DENTAL MAGNETICS

We are pleased to present the Dental Magnetics Newsletter Vol. 2. This newsletter is part of the Dental Magnetics Research Project (DMRP), aimed to providing the dental community with updates on the most recent research and development of magnetic technologies and their applications, in collaboration with MagneDesign Corporation (MDC). It will be published once every four months, and we greatly appreciate your continued support.

This issue highlights the latest developments in the clinical application of the ultra-thin magnetic attachments developed by MagneDesign, with a particular focus on their application in dentistry.

NEW CHALLENGE:

Design & development of lightweight motors for dental handpieces

Last year, MagneDesign received research grant on “Research and Development of Energy-Saving Technology and Promotion of Social Implementation for the Realization of a Decarbonized Society” program, by New Energy and Industrial Technology Development Organization (NEDO). The theme focuses on “50% downsizing and weight reduction of small motors and promotion of energy conservation,” and the company is actively working toward achieving this goal.

The objective of this research is to double the output of a motor while maintaining the same size. To accomplish this, the team aims to enhance the output by doubling the rotational speed. Previously, 100,000 rotations per minute (rpm) was considered as the limit, but a new technology has been developed that is able to reach 200,000 rpm. A prototype motor utilizing this breakthrough technology is planned for production by the end of March.

Currently, the maximum speed of a dental micromotor (contra) is 40,000 rpm. Achieving higher speeds typically requires replacing it with a 1:5 contra-angle handpiece. However, with this new technology, it is now possible to achieve a full range of speeds, from low to high, using a single micromotor.

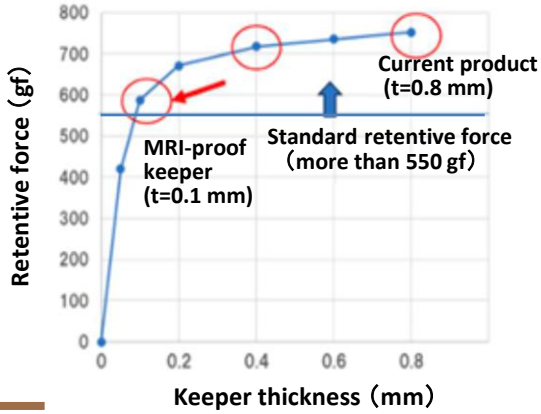
Magnetic Attachment Seminar for Short-Term International Students from Five Universities in Indonesia – Tokushima



A total of 10 undergraduate students—two from each of the dental schools at Gadjah Mada University, Muhammadiyah University, Unissula University, Mahasaraswati University, and Udayana University in Indonesia—participated in a short-term exchange program at the Tokushima University School of Dentistry. As part of their off-campus training, the students visited the ”EXCEL“ Dental Laboratory in Tokushima City and attended a seminar on magnetic dentistry and magnetic attachments, organized by MagneDesign and Presisi Auto Medika.

Will the issue of artifacts in MR images, a drawback of magnetic attachments, be resolved? - The impact of the ultra-thin keeper

One of the main reasons for the lack of widespread use of magnetic attachments is the artifacts (image disturbance) that occur in MRI. The ultra-thin magnetic attachment “MTS700” developed by MagneDesign has been confirmed to provide sufficient magnetic attraction even with a keeper thickness of 0.1 mm (see diagram on the right). From a magnetic engineering perspective, reducing the keeper thickness from 0.8 mm to 0.1 mm has the potential to reduce artifacts by 80% and solve the problem. Research into this effect is currently underway at several universities.



What is Dental Magnetics Research Project (DMRP)?

This research group was established in July 2023 with the aim of expanding the applications of dental magnetics (DM) further in dentistry, as well as exploring new clinical applications of magnetic attachments, following the recent innovations in magnetic attachments by MagneDesign Corp.

