[CLAIMS]

[Claim 1]

A manufacturing method of glass substrate for magnetic disk including a pair of principal surfaces, the method comprising the steps of:

forming a glass blank by performing press forming to molten glass or softened glass with planar press forming surfaces of dies in such a way that the molten glass or the softened glass is sandwiched from the both sides, and

polishing the glass blank,

wherein temperature condition is equalized around the pair of principal surfaces of the glass blank during the pressing in the forming step.

[Claim 2]

The manufacturing method of glass substrate for magnetic disk according to claim 1, wherein temperatures of the press forming surfaces which contact the principle surfaces of the glass blank during the pressing are equalized in the forming step.

[Claim 3]

The manufacturing method of glass substrate for magnetic disk according to claim 1 or 2, wherein temperatures of the dies positioned at the both sides of the molten glass or softened glass immediately before the pressing are equalized in the forming step.

[Claim 4]

The manufacturing method of glass substrate for magnetic disk according to one of claims 1 to 3, wherein, when pressing molten glass or softened glass with the dies, contacts of the dies to the molten glass or softened glass begin simultaneously, the dies positioned at the both sides of the molten glass or softened glass immediately before the pressing.

[Claim 5]

The manufacturing method of glass substrate for magnetic disk according to claim 4, wherein timing difference between contact timing of one of the dies to the molten glass or softened glass and contact timing of the another of the dies to the molten glass or softened glass is 10 ms or less.

[Claim 6]

The manufacturing method of glass substrate for magnetic disk according to one of

claims 1 to 5, wherein the glass blank is polished in the polishing step, surface irregularity of the pair of principal surfaces of the glass blank as formed.

[Claim 7]

The manufacturing method of glass substrate for magnetic disk according to claim 6, wherein target thickness of the glass substrate for magnetic is defined, and thickness of the glass blank formed in the forming step is substantially identical to the target thickness.

[Claim 8]

The manufacturing method of glass substrate for magnetic disk according to one of claims 1 to 5, wherein target thickness of the glass substrate for magnetic is defined, and thickness of the glass blank formed in the forming step is larger than the target thickness, comprising a step of

grinding, before the polishing step of the glass blank, the glass blank such a way that thickness of the glass blank formed in the forming is substantially identical to the target thickness.

[Claim 9]

The manufacturing method of glass substrate for magnetic disk according to one of claims 1 to 8, wherein flatness of the principal surface is 4 μm or less, and the principal surface has surface irregularity of 0.2 nm or less in roughness.

[Claim 10]

A manufacturing method of glass blank for magnetic disk including a pair of principal surfaces, the method comprising the steps of:

causing a lump of molten glass or softened glass to fall, and

forming a glass blank by pressing the lump with planar press forming surfaces of dies in such a way that the lump is sandwiched from the both sides during the fall of the lump,

wherein temperatures of the press forming surfaces that contact the pair of principal surfaces during the pressing of the glass blank are equalized.

[Claim 11]

The manufacturing method of glass blank for magnetic disk according to claim 10, wherein flatness of the principal surface is 4 μm or less.

[Claim 12]

A manufacturing method of glass substrate for magnetic disk including a pair of principal surfaces, the method comprising the steps of:

causing a lump of molten glass or softened glass to fall, and

forming a disk-shaped glass blank by pressing with a pair of dies the falling lump from directions orthogonal to a falling direction,

wherein the lump is pressed in the forming of the glass blank from the start of the pressing with the dies until temperature of the lump drops to a strain point in such a way that temperatures of portions of press forming surfaces at the both sides of the dies are equalized, the portions contacting the lump, thereby making flatness of the glass blank into target flatness provided for the glass substrate for magnetic disk.

[Claim 13]

The manufacturing method of glass substrate for magnetic disk according to claim 12, wherein temperature difference between the press forming surfaces at the both sides is 5 degree Celsius or less.

[Claim 14]

The manufacturing method of glass substrate for magnetic disk according to claim 12 or 13, wherein the coefficient of thermal expansion of the glass substrate for magnetic disk ranges from 30 to 100 X 10^{-7} (K^{-1}).

[Claim 15]

A manufacturing method of glass substrate for magnetic disk including a pair of principal surfaces, the method comprising the steps of:

causing a lump of molten glass or softened glass to fall;

forming a disk-shaped glass blank by pressing with a pair of dies the falling lump from directions orthogonal to a falling direction; and

grinding with fixed abrasive grains the pair of principal surfaces at the both sides of the glass blank,

wherein the glass blank is pressed in the forming of the glass blank from the start of the pressing with the dies until temperature of the pressed glass blank drops to a strain point in such a way that temperatures of portions of press forming surfaces at the both sides of the dies are equalized, the portions contacting the glass blank, thereby making flatness of the glass blank into target flatness provided for the glass substrate for magnetic disk, and forming the glass blank

whose section thickness is decreased from the outer circumference side to the central side.

[Claim 16]

The manufacturing method of glass substrate for magnetic disk according to claim 15, further comprising a step of polishing the glass blank using a polishing pad after the step of grinding the glass blank,

wherein thickness of the glass substrate obtained with the polishing ranges from 80% to 96% of the maximum thickness of the glass blank.

[Claim 17]

The manufacturing method of glass substrate for magnetic disk according to claim 15 or 16, flatness of the formed glass blank is 4 μm or less.

[CLAIMS]

[Claim1]

A glass blank for magnetic disk which is used for manufacturing a glass substrate for magnetic disk,

wherein the glass blank forms a concave shape, thickness of the section of the concave shape being decreased from the outer circumference side to the central side,

wherein difference of the maximum thickness and the minimum thickness of the glass blank is 8 μm or less, and

wherein haze rate of the glass blank is 20% or more.

[Claim2]

The glass blank for magnetic disk according to claim 1, wherein flatness of the principal surface of the glass blank is 4 μm or less.