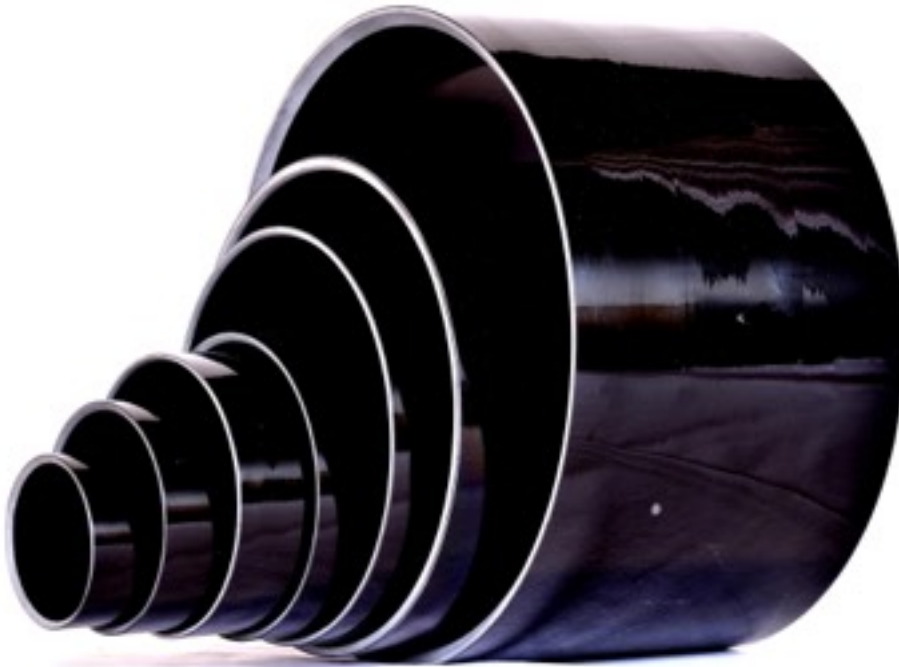


# Composite parts for PNEUMATIC CYLINDERS



Standard series  
conforming to the  
recommendations of :



STANDARD CYLINDER  
HOUSINGS RANGE

Here are the benefits of a composite solution in the pneumatic cylinders sector :

- Self-lubricating
- Sustainability
- Dimensional tolerances and surface aspect
- Dimensional tolerances and surface aspect
- Anti-corrosion
- Good resistance to high temperatures ( $\leq 130\text{ }^{\circ}\text{C}$ )
- Lightness
- Non-magnetism



Over the last three decades, Plasticon Composites France has developed a unique savoir-faire in the sizing and the fabrication of high performance composite cylinder housings. We have carefully selected a high-quality epoxy resin in order to guarantee the sustainability of our cylinder housings (corrosion, high internal pressure, high temperature, microorganism, corrosive agents... etc). The excellent surface finish of our adjusted chrome-steel mandrels, around which we wind up our impregnated fibers, enables to get a H11

bore on the internal surface of the tube (rectitude  $< 0,1\text{ mm/m}$  – total roughness between 0,05 and 1,5). Such a surface finish makes it possible to seal directly on this surface. Our products develop in high-standard environments such as the water treatment field, the chemical, food-processing and electronic industries, boiler feed-water, cosmetic cleansing, bio-engineering, oil and gas.

Our engineering service is at your disposal to support you along the development project.

[www.epoxyresolutions.com](http://www.epoxyresolutions.com)

Standard series conforming to  
the recommendations of :



Boring diameter (mm) H11	External diameter (mm)	Average weight per meter (Kg)	Allowable axial compressive stress (daN)	Tightening torque on each of the 4 tie-rods m.daN
32	36 (+1/-0,2)	0,45	500	0,15
40	44 (+1/0,2)	0,57	1000	0,3
50	55 (+0,6/-0,2)	0,79	1000	0,4
63	68 (+0,8/-0,6)	1	1300	0,5
80	86 (+0,4/-1)	1,45	1600	0,8
100	106 (+1/-0,4)	2	1600	0,8
112	118 (+1/-0,4)	2,2	1600	0,8
125	132 (+0,8/-0,6)	2,8	1700	1
160	167 (+0,8/-0,6)	3,56	2000	1,6
200	210 (+1,6/-0,4)	6,65	2700	2,1

