

## Foam test objects

COST WG 3  
19.10. - 21.10.2000

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## Goal:

To prepare phantoms with textural parameters  
comparable to (brain) tissue

## Generally about phantoms

- Phantoms for the NMR machine are prepared as a mixture of two (or more) materials with different parameters

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- in our case - with different brightness (intensity of signal)

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- “Sphere” phantom
- “liquid” spheres  
(**High brightness**)
- interstitial matter (solid)  
(**Low brightness**)

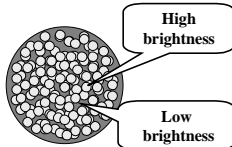
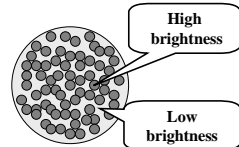
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- “Foam” phantom
- “Sphere” phantom
- “liquid” spheres (High brightness)
- solid spheres (Low brightness)
- interstitial matter (solid) (Low brightness)
- interstitial matter (“liquid”) (High brightness)

## Generally about phantoms

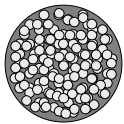
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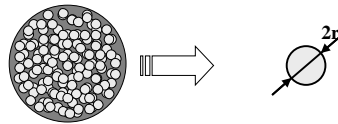
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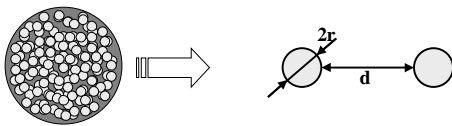
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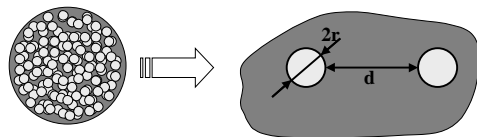
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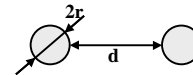
## Generally about phantoms

- Size of the phantoms must guarantee stability of the textural parameters

(size have to be bigger than is minimal stabile ROI for given parameters)

## Technical realization

- Our group prepare “Foam” phantoms
  - we choose from foam matter only by parameter  $\underline{d}$
- relation between  $2r$  and  $\underline{d}$  are given by the producer of the foam



## Base of the Phantom - type of a foam

### Quality of foams

- Very coarse
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- Middle
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### We choose foams

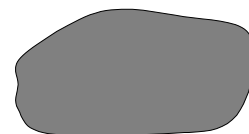
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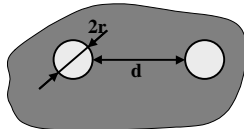
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- For brightness setup of phantom we use water solution of the “Magnevist” (SHERING)
  - brightness of the spheres are given by matter



### Base of the Phantom interstitial matter - liquid

#### Solution concentration

- 1:100
- 1:200
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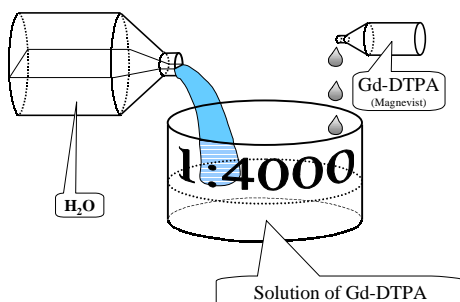
#### We choose concentration

- **1:4000**

#### Criteria

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### Base of the Phantom - size

#### We tested two size of phantoms

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- length 60 mm
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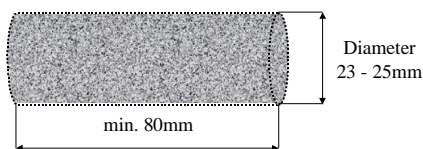
#### Usable Phantom Size

- Diameter min. 23mm
- Length 80mm

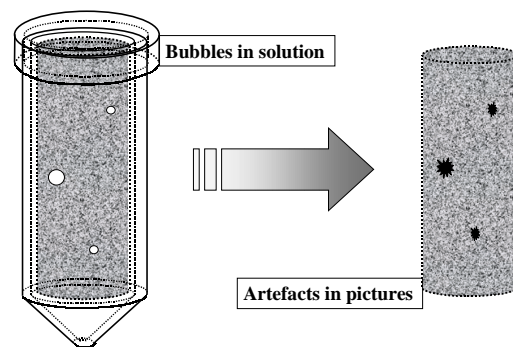
**Criteria**  
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### Base of the Phantom

