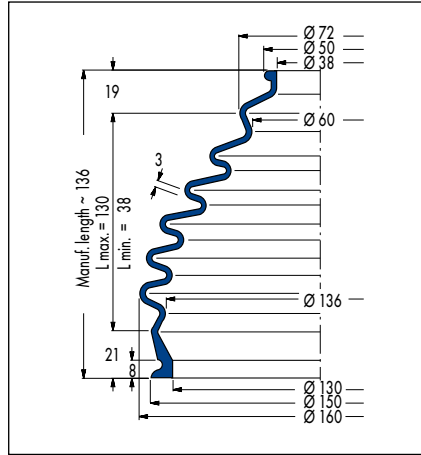
V6-00619, Article No. 431955 (CR)/
431957 (NBR)



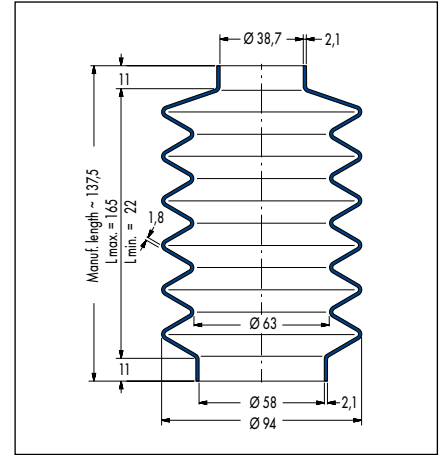
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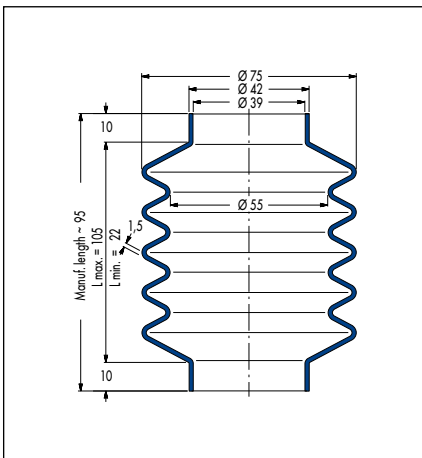
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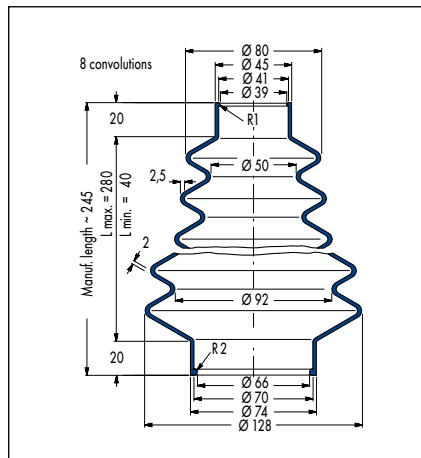
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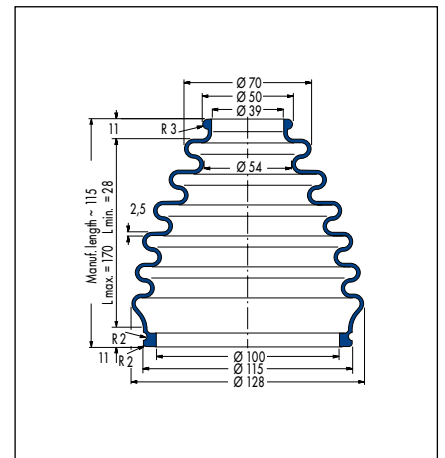
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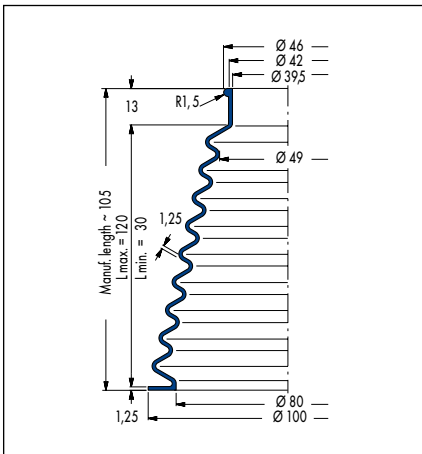
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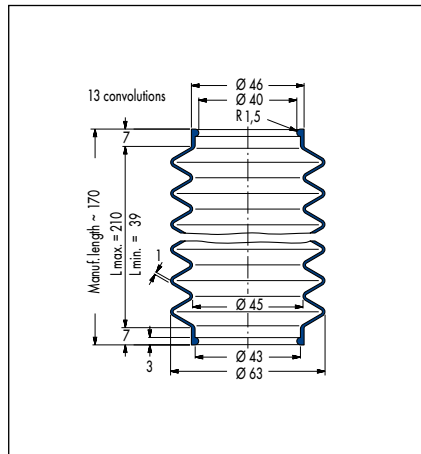
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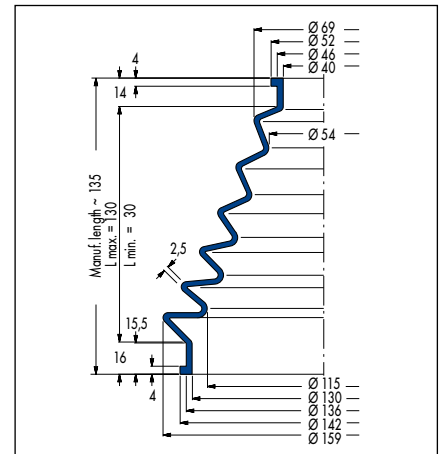
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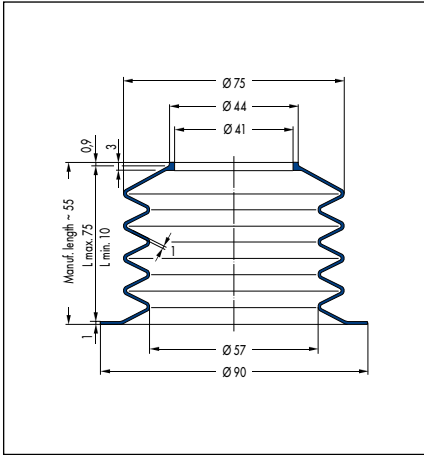
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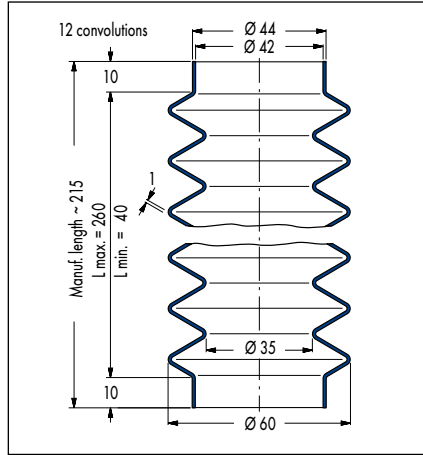
V6-00801, Article No. 438557 (50 CR 879)/
440760 (42 CR 764)



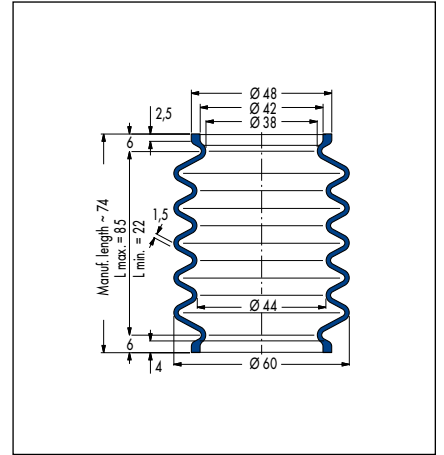
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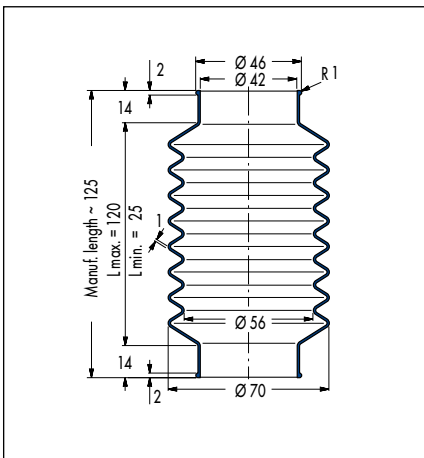
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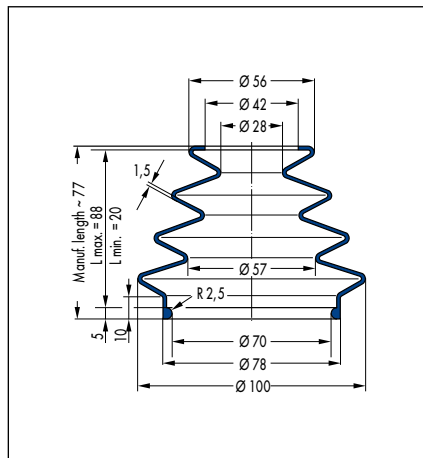
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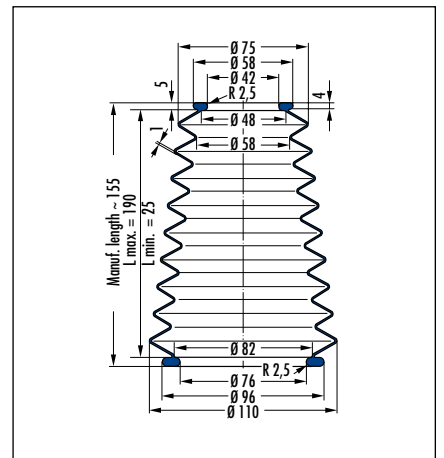
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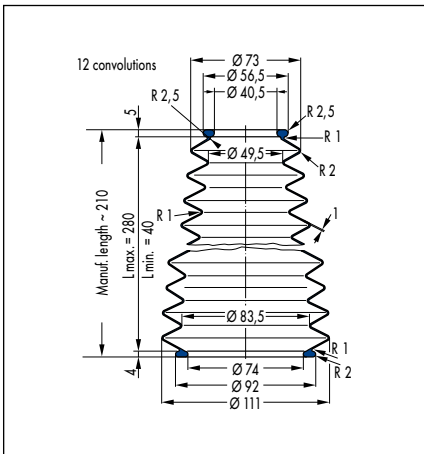
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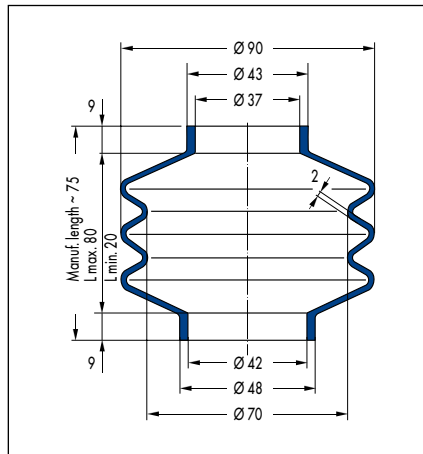
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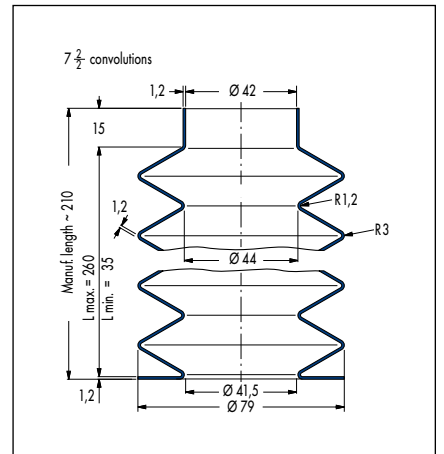
V6-00328, Article No. 432424 (42 CR 764)/
454213 (50 CR 879)