Cylinder housings technical characteristics	
Density	1,9 kg/dm <sup>3</sup>
Glass percentage by mass	70 à 75%
Coefficient of linear expansion	23.10-6 m/m C°
Thermal conductivity	0,30 Kcal/m/f / C°
Operating temperature	-50° / + 120 °
Tensile strength, longitudinal direction	12 daN/mm <sup>2</sup>
Tensile strength, circumferential direction	100 daN/mm <sup>2</sup>
Elastic modulus, circumferential direction	4000 daN/mm <sup>2</sup>
Tensile strength, axial compression	15 daN/mm <sup>2</sup>
Tensile strength, 90° / axe compression	40 daN/mm <sup>2</sup>
Bending tensile strength	10 daN/mm <sup>2</sup>
Bending elastic modulus	1300 daN/mm <sup>2</sup>
Shock resistance	160 kg/cm/cm <sup>2</sup>
Dielectric strength	200 Kv/cm

# LIST OF OUR TOOLS

## FOR EPOXY RESIN MANUFACTURING (Glass or carbon fiber)

*Wide range of mandrels for a low economical launch price.*

### Minimum thickness

0,8 mm (standard) 0,3 mm (machined - on demand).

### Thickness up to

150 mm with an external diameter limit  $\leq 270$ mm (size of our sterilizers)



### Tools length = 3 operating meters

Ø int (mm)	Ø int (mm)	Ø int (mm)	Ø int (mm)	Ø int (mm)	Ø int (mm)
21,50	43,30	58,00	82,55	114,50	178,30
22,00	44,00	60,00	85,00	117,50	185,00
23,00	45,00	62,00	88,90	120,00	190,00
24,00	46,00	63,00	90,50	125,00	200,00
25,00	47,00	65,00	92,40	130,00	202,00
26,00	48,00	70,00	95,00	134,00	250,00
28,00	49,00	72,00	97,20	135,00	254,40
32,00	50,00	74,00	100,00	140,00	
34,00	50,90	75,00	101,60	142,00	
35,00	51,00	76,00	104,00	150,00	
36,00	54,00	76,20	105,00	150,70	
37,00	55,00	80,00	107,00	155,00	
40,00	57,00	81,00	110,00	160,00	

### Tools length = 9 operating meters

Ø int (mm)					
202 - 8"	Specific tools (non-standard diameter) on demand.				
325					
450					

# Dimensional tolerances, finishing and surface finishes

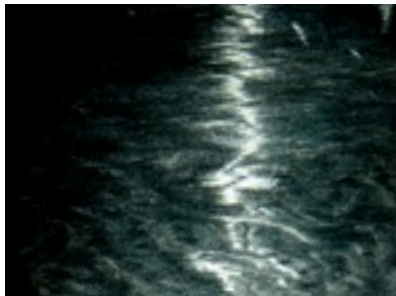
*on external diameter...*



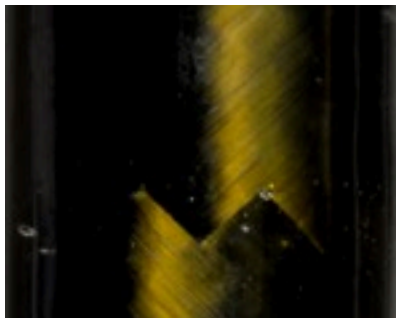
Type-A finishing :  
Natural surface with removed tear strip (rough surface)  
Max. dimensional tolerance on external diameter :  
**+/0,8 mm.**



Type-B finishing :  
Natural surface with external skin (smooth aspect).  
Max. dimensional tolerance on external diameter :  
**+/0,8 mm.**  
Colour : tinted black in the mass (= standard).  
On demand : White, Green, Yellow, Red, etc.



