



Maintaining the grain structure of NiTi during file production results in a stronger and more flexible rotary instrument. With the introduction of the Twisted File (TF) with proprietary R-phase technology, mechanical root canal preparation has become safer and more predictable.

This new, improved manufacturing process for NiTi has enabled SybronEndo to provide clinicians with solutions for common problems and limitations seen in current ground instruments. Grinding into the grain of NiTi actually compromises the integrity of the grain structure and lowers the amount of torsional force that an instrument can withstand. This can increase the risk of instrument separation.

The principle of respecting grain structure is a key element in withstanding stress, such as cutting wood. Each plank possesses a unique grain structure that must be preserved for maximum strength. Similarly, each TF file is unique. Those subtle differences are due to not tampering with the grain structure of the alloy during the manufacturing process.

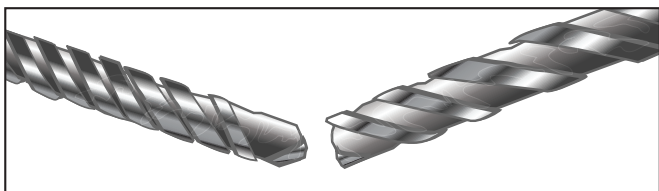
Simply, TF allows the clinician to perform with confidence and efficiency because it is the only endodontic file manufactured by twisting nickel titanium for unsurpassed strength and flexibility.

PROBLEM & SOLUTION

PROBLEM 1

A ground-fluted NiTi instrument has a relatively narrow elasticity range due primarily to the damage caused by grinding across the grain structure. As a result, when the flutes on the file begin to unwind, the instrument can separate unexpectedly—even before the clinician has the opportunity to disengage the file.

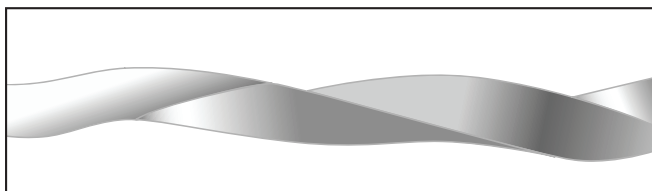
Separation



SOLUTION 1

R-phase technology gives the crystalline structure of TF a greater elasticity range than other rotary NiTi files. This elasticity, combined with the ability of the flutes to unwind, allows TF to tolerate more stress for better safety.*

Greater elasticity range

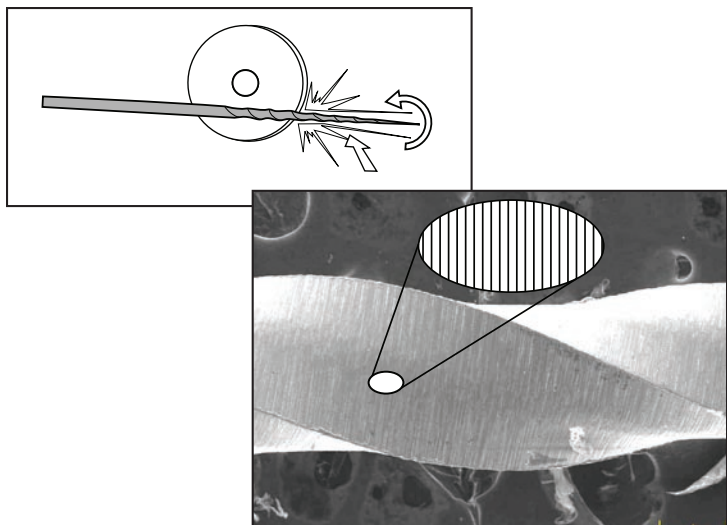


*Data on file, Sybron Dental Specialties, Inc. Data from Sleiman P. The Twisted File: R-phase technology and stress tolerance.

PROBLEM 2

Ground files are not inherently resistant to fracture because grinding across the grain structure creates microfracture points along the length of the instrument.