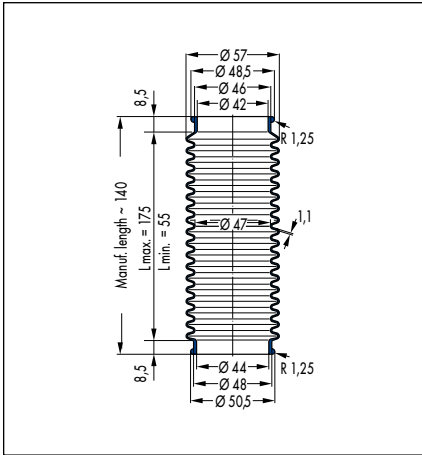
V6-00562, Article No. 29741



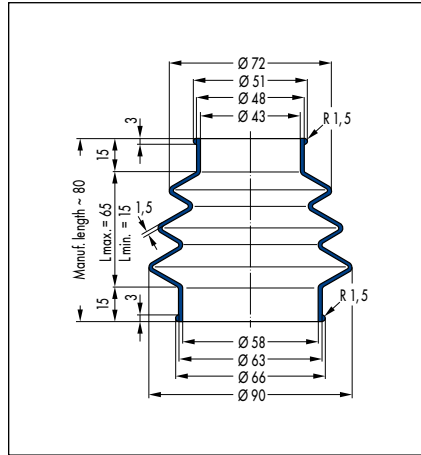
V6-01030, Article No. 400918



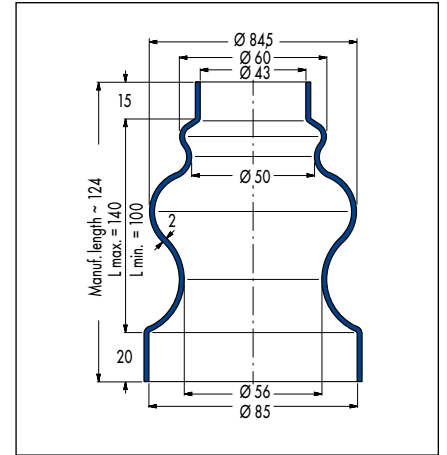
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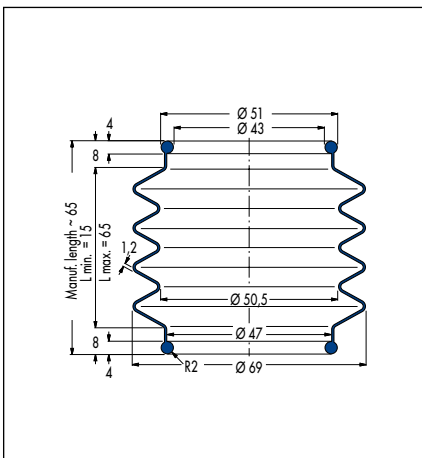
V6-00449, Article No. 456484



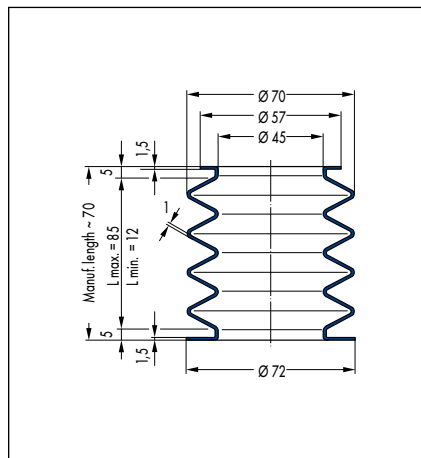
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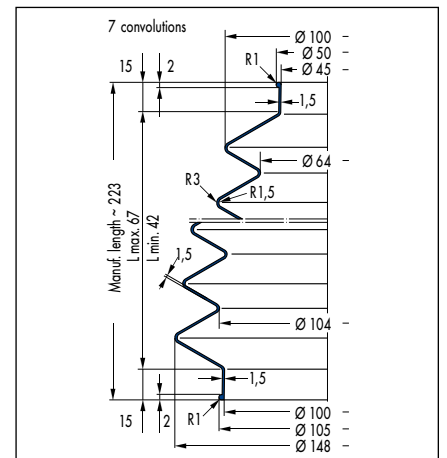
V6-00012, Article No. 426317 (42 CR 764)/
60032051 (45 NBR 670)



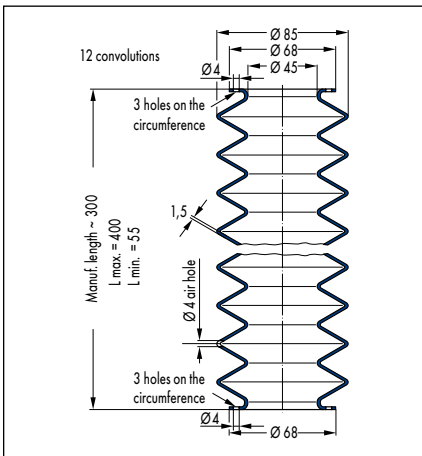
V6-00784, Article No. 432192



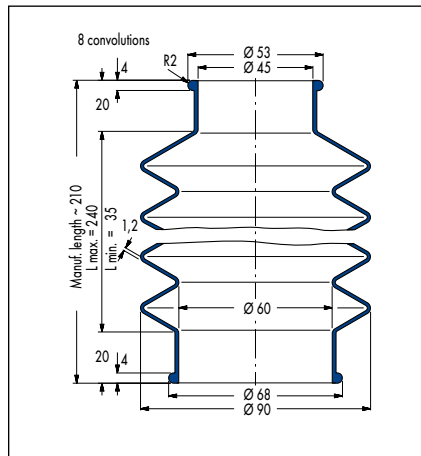
V6-00967, Article No. 89513



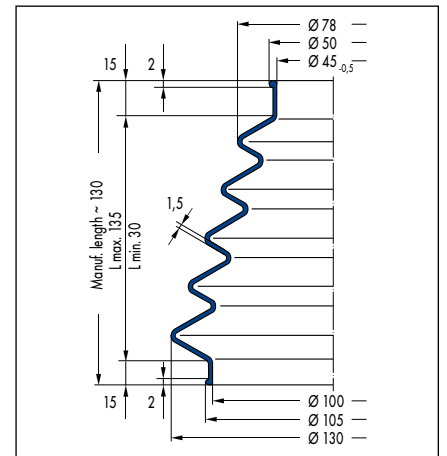
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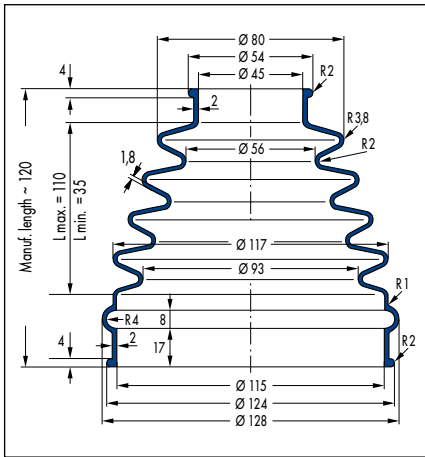
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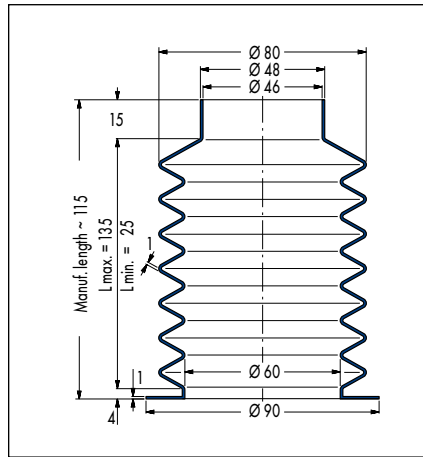
V6-00593, Article No. 439497 (42 CR 764)/
439499 (50 CR 879)



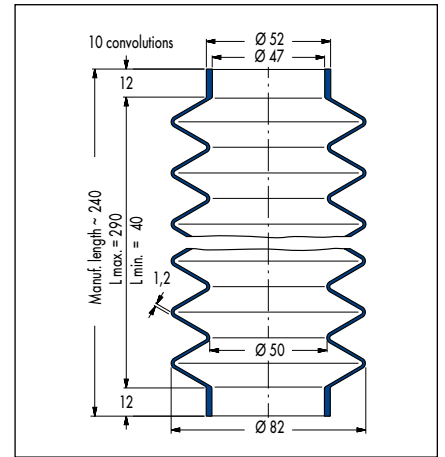
V6-01047, Article No. 454226



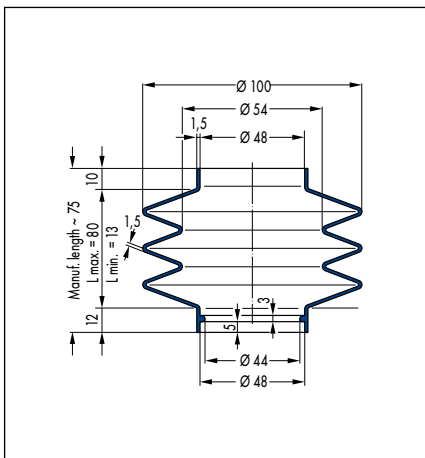
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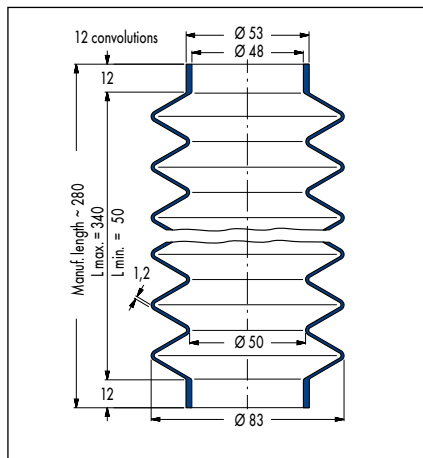
V6-00466, Article No. 430847



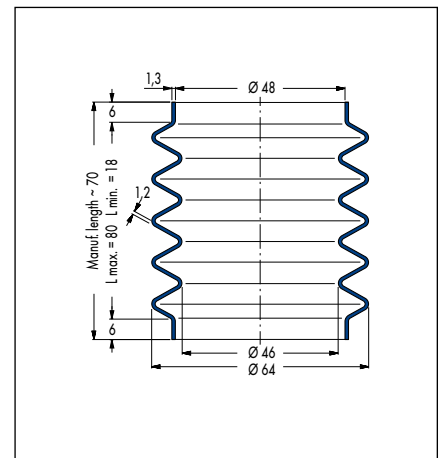
V6-01022, Article No. 49344567 (CR)/
49344592 (NBR)



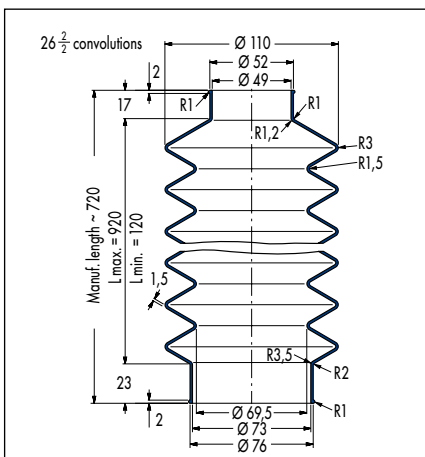
V6-01136, Article No. 425266



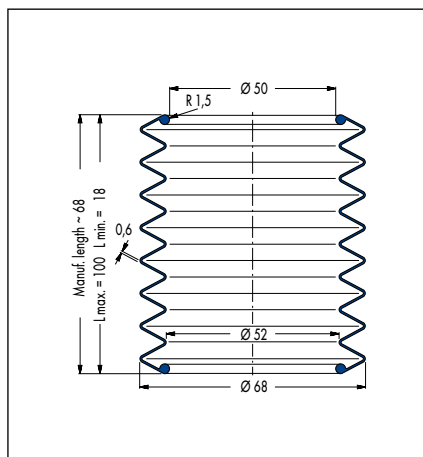
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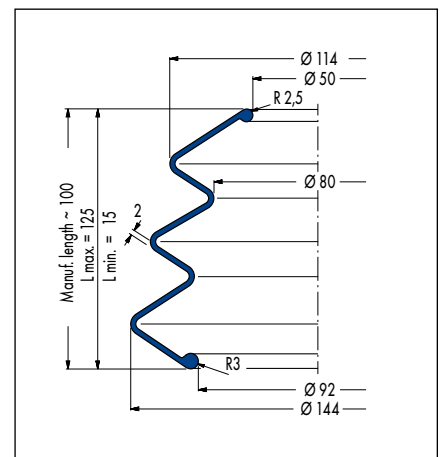
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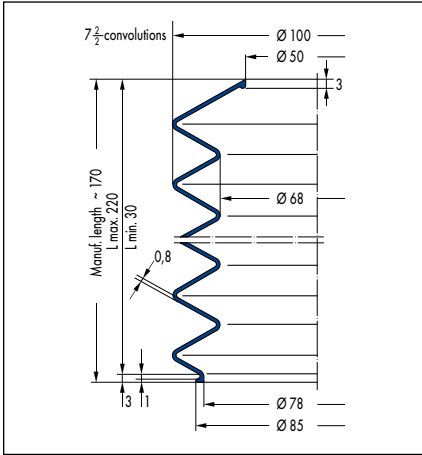
V6-00723, Article No. 29915