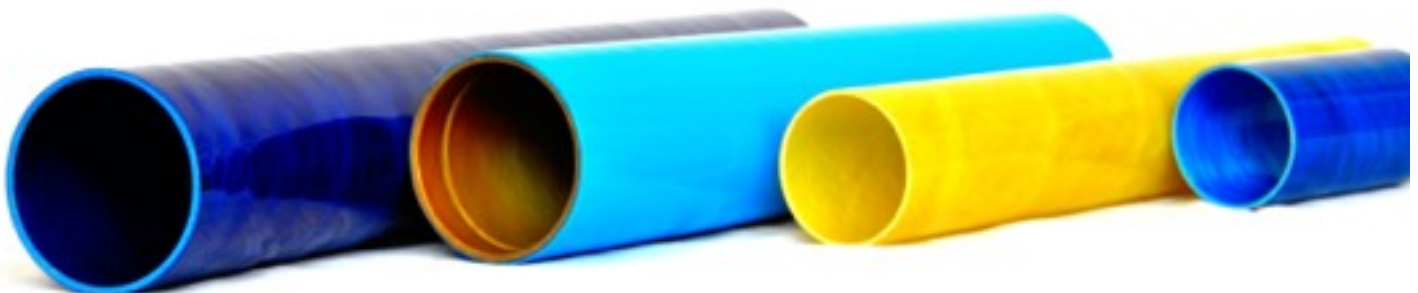
Type-C finishing :  
Surface after partial machining or sanding.  
Max. dimensional tolerance on external diameter :  
**+/- 0,2 mm to +/- 0,5mm (\*)**



Type-D finishing :  
Varnished surface (matt or shiny) after partial sanding.  
Max. dimensional tolerance on external diameter :  
**+/- 0,2 mm to +/- 0,5mm (\*)**



(\*) according to the selected diameters and the thickness of the part.



impact on the part's final price.

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# Dimensional tolerances, finishing and surface finishes on internal diameter...



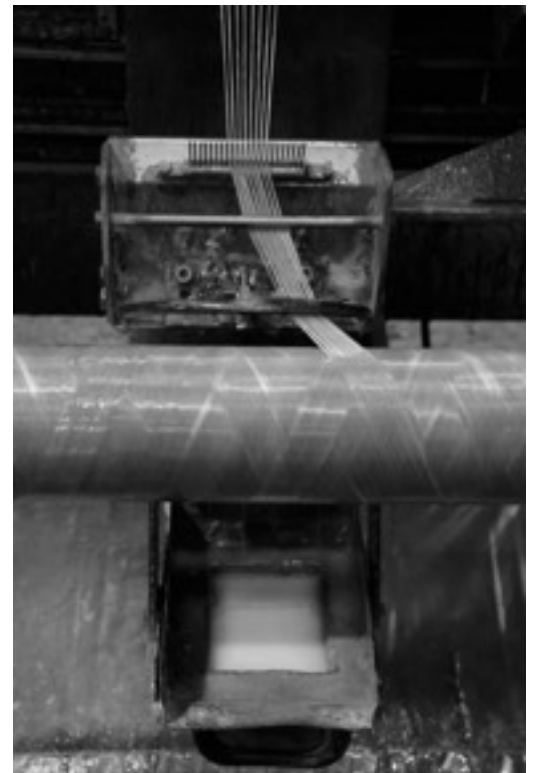
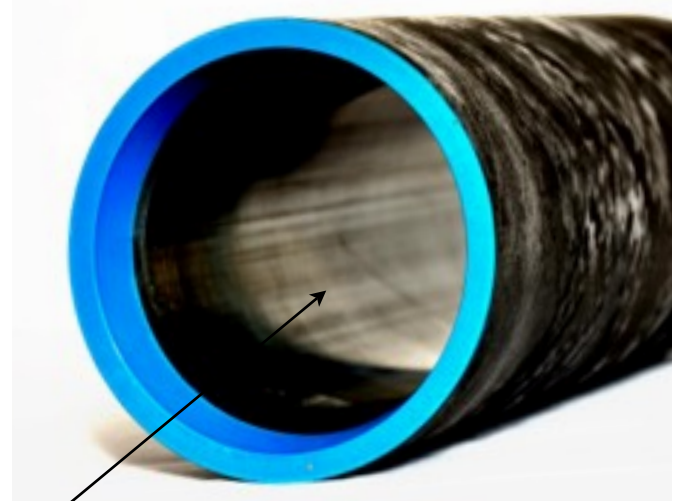
Internal diameter tolerance up to **H11**

