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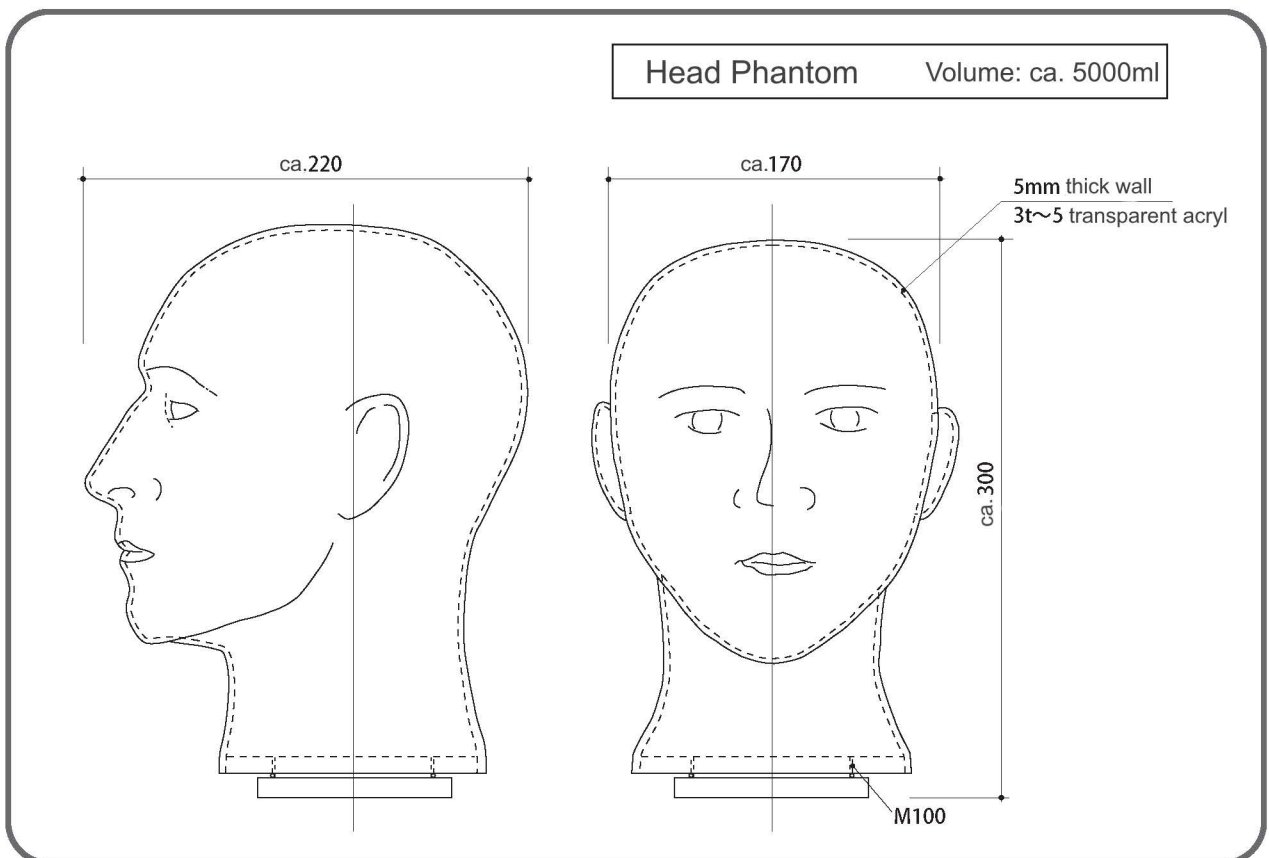
# MRI Head Phantom NH

Instruction manual



## Contents

- General information . . . . . backside
- Set includes  
Filling with nickel chloride solution



# General Information

Set includes  
Filling with aqueous solution

## Set includes



- a MRI Head phantom
- b Vaseline
- c 10 mM Nickel chloride solution
- d spigot

## Filling with aqueous solution



Remove the precut opening of the box containing the solution, open the lid and attach the spigot.

Remove the lid from the neck of the head phantom. Fill the solution into a beaker or other container first, then inside the phantom. When putting the lid back on the head, put vaseline on the sealing ring before closing it.



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# Aqueous solution for MRI

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○ **Regarding the solution used for MRI testing**

MRI is the most advanced diagnostic imaging device but the standards for quality assurance and maintenance are not yet uniform.

For our MRI phantom's aqueous solution, after safety considerations, we have decided to use Nickel chloride (II) solution ( $\text{NiCl}_2$ ), which is one of the substances that has been mentioned in the Report of AAPM\* as a phantom.

In Table 1, the T1 and T2 values for the magnetic resonance of nickel chloride (II) solution have been listed (Figure 1 shows this data as a graph).

10mM of the solution are included with our phantom.

\*Quality assurance methods and phantoms for magnetic resonance imaging  
: Report of AAPM nuclear magnetic resonance Task Group No.1

## ○ Important

As the T1 and T2 values depend on the temperature, please make sure to always perform tests with the same temperature conditions.

