

## Comparison Between Radiotracer and Surface Profile Methods for the Determination of Dentifrice Abrasivity

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**Introduction:** ISO11609 states that a surface profile (Sp) method can be used to determine dentifrice abrasivity in relation to dentin (RDA) as an alternative to the traditional radiotracer method (Rt). A comparison between both methods was performed in this study.

**Methods:** Specimens from human root dentin were prepared for each method and randomly assigned to 8 dentifrice/abrasive groups (n=8), which represented a wide abrasivity range. Aqueous dentifrice slurries or abrasive suspensions in a solution containing 0.5% carboxymethylcellulose and 10% glycerin were used to brush specimens in a custom-made V-8 cross-brushing machine. Two independent studies (Sp, Rt) were carried out. For Rt, the specimen preparation, study design, analysis and calculation of the abrasive level (RDA) followed the ISO11609/Annex A guidelines. Similarly for Sp, the ISO11609/Annex B recommendations were followed, except by the number of brushing strokes, which was pre-determined to be 2000 strokes (instead of 10000) in a preliminary test. Data were analyzed using ANOVA and Tukey tests, with significance level set at 5%. The correlation between methods was also investigated.

**Results:** Overall, higher variation and RDA values were observed for the Sp method compared to Rt.

While good correlation was found between methods ( $R^2=0.841$ ), group ranking was dissimilar and better statistical differentiation among groups was observed in Rt.

**Conclusions:** The Rt method showed to be a more standardized and robust method compared to Sp for the determination of RDA values of dentifrices/abrasives. Sp needs to be further developed before being considered as an equivalent test method for RDA. The determination of the abrasive levels of toothpastes using standard testing methods is important to guide oral care professionals and patients on the prevention of toothbrushing abrasive wear.

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