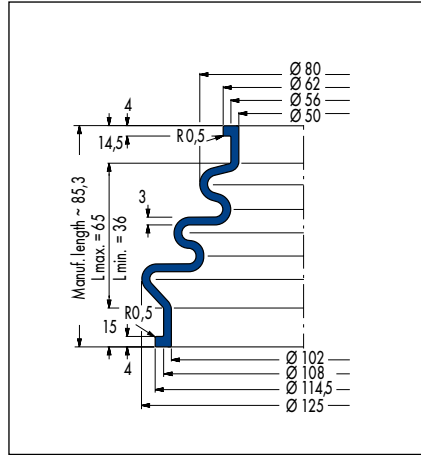
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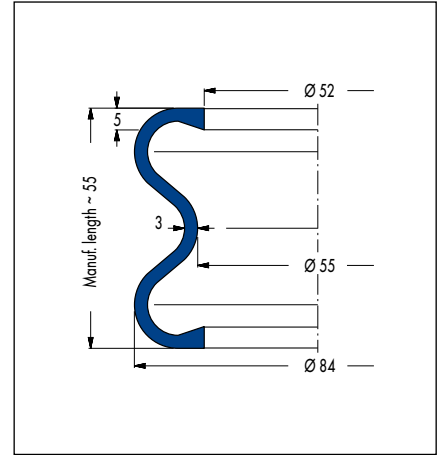
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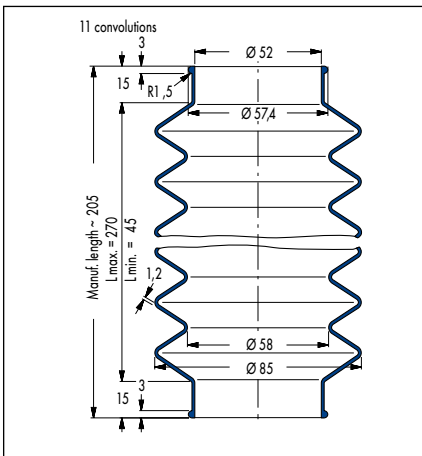
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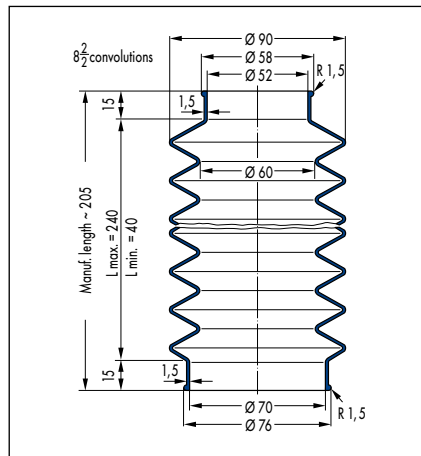
V6-00091, Article No. 456482



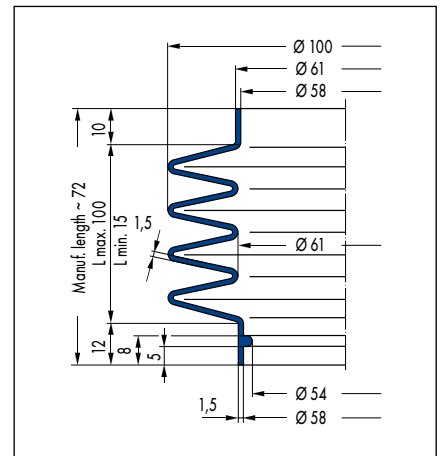
V6-00291, Article No. 440381



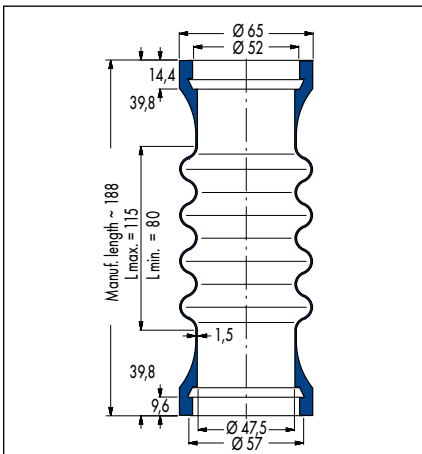
V6-00987, Article No. 49312666 (42 CR 764)/
49312659 (50 CR 879)



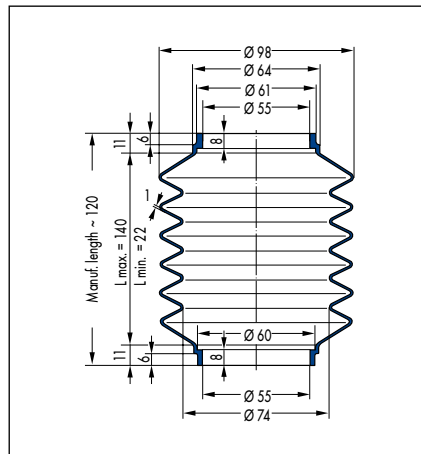
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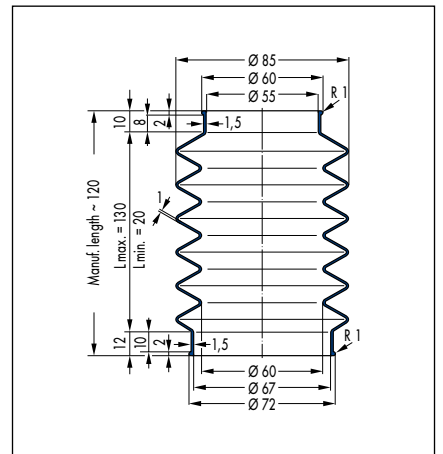
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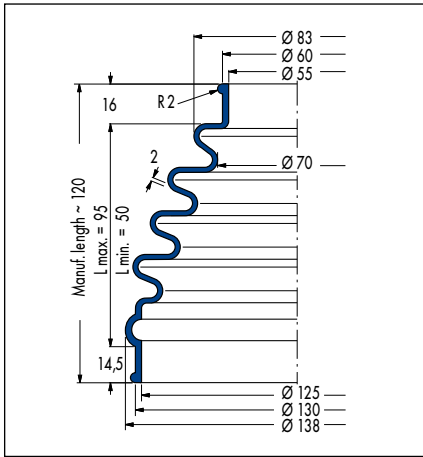
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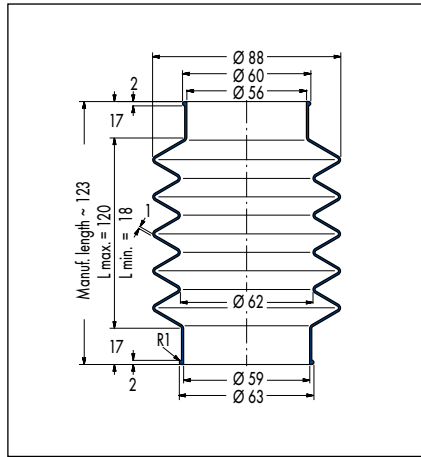
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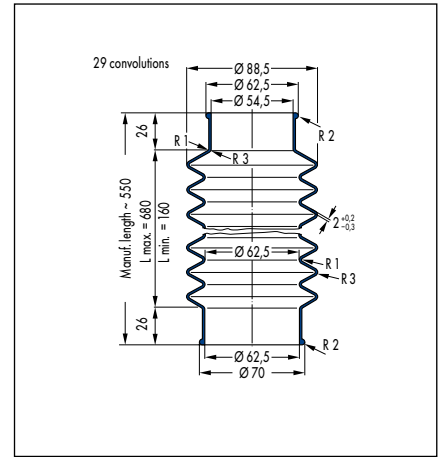
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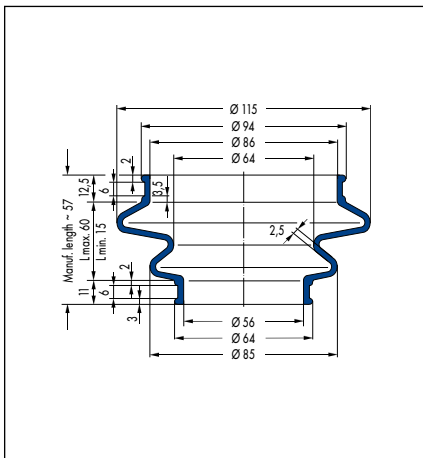
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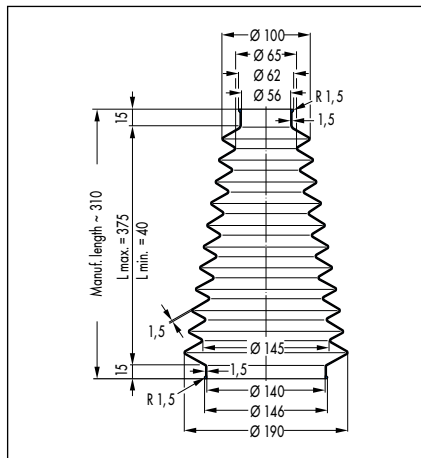
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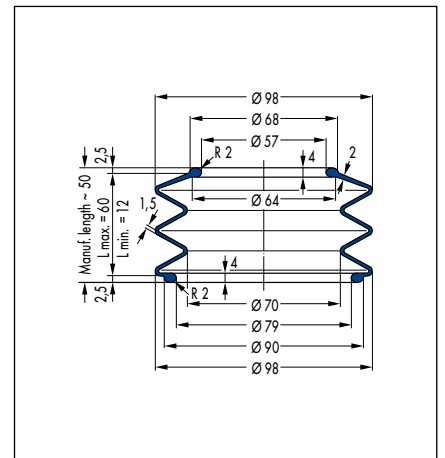
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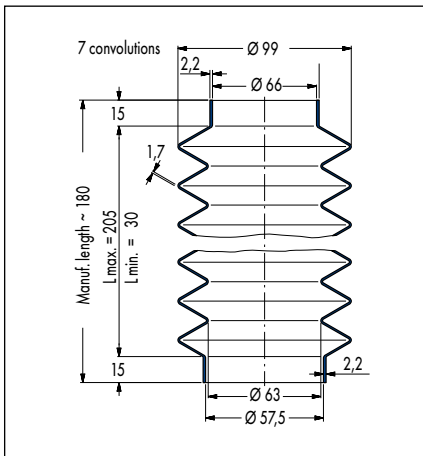
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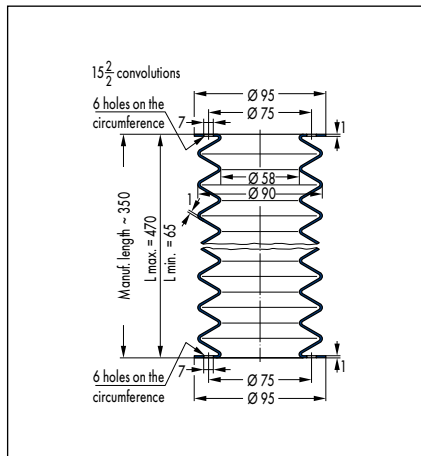
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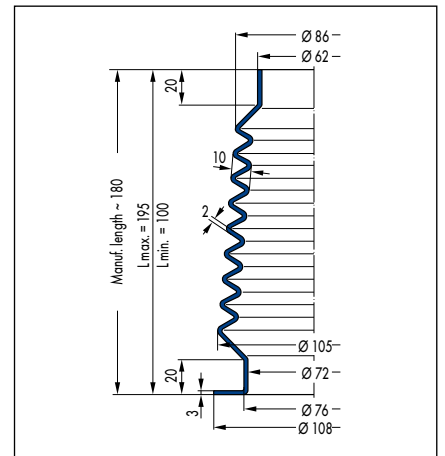
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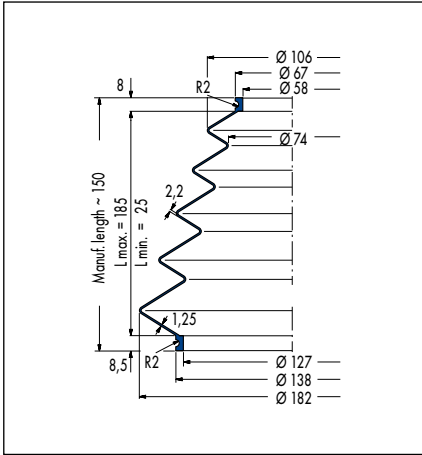
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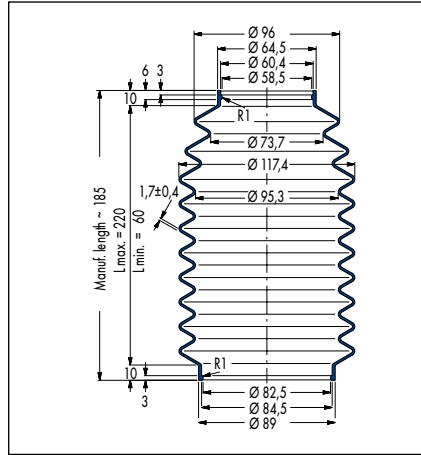
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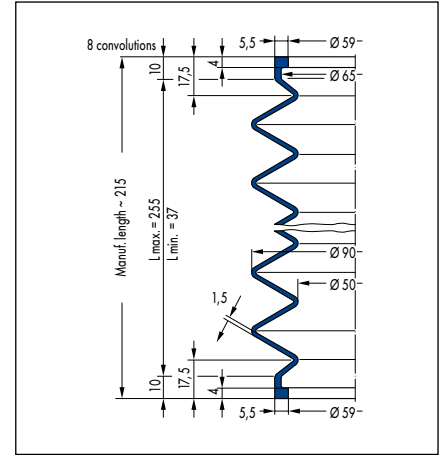
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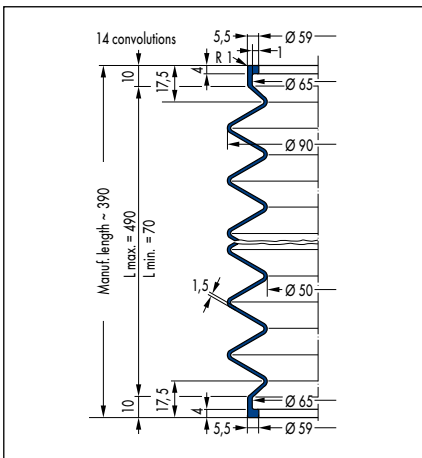
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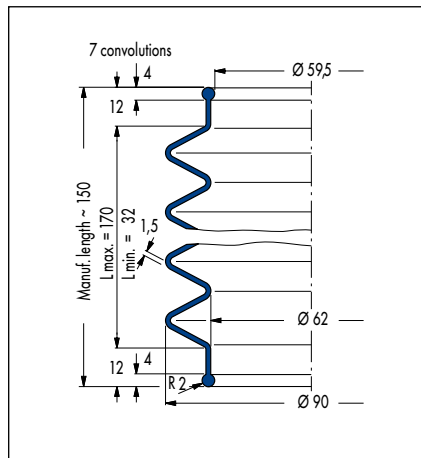
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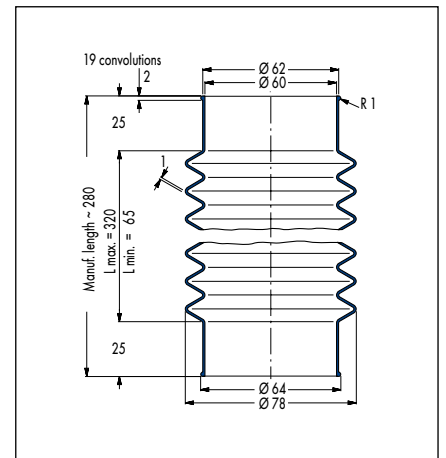
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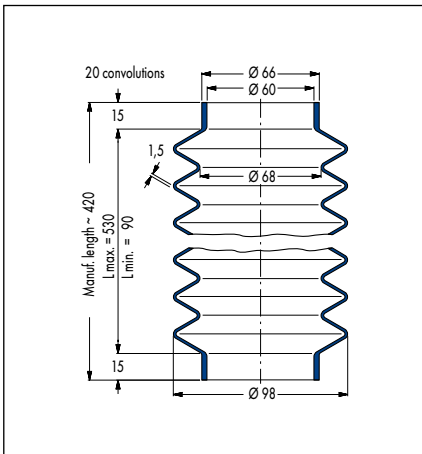
V6-00910, Article No. 103132



