

# **Product Overview**

## **Keen KHTF-600 Subarc Flux Rebake Oven**

### **About the KHTF-600 Flux Rebake Oven – 600 lbs. Capacity**

The Keen KHTF-600 is a floor-positioned, large capacity subarc flux rebake oven. Subarc flux is top-loaded by way of a hinge-supported lid that is easily lifted manually, and discharged through a slide valve located on the bottom of the unit. Handy, fixed steel bars that stretch across the hopper opening allow the easy emptying of new flux from unopened factory packaging. The flux bags can be placed across these bars, cut open and emptied into the oven hopper. When flux needs to be removed, a container is placed by the user beneath the hopper to catch the granulated flux as it is dispensed. The hopper unit is securely mounted onto a stationary, heavy-duty stand.

The welding flux temperature inside the oven is regulated and controlled by a field-adjustable, digital PID controller with bright, LED temperature indicating display (user can switch from Celsius and Fahrenheit). This microprocessor is housed in a control box on the side of the flux oven hopper, along with a separate on/off indicating red light. This light enables users to quickly view from a distance if the oven is receiving power or has been shut off.

### **Heavy-Duty Construction**

The Keen KHTF-600 subarc flux holding oven is ruggedly designed to withstand years of use in the most demanding industrial environments. Heavy-gauge steel is used throughout the unit and 4-inch thick, semi-rigid, high-density mineral wool in the oven walls and lid keeps the KHTF-600 flux oven well-insulated and energy efficient. The exterior features a durable powder-coated paint that is highly resistant to industrial environments and will stand up to years of use. The KHTF-600's hopper has welded seams inside and out, and is securely mounted to our custom-built stand with heavy-duty screws.

### **Performance Heating**

Thorough, energy-efficient and quick heating of welding flux is the hallmark of all Keen flux ovens. The KHTF-600 in particular has 27 / 1000W elements evenly dispersed throughout the flux oven hopper cavity. The elements are arranged inside the oven cavity from top to bottom with the last 3 elements at the very top of the oven; if a welding inspector opens the lid to test the temperature, he will get an accurate reading. When loaded with flux, no more than 2" of flux is without direct heating.

Our large-capacity flux ovens are designed to reduce watt density to the heating elements through a unique wiring series, greatly reducing overall power

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consumption (The KHTF-600 is only 3000 watts) while increasing heat-up times for cold-loaded flux. This eliminates the problem of flux fusing to the heating elements which is a common problem seen in competing brands (Fusing of flux often creates a “gumming” effect causing the granulated material surrounding the elements to meld together). According to our testing data the KHTF-600 can heat 600 lbs of cold-loaded subarc flux to 550F in approximately 4.5 hours and up to 800F in 8 hours; very quick when compared to many competing models.

#### **Quality Temperature Control and Electrical Safety**

As standard equipment, Keen KHTF-600 flux ovens feature a UL® approved programmable PID microprocessor with digital temperature control and LED temperature-indicating display. The temperature reading can be displayed in either Fahrenheit or Celsius, and has a  $\pm 0.2$  degree accuracy. Handy tactile increment/decrement keys on the controller’s water-resistant front panel enable easy temperature set point adjustment. The controller also features an on/off control mode. The standard control unit supplied with the KHTF-600 flux oven is programmable for standard operation, and an upgraded “ramp & soak” version is available.

#### **Quality Insulation**

Efficient heating design must be supported by quality insulation. The Keen KHTF-600 features a semi-rigid, mineral wool “board” insulation that is bonded together with a high temperature binder. It is highly thermally efficient and is installed within the walls and lid of the unit.

#### **Optional Accessories**

As an optional accessory, Keen offers slag screens that can be installed at the top of the oven chamber. Our slag screens are designed to be a sieve for filtering out contaminants in reused flux as it is being poured back into the flux oven hopper. The hole size on our flux oven slag screens is standard, but we can adjust the screen hole size if you have a different requirement. The slag screens are a fixed size according to the flux oven with which they are used.

#### **Customization**

We have the unmatched ability to customize any of our standard ovens, and/or design one-of-a-kind ovens for unique storage requirements. Welding codes are constantly changing, and Keen is ready to meet the demands of today’s welders.