Rectitude : 0,1mm/m

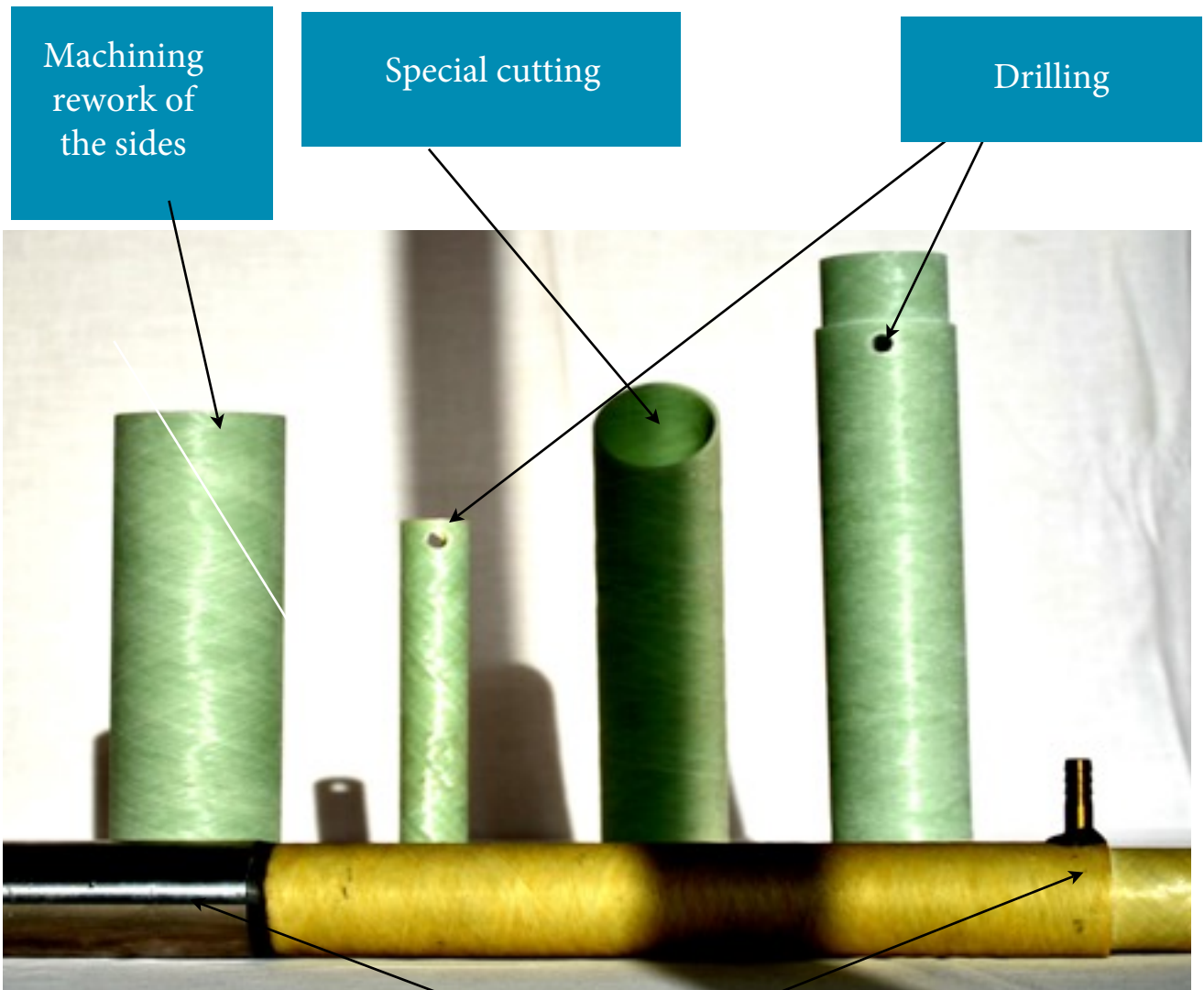
Ovalization : 0,05mm maxi.

Internal roughness : AR between 0,5 and 1,5  $\mu$ m

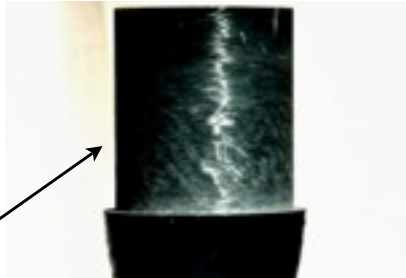
**Explanation :** the fiber is wound-up around a mandrel whose surface finish is extremely smooth (some of our mandrels are chromed-adjusted), depending on the selected mandrel, the internal roughness of the tube makes it possible to seal directly on this surface.