#### Plastic foam with different mesh turning to the cylindrical shape



### The Main Problem - Bubbles in Phantom



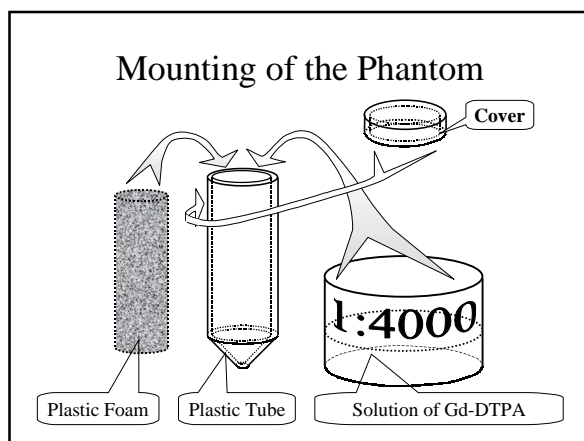
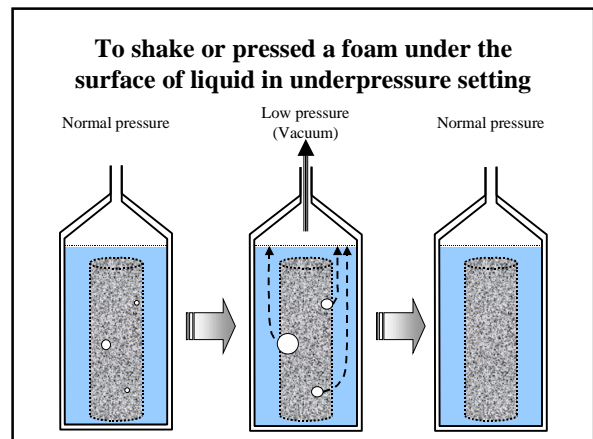
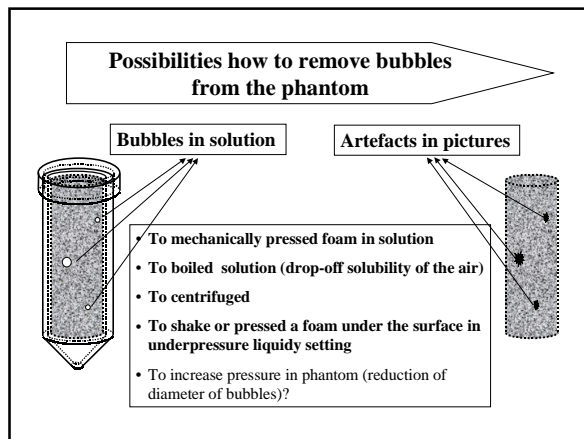
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- Way how to remove bubbles from the solution:
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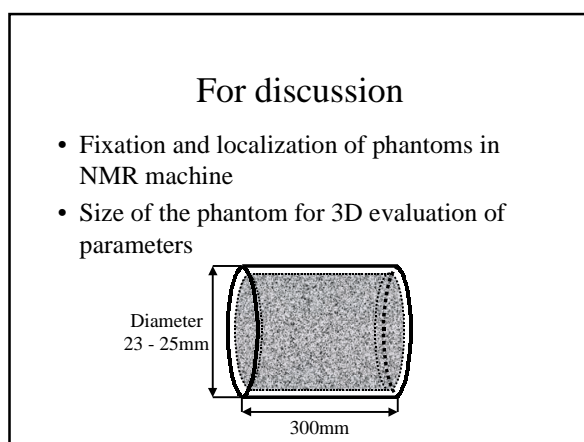
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We recommended combination of all of them



**For discussion**

- Fixation and localization of phantoms in NMR machine
- Size of the phantom for 3D evaluation of parameters



**Thank you  
for the attention**

