

HHH Tempering Resources Inc. Glass Fabrication Equipment

HHH Tempering Resources' Partners in Progress

One goal.

Create comprehensive and seamless tempering experiences for all glass fabricators.

In today's world market, no single product will fit every glass fabricator's needs. To fulfill these needs, we've created product partnerships with world-renowned global manufacturers, K-Star and NorthGlass. These quality products complement the existing line of fully customized HHH Tempering furnaces.

At HHH Tempering Resources, we service everything we sell. Comprehensive technical support is an insurance policy for your largest investment. You'll gain peace of mind knowing full-service maintenance, technical support and parts are available 24/7 from both our U.S. East and West Coast facilities.

Every single day we work toward creating a better tempering experience. As advocates for glass fabricators, we continue to build and distribute quality tempering solutions that offer a quick return on your investment and unparalleled service.

HHH Tempering Resources. Your tempering experts for unparalleled products and service.







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About HHH Tempering Resources

HHH Tempering Resources, Inc. is a global leader in glass tempering equipment. We pride ourselves on providing reduced energy costs, easy maintenance, glass quality and accurate temperature monitoring to provide you with equipment that outlasts the competition. Our U.S. headquarters and factories enable us to service and maintain our equipment 24/7 to ensure minimal productivity loss, and our consultative approach ensures the right furnace to maximize your revenue opportunities. To better serve the glass fabrication industry, we have aggressively evolved to provide industry-leading, comprehensive tempering solutions, service and support.

An HHH Tempering Resources, Inc. furnace provides the ability for your business to grow through increased sales and production—simply, you won't find a more reliable or quality system in the industry.

Our furnaces are known to outlast the competition, reduce your energy costs and ensure less downtime. They are engineered to be safe, operator-friendly, easily maintained and efficient.

Manufactured and assembled in the U.S., each furnace comes with a two-year warranty and 24/7 VPN technical support.



HHH Tempering Timeline



2014

20th anniversary celebrating two decades of serving the glass fabrication industry.



1994

HHH Tempering is founded by John Haws and Keith Hunt, key Mrozeck Tempering Furnaces employees with over 30 years combined industry experience.

2015

Planned leadership transition and further company evolution with product and service line expansion through K-Star and NorthGlass partnerships.





HHH Tempering Furnaces

Highest reliability in the market

Custom manufacturing with a customer focus

We're driven by our commitment to exceeding customer expectations, while designing top quality, custom glass tempering furnaces and equipment. The majority of our glass tempering furnaces are engineered to specific client needs and custom requirements. Our collaborative and client-driven approach produces a custom tempering furnace fabrication and build. Every one of our furnaces is custom built to provide a greater ROI.



Benefits

Designed and manufactured to meet your specific tempering requirements with sizes from 42 inches to 120 inches.

- Designed with redundancies to ensure operational uptime
- Engineered to minimize roll wave distortion
- Ceramic rolls are tested to an average TIR of .005
- Engineered for quick adjustments between glass thicknesses and edge kink elimination
- Designed with random oscillation to improve glass tempering consistency and eliminate iridescence

- Programmed for bias zones to eliminate hot and cold inconsistencies
- Produced to manually adjust quench setting and occupy smallest footprint
- Built with cost-effective ceramic rolls; no costly end caps required
- Operated with Windows-based, touch-screen technology



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Comprehensive Tempering Technical Support

Our best-in-class service spans beyond furnace manufacturing.

HHH Tempering consulting and support services include:

- Furnace relocation and installation
- Service agreements for preventative and emergent maintenance
- 24/7 technical support via VPN access from our East and West Coast facilities
- Refurbished equipment sales
- Furnace accessories

- Glass furnace rebuilds and upgrades
- Quench design
- Software upgrades and customization
- Pre-Audit assistance for PPG & Guardian Certification
- Service and maintenance contracts for competitor brands

Service Agreements

Extend your tempering furnace's life with an HHH Master Service Agreement guaranteed to reduce downtime and maximize furnace productivity.

HHH service agreements include:

- Installation and evaluation consultation
- Quarterly and yearly product inspections

• Preventative and emergent consultative services to decrease costly downtime

Increase productivity with comprehensive HHH glass fabrication support.



Dual-Belt Seamer

Quickly remove sharp edges to expedite the fabrication process.





Sizes (W x H x L): 26 in. x 73 in. x 50 in.

Working Height: $33 \sim 37$ in.

Net Weight: 557 lbs.