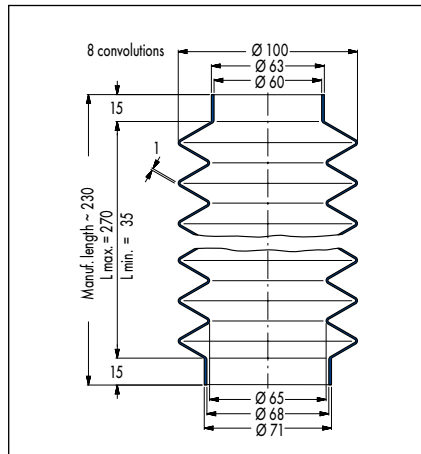
V6-00260, Article No. 434071



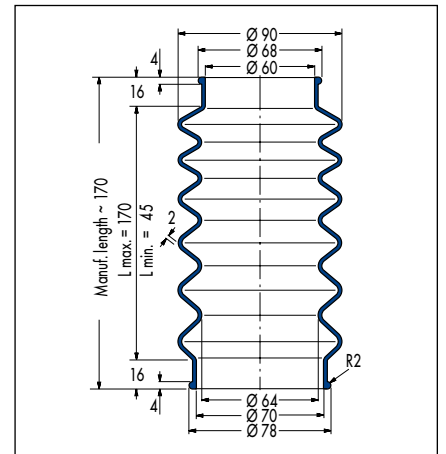
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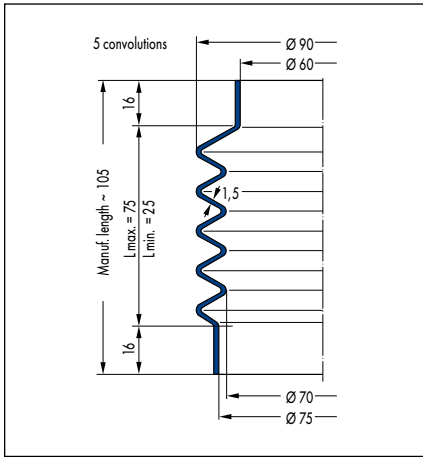
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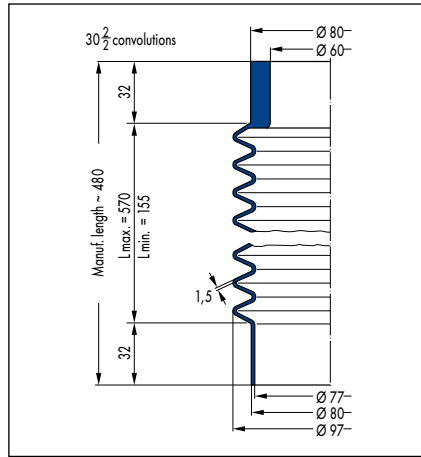
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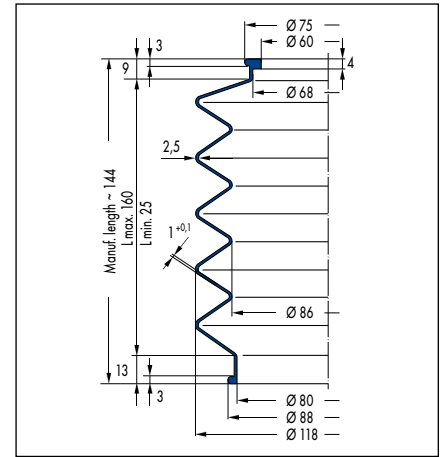
V6-00453, Article No. 426371



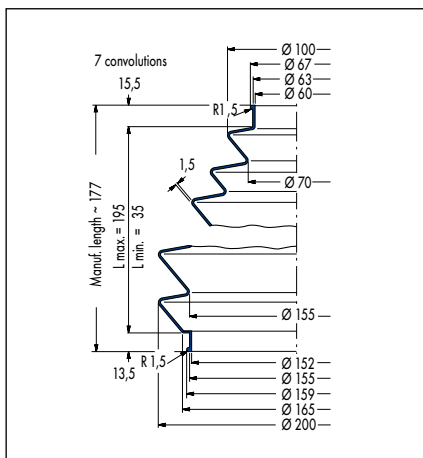
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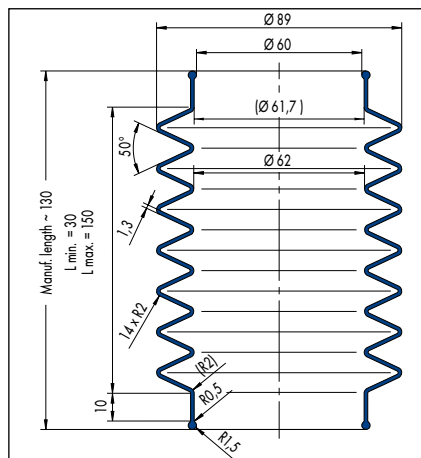
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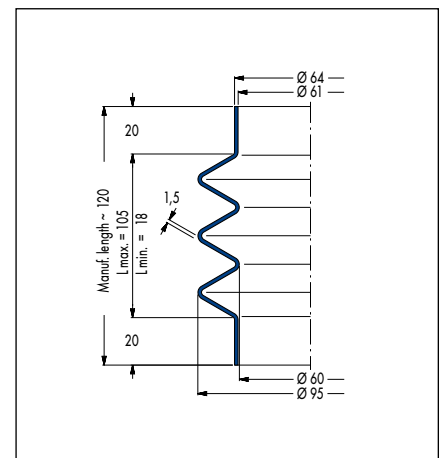
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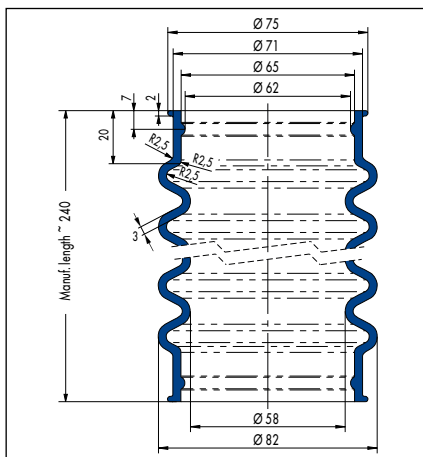
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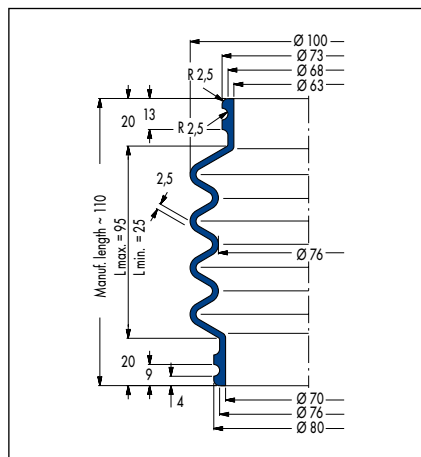
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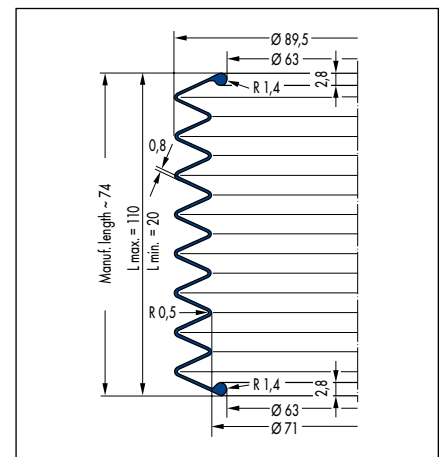
V6-00099, Article No. 434091 (NBR)/
434092 (CR)