Objectives:
Verify and evaluate the clinical applications and effectiveness of magnetic dentistry, including:

- Magnetic digital dentures
- Magnetically guided dental navigation systems and implant treatment robots
- Magnetic therapy to promote the healing of mucosa and bone
- Magnetic-guided examination systems
- Create international network for magnetic dentistry

Activities:

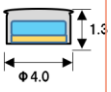
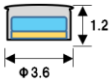
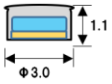
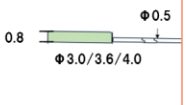
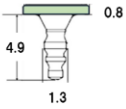
- Publishing and distributing scientific informations on magnetic dentistry
- Organizing and participating in seminars and workshops on magnetic dentistry
- Sharing and presenting case reports and research results on magnetic dentistry
- Providing materials and equipment related to magnetic dentistry

The DMRP is open to all interested parties free of charge. For more information or if you have any questions, please contact us at the following e-mail address: dmrp@magnedesign.co.jp

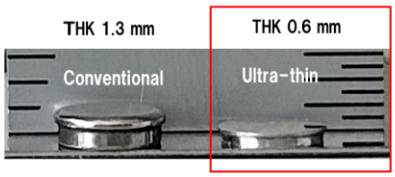
Ultra-thin Magnetic Attachment Now Available in Indonesia

The application for the medical device approval of the ultra-thin magnetic attachment (MTS700), developed by MagneDesign, has been accepted by the Indonesian Ministry of Health. This application was submitted by PT PAM (CEO: Rudi Wigianto, DDS, PhD), following the previous magnetic attachment (Magteeth®: MT) which was also developed by MagneDesign. A clinical trial of the ultra-thin magnetic attachment is scheduled to begin in Indonesia in the near future, and it is expected to significantly expand the range of applications for magnetic attachments.

Existing products lineup

Product No.	MT900	MT700	MT500	CAST keeper	Root Keeper
Images					
Dimension					
Retentive force	900±50gf	700±50gf	500±50gf	–	–

New products

Product No.	MTS700 (ϕ4 mm)	
Magnet assembly		
Keeper	THK 0.8 mm	THK 0.4 mm
Retentive force	900±50 gf	700±50 gf

Active academic activities of PT Presisi Auto Medika in Indonesia

- PT PAM participated in the 15th i-SWAM (International Seminar & Workshop on Aesthetic Medicine), held in Jakarta from December 6 to 8, 2024. Magteeth® was featured in the sponsor presentation section.
- Dr. Wigianto, CEO of PTPAM delivered a presentation on the topic “New Generation of Magnetic Attachments” at the World Dental Congress, which took place at Bintan Bali Resort Hotel from December 14 to 15, 2024. The conference was organized in collaboration with the Indonesian Dental Association and the Indian Dental Association. This event provided an excellent opportunity to introduce Magteeth® to participants from Indonesia, India, and overseas.
- PTPAM also obtained a “Certificate of Good Manufacturing Practice for Medical Devices” for the manufacture of Magteeth® from the Indonesian Ministry of Health. The certificate is valid for five years, from December 22, 2024, to December 22, 2029.

27 Oct 2025
Fukuoka

The 3rd International Symposium on Magnetic Dentistry

The 3rd International Symposium on Magnetic Dentistry will be held on October 27th, 2025, in conjunction with the 55th Annual Meeting of the Japanese Society of Oral Implantology and the 13th Asian Academy of Osseointegration (AAO) at the Fukuoka International Congress Center from October 24 to 26, 2025. We hope you can join us, and we welcome any ideas you may have for the program.

Members activity

In Indonesia, a total of 1,759 units of Magteeth 500, 700, and 900 magnetic attachments have been sold. MagneDesign recently received an order for an additional 300 units of the MT700.

Prof. Kanazawa and his team at the Institute of Science Tokyo are currently conducting fundamental research to evaluate the physical properties of ultra-thin magnetic attachments. They are also preparing to initiate specific clinical research in 2025 to assess the clinical performance of magnetic attachment dentures utilizing ultra-thin magnetic attachments. In addition, the team is planning to conduct basic research to investigate the impact of MRI artifacts on ultra-thin magnetic attachments.

Prof. Ueda and his team at Tokyo Dental College are exploring the long-term use of ultra-thin magnetic attachments in the challenging environment of the oral cavity. Their research focuses on the corrosion resistance and durability of the magnet structure and keeper when exposed to chlorides and acids.

Tokushima University (PI: Dr. Ishida) has initiated a clinical study using magnetic attachments, including ultra-thin types, from MagneDesign for patients. This research is classified as “specified clinical research” under the Clinical Research Act, which came into effect in 2018. The team has completed all necessary procedures for conducting specified clinical research and is now actively carrying out the study. This prospective study involves securing test subjects and conducting long-term follow-up. While some challenges remain, it is anticipated that the usefulness of this device will be reported in the near future.

DMRP

Dental Magnetics Research Project

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