Voltage: AC 3P 220V/440V 60Hz

Control Box: Assembled

Power Connection Method: Circuit Breaker + Magnetic Switch/Overload

Motor HP: 1HP * 2EA

Wet or Dry Type: Wet or Dry Type

Belt Size: 4 in. x 106 in.

Exchange Device for Belt: Tension Spring

Pulley Material: Crown Pulley AL + NBR coating

Pulley Type: Pulley + Spindle is rotation together

Water valve type (Wet): Water Valve

Packing: Knocked-down Body Material: Steel

Option:

Caster Table

• Dust Collection Unit







ision Spring | Pulley + Spindle in rotat

Servicing What We Sell

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NorthGlass Fabrication Technology

HHH is a proud contracted distributor of NorthGlass products. Peace of mind is part of the package with HHH Tempering. We offer full parts stocking, installation and 24/7 technical on all NorthGlass products to keep your furnace up and tempering.



AG1 Glass Tempering Furnace

The AG1 showcases an innovative merger of matrix radiation heating and forced convection heating technologies.

Glass Thickness: 0.16 - 0.75 in. **Unit Heating Time:** 711.2 - 1143 s/in.

Energy Consumption (Kw.h/m squared): 37.7 - 107.6

Features:

- Unique hot-air circulation convection ventilators
- Updated quenching system design
- Stable and reliable computerized control system with user-friendly interface
- · Anti-deformation ceramic transition rollers and entry and exit



AD1 - GD Dual Chamber Tempering Furnace

AD1 - GD offers increased production using double heating chambers for top and bottom gapless convection, radiation with two quenching and cooling stations.

Features:

- 2 times the heating power of a traditional single chamber radiation furnace
- 1.8 times production compared to a traditional single chamber radiation furnace
- Even heating through one-way transmission to minimize glass breakage
- Low energy consumption
- Ideal for mass production tempering in architectural or other high-quantity settings





B1 Convection Furnace

Stable construction provides economic convection with maximized uptime. Uses external compressed air to feed the convection system in the B1 furnace.

Maximum width: 96 in. Maximum length: 315 in.



BC1 Tempering Furnace

Add online and offline Low-E coated glass production to your capabilities with the BC1 Tempering Furnace. Uses external compressed air in the convection system.

Maximum width: 96 in. Maximum length: 315 in.



NorthGlass Cutting System

Custom-made, modular cutting system for return on investment, flexible cutting and maximum productivity.

3 basic configurations with advanced options available:

- 1.) Automatic loading machine, cutting machine and manual break-out table
- 2.) Cutting table with assistant loading device
- 3.) Cutting table with automatic loading, manual breaking and assistant unloading device

Complete cutting system features the following options:

Original glass warehousing, full-package glass loading, single glass sheet loading, work station loading, loading machine, cutting machine, break-out table, automatic breaking machine, vertical reorganizing machine, horizontal reorganizing machine and automatic label-sticking machine.

Max cutting size: 110.2 in. x 165.4 in.

134 in. x 110.2 in.

Min cutting size: 39.4 in. x 59 in.

Cutting thickness: 79.7 in.

Cutting precision: Linear +- 0.0059 in./78.7 in.

Diagonal < 0.009 in.

Shape outline < 0.007 in.

Convey speed: 131.2 ft./min. Cutting speed: Max 590.5 ft./min.

Working time: 40-65 s



K-Star Glazier's Tools and Equipment

HHH is pleased to offer glazier's tools from premier manufacturer K-Star through an official product partnership. K-Star product excellence provides increased accessibility to quality fabrication tools.



Diamond & Carbide Glass Cutter







D-101

Diamond Tip Glass Cutter

Traditional glass-cutting tool featuring a natural diamond tip.

W-301

Carbide Tip Glass Cutter

Glass-cutting tool with dry type carbide tip.

- Appropriate for glass 0.12 in. to 0.24 in. thick
- 138 in. standard cutting angle

303A | 303B Pistol Grip Barrel Glass Cutter

Clear plastic handle ergonomically designed as the most comfortable cutter in its class.

- Replaceable, non-reflective cutter head
- · Set cutter head in swivel or locked position
- Use for pattern work and straight-line cutting

Oil-feed Glass Cutter

High-precision tools offer unsurpassed quality in hand-held cutters. Features include:

- Tungsten-carbide wheel, perfectly ground to 138°
- Fitted to a tungsten-carbide axle for the cleanest score and wobble-free service life
- Oil-feed system controls output to custom requirements







RH-ND

Industrial Oil-Feed Cutter Industrial-grade textured solid aluminum tubular handle.

