

## Preliminary

planned mechanical load
<input type="radio"/> transportation (loan)
<input type="radio"/> exhibition
<input type="radio"/> transportation and exhibition
<input type="radio"/> restoration treatment

AND

format of canvas
<input type="radio"/> quadrangle
<input type="radio"/> oval
<input type="radio"/> circular*

\* If the format of the canvas is circular, the dimensions "width" and "height" are replaced by "diameter".

AND

know first natural frequency?																										
NO				YES																						
<table border="1"> <thead> <tr> <th>pretension</th> </tr> </thead> <tbody> <tr> <td><input type="radio"/> low: TensionFactor = 0.7</td> </tr> <tr> <td><input type="radio"/> low-medium: TensionFactor = 0.85</td> </tr> <tr> <td><input type="radio"/> medium: TensionFactor = 1</td> </tr> <tr> <td><input type="radio"/> medium-high: TensionFactor = 1.1</td> </tr> <tr> <td><input type="radio"/> high: TensionFactor = 1.2</td> </tr> </tbody> </table>	pretension	<input type="radio"/> low: TensionFactor = 0.7	<input type="radio"/> low-medium: TensionFactor = 0.85	<input type="radio"/> medium: TensionFactor = 1	<input type="radio"/> medium-high: TensionFactor = 1.1	<input type="radio"/> high: TensionFactor = 1.2	<p>∧</p> <table border="1"> <thead> <tr> <th>lining</th> </tr> </thead> <tbody> <tr> <td><input type="radio"/> 0: LiningFactor = 1</td> </tr> <tr> <td><input type="radio"/> 1: LiningFactor = 1.1</td> </tr> <tr> <td><input type="radio"/> 2: LiningFactor = 1.2</td> </tr> <tr> <td><input type="radio"/> 3: LiningFactor = 1.3</td> </tr> </tbody> </table> <p>affects base thickness**</p>	lining	<input type="radio"/> 0: LiningFactor = 1	<input type="radio"/> 1: LiningFactor = 1.1	<input type="radio"/> 2: LiningFactor = 1.2	<input type="radio"/> 3: LiningFactor = 1.3	<p>∧</p> <table border="1"> <thead> <tr> <th>deformation</th> </tr> </thead> <tbody> <tr> <td><input type="radio"/> not at all: DeformFactor = 1</td> </tr> <tr> <td><input type="radio"/> medium: DeformFactor = 1.1</td> </tr> <tr> <td><input type="radio"/> heavy: DeformFactor = 1.2</td> </tr> </tbody> </table>	deformation	<input type="radio"/> not at all: DeformFactor = 1	<input type="radio"/> medium: DeformFactor = 1.1	<input type="radio"/> heavy: DeformFactor = 1.2	<p>∧</p> <table border="1"> <thead> <tr> <th>impasto-painted</th> </tr> </thead> <tbody> <tr> <td><input type="radio"/> 0%: ImpastoFactor = 1</td> </tr> <tr> <td><input type="radio"/> 10%: ImpastoFactor = 1.1</td> </tr> <tr> <td><input type="radio"/> 20%: ImpastoFactor = 1.4</td> </tr> <tr> <td><input type="radio"/> 50%: ImpastoFactor = 2</td> </tr> </tbody> </table>	impasto-painted	<input type="radio"/> 0%: ImpastoFactor = 1	<input type="radio"/> 10%: ImpastoFactor = 1.1	<input type="radio"/> 20%: ImpastoFactor = 1.4	<input type="radio"/> 50%: ImpastoFactor = 2	<p>∨</p> <table border="1"> <thead> <tr> <th>known frequency</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> frequency from user</td> </tr> </tbody> </table>	known frequency	<input type="checkbox"/> frequency from user
pretension																										
<input type="radio"/> low: TensionFactor = 0.7																										
<input type="radio"/> low-medium: TensionFactor = 0.85																										
<input type="radio"/> medium: TensionFactor = 1																										
<input type="radio"/> medium-high: TensionFactor = 1.1																										
<input type="radio"/> high: TensionFactor = 1.2																										
lining																										
<input type="radio"/> 0: LiningFactor = 1																										
<input type="radio"/> 1: LiningFactor = 1.1																										
<input type="radio"/> 2: LiningFactor = 1.2																										
<input type="radio"/> 3: LiningFactor = 1.3																										
deformation																										
<input type="radio"/> not at all: DeformFactor = 1																										
<input type="radio"/> medium: DeformFactor = 1.1																										
<input type="radio"/> heavy: DeformFactor = 1.2																										
impasto-painted																										
<input type="radio"/> 0%: ImpastoFactor = 1																										
<input type="radio"/> 10%: ImpastoFactor = 1.1																										
<input type="radio"/> 20%: ImpastoFactor = 1.4																										
<input type="radio"/> 50%: ImpastoFactor = 2																										
known frequency																										
<input type="checkbox"/> frequency from user																										

· Parameters are not dependent on each other.