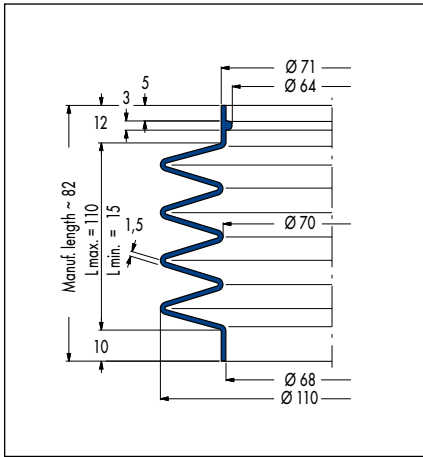
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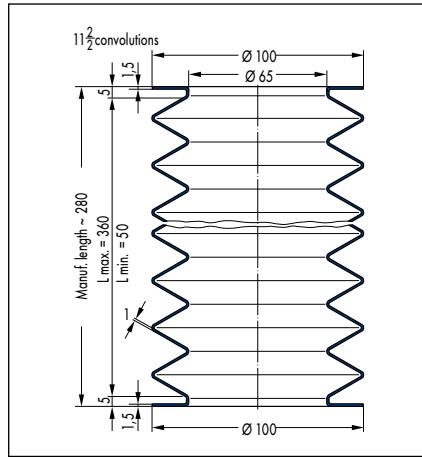
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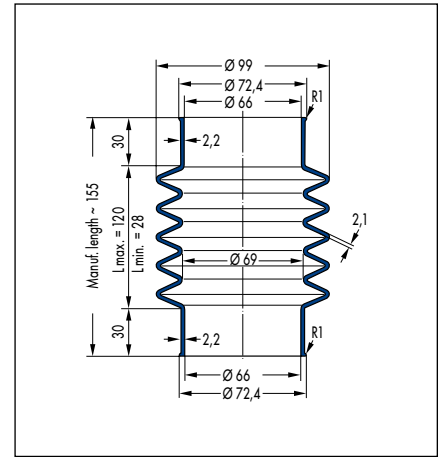
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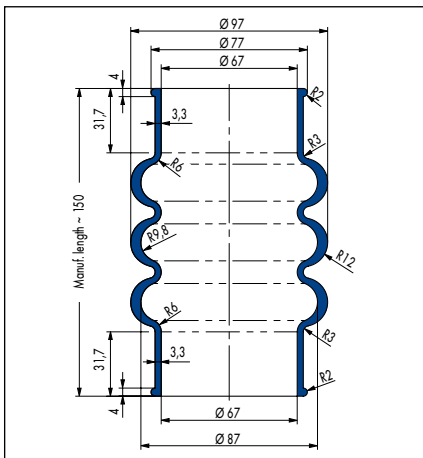
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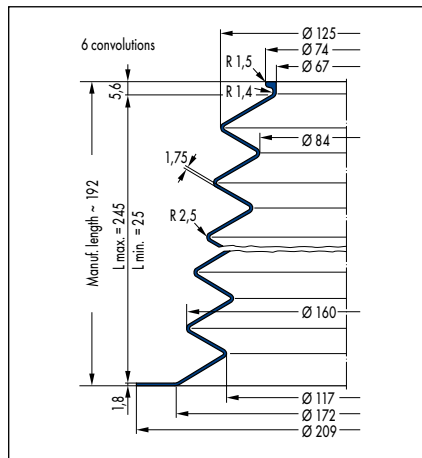
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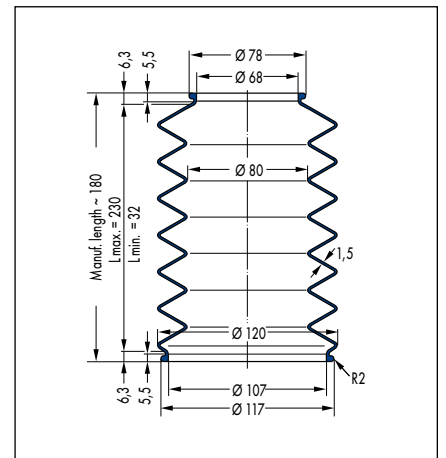
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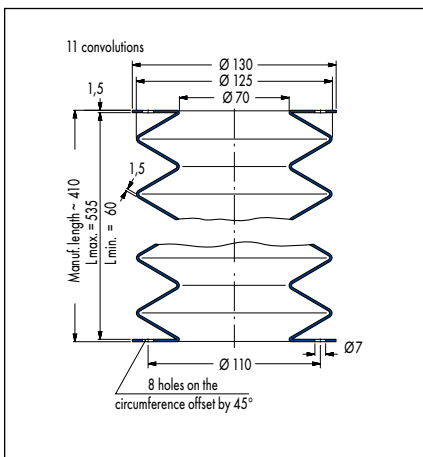
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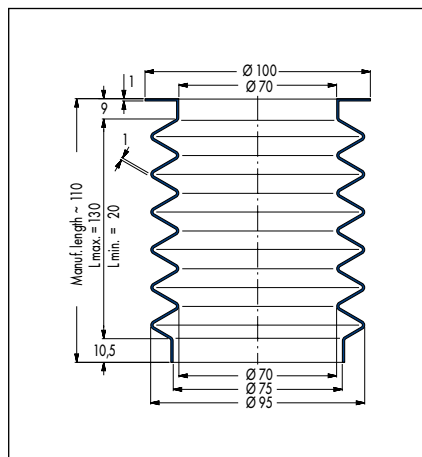
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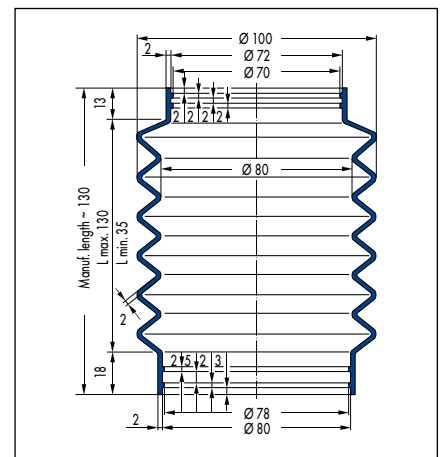
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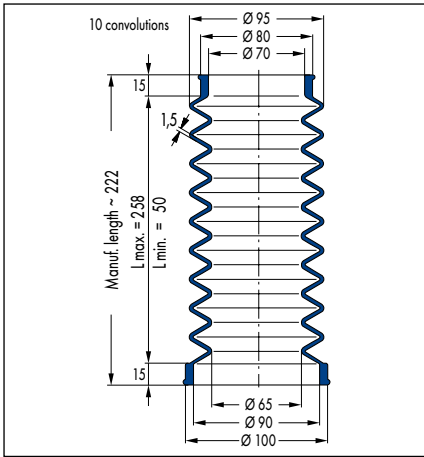
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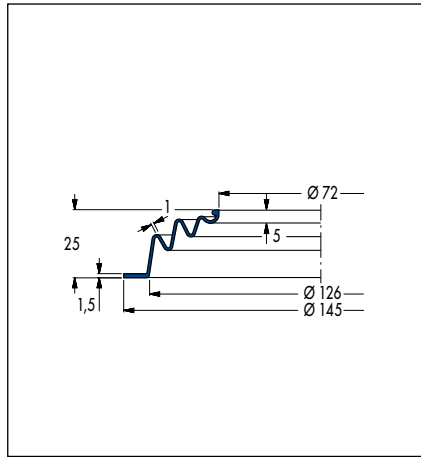
V6-00638, Article No. 29803



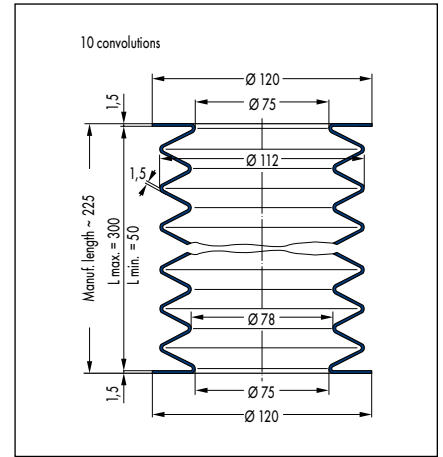
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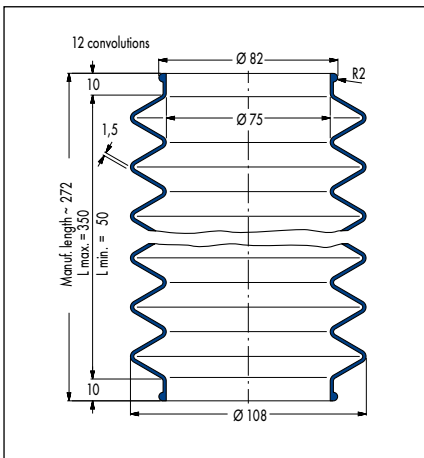
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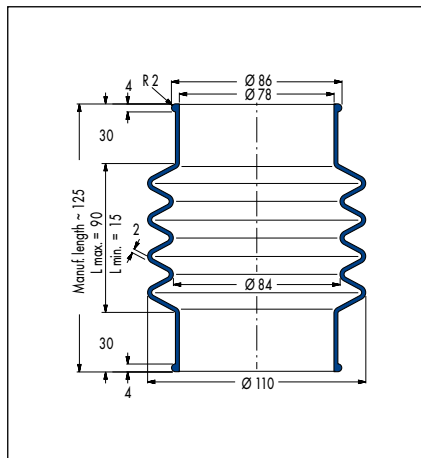
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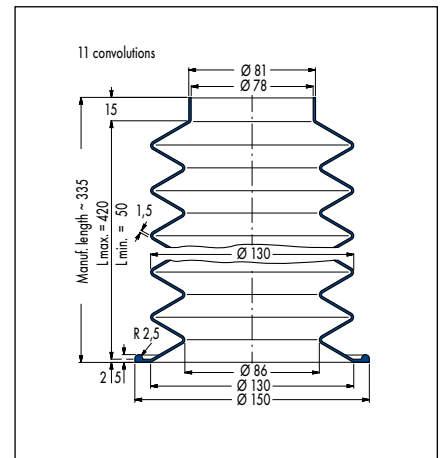
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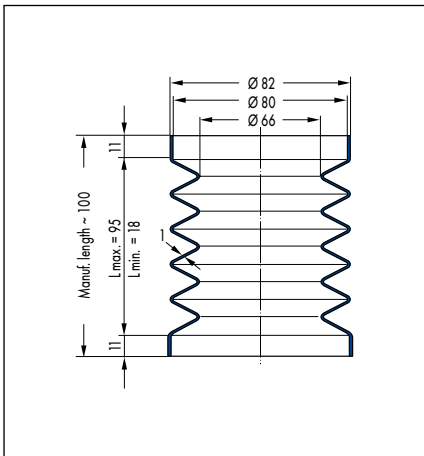
V6-00093, Article No. 440343 (CR)/
440342 (NBR)



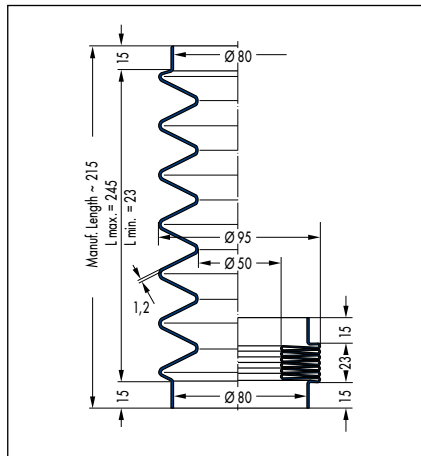
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438946 (42 CR 764)