N308

310 **Commercial Oil-Feed Cutter**

Sturdy and straight clear plastic handle designed for commercial use.

308BH

Rugged Oil-Feed Cutter

148 ft. cutting angle, oil glass cutter manufactured for heavy glass thicknesses 0.43 in. to 0.75 in.

- Interchangeable cutting head (Model RH-WH)
- Available with tubular aluminum handle (Model 308 Type)



RH-WD

RH-WH

Replacement Cutter Heads

Easily interchangeable cutter heads provide additional options.

MODEL	DESCRIPTION
RH-ND	For narrow or pattern cuts
RH-WD	For wide or straight cuts
RH-WH	Glass thickness from 0.43 in. up to 0.75 in.

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Holder & Cutting Wheels

Plastic Holder Set

Plastic holders featuring high-precision tungsten-carbide cutting wheels in various angles and holder colors for a range of glass thickness. Designed for automatic cutting machines like Grenzebach, Bottero, Lisec, Bystronic, Copmes etc.



Glass Thickness: 13-14 mm. Color: Violet



Glass Thickness: 1 mm. Color: Grav



Glass Thickness: 2 mm. Color: Blue



Glass Thickness: 15 mm. Color: Brown



Glass Thickness: 7-8 mm. Color: Green



Glass Thickness: 6 mm. Color: Black



Glass Thickness: 5 mm.



Glass Thickness: 10-12 mm. Color: Orange



Angle: 130° Glass Thickness: 3 mm.



Angle: 135° Glass Thickness: 4 mm. Color: White



Angle: 140° Glass Thickness: 5 mm.



Angle: 130° Glass Thickness: 3 mm. Color: Yellow

B/T Holder



SC-6010



B/T Holder Block



C-6010M



PDP Holder



C-6010



PDP Holder



KA-6015



LCD Holder

PCD Cutting Wheel & Axle

Spend less time changing tools and more time working with the PCD cutting wheel and axle.

Wear resistant

Extended tool life



Maxi

Normal



Axle

Maxi & Axle

Circle & Shape-Cutting Tools

KW-Series Oil-Feed Circle Cutter

Free-swinging and calibrated arm can be centered on flat glass for clean, accurate scores 3 in. to 70 in. in diameter.

 Superior carbide wheel and axle cutter designed to outlast standard market turret cutters

Metric bar only







KW-6010



KW-6030



KW-6040

MODEL	DESCRIPTION
KW-451	Cuts circles 4 in. to 35 in.
KW-901	Cuts circles 4 in. to 70 in.

Cutting Guide

MODEL	DESCRIPTION
CGN-360	Cuts to 12 in
CGN-660	Cuts to 24 in.
CGN-1000	Cuts to 36 in.

Replacement Parts

MODEL	DESCRIPTION
KW-6010	Reservoir with bearing case including carbide wheel holder
KW-6030	Holder for carbide wheel
KW-6040	Carbide cutting wheel For 0.078 in. to 0.12 in. glass For 0.16 in. to 0.25 in. glass
KW-6050	Vacuum lock cup base

Holders

Speed Kutter

Conquer Straight Cuts

Add speed, quality and ease of use to your glass cuts with the market's best manual operation sheet glass cutter. Perfect for mirror or sheet glass use. Features include:

- Only manual cutter with automatic oil-feed cutter
- · Quickly adjustable for odd-sized pieces
- Runs along straight-edged glass on adjustable and replaceable precision rollers
- Right- or left-hand operation
- Long service life and low maintenance
- Metric bar only

Speed Kutter

MODEL	DESCRIPTION
EC-300	Cuts up to 12 in.
EC-600	Cuts up to 24 in.
EC-900	Cuts up to 36 in.
EC-1200	Cuts up to 48 in.
EC-1500	Cuts up to 60 in.
EC-1800	Cuts up to 72 in.
EC-2100	Cuts up to 84 in.
EC-2400	Cuts up to 96 in.

















EC-1901









EC-1903

DTC-1903

Speed Kutter Replacement Parts

MODEL	DESCRIPTION
EC-1901	Holder with cutter head
EC-1902	Cutter head
EC-1902H	Cutter head for heavy glass 0.43 in. to 0.75 in.
EC-1903	Guide roller
DTC-1903	20 pcs./pack

Vacuum Cup Holders





KS-708

KS-708

Designed for flat-surfaced materials. Adjustable

DESCRIPTION	LIFTING CAPACITY	UNIT/PKG	WEIGHT
Cast aluminum body with plastic trigger	265 lbs.	2	6 lbs.