· Pretension, lining, and deformation act as adjustment parameters in the calculation of the Young's modulus, and impasto is used to adjust the density.

· \*\*If the thickness of painting is not provided, the base thickness is estimated based on the presence and number of lining layers. Without lining (0 layers), it is set to 2–2.5 mm. With lining, the base thickness is set to 2–3 times the value with lining. However, for improved accuracy, entering the measured thickness is recommended.

AND

measurements of artwork																										
<table border="1"> <thead> <tr> <th>canvas size</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> weight [kg]</td> </tr> <tr> <td><input type="checkbox"/> width/height or diameter [mm]</td> </tr> <tr> <td><input type="checkbox"/> average thickness** of painted canvas [mm]</td> </tr> </tbody> </table>	canvas size	<input type="checkbox"/> weight [kg]	<input type="checkbox"/> width/height or diameter [mm]	<input type="checkbox"/> average thickness** of painted canvas [mm]	<table border="1"> <thead> <tr> <th colspan="2">stretcher construction</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> weight [kg]</td> <td><input type="checkbox"/> width/height or diameter of one partition [mm]</td> </tr> <tr> <td><input type="checkbox"/> width/height or diameter [mm]</td> <td><input type="checkbox"/> average thickness of length and cross bars [mm]</td> </tr> <tr> <td><input type="checkbox"/> thickness [mm]</td> <td><input type="checkbox"/> type of wood: soft/hard</td> </tr> <tr> <td><input type="checkbox"/> number of partitions</td> <td></td> </tr> </tbody> </table>	stretcher construction		<input type="checkbox"/> weight [kg]	<input type="checkbox"/> width/height or diameter of one partition [mm]	<input type="checkbox"/> width/height or diameter [mm]	<input type="checkbox"/> average thickness of length and cross bars [mm]	<input type="checkbox"/> thickness [mm]	<input type="checkbox"/> type of wood: soft/hard	<input type="checkbox"/> number of partitions		<table border="1"> <thead> <tr> <th colspan="2">decorative frame</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> weight [kg]</td> <td><input type="radio"/> type of glazing: plain/museum/acrylic</td> </tr> <tr> <td><input type="radio"/> weight with/without glazing</td> <td><input type="checkbox"/> width/height or diameter of glazing [mm]</td> </tr> <tr> <td><input type="checkbox"/> width/height or diameter [mm]</td> <td><input type="checkbox"/> thickness of glazing [mm]</td> </tr> <tr> <td><input type="checkbox"/> thickness [mm]</td> <td></td> </tr> </tbody> </table>	decorative frame		<input type="checkbox"/> weight [kg]	<input type="radio"/> type of glazing: plain/museum/acrylic	<input type="radio"/> weight with/without glazing	<input type="checkbox"/> width/height or diameter of glazing [mm]	<input type="checkbox"/> width/height or diameter [mm]	<input type="checkbox"/> thickness of glazing [mm]	<input type="checkbox"/> thickness [mm]	
canvas size																										
<input type="checkbox"/> weight [kg]																										
<input type="checkbox"/> width/height or diameter [mm]																										
<input type="checkbox"/> average thickness** of painted canvas [mm]																										
stretcher construction																										
<input type="checkbox"/> weight [kg]	<input type="checkbox"/> width/height or diameter of one partition [mm]																									
<input type="checkbox"/> width/height or diameter [mm]	<input type="checkbox"/> average thickness of length and cross bars [mm]																									
<input type="checkbox"/> thickness [mm]	<input type="checkbox"/> type of wood: soft/hard																									
<input type="checkbox"/> number of partitions																										
decorative frame																										
<input type="checkbox"/> weight [kg]	<input type="radio"/> type of glazing: plain/museum/acrylic																									
<input type="radio"/> weight with/without glazing	<input type="checkbox"/> width/height or diameter of glazing [mm]																									
<input type="checkbox"/> width/height or diameter [mm]	<input type="checkbox"/> thickness of glazing [mm]																									
<input type="checkbox"/> thickness [mm]																										

individually

partially

as a whole

## Calculation of first natural frequency