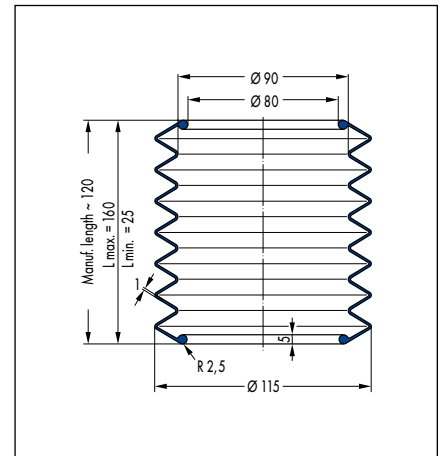
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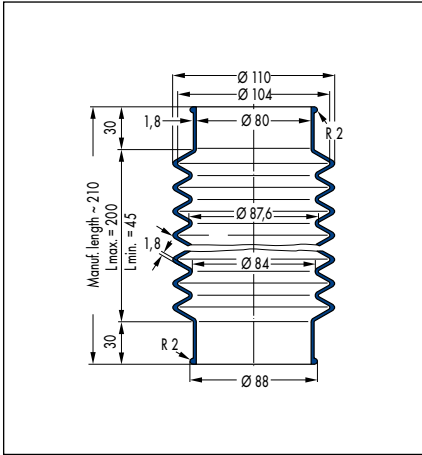
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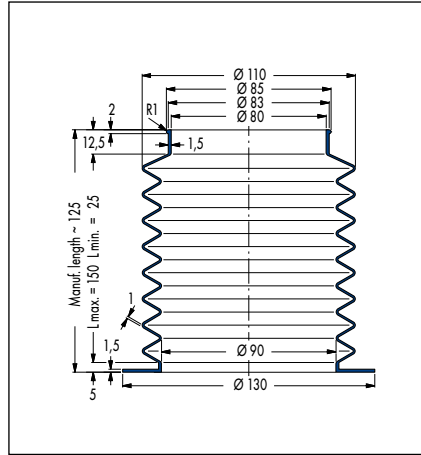
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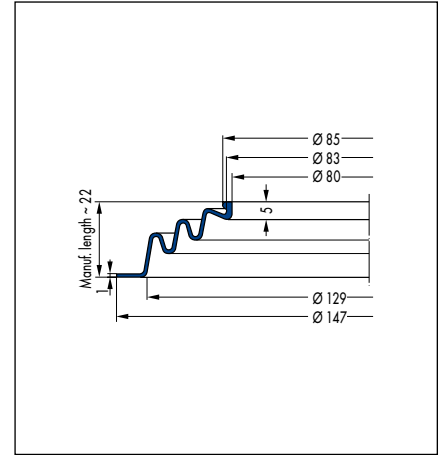
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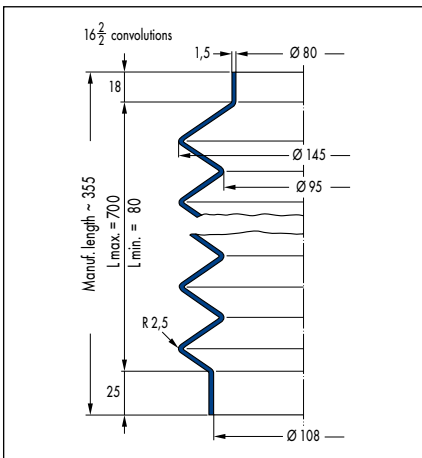
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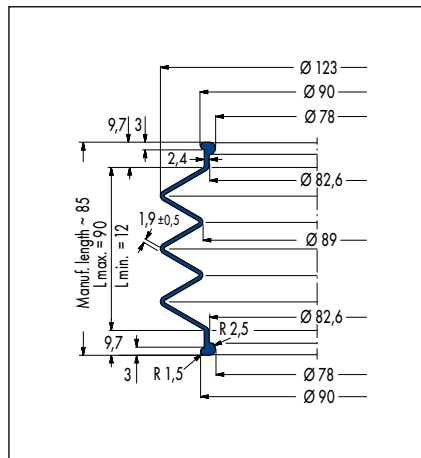
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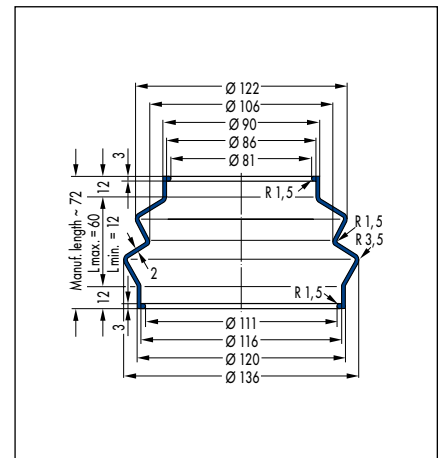
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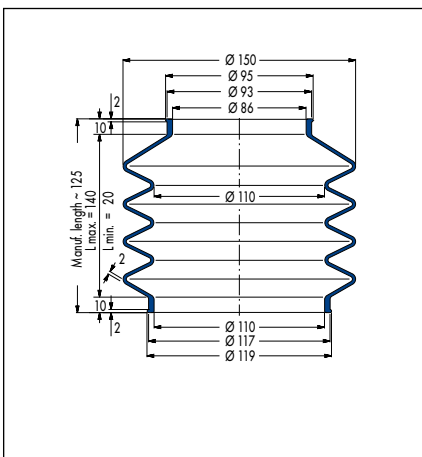
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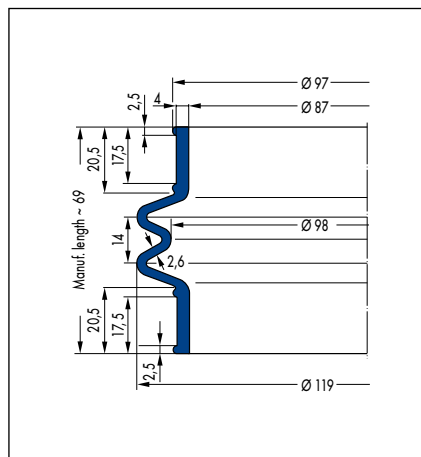
V6-00633, Article No. 426324



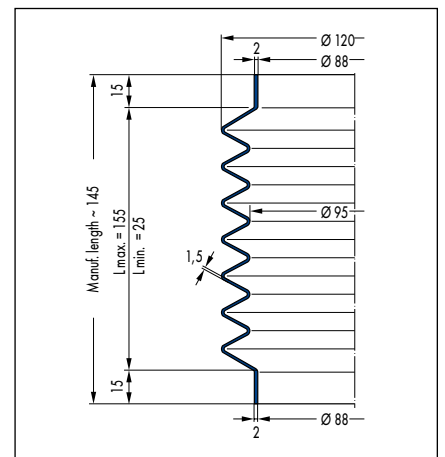
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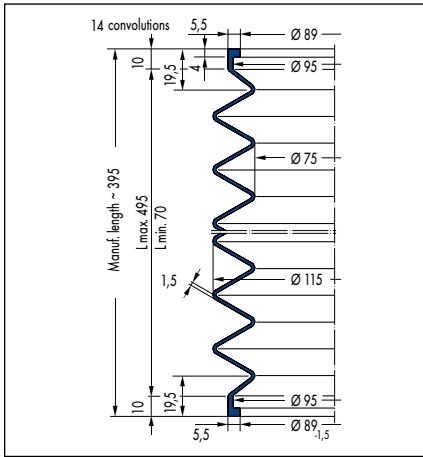
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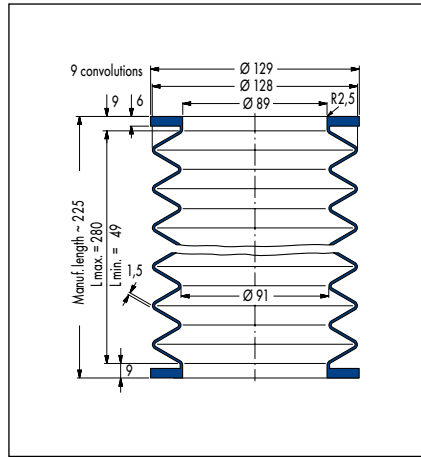
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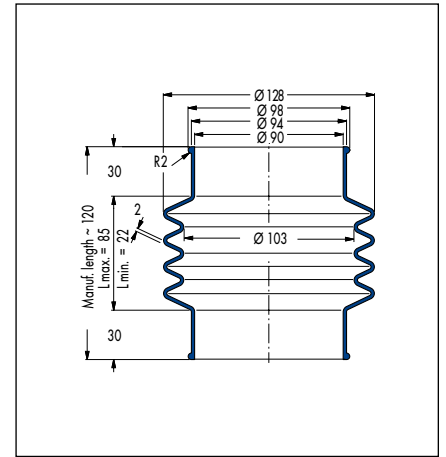
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454480 (NBR)



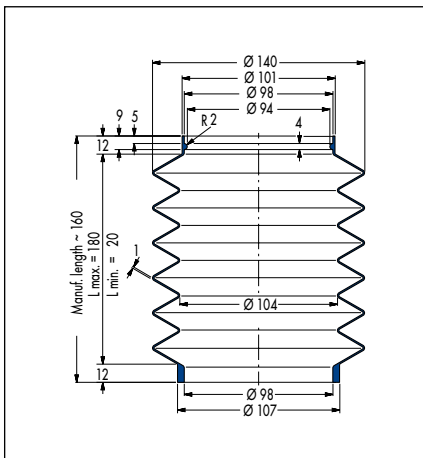
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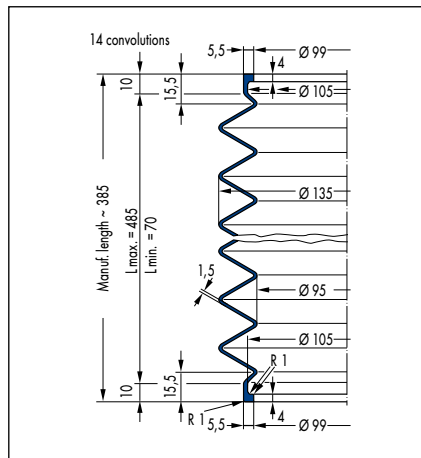
V6-00721, Article No. 29912



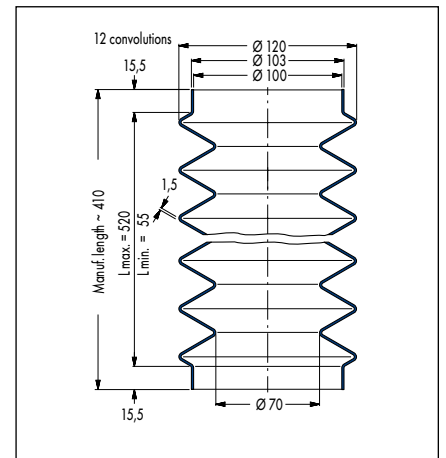
V6-00517, Article No. 454473



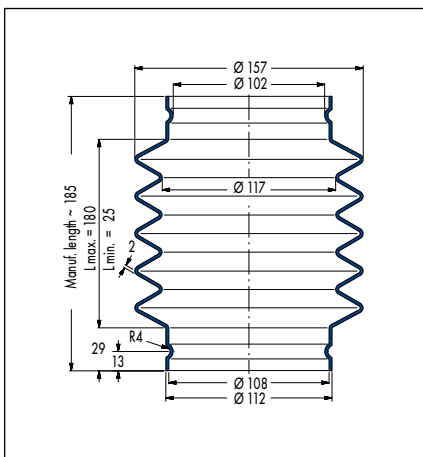
V6-01140, Article No. 454240



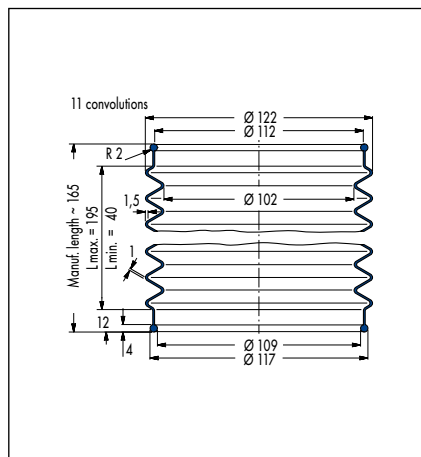
V6-00909, Article No. 505424



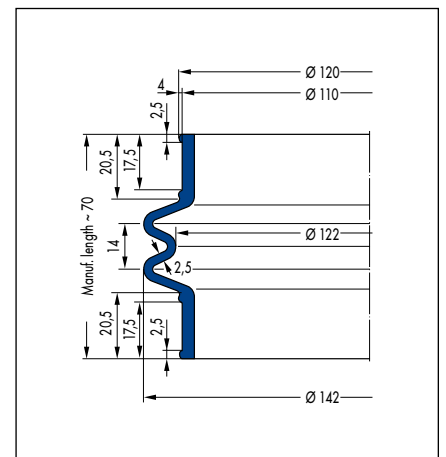
V6-00468, Article No. 29675



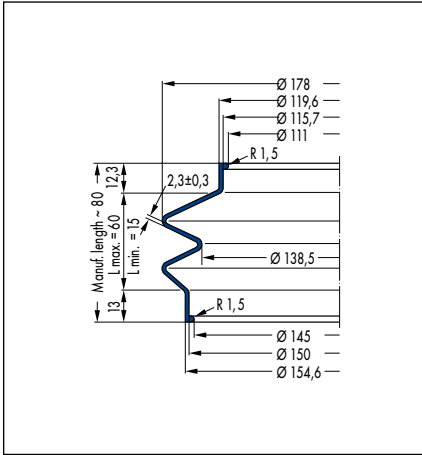
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368633 (NBR)