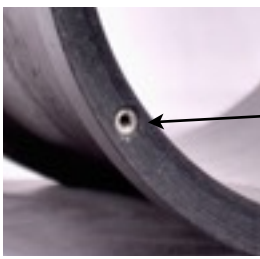
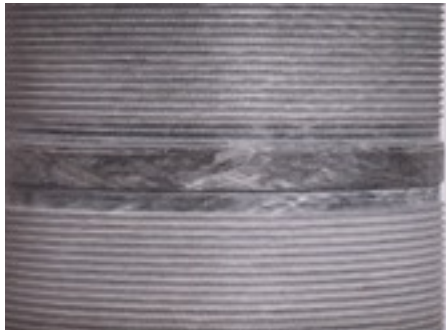
# POSSIBLE COMPLETION OPERATIONS ON A COMPOSITE PART



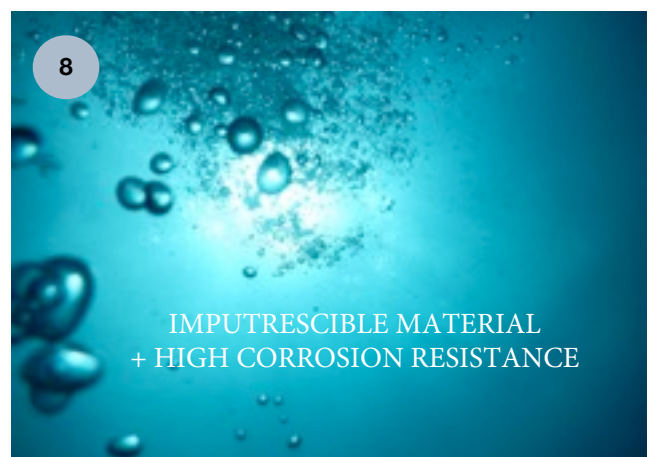
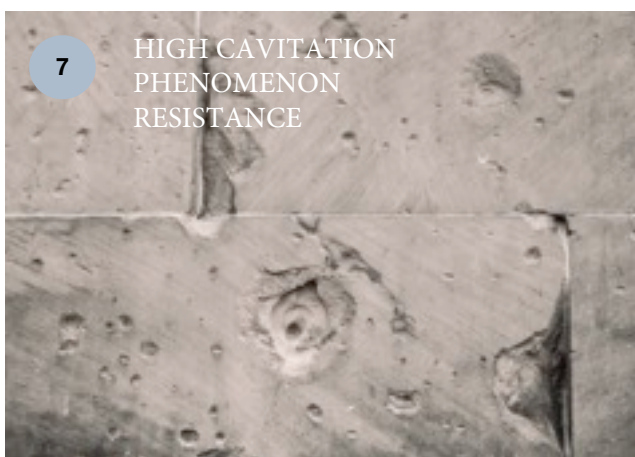
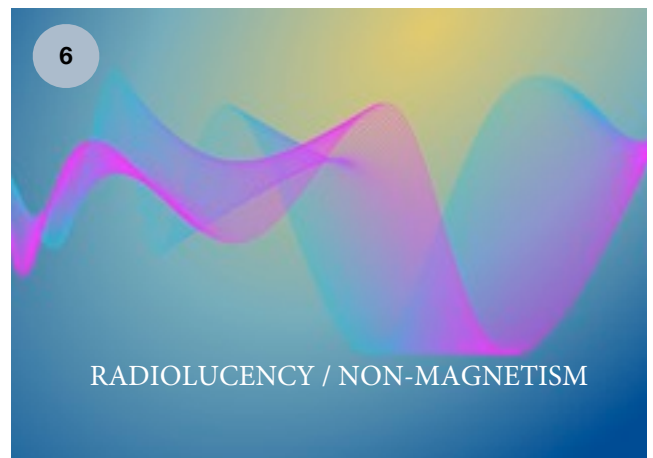
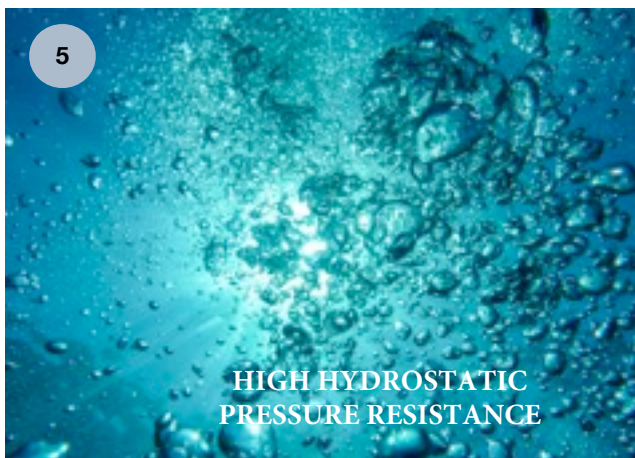
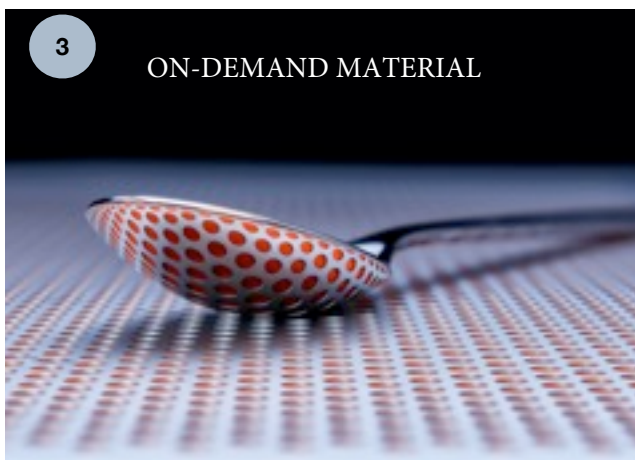
Bonding of an insert or other additional parts



