

WIRELESS POWER

CONSORTIUM

Cordless kitchen appliances

A powerful new kitchen concept

White paper – April 2013



WIRELESS POWER

CONSORTIUM

1. Introduction:

In March 2013, the Wireless Power Consortium (WPC) has established a Work Group to develop specifications for cordless kitchen appliances. This white paper explains the concept and benefits of a standardized interface for cordless kitchen appliances and why standardization is a good idea.

2. Concept

Let's cut the cord!

Wireless charging of mobile devices has enjoyed increasing popularity thanks to the success of Qi, the global standard for wireless charging devices up to 5W. The power cord is generally regarded as “the final cord” that needs to be eliminated in order to get a true wireless user experience.

Why not apply this in the kitchen domain? Market surveys have reported significant value of a cordless, clutter free work area in the kitchen which is perceived as tidy and clean by the end user.



Courtesy of Haier Group

Figure 1: Wuwei appliances from Haier

Wuwei

Haier Group, a Chinese multinational corporation, has already introduced a combination of a cordless blender, cordless rice cooker and an inductive power source for integration into the kitchen furniture to the Chinese market. These products, which are labeled “wuwei” (without a tail), are well received and confirm cordless appliances are appreciated by the customers.

Cordless appliances

The new specifications will define the interface between kitchen appliances and inductive power sources. It enables a whole new class of cordless appliances. These appliances will be easy to handle, easy to clean and easy to store. Rather than a conventional wall power outlet, these appliances need an inductive power source to be powered.

In the new specifications, almost any kitchen appliance can be made cordless. Power requirements may vary from the 100W range (simple juicers) to 1.5 – 2.4 kW¹ for heating appliances such as kettles. The new specifications will also enable appliances such as pots and pans for cooking and frying. These cooking appliances may be used on countertops or induction cooktops that have inductive power sources integrated.

¹ The maximum power that can be transferred may depend on the mains Voltage, i.e. the power may be limited to 1.5 kW in 100 Volt countries whereas 2.4 kW may be available in 240 Volts countries.

WIRELESS POWER

CONSORTIUM



© Philips Electronics

Figure 2: Inductive power source integrated in kitchen table

Inductive power sources

Inductive power sources may be stand alone or integrated in kitchen counter tops to power cordless appliances. Traditional inductive cookware will in general not work on these power sources. On the other hand, Inductive power sources could combine power transfer to a cordless appliance with inductive heating of traditional cookware in a novel type of induction cooktop.

Integration of power sources is not limited to counter tops and induction cooktops. They may also be integrated into kitchen or dining tables, thus enabling completely new functions that were not

possible before. Examples are keeping food or drinks warm, toasting bread, making coffee or cooling wine. It will also enable a whole range of table top cooking possibilities at home or in restaurants such as the popular Chinese “Hot Pot” or Japanese “Shabu Shabu”.

© Philips Electronics



Figure 3: a new type of induction cooktop capable of powering appliances

Appliance in control

The new specifications will feature a feed-back loop from appliance to power source. So, controls (On/off, more/less, temperature, timer) are on the appliance, just as is the case with conventional appliances. For cooking appliances, this means the temperature in the pan can be controlled accurately which will improve the cooking result. Control on the pan (i.e. a smart pan) is a new concept which could potentially conflict with control by the induction cooktop itself. The specifications will prevent unsafe situations as a result of this.

Compatibility and logo

Cordless appliances and inductive power sources that comply with the new specifications will be interoperable, regardless of brand or model. The interoperability will be indicated by a logo. Inductive power sources may feature Qi wireless charging functionality to enable Qi phone or laptop charging but this will not be mandated by the specifications. Alternatively, separate Qi chargers may be built into the work surface, thus providing Qi wireless charging functionality in the kitchen.

WIRELESS POWER

CONSORTIUM

3. Benefits of cordless kitchen appliances

Convenient & Clean

As mentioned above, market surveys have shown users appreciation of a tidy kitchen. Cordless appliances eliminate clutter and facilitate storage of our appliances, leaving a smooth, blank work surface, which looks tidy and is very easy to clean.

Not only the countertop, also the appliances are easy to clean. As they are cordless, appliances may be completely sealed and waterproof. Such an appliance may be rinsed under cold or warm water for easy cleaning.



Figure 4: *The countertop is easy to clean*

Appliances can be easily moved

To obtain flexibility in placement of the appliances, inductive power sources can be installed in multiple locations in countertops and tables. That will enable us to move appliances from one end of the countertop to another or from the countertop to a table e.g. for keeping warm, toasting bread or table top cooking.



Figure 5: *Enjoying Shabu Shabu dinner with the family*

Space efficient

As we appreciate a tidy kitchen, appliances that are not in use (except for those appliances that we use all the time) should be stored away. Cordless appliances are easy to store as they have no cord which has a life of its own. This is especially important for small kitchens where storing is a must to preserve room for food preparation and everyday use.

Where we usually separate the food preparation area from the cooking area in our kitchen, often by the rather dominant position of the cooking stove, the specifications for cordless appliances will enable us to combine these functions. Not only could we use new smart cooking appliances on the countertop, we could also operate our blenders and food processors on a new induction cooktop in which power transfer to cordless appliances has been enabled. This could represent a significant advantage in small kitchens for example in metropolitan apartments, where space is limited.