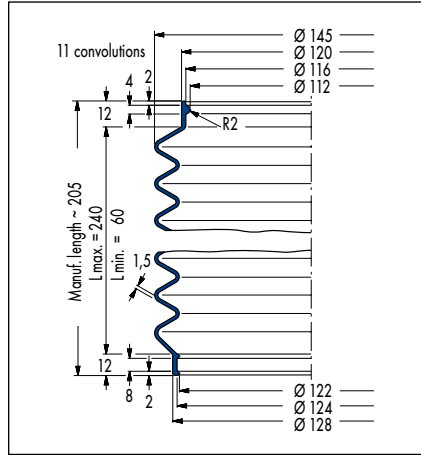
V6-00332, Article No. 454470 (CR)/
49040057 (NBR)



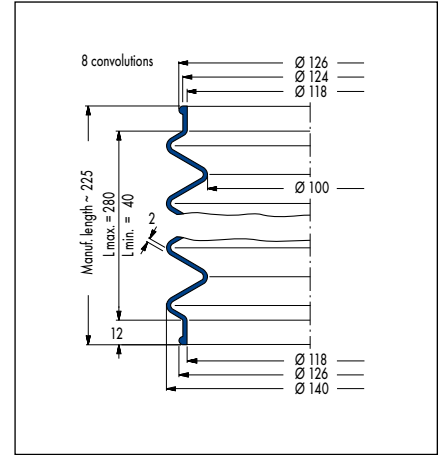
V6-01406, Article No. 333285



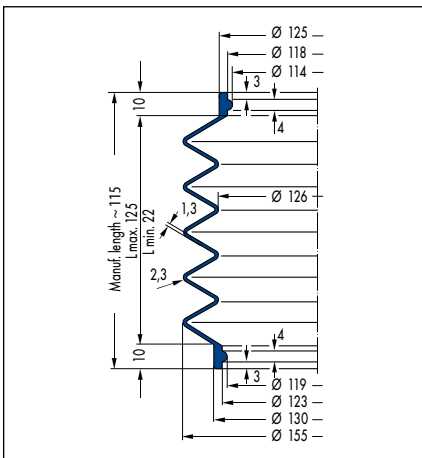
V6-00443, Article No. 1065



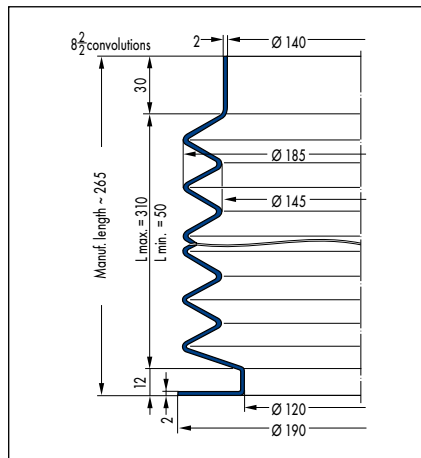
V6-01247, Article No. 454251



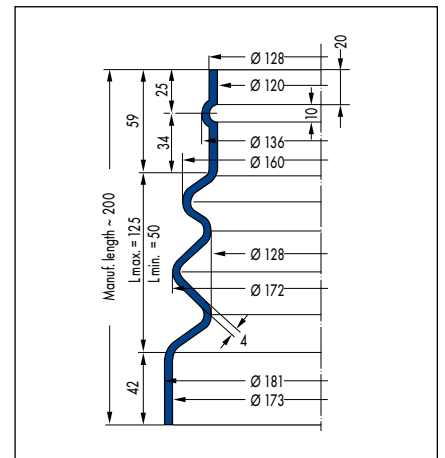
V6-00642, Article No. 2708



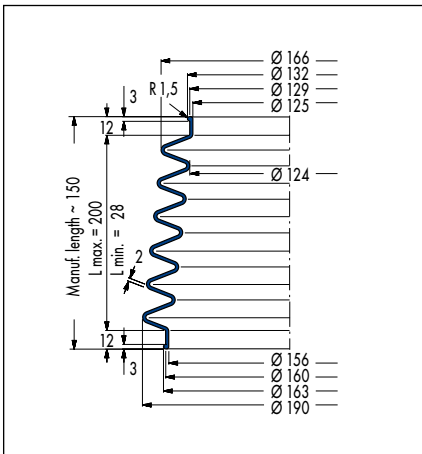
V6-01003, Article No. 454224



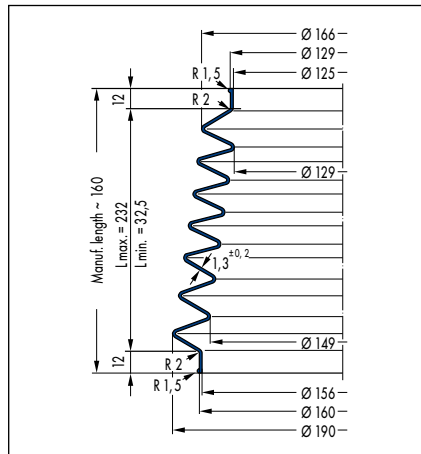
V6-00542, Article No. 125325



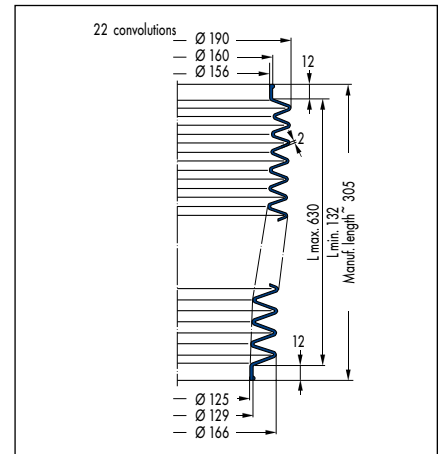
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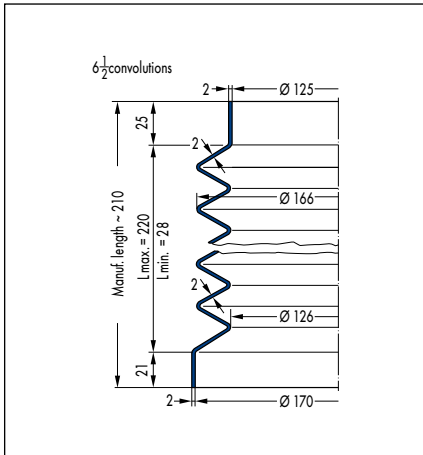
V6-00217, Article No. 29370



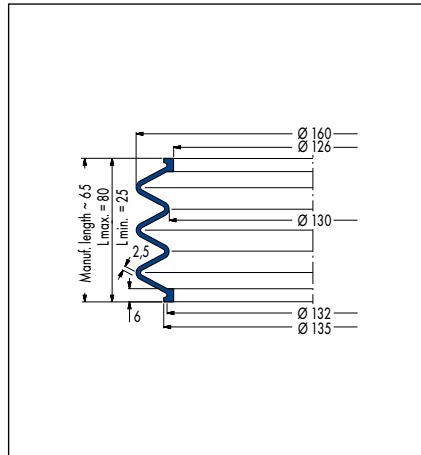
V6-01445, Article No. 355400



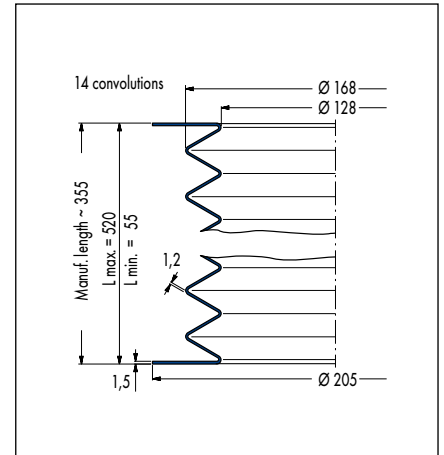
V6-01444, Article No. 60040372



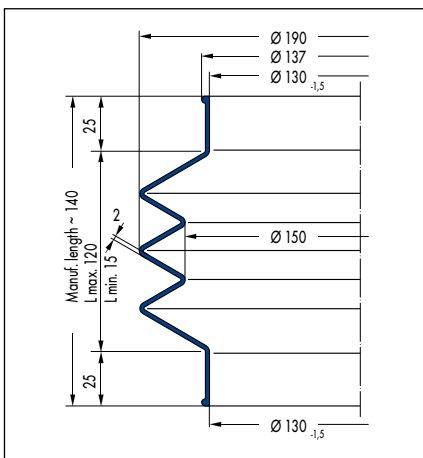
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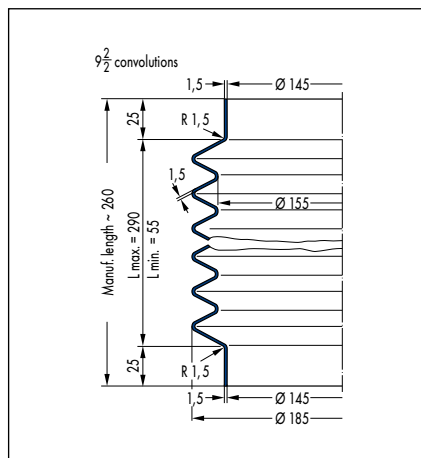
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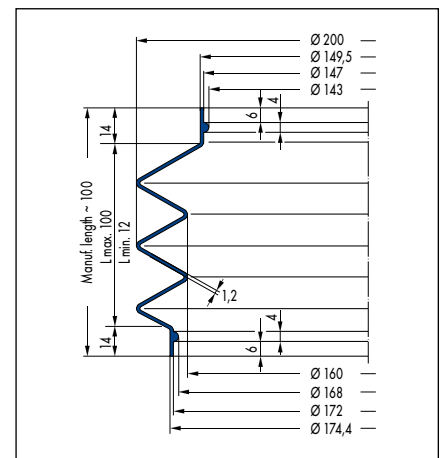
V6-00628, Article No. 29793



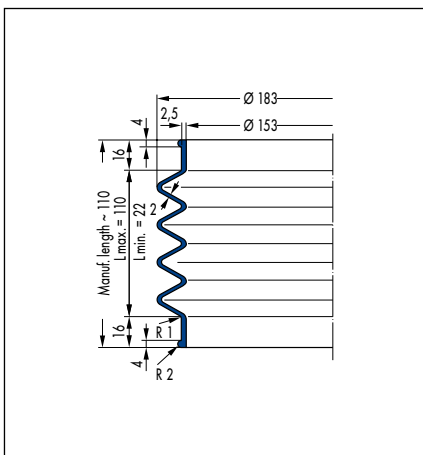
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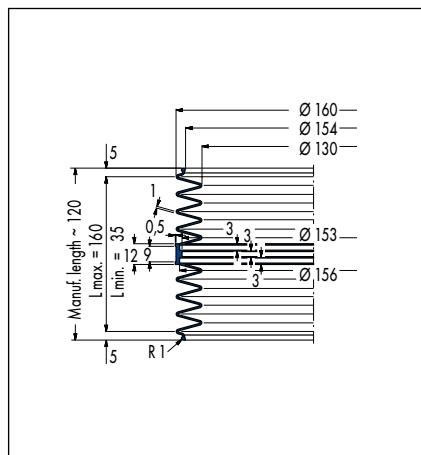
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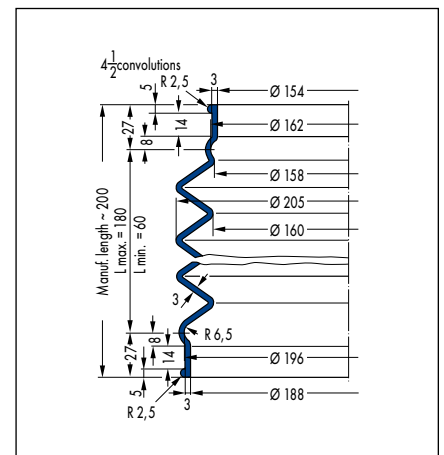
V6-00717, Article No. 505499



