

Principle of high frequency welding of capacitors

How does high frequency welding work?

By applying a controlled amount of High Frequency (HF) power, it is possible to heat the materials so that the zone of resulting higher temperatures includes the surfaces to be welded together. Heating the contact boundaries using this method forms a strong weld without damaging the outer surfaces of the materials.

What is capacitor discharge welding?

Capacitive discharge welding, particularly for large-scale systems, is typically done using film-type capacitors. These capacitors store energy along alternating plates separated by a dielectric film. Charge is stored statically along the lengths of the plates. The basic configuration of the film capacitor is provided in Figure 1.

What is HF welding?

This section describes the HF welding process in simple terms. The fusing of the polymer to perform the weld. Plastic materials can be welded by applying heat externally, e.g. by using a tool similar to a domestic iron or a hot air gun. Generally, this form of welding is restricted to very thin materials, such as Polyolefins.

Are electrolytic capacitors a viable alternative for large capacity CD welding systems?

Electrolytic capacitors (E-caps) offer a potential alternative for large capacity CD welding systems. E-caps incorporate an electrolyte impregnated into a separator. The separator is then sandwiched between anodic and cathodic foils. A dielectric is also used to prevent direct contact of the foils with the electrolyte.

How much HF power is needed for a weld?

Thus during the period when the HF power is applied for the weld, the average power supplied to the electrode is considerably less than the maximum power output. The relationship between a given workpiece area and the HF power necessary to weld it has been established as typically 25 cm² per Kilowatt.

What is capacitive discharge or CD welding?

Capacitive discharge or CD welding is a variant of resistance welding (1,2). The process differs from the conventional variants largely in the type of power supply used. Conventional systems provide some variant of alternating current to a transformer arrangement.

High frequency (HF) welding of polymer materials is increasingly used in modern manufacturing processes. The literature on HF welding process parameters was reviewed and it was found that 3-5 basic welding parameters were considered, which is insufficient for ...

Although the application varies, the basic principle of HF welding involves creating a "vee" where the two surfaces to be welded are brought together. The example below illustrates this in a tube welding application

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showing both the contact and induction method.

The High Frequency welding technique overcomes the problems associated with the application of direct heat alone, and enables plastic materials to be welded under controlled conditions. By applying a controlled amount of High Frequency (HF) power, it is possible to beat

What is Dielectric Heating? The process of heating in which a high-frequency alternating electric field or radio waves or microwave electromagnetic radiation are used to heat the dielectric materials is known as dielectric heating.. Dielectric heating is also known as electronic heating, radio frequency (R.F.) heating, high frequency heating and diathermy.

HIGH FREQUENCY WELDING HANDBOOK 4.2 WELD AREA CALCULATIONS The HF power required to weld a given area depends upon a number of factors. In this sub-section, these ...

In this example, by placing a capacitor in a signal path that includes high-frequency AC components (noise) in addition to the base AC, as shown in the diagram, only the high-frequency noise components pass through the capacitor and are separated, which prevents their propagation to the following stage. One example of such use is removing the switching ...

Capacitive Discharge Welding System Jerry E. Gould and Sam Lewis EWI Abstract Capacitive discharge (CD) welding is a variation of resistance projection welding (RPW). For CD welding, ...

So far, scientific studies on high frequency welding (HF) have observed the three main parameters: anode current, welding time and pressure of upper electrode. Some ...

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