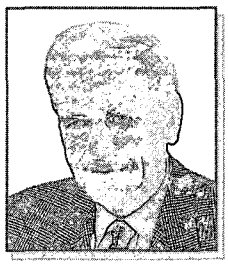
The SAE Spark Erosion Method of achieving a passive fit of implant framework

Mr. Günter Rübeling



연자약력

1958 Graduation as Master Dental Technician in Stuttgart founding of first dental laboratory Rubeling Dental-Labor in Bremerhaven
1963 Board member of Zahntechnikerinnung Bremen
1976 Vice-president of Zahntechnikerinnung Bremen
1978 State representative of Federal Dental Technicians Association
1982 Introduction of the spark erosion technique to the dental field and founding of the SAE company
1991 Founding of second dental laboratory Rubeling & Klar in Berlin
1999 Honorary member of "Arbeitsgemeinschaft Deutche Dentale Technologie" for achievements in the field of titanium and spark erosion technology

The conventional methods of casting framework in the dental laboratory will never lead to a passive fit of the substructures and suprastructures situated on osseointegrated implants.

However, to comply with the demand of dentistry to achieve a passive fit of the implant related framework, many variables are considered. The cast suprastructure is segmented and reconnected, either by soldering or welding. This procedure leads to new inaccuracies, if only to an insignificant extent. But when the ceramic veneering is applied to the multispanned restoration, the framework shows a stress producing potential due to the shrinkage of the ceramic during firing. Again, we find an inaccurate fitting fixture.

The discrepancies resulting from conventional prosthetic techniques can be corrected after completion of the suprastructure by applying the SAE Secotec Spark Erosion Method.

With the SAE Secotec Spark Erosion Technique, short circuit impulses in an electrical field burst out particles from the metallic surface of the suprastructure, starting from the areas that first come into contact with the implant abutment replicas and continuing until all contours of the framework are equally spark eroded, thus achieving uniform contact.

A special model is needed to provide electrical contact during the spark erosion procedure. The lab analogs furnish the opportunity to exchange the implant replicas for identical electrodes, assuring an even flow of electricity.

The Secotec System is applicable to all conductible metals and alloys and to acrylic or ceramic veneered suprastructures.

The Secotec-Technology is a scientific method that has been acknowledged by the Free University of Berlin, University Clinic Benjamin Franklin.

To attain a gap-and strain-free fit of the implant at the first point of contact through the spark erosion process, the framework is machined onto the implant electrodes which function as replacement for the implant abutment replicas. These electrodes have been tightened to the implant analogs embedded in the model prior to erosion treatment. The implant abutment replica and the electrode are designed to correspond to the shape of the osseointegrated implant abutment. Since the implant electrode must substitute for the implant electrode must substitute for the implant abutment replica. It is necessary to allow an easy exchangeability of these components by screwing them into the lab analog embedded in the model(lab analogs) must be replaced by an implant electrode to enable spark erosion treatment of the framework. The implant replicas are not suitable for spark erosion machining, yet the implant electrodes are made of erosion-supporting metal. It is also necessary to be able to exchange the replicas for the electrodes to prevent circumstantial erosion damages to the implant abutment replicas. The exact 0° position of the model is guaranted, even if the erosion process must be repeated.

Adjusting the plus, and minus polarity of the spark erosion process and, depending on how much material is to be removed, by repetition of the process, material removal at the conclusion of the process has occurred only at the substructure and suprastructure and not at the electrode.

The implant analogs, implant electrodes and the framework are attached to the dental spark erosion unit in in such a way that the analogs holding the implant electorodes form one electrode(anode) and the dental framework forms the other(cathode).
The cast(model) and the framework are moved towards each other during in maching process in the spark erosion unit type SAE EDM 2000 so that substance removal on the framework will lead to an exact match of the design of the osseointegrated implant.

The erosion process is interrupted from time to time to exchange the worn down implant electrodes. This electrode replacement procedure is repeated again and again until an entirely strain free fit is achieved between the implant and the framework, and the electrodes show no further sign of erosion. After the spark erosion treatment is completed, the electrodes are replaced by the implant abutment replicas.