Figure 6: *a small kitchen*

WIRELESS POWER

CONSORTIUM

Safe & Robust

As we know from our inductive toothbrush charger in the bathroom, Inductive Power transfer is robust against water and dirt. This means the appliances will operate no matter the conditions of the work surface. Electrical shock hazard will never be an issue, even if the work surface is wet or flooded with water.



The inductive power sources and cordless appliances will comply with the same safety standards as conventional kitchen appliances with power cord and induction cooktops. The new specifications will also feature mandatory detection systems that will prevent metal objects from being accidentally heated.

Figure 7: Inductive Power Transfer is robust against water

Smart

Cordless cooking appliances can be made in control of the power (heating) source. Temperature may not only be controlled but even programmed for automated recipe cooking (as we know it in bread makers and rice cookers). This will enable intelligent cooking appliances (i.e. smart pans) that may be controlled through a PC, smart phone or other controller.



Figure 8: a smart pan

WIRELESS POWER

CONSORTIUM

4. Why do we need a standard?



Figure 9: family breakfast with cordless toaster and egg cooker

Consumers want interoperability

Consumers are, in general, delighted if a feature works across different brands and get frustrated if it only works with one brand. This is not only true for mobile products but also for more or less stationary products such as kitchen appliances. These appliances are not only expected to work everywhere in the house, but are still expected to work when moved to another house. The use of a logo will help the consumers to recognize the

standard and its interoperability promise.

The new specifications will be accompanied by a worldwide compliance and certification program that will lead to flawless and intuitive interoperability of appliances in kitchens worldwide. That will represent value for the consumer and will contribute to the adoption of the standard.

Avoid brand Lock-in

Consumers will ponder the question: *“what if the appliance breaks down, can I buy another brand and still keep the cordless functionality?”* With interoperability, assured by the specification and its logo, consumers can buy the appliances and will not be bothered by such concerns. Moreover, when a new kitchen is installed, the customer will be able to choose from a wide selection of competing products that all work with the inductive power sources in the kitchen.

Create a market for inductive power sources and components

With adoption of the standard, markets will emerge not only for the standardized inductive power source units, but also of inductive power receiving units that can be designed in various appliances. With increasing adoption, the volume of these markets will grow and consequently, prices will drop. Hence, consumers will profit from the economies of scale which will further drive adoption.

WIRELESS POWER

CONSORTIUM

www.wirelesspowerconsortium.com

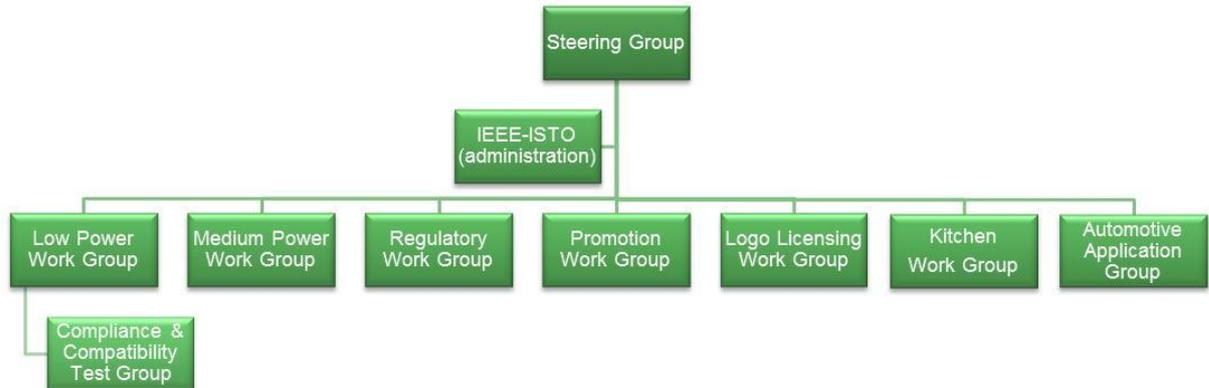


Figure 10: Wireless Power Consortium organization chart

5. Why the Wireless Power Consortium?

Qi: The global standard for wireless charging

The Wireless Power Consortium was established in December 2008 and developed the Qi specifications in just 1.5 years. It has seen a tremendous growth in membership from 8 companies at its start until approximately 135 members today. Members are not only from mobile phone companies, but include a wide range of categories such as power supply, coils and shielding, components and semi-conductor companies. Today, Qi is on the verge of worldwide breakthrough with support from the world's most successful smartphones.



Cordless Kitchen Appliances: an attractive proposition

Wireless Power Consortium members have made a thorough investigation into the possibilities of cordless kitchen appliances, which has resulted in a set of commercial requirements for the standard. The Kitchen Work Group was established in March 2013 and charged with the development of the specifications for cordless kitchen appliances. Large corporations from the kitchen and consumer electronics industry have already committed their support.



WIRELESS POWER

CONSORTIUM

6. Join us!

The Wireless Power Consortium has started development of the specifications for cordless kitchen appliances. If your company is interested in this activity, we cordially invite you to join the Wireless Power Consortium and the Kitchen Work Group!

Why join now? The Wireless Power Consortium has reached agreement on the high level commercial requirements for the specifications. However, fundamental technology choices still have to be made and many features are yet to be discussed. By joining the Kitchen Work Group you will be able to present your views and influence the specifications. Also, by becoming a member of the Wireless Power Consortium, you will get early access to draft specifications and other technical resources.

Come join us and help us to realize the dream of a kitchen without power cords



www.wirelesspowerconsortium.com