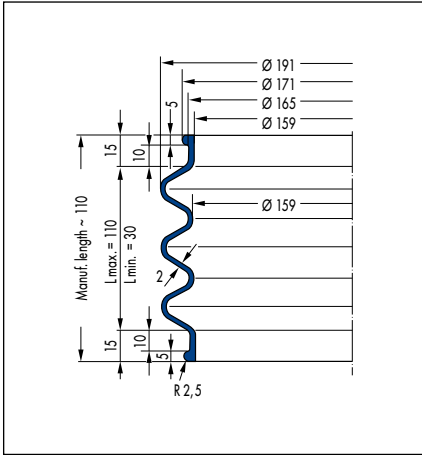
V6-00349, Article No. 423911



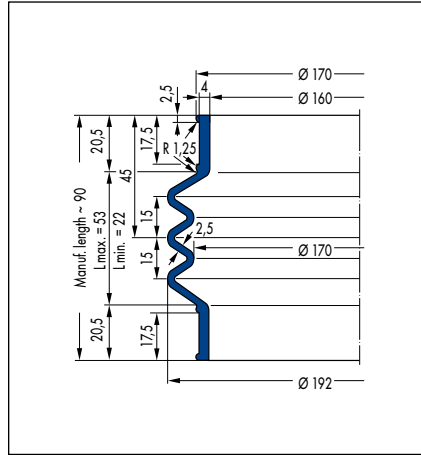
V6-00250, Article No. 29416



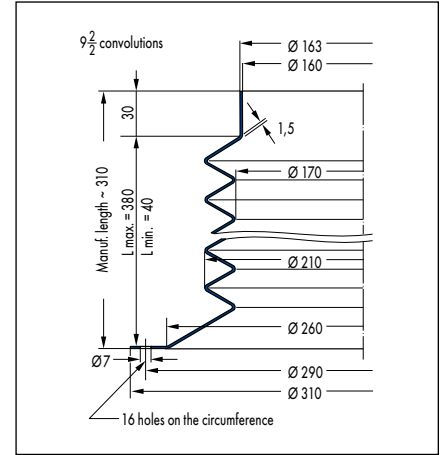
V6-00330, Article No. 325674



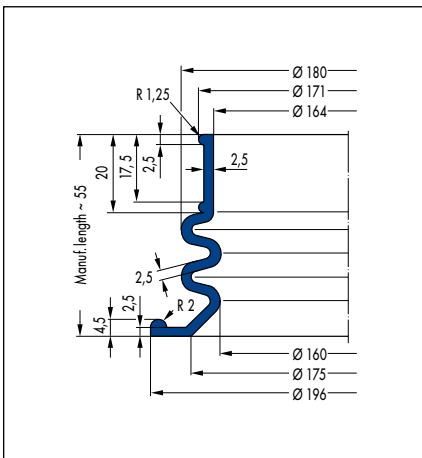
V6-00420, Article No. 29612



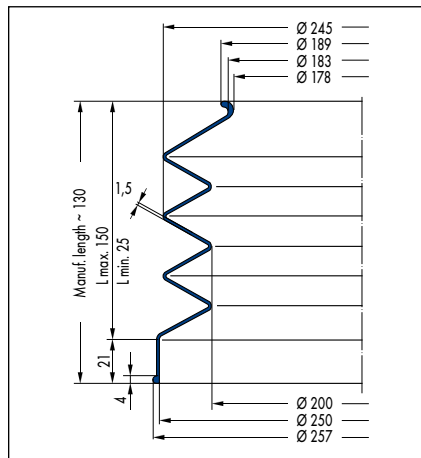
V6-01413, Article No. 104556



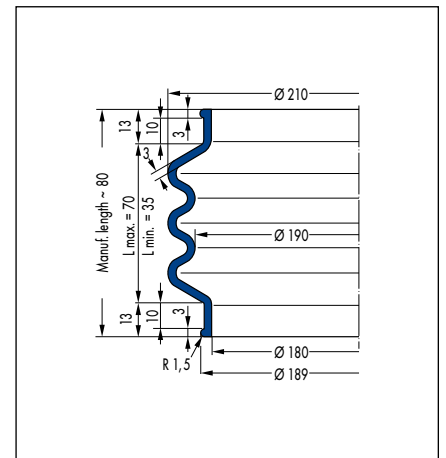
V6-00676, Article No. 29842 (CR)/
60028661 (NBR)



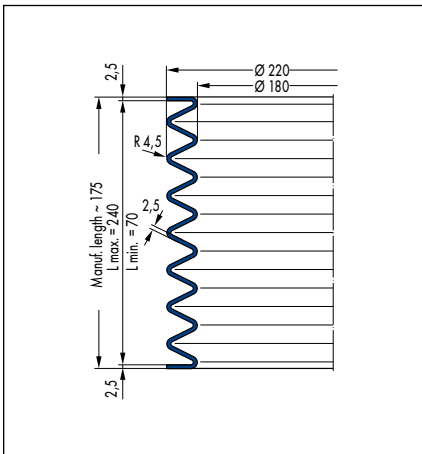
V6-01234, Article No. 501406



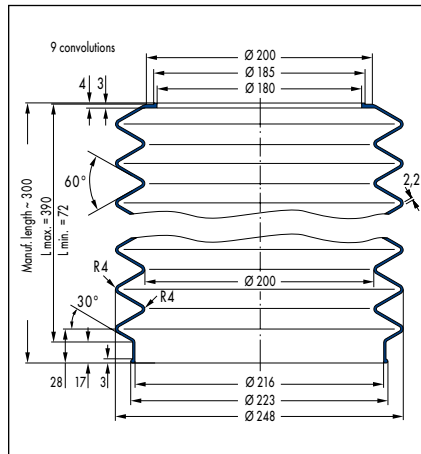
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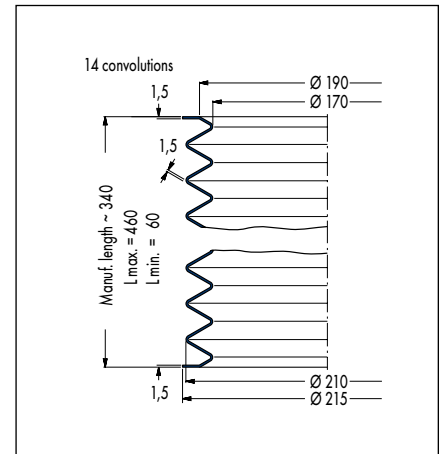
V6-00661, Article No. 29824 (45 NBR 670)/
60028128 (50 CR 879)



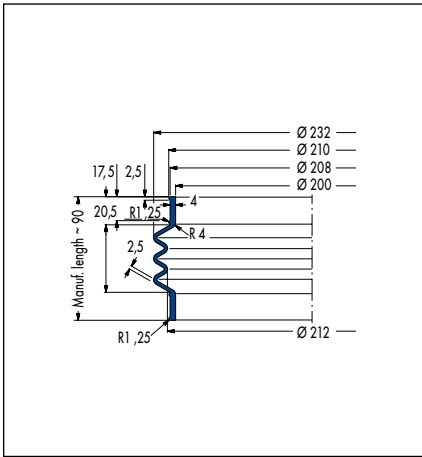
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29554 (NBR)



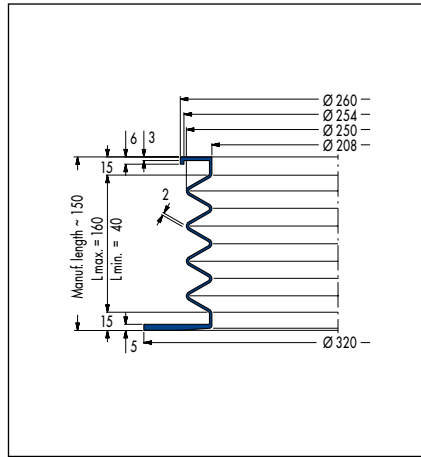
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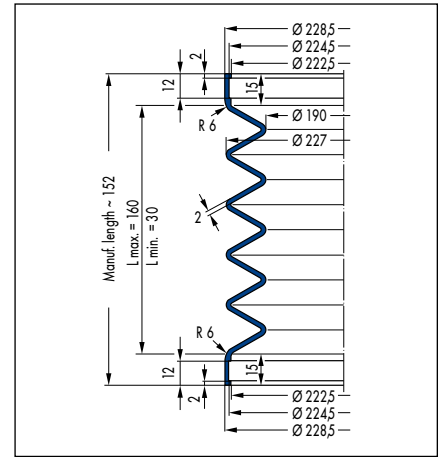
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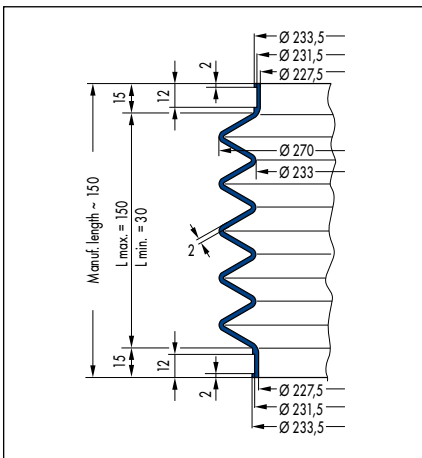
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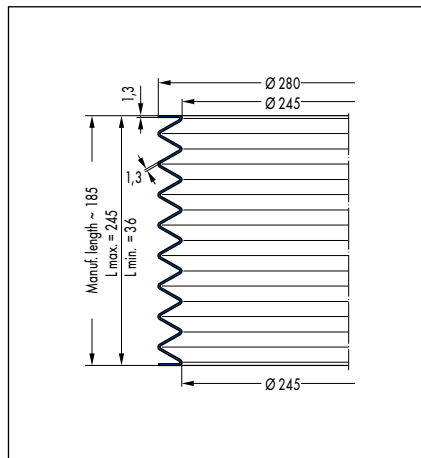
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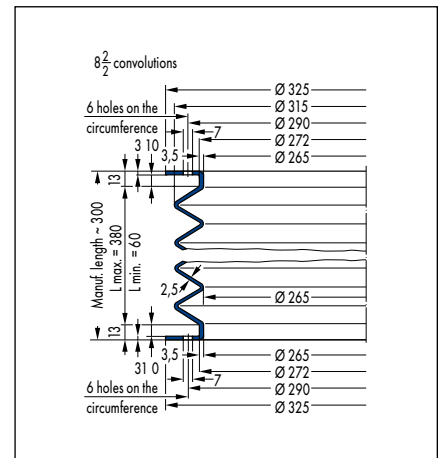
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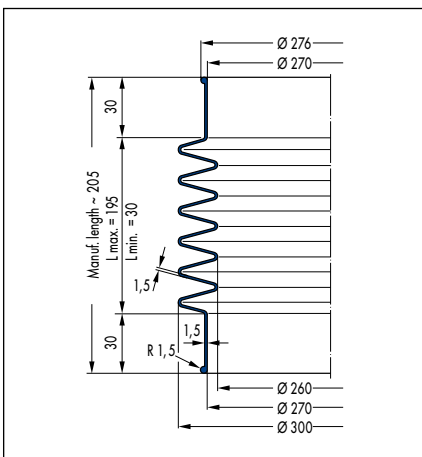
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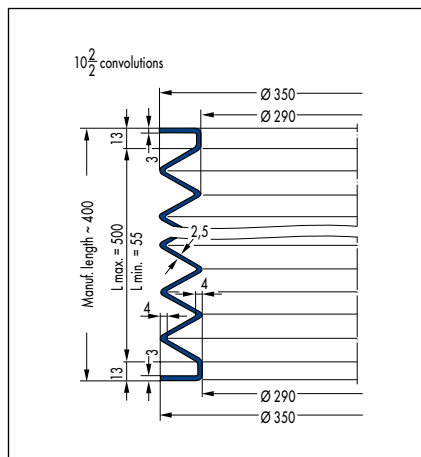
V6-00841, Article No. 49402539



V6-00632, Article No. 506890



V6-01031, Article No. 361913



V6-00732, Article No. 510580