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## Specifications for Keen KHTF-600 Flux Oven High-Temperature Rebake Unit

Part Number	011501 - (240V – 1 Phase)
011505 – (480V – 3 Phase)	011502 – (480V – 1 Phase)
Oven Category	Flux Oven - Rebake
Flux Capacity (LBS)	600 lbs. Flux
Flux Capacity (KGS)	272.1 kgs. Flux
Standard Voltages Available	240V, 480V
Wattage	3000W
Temperature Range (°F)	Ambient - 999°F
Temperature Range (°C)	Ambient - 537°C
Thermostat	Digital Proportional Integral Temperature Control
Safety Feature	Manual Reset Over Temperature Control
Insulation	4" Thermal Wool
Interior Dimensions (IN)	20" L x 20" W x 40" D Sloped Bottom
Interior Dimensions (CM)	50.8cm L x 50.8cm W x 101.6cm D Sloped Bottom
Exterior Dimensions (IN)	28" L x 28" W x 64" H
Exterior Dimensions (CM)	71.12cm L x 71.12cm W x 162.56cm H
External Thermometer	Digital Temperature Display
Net Weight (LBS)	331 lbs.
Net Weight (KGS)	150.14 kgs.
Shipping Dimensions (IN)	47" W x 73" L x 40" H
Shipping Dimensions (CM)	119.38cm L x 198.12cm W x 101.60cm H
Shipping Weight (LBS)	585 lbs
Shipping Weight (KGS)	265.35 kgs.
Power Cord Length	8 ft.
"ON" Indicating Light	Yes
CSA Approval	No
UL Approval	No
Accessories	Slag Screen 100608
Similar Keen Ovens	KF-100A, KF-300, KF-600

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# KEEN Submerged Arc Welding Flux Ovens (SAW)

Made in the USA and ruggedly constructed, KEEN submerged arc flux storage and rebake ovens are available in a variety of capacities to suit the most rigorous subarc welding operations. Our flux ovens have industry-leading heat up times due to our proprietary design, and can be found in a wide variety of industries across the world.

Below is a list of industries where KEEN subarc flux storage and rebake ovens are commonly used:

- Wind Turbine Tower Fabrication
- Longitudinal Submerged Arc Welded Pipe (LSAW) Production
- Helical Submerged Arc Welded Pipe (HSAW) Production
- Double Submerged Arc Welded Pipe (DSAW) Production
- Carbon Steel Tank and Vessel Fabrication
- Boiler Fabrication
- Pressure Vessel Fabrication
- Large Bridge Joint Installation
- Thick Plate Installation in Shipbuilding
- Offshore Platform Construction and Repair

Just as stick welding electrodes readily pick up moisture from the surrounding atmosphere, the same applies to bonded welding fluxes that are comprised mostly of dry, powdered ingredients. The purpose of welding flux is to clean and shield the weld area from impurities. If moisture has contaminated the flux, hydrogen is released into the metal when heat is applied. When the weld cools, it can become brittle, crack and/or develop pinholes. Moisture-contaminated flux can also accelerate corrosion to certain metals like aluminum and must be kept dry throughout the welding process.

KEEN welding flux holding ovens and rebake ovens are an indispensable addition to any subarc welding operation to help ensure quality welds. Our flux holding ovens and rebake ovens are suitable for almost any flux heating application that is required for today's welding professionals.

Please read the following FAQ section for more information about KEEN flux ovens, as well as individual product overviews and specifications for the various subarc flux ovens we manufacture at KEEN.

# Keen Subarc Flux Ovens (SAW) – FAQs

## **What is subarc flux and what is submerged arc welding (SAW)?**

Submerged arc welding (SAW) is a common welding process that is frequently used in the structural and vessel construction industries. The process requires a tubular or consumable solid electrode that is continuously fed into the work area using fully-automatic or semi-automatic methods. As the electrode is fed into the arc and melted, a layer of granular material provides a protective cover beneath which the welding occurs. Called flux, this fusible material consists of lime, silica, manganese oxide, calcium fluoride, and other compounds. The flux forms a hardened layer after it is heated and becomes molten. In this melted state the flux becomes conductive, thus enabling it to supply a constant current between the electrode and the welding work. The remainder of the flux is recovered and reused, unless it has become contaminated.

