

$(\frac{d}{R})$
 $d >$
 $1mm$
 $R <$
 $50mm$
 $R_{cylinder} =$
 $30mm$
 $R_{out} =$
 $25mm$
 $b =$
 $30mm$
 $??$
 $1/female_mold.jpg$ Longitudinal section of the female mold
 $R_{in} =$
 $R_{cylinder} =$
 $30mm$
 $5mm$
 $5mm$
 5
 $1/sleeve_translation.jpg$ longitudinal section of the sleeve
 $??$
 $R_{int} <$
 R_{out}
 $R_{int} =$
 $18.5mm, 20mm, 23mm$
 1
 $1/male_mold.jpg$ longitudinal section of the male mold
 $R_{in} =$
 $R_{cylinder} =$
 $30mm$
 $5mm$
 $50mm$
 $??$
 $1/rolling_machine.png$ Pastamaker

®

®
 $\frac{d}{dt}$
 $\frac{1}{A}$
 $\frac{1}{B}$

$$\frac{R_{int}}{t_h}?$$

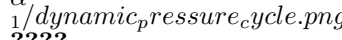
$$\begin{array}{c} 5 \\ \textcircled{\text{R}} \\ 2\pi R_{out} \approx \\ 157mm \\ 6 \end{array}$$

ρ
 μ
 $\frac{1}{7}$
 $??$
 $1/schematic_experimental_setup.png$ Schematic of the spring experiment
 $??$
 $3 \cdot 10^5 Pa$
 $1/cuve.pdf$ Schematic of the pressurizable tank
 $F_{measured} =$
 $K \Delta x$
 $\lesssim 20\%$
 \textcircled{R}
 $?$
 $P_c \propto$
 $(\frac{d}{R})^2$
 $6.4 \cdot 10^{-3}$
 $6.76 \cdot 10^{-2}$
 \textcircled{C}
 $??$
 μ
 $1/OB1.png$ OB1 pressure controller
 \textcircled{C}
 μ
 $f =$
 \textcircled{C}
 20
 $??$
 $1/schematic_experimental_setup_light_lenses.png$ Representation of the light and camera disposition

$$\begin{array}{r}
 8 \\
 77 \\
 77 \\
 -3 \\
 \hline
 -3 \\
 -6
 \end{array}$$

12

??

Qualitative representation of pressure cycles applied for the dynamic experiments

???

??

$\frac{d}{R} - 1$

$\frac{d}{R} =$

$\frac{d}{R} =$

$\frac{d}{R} =$

$$\theta_0^{14}$$

$$a_k^{14}$$

$$k=0,\ldots,M$$

$$\tilde{R}_{exp}(\theta)_i - \tilde{R}(\theta)_i$$

”Levenberg-Marquardt”
 ”least-squares”
 1/outer_contour.png Fitted outer contouring green, and center of the parametric curve in blue
 ??
 1/concavity_extraction.png Extraction of the concavity experimental points
 $M(R_h, \theta_h)$
 $\tan(\theta + \alpha) = 0$

(1)

$$\frac{\tilde{R}(\theta)}{\tilde{R}'(\theta)}$$

(2)

$$\frac{\tan(\theta) + \tan(\alpha)}{1 - \tan(\theta)\tan(\alpha)} = \frac{\tan(\theta) + \left| \frac{\tilde{R}(\theta)}{\tilde{R}'(\theta)} \right|}{\tan(\theta) + \frac{\sum_{k=0}^M a_k \sin(\theta)^k}{\cos(\theta) \sum_{k=1}^M k a_k \sin(\theta)^{(k-1)}}} =$$

$$\tilde{R}(\theta) = \sum_{k=0}^M a_k \sin(\theta)^k$$

$$\theta \in [-\pi - \theta_h, \theta_h]$$

$$M(R_h, \theta_h)$$

$$6 + bx^4 + cx^2 + d$$

with the following continuity conditions on and $d =$

$$-cx_c^2 - bx_c^4 - ax_c^6 + y_c$$

and $c =$

$$-2bx_c^2 - 3ax_c^4$$

a, b, c, d
 x_c, y_c
 $M(R_h, \theta_h)$
 ”Levenberg-Marquardt”
 ??
 15
 θ_h
 $\frac{\pi}{2}$
 1/outer_contour_complete.png Fitted outer contour in blue, fitted concavity in red, and experimental concavity points in yellow