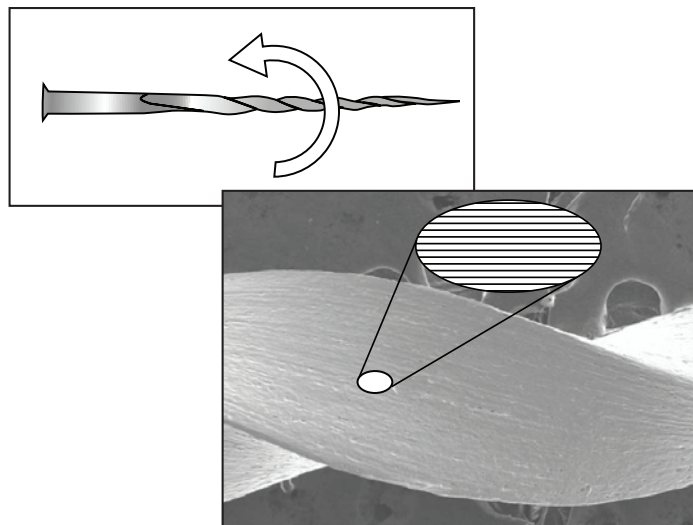
Ground flutes



SOLUTION 2

TF exhibits incredible resistance to fracture because the natural grain structure is maintained during the manufacturing process.

Twisted flutes

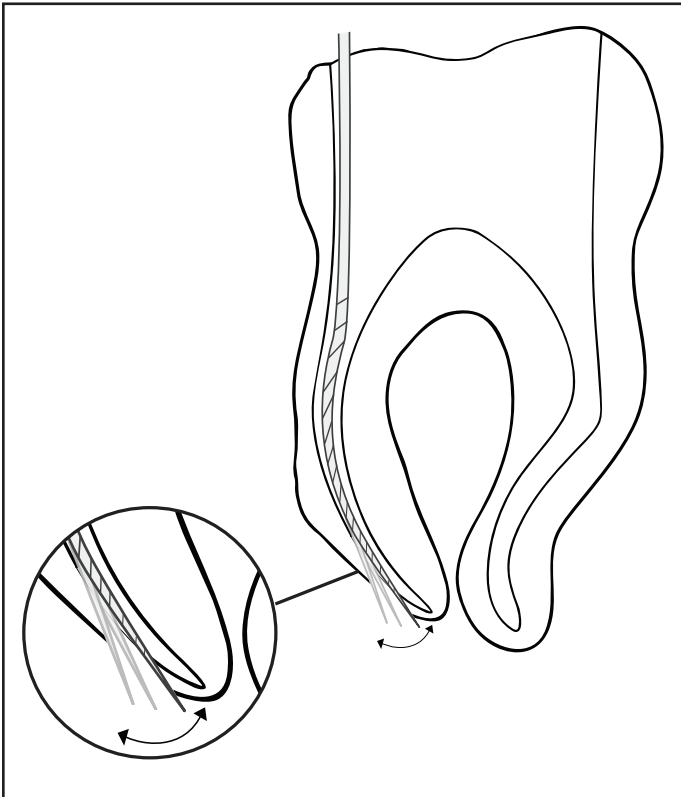


PROBLEM & SOLUTION

PROBLEM 3

Non-landed, ground-fluted instruments with aggressive cutting action have more difficulty negotiating a severe curvature.* This may increase the risk of ledging or transportation.