RF-908

Designed to suit both curved and flat glass surfaces.

DESCRIPTION	LIFTING CAPACITY	UNIT/PKG	WEIGHT
Plastic body	Convex 154 lbs. Concave 110 lbs. Flat 176 lbs.	2	4 lbs.

Pump Vacuum Holders

RF-908

Solid unibody frame provides maximum safety and durability. Features include:

• Lexan pump and single-touch release for minimum activation time

• Secondary handle for extra grip and carrying ease





RP-808 RP-808H



RP-207







LP-6090

RP-808

1	DESCRIPTION	PAD SIZE	NET W/T	WEIGHT
	Curved or irregular surfaces	10 in.	3.3 lbs.	4 lbs.

RP-808H

DESCRIPTION	PAD SIZE	NET W/T	WEIGHT
Hot surfaces (less 80 °C)	10 in.	3.3 lbs.	5.6 lbs.

RP-207

DESCRIPTION	PAD SIZE	NET W/T	WEIGHT
Patterned and flat surfaces	8 in.	3 lbs.	5.5 lbs.

Replacement Parts

	MODEL	DESCRIPTION
	RP-6050	Rubber pad
	HP-6080	Handle with pump
	LP-6090	ABS pump

Standard Vacuum Lifter



KSAF-01

Power supply: 220V, 1P, 50/60 Hz

Rotation: Manual 90° to left and 90° to right **Vacuum pad:** 250 x 6 each (model no. KSPD-241)

Lifting capacity: 1058 lbs.

• Ideal for factory and construction work

Glass size: Min. 67 in. x 37.4 in.

Arm sliding: 2 pads enable handling of different glass sizes with 1 lifter **Aluminum frame:** Min. 35.4 in. x 67 in. (Max. 35.4 in. x 98.4 in.)

Features: Push-button control for suction and release



KSAF-02

Power supply: 220V, 1P, 50/60 Hz

Rotation: Manual 90° to left and 90° to right **Vacuum pad:** 240 x 4 each (model no. KSPD-237)

Lifting capacity: 705 lbs.
Ideal for insulation lines
Glass size: Min. 43.3 in. x 37.5 in.
Aluminum frame: Min. 43 in. x 35.4 in.

Features: Push-button control for suction and release



KSAF-03

Power supply: 220V, 1P, 50/60 Hz

Tilt and rotation: Manual 90° tilting and manual 90° to left and 90° to

right

Vacuum pad: 250 x 6 each (model no. KSPD-241)

Lifting capacity: 1058 lbs.

• Ideal for either for factory and construction work

Glass size: Min. 67 in. x 37.4 in.

Arm sliding: 2 pads enable handling of different glass sizes with 1 lifter **Aluminum frame:** Min. 35.4 in. x 67 in. (Max. 35.4 in. x 98.4 in.)

Features: Push-button control for suction and release



KSAF-04

Power supply: 220V, 1P, 50/60 Hz **Rotation:** Manual 360° rotation

Vacuum pad: 240 x 6 each (model no. KSPD-237)

Lifting capacity: 1058 lbs.

• Ideal for general factory lifting Glass size: Min. 55.1 in. x 43.3 in. Aluminum frame: Min. 53.2 in. x 41.3 in.

Features:

Push-button control for suction and release

• 1/10 HP compressor for fast release



KSAF-05

Power supply: 220V, 1P, 50/60 Hz **Rotation:** Manual 360° rotation

Vacuum pad: 240 x 4 each (model no. KSPD-237)

Lifting capacity: 705 lbs.

• Ideal for general factory lifting Glass size: Min. 41.3 in x 33.5 in. Aluminum frame: Min. 39.4 in. x 31.5 in.

Features:

Push-button control for suction and release

• 1/10 HP compressor for fast release



KSAF-06

Power supply: 220V, 1P, 50/60 Hz **Rotation:** Manual 360° rotation

Vacuum pad: 250 x 6 each (model no. KSPD-241)

Lifting capacity: 1058 lbs.

• Ideal for factory and construction applications

Glass size: Min. 53.2 in. x 31.5 in.

Arm sliding: 4 pads enable a single lifter to handle multiple sizes

of glass

Aluminum frame: Min. 51.2 in. x 29.5 in.

(Max. 82.7 in. x 51.2 in.)

Features: Push-button suction and release control

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Experience you can see.

