Sealed. Safe.

* Data on file.
"The epoxy resin-based sealer AH Plus® had the highest push-out bond strength."
An in vitro comparison of bond strength of various obturation materials to root canal dentine using a push-out test design

**Study Site:** Department of Endodontics, Marquette University, School of Dentistry, Milwaukee, Wisconsin

**Authors:** M.A. Fisher; D.W. Berzins; J.K. Bahcall

**Published:** Journal of Endodontics Volume 33, Number 7, July 2007

**Aim:** To compare the bond strengths of various obturation materials to root canal dentine by using a push-out test design.

**Method:** 25 single-rooted extracted human teeth were prepared for obturation and divided into 5 groups. Group 1 was filled with Kerr EWT pulpal canal sealer (zinc oxide-eugenol-based) and gutta percha. Group 2 was filled with DENTSPLY AH Plus® (epoxy-amine-resin-based) and gutta percha. Group 3 was filled with Pentron Epiphany sealer and Resilon points. Group 4 was filled with the Brasseler Activ GP obturation system and Group 5 with the Ultradent EndoRez obturation system. The teeth were cut perpendicular to the long axis to create 1 mm thick slices from the apical, middle and coronal thirds. Bond strength was measured for each test slice.

**Result:** Group 2 showed a significantly greater bond strength compared with all other groups. Groups 1 and 4 had significantly higher bond strengths compared with groups 3 and 5.

<table>
<thead>
<tr>
<th>Bond Strength of various obturation materials</th>
<th>Kerr EWT</th>
<th>AH Plus®</th>
<th>Resilon®</th>
<th>Activ GP®</th>
<th>EndoREZ®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Micropush-out Bond Strength Value (MPa)</td>
<td>0.79</td>
<td>2</td>
<td>0.32</td>
<td>1.1</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Mean Micropush-out Bond Strength Value (MPa) for each group measured for the interface AH Plus® – Gutta Percha

**“AH Plus® / Gutta Percha showed a significantly greater bond strength compared with all other groups.”**

Matthew A. Fisher, DDS
School of Dentistry, Department of Graduate Endodontics, Marquette University, Milwaukee, WI, USA

1 Kerr EWT, Epiphany, Resilon, Activ GP and EndoREZ are not registered trademarks of DENTSPLY International, Inc.
Antibacterial activity of endodontic sealers by modified direct contact test against Enterococcus faecalis

**Study Site:** University British Columbia, Vancouver, Canada

**Authors:** H. Zhang, Y. Shen, N.D. Ruse, M. Haapasalo

**Published:** Bayerisches Zahnärzteblatt, Sept. 2004, 32

**Aim/ Method:** The purpose of this study was to use a modified DCT assay to evaluate the antibacterial activity of 7 different endodontic sealers against E. faecalis 20 minutes after mixing (fresh samples) and 1, 3 and 7 days after mixing (set samples).

**Result:** The present study also showed that fresh AH Plus® had significant antibacterial effect whereas set samples did not show any antibacterial activity.

“Fresh AH Plus® killed Enterococcus faecalis effectively.”

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Professor Dr. M. Haapasalo
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Department of Oral Biological & Medical Sciences,
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University British Columbia, Vancouver, Canada

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1 Apexit, TubliSeal and Sealapex are not registered trademarks of DENTSPLY International, Inc.
Radiopacity evaluation of new root canal filling materials by digitalization of images

Study Site: Dental School, São Paulo State University, Brazil

Authors: M. Tanomaru-Filho; É. Gouveia Jorge; J.M. Guerreiro Tanomaru and M. Gonçalves

Published: Journal of Endodontics, Volume 33, Number 3, March 2007

Aim: To evaluate the radiopacity of five root canal filling materials (AH Plus®, Intrafill®, Roeko Seal®, Epiphany® and EndoRez®).

Method: Samples of the prepared sealer were inserted into impressions and stored in a moist chamber at 37°C until completely set. The specimens were positioned on five occlusal radiographic films and exposed along with an aluminum step-wedge with variable thickness. Radiographs were digitalized. The area corresponding to the specimen was selected from each radiographic image to verify which thickness of the aluminum step-wedge was detected by the software as equivalent to the radiographic density of the sample. This determined the radiopacity of the selected material compared with a particular thickness of aluminum measured in mm.