Standard NiTi transports

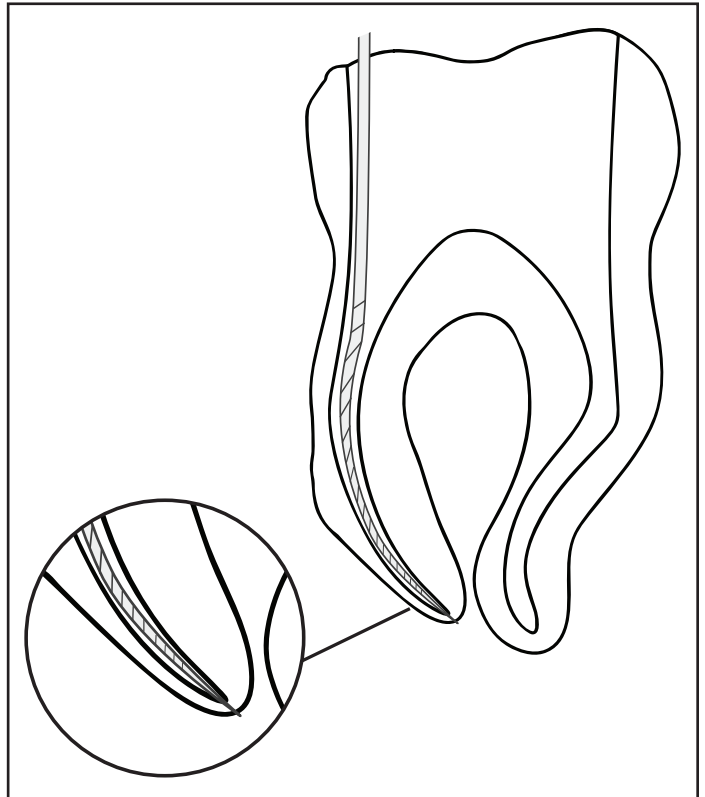


*Bergmans L, van Cleynenbreugel J, Beullens M, et al. Progressive versus constant tapered shaft design using NiTi rotary instruments. *Int Endod J.* 2003;36(4):288-295.

SOLUTION 3

TF with R-phase technology overcomes this limitation by giving the instrument a much higher level of flexibility. TF can perform side-cutting with great efficiency, while still successfully negotiating a complex curvature.

R-phase technology provides greater flexibility



PROBLEM 4

Electropolishing dulls other files' cutting edges, weakening material structure during the production process.*

Dull edges

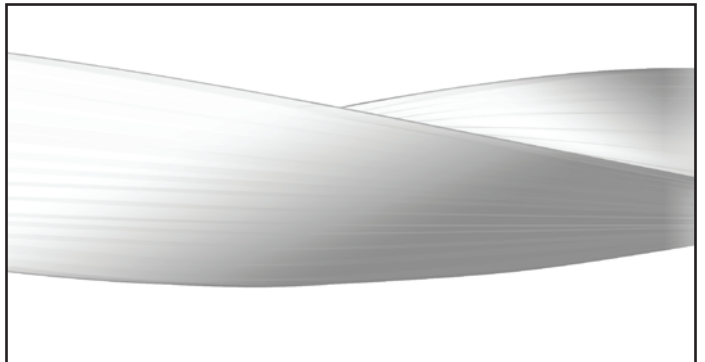


*Bui TB, Mitchell JC, Baumgartner JC. Effect of electropolishing ProFile nickel-titanium rotary instruments on cyclic fatigue resistance, torsional resistance and cutting efficiency. *J Endod.* 2006;34(2):190-193.

SOLUTION 4

The proprietary surface treatment (DeOx) maintains the sharpness of the flutes and the structural integrity.