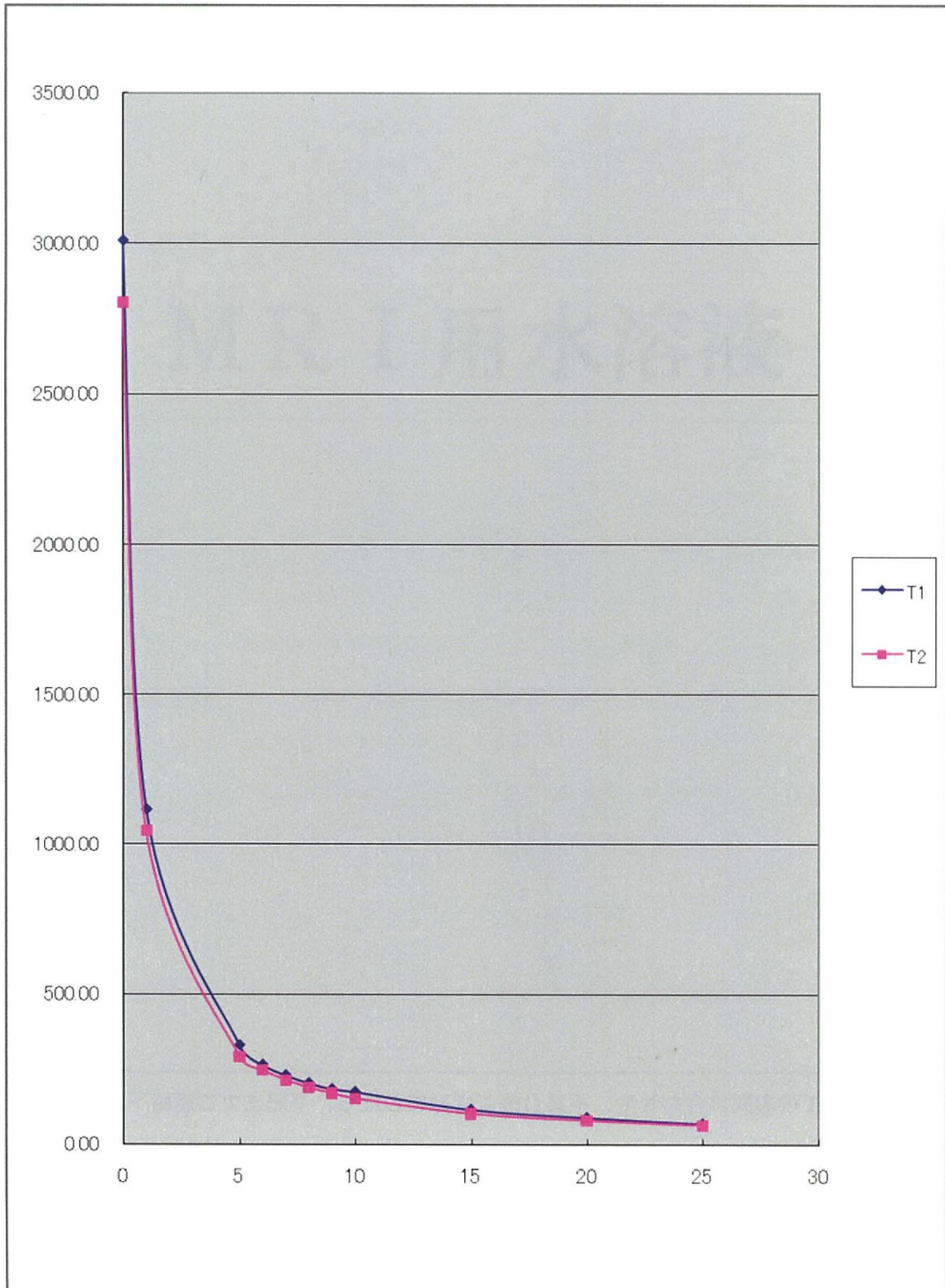
If left in a room with a consistent temperature for 24 hours, the solution inside the phantom will have reached that room's temperature.

The raw materials for our nickel chloride (II) solution that comes with our phantom was produced at a room temperature of 23°C and a relative humidity of 40%.

NiCl <sub>2</sub> concentration (mM)	1	5	6	7	8
T1 value (msec)	1117	329	264	229	203
standard deviation	23.53	5.54	10.11	4.5	3.02
T2 value (msec)	1044	291	246	213	189
standard deviation	6.96	0.83	0.56	0.61	0.66
NiCl <sub>2</sub> concentration (mM)	9	10	15	20	25
T1 value (msec)	184	174	116	89	69
standard deviation	4.28	2.11	1.27	1.03	0.71
T2 value (msec)	169	152	102	79	64
standard deviation	0.51	0.65	0.5	0.11	0.4

**table 1** T1, T2 values for magnetic resonance of different concentrations of nickel chloride (II)

✂ this data was taken with a room temperature of 24°C and a magnetic field strength of 1.5 tesla



**Figure 1** T1, T2 value for varying concentrations of nickel chloride (II)

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