Specific machining

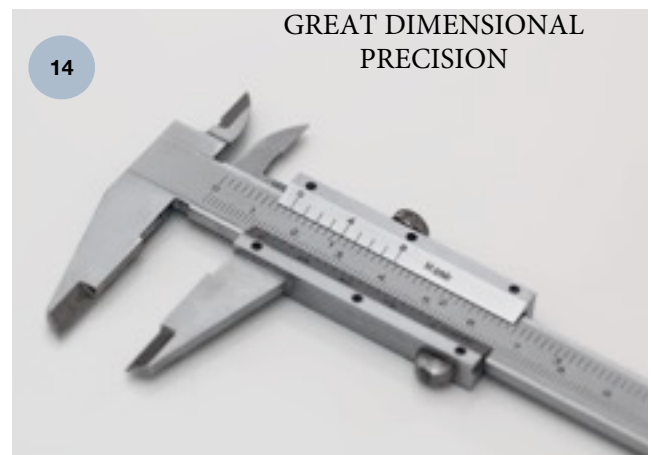
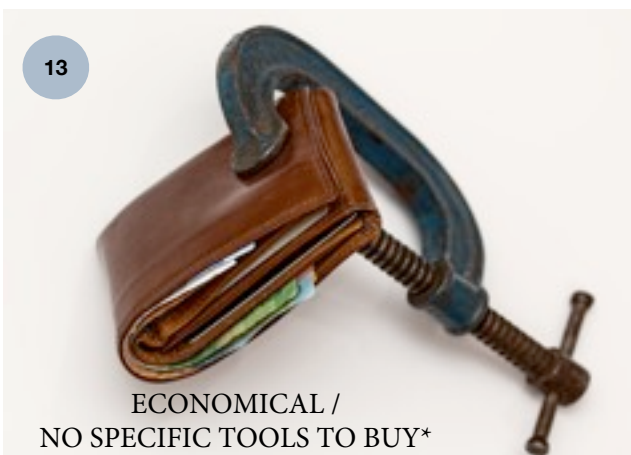
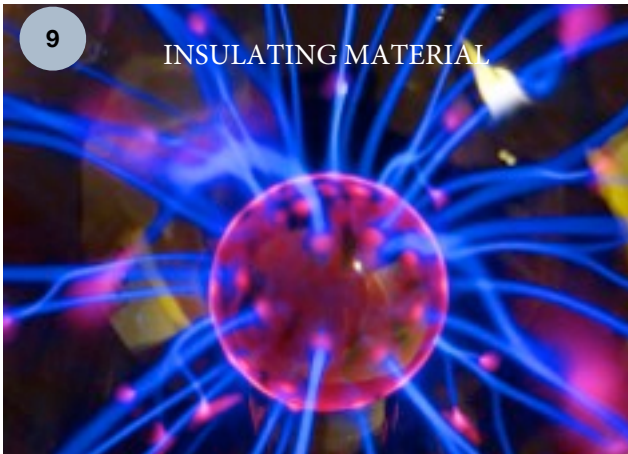


# COMPARED BENEFITS OF OUR PARTS





# COMPARED BENEFITS OF OUR PARTS





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