Result: AH Plus® (9.8 mm Al) and Epiphany® (8.8 mm Al) presented the highest mean values of radiopacity (p<0.05).

![Radiopacity mean values of five different root canal sealers in the test](image)

“With 9.8 mm Al, AH Plus® was the most radiopaque material in the test.”

1 Epiphany, EndoREZ, Intrafill and RoekoSeal are not registered trademarks of DENTSPLY International, Inc.
Sealing Ability

“AH Plus® filled root canals exhibited the last leakage / dye penetration among all groups.”

Professor A. Lussi
Department of Operative, Preventive and Pediatric Dentistry
University of Bern, School of Dental Medicine
Switzerland

Aim: To evaluate and compare the sealing quality of hand- or vacuum-obturated root canals after hand-instrumentation or non-instrumentation cleansing.

Method: A total of 60 single-rooted teeth were divided into six comparable groups. The root canals of three groups were instrumented with the balanced-force technique (hand-instrumentation) and obturated with gutta-percha condensation. The remaining teeth were cleansed and filled using non-instrumentation technology. For both obturation types, the same sealers were used (AH Plus®, Apexit®, Pulp Canal Sealer EWT®). After aging, the quality of coronal seal was assessed with a dye penetration method.

Result: Superior sealing of the machine-filled roots (non-instrumentation technology), compared with laterally condensed conventionally filled root canals. AH Plus® showed less dye penetration compared to EWT and Apexit.

Professor A. Lussi
Department of Operative, Preventive and Pediatric Dentistry
University of Bern, School of Dental Medicine
Switzerland

1 Apexit and PCS EWT are not registered trademarks of DENTSPLY International, Inc.
Gold Standard

“AH Plus® is quasi a “Gold standard” due to its excellent sealing ability, adhesive and good handling properties.”

Matthias J. Roggendorf, DMD
Associate Professor
Department of Operative Dentistry and Endodontics
Medical Center for Oral and Maxillofacial Sciences
Philipps University of Marburg and University Hospital Giessen and Marburg, Germany

“I have been using AH Plus® for more than 5 years, mainly in combination with cold but also with warm filling techniques. The excellent flow behavior allows for reliable sealing in the root canal. Compared to sealers based on zinc-eugenol and calcium salicylate, shrinkage and solubility are negligible. The working time is sufficient for all kinds of obturation techniques. The product is delivered in a double barrel syringe which ensures homogeneous and void-free mixing of both pastes.”

Study Site: University Erlangen-Nürnberg, Germany
Author: M. Roggendorf
Published: Bayerisches Zahnärzteblatt, Sept. 2004, 32
Aim: The article is focused on handling and properties of different sealers.
Result: The newly developed AH Plus® sealer is almost insoluble, shows slight expansion and has certain adhesive properties. The composition of the sealer seems to be responsible for the superior sealing efficiency of AH Plus®. Microleakage investigations revealed a very good seal so that this sealer quasi represents a “gold standard”.

Root canal sealing materials up-to-date
Comparison of classic and modern root canal sealers

SCIENCE UPDATE
AH Plus® Jet™ Starter Kit
1 x AH Plus® Jet™ Mixing Syringe, 15 g
20 x Mixing Tips with Intra Oral Tip
1 x Mixing Pad
1 x Illustrated Technique Guide
1 x Organizer Tray
ReOrder 606.20.115

AH Plus® Jet™ Refill
2 x AH Plus® Jet™
Mixing Syringe, 15 g
ReOrder 606.20.118

Mixing/Intra Oral Tips for AH Plus® Jet™
40 x Mixing Tips with Intra Oral Tip
ReOrder 606.20.116

AH Plus® Export Package (Tube Set)
1 x Tube of paste A, 4 ml
1 x Tube of paste B, 4 ml
1 x Mixing Pad
ReOrder 606.20.112

AH Plus® China Package (Tube Set)
1 x Tube of paste A, 3 ml
1 x Tube of paste B, 3 ml
1 x Mixing Pad
ReOrder 606.20.113

AH Plus® Export Package (Tube Set)
1 x Tube of paste A, 4 ml
1 x Tube of paste B, 4 ml
1 x Mixing Pad
ReOrder 606.20.112

AH Plus® China Package (Tube Set)
1 x Tube of paste A, 3 ml
1 x Tube of paste B, 3 ml
1 x Mixing Pad
ReOrder 606.20.113

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