

Operational Experience of Industrial Scale Electroporation Devices

C. Schultheiss, M. Sack, H. Bluhm, H.G. Mayer and M. Kern*

Forschungszentrum Karlsruhe GmbH,
Institute for Pulsed Power and Microwave Technology,
P.O. Box 3640, D-76021 Karlsruhe, Germany

*KEATEC GmbH, D-68753 Waghäusel, Saarstr. 4

The "cold" denaturation of large amounts of fruits, as for instance beets, apples, grapes etc., by means of electroporation is the goal of several cooperations between the Forschungszentrum Karlsruhe and industry. An important part of the operational procedure is the treatment of the fruits under water by applying a number of high-voltage pulses with field strengths of several kilovolts per centimeter and pulse lengths in the order of 1 to 2 microseconds. The feed-through capacity of fruits in the agricultural industry can be up to 10.000 tons a day. Appropriate pilot plants for electroporation are subject of development. The pilot plant KEA-ZAR (Karlsruhe Electroporation Plant - Cell Denaturation Reactor) started with the operation in the campaign 2003 to treat daily some tons of beets for experimental purposes. An essential constructive feature of the pilot plant with an electroporation capacity of about 8 tons per hour is the enforced transportation of whole fruits by means of a roll through an electrode area, connected to two Marx generators (350 kV, 6 kA, 1,4 μ s pulse length) each operating at 20 Hz repetition rate [1], where the fruits suffer cell denaturation.

1. C. Schultheiss, M. Sack, H.-J. Bluhm, , H.-G. Mayer, and M. Kern, W. Lutz "Operation of 20 Hz Marx Generator on a Common Electrolytic Load in an Electroporation Chamber", 14th IEEE International Pulsed Power Conf. June 15-18, 2003, Dallas, Texas, USA

The work is supported by BEO, Projektträger Biologie, Energie, Umwelt des Bundesministeriums für Bildung und Forschung (BMBF) und des Bundesministeriums für Wirtschaft (BMWi) der Bundesrepublik Deutschland.

A **ICOPS**
I **2004**

On Plasma Science

June 28-July 1, 2004
Baltimore, Maryland

See page 14 for instructions on abstract preparation.

Session Topic: Medical, Biological, Environmental Applications

Session Topic Number: 5.6

Prefer Oral Session

Prefer Poster Session

No Preference

Special requests for placement of this abstract:

Special requests for equipment:

Signature: CS

Typed Name: Christoph Schultheiss

Affiliation/Institution/Company:

Forschungszentrum Karlsruhe GmbH,
Institute for Pulsed Power and Microwave Technology

Mailing Address:

P.O. Box 3640,
D-76021 Karlsruhe, Germany

City: Karlsruhe

State/Province: Baden-Württemberg

Zip Code: 76021

Country: Germany

Phone: +49 7247 82 4384

Fax: +49 7247 82 6126

E-mail: christoph.schultheiss@ihm.fzk.de

Abstract must be received no later than Friday, January 30, 2004. Please e-mail abstract to:

icops2004@pcm411.com

If e-mail is not available, then submit original and two copies by mail to:

ICOPS2004
c/o Palisades Convention Management
411 Lafayette Street, Suite 201
New York, NY 10003-7032

Abstracts received after the January 30, 2004 deadline will be placed in a post-deadline session.

The presenter must be a registered conference participant. At least one author should be registered to assure that the abstract appears in the Conference Record - Abstracts book.