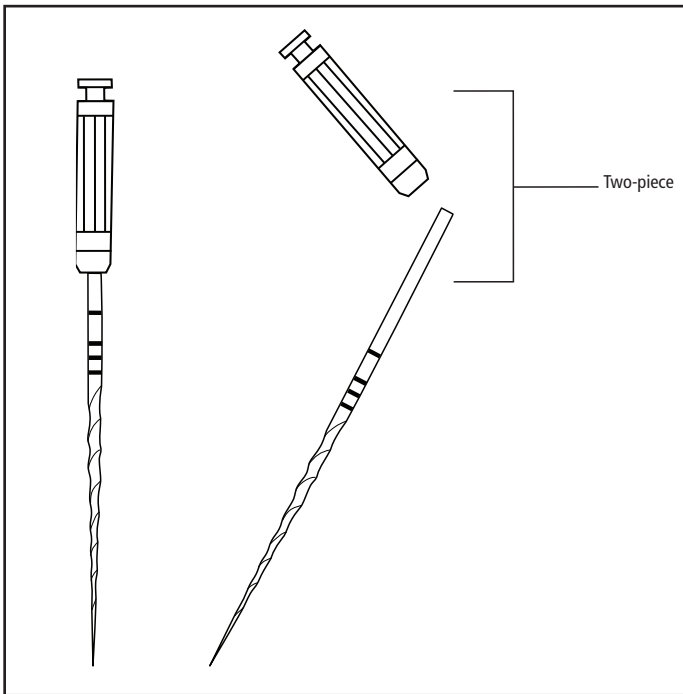
Sharpness of edges maintained



PROBLEM & SOLUTION

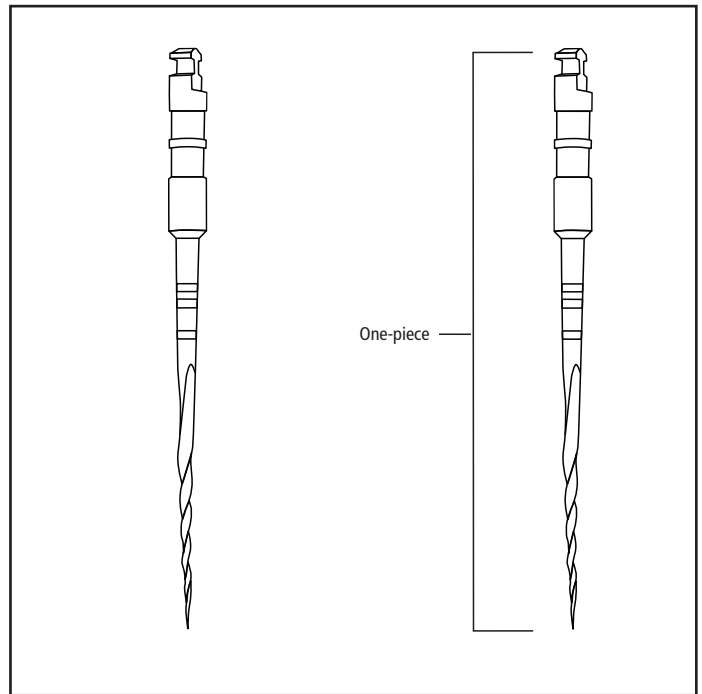
PROBLEM 5

Files made from a separate handle and shank can experience component separation under high torsional stress.



SOLUTION 5

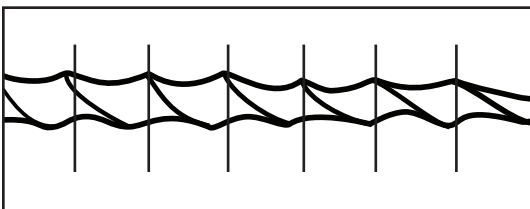
A one-piece design provides greater strength and structural integrity.



PROBLEM 6

A file with a constant pitch decreases a clinician's level of control and can pull the file into the canal when dentin is engaged.

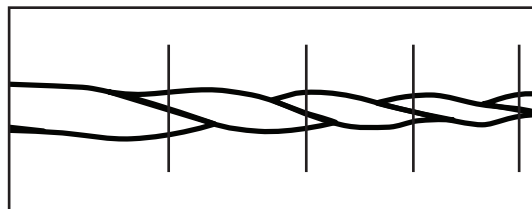
Constant pitch



SOLUTION 6

Employing a variable pitch in an instrument's design alleviates the "pull-in" effect when the file is shaping the canal.