The granular flux used in SAW serves several functions. In addition to providing a protective cover over the weld, the flux shields and cleans the molten puddle. The flux also affects the chemical composition of the weld metal, the weld bead shape, and the mechanical properties of the weld. Another function of granular flux is to act as a barrier that contains and concentrates the heat into the weld area thus enabling deeper weld penetration.

## **Why do I need to store subarc flux in a heated oven?**

In order to answer this question, it is pertinent to describe the four types of welding fluxes that are commonly available: fused, bonded, agglomerated and pre-mixed fluxes.

**Fused** — this type of flux is non-hygroscopic (does not absorb moisture from the air). Any surface moisture on the particles can be removed at a low temperature oven setting of 300°F.

**Bonded** — this type of flux is hygroscopic (absorbs moisture from the air) and is comprised of a combination of dry ingredients that are glued together with a liquid binder, then baked at a low oven temperature.

**Agglomerated** — this type of flux is hygroscopic and is manufactured the same way as bonded fluxes only a ceramic binder is used instead of a liquid binder.

**Pre-Mixed** — this type of flux is hygroscopic and is simply a combination of two or more bonded or agglomerated fluxes.

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Welding flux holding ovens and rebake ovens are an indispensable addition to any subarc welding operation to help ensure quality welds. Our flux holding ovens and rebake ovens are suitable for almost any flux heating application that is required for today's professionals.

### **What are the proper storage and rebaking guidelines for subarc flux?**

For specific storage and rebake temperature guidelines, we recommend contacting the welding consumable manufacturer directly. It is also important to check with local welding codes and/or ask a welding inspector to provide some information. Welding standards change frequently, and each manufacturer often provides a different recommendation regarding welding consumable storage. Check the packaging and also manufacturer websites for information. Keen offers a wide range of products to handle almost any welding consumable storage requirement.

### **What is the difference between subarc flux holding/storage and subarc flux rebaking/reconditioning?**

Generally, there are two processes involved with the proper maintenance of subarc welding flux: holding (also called storing) and rebaking (also called reconditioning).

The holding process refers to the long-term\* heated storage of welding flux to maintain factory-fresh dryness. Storing the flux at elevated temperatures prevents atmospheric moisture contamination of the hygroscopic granules. There are various temperature requirements according to the type of flux and also that are also set forth by welding codes. **For specific holding temperature guidelines, please contact the manufacturer of your welding consumable.**

The rebaking process refers to the short-term\*, high temperature heating of subarc flux that has been contaminated by atmospheric moisture. The rebaking process "reconditions" the welding flux, meaning it bakes out the moisture that has been absorbed thus restoring the flux so it is suitable for reuse. **For specific rebake temperature guidelines, please contact the manufacturer of your consumable.**

\* - In relation to our products, we consider long-term to mean 24 hours/day 7 days/week.

### **What are the key differences between welding flux holding ovens and welding flux rebake ovens?**

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## Keen Subarc Flux Ovens (SAW) – FAQs

Keen ovens are specifically designed according to the temperature range of the process, and the amount of subarc flux to be stored. The standard holding ovens are designed to accommodate a maximum temperature of 550F and the rebake ovens are designed to reach 999F. The higher temperature ovens have larger wall thicknesses to accommodate more insulation and digital programmable temperature controllers.

### **How can I determine the amp draw for a particular model?**

Use this formula:  $\text{Watts} / \text{Voltage} = \text{Amps}$



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### One Year Limited Warranty

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Henkel Enterprises, LLC warrants its products against defects in material and workmanship. Henkel Enterprises, LLC will either repair or replace without charge any properly installed product which fails under normal operating conditions within one year from date of installation, provided it is returned to our factory, transportation prepaid, and our inspection determined it to be defective under the terms of this warranty. The warranty covers only equipment manufactured by Henkel Enterprises, LLC and does not extend to transportation, installation, or replacement charges at the buyer's facility; nor does it apply to any other equipment of another manufacturer used in conjunction with Henkel Enterprises, LLC equipment. No other warranty, expressed or implied exists beyond that included in this statement.

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