Standard Vacuum Lifter







KSHSN-50404

Power supply: DC 12V Lifter (Battery Charger 220V)

12V 18A battery works 8 hours in 20 °C

• Average recharge time: 8 hours

Tilt and rotation: 90° manual tilting and 180 ft. manual rotating lifter (90° to left and 90° to right rotating)

Valve control: Sliding valve control or push-button system for suction and release

Vacuum pads: 9.4 in. rubber pad inline pad arrangement

Ideal for flat and curved glass

Max. capacity: 705 lbs.

• Ideal for barrow and medium-size glass projects

Features:

- Extra safety feature (option)
- Low vacuum sonic and visual alarm

KSHSN-50606

Power supply: DC 12V Lifter (Battery Charger 220V)

- 12V 18A battery works 8 hours in 20 °C
- Average recharge time: 8 hours

Tilt and rotation: 180° Manual rotating lifter

Sliding arm: 2 pads enable a single lifter to handle multiple sizes

of glass

Vacuum pads: 9.4 in. rubber pad ideal for various glass sizes

Max. capacity: 1058 lbs.

• Ideal for construction site applications

Features:

- Extra safety feature (option)
- Low vacuum sonic and visual alarm

KSHSN-50608

Power supply: DC 12V Lifter (Battery Charger 220V)

Tilt and rotation: 90° manual tilting and 90° manual rotation

Extension arm: 4 pads Max. capacity: 1410 lbs.

Ideal for construction site work

Fixed Frame Metal Processing Factory Lifter



KSHL-30706

Power supply: AC 220V 1P

Tilt and rotation: No tilting and no rotating frame

(horizontal movement only)

Vacuum pads: 9.4 in. rubber pad

Max. capacity: 1058 lbs.

Ideal for metal plate lifting work in a factory

Features: Wire remote control or push-button system for

suction and release

Pneumatic 90° Tilting Vacuum Lifter



KSPT-40710

Power supply: AC 220V (motor)

• Pneumatic power (tilting cylinder) (compressor sold separately)

Tilt: 90° pneumatic tilting function **Max. capacity:** 1764 lbs. (9.4 in. pad)

Ideal for tempering factories

Sliding pad: 4 pads

Features:

• Output side for tempering furnace applications

• Wire remote control or push-button system for suction and release



KSPT-40708

Power supply: AC 220V (motor)Pneumatic power (tilting cylinder)

Tilt and rotation: Auto 90 lbs. tilting

Extension arm: 4 pads

Max. capacity: 1058 lbs.

Ideal for cutting and tempering

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Pneumatic 90° Rotation Vacuum Lifter



KSPR-40706

Power supply: AC 220V (motor)

Pneumatic power (rotation cylinder)

Tilt and rotation: Auto 90° rotation

Vacuum pads: 9.4 in. vacuum pads x 6 each

Extension arms: x 2 pads for handling large glass sheets

Max. capacity: 705 lbs.

Ideal for vertical processing line



KSPR-40704

Power supply: AC 220V (motor)

Pneumatic power (rotation cylinder)

Rotation: Auto 90° rotation

Vacuum pads: 9.4 in. vacuum pads x 4 each

Max. capacity: 705 lbs.

Ideal for vertical processing line

Mini Vacuum Lifter with Fast Release



KSMR-60704BC

Power supply: AC 220V 1P

Tilt and rotation: 360° manual rotating frame

Vacuum pads: 9.4 in. rubber pad

Max. capacity: 353 lbs.

Ideal for fast and consecutive conveyor work

Features:

- Light aluminum frame
- 1/10 HP compressor (fast release)
- Push-button control or valve system for suction and releasing

Jib Crane with Ejector Lifter



Power supply: Pneumatic power

• Up & down stroke

Tilt and rotation: Auto 90° tilting and auto 90° rotation

Max. capacity: 551 lbs.

Option: Base with moving wheel, 4 pieces

Various Vacuum Pads



KSPC-250







KSUP-200





KSPD-300





KSPD-237



KSPD-203B

KSPD-R203

KSPD-R203H

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Core Drills

Diamond grits can be arranged based on customer's application.



Belgium Thread Core Drill (CD-P) with Adjustable Countersink

Countersink position can be adjusted



Belgium Thread Core Drill with Fixed Countersink (CD-PF)

Stainless steel shank for rust-free and high-production lines



Countersink (Seamer)Either steel or stainless steel body



Straight Shank Core Drill (CD-N Type)

Hand-held drill job



Belgium Thread Core Drill (CD-P Type)



Habit Fit Core Drill (Habit Type)



Router Bit Various by segment and length



Notes



www.HHHTempering.com



Fax: 360-993-1272