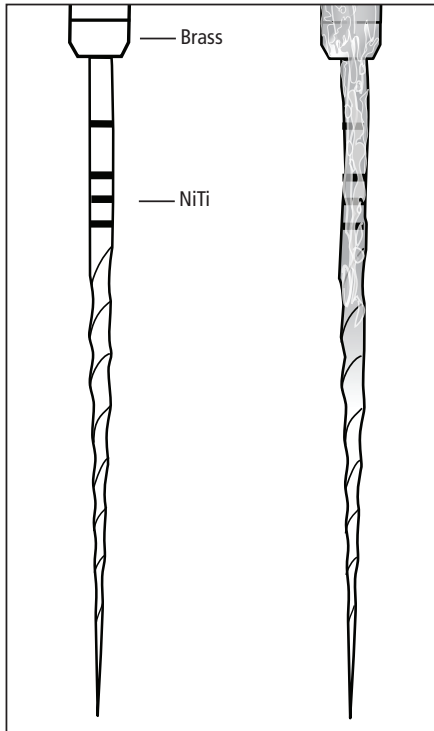
Variable pitch



PROBLEM & SOLUTION

PROBLEM 7

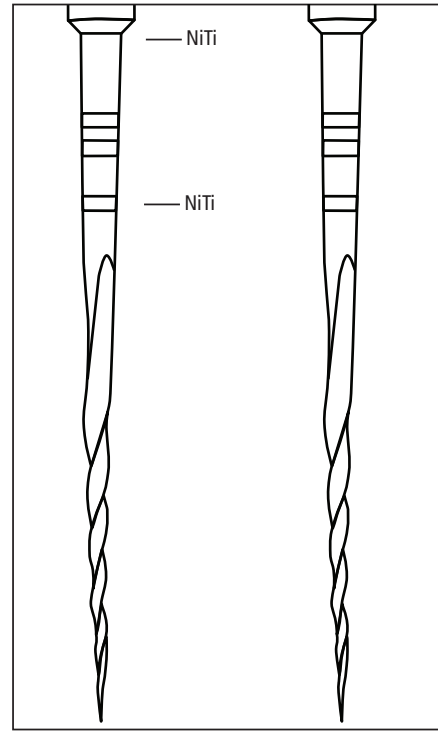
A two-piece design with a non-NiTi handle and NiTi shank is susceptible to galvanic corrosion.*



*Data on file, Sybron Dental Specialties, Inc. Data from Gambarini G. A new era for NiTi rotaries: The Twisted File (TF).

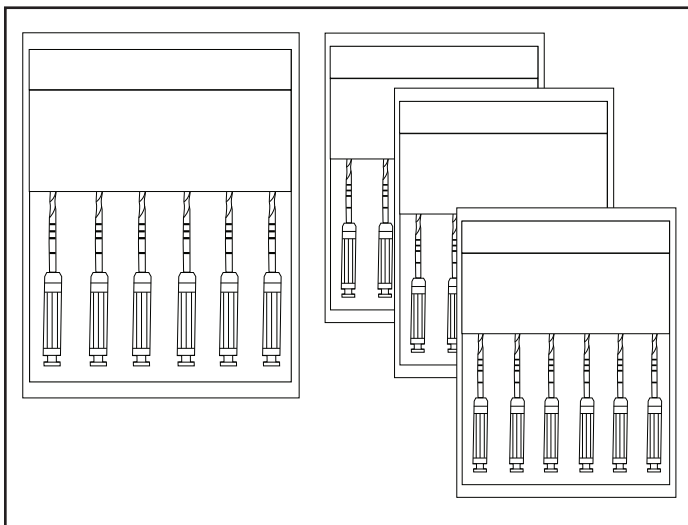
SOLUTION 7

TF incorporates a one-piece design in which the entire instrument is made of NiTi, eliminating the possibility of galvanic corrosion.



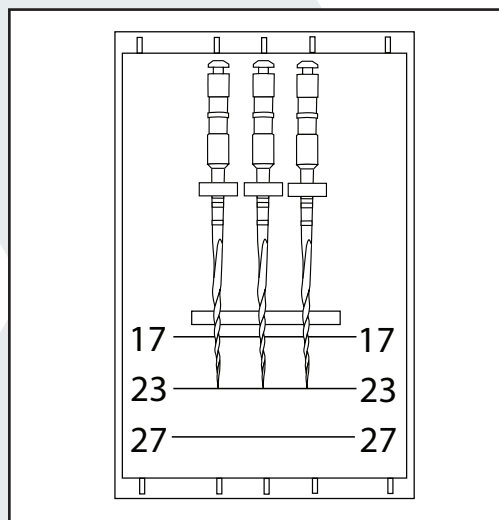
PROBLEM 8

Many NiTi rotary systems consist of too many files and require more inventory.



SOLUTION 8

For most cases, TF requires three files or less to shape to working length.



SybronEndo

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TWISTED FILES
Part No. 077-3140 Rev. A