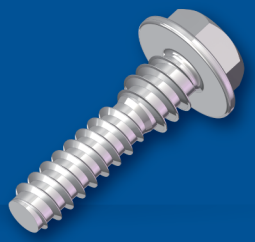
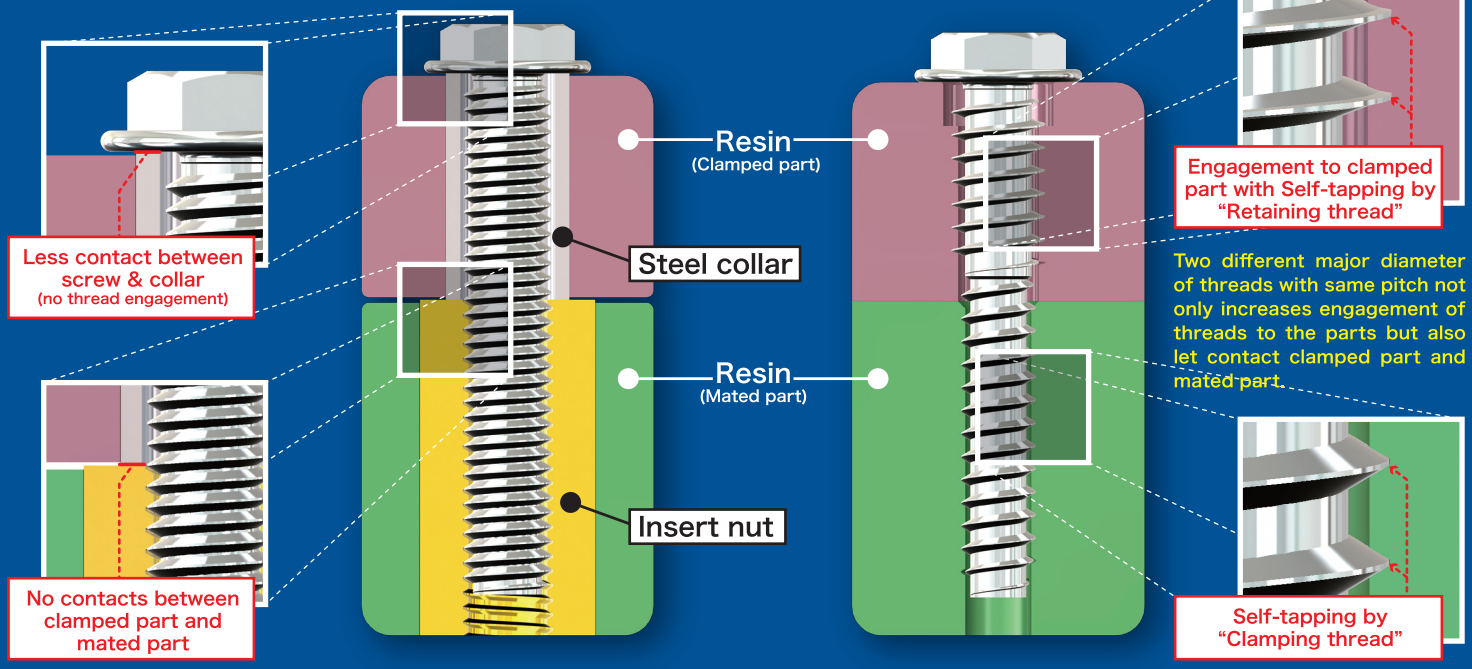
NITTOSEIKO

COLLARLESS TITE™

Self-tapping screws that eliminate collars and insert nuts





Features

Reduces loosening after creep deformation*1

Phases of the screw, the clamped part, and the mated part are maintained by performing self-tapping on both the clamped and mated parts.
Prevents screw loosening even when axial force is low.

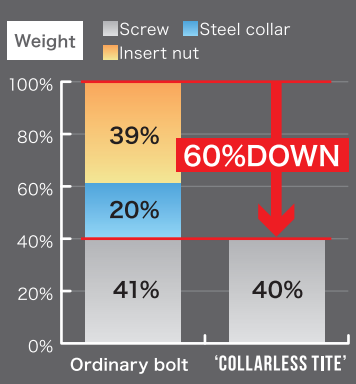
1: A phenomenon in which an object deforms over time when a certain amount of stress is applied.

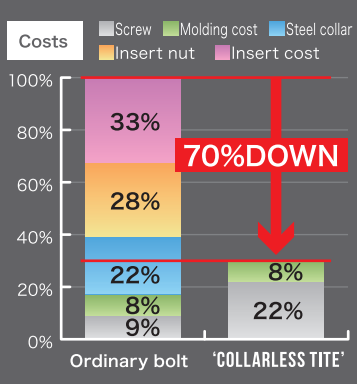
Reduction of product weight

Steel collars and insert nuts can be eliminated, contributing to weight reduction.

Reduction of fastening costs

Steel collars and insert nuts can be eliminated, reducing fastening costs.





(Condition) When 15 screws (M5 x 20) are fastened to two A4 size resin sheets with a thickness of 10 mm.
※According to our research

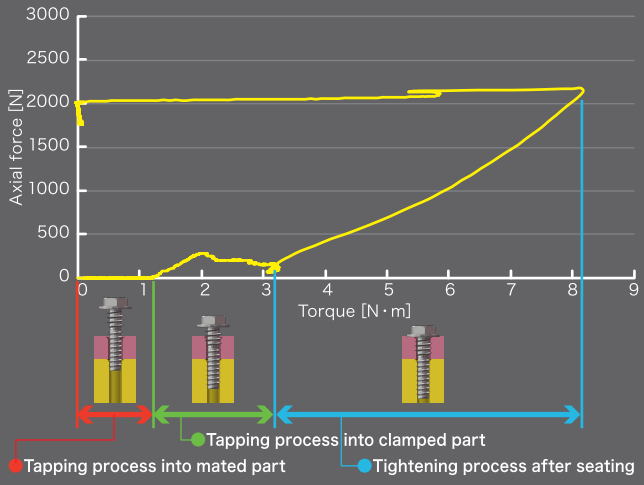
COLLARLESS TITE™ works as a centering retainer.

No need for centering with positioning pins, etc., since self-tapping into both the clamped and mated parts allows the parts are positioned with reference to the screw.

Initial fastening by axial force is possible.

While the Retaining thread is self-tapping into the mated part, it compresses clamped part to mated part. That adhesion generates higher axial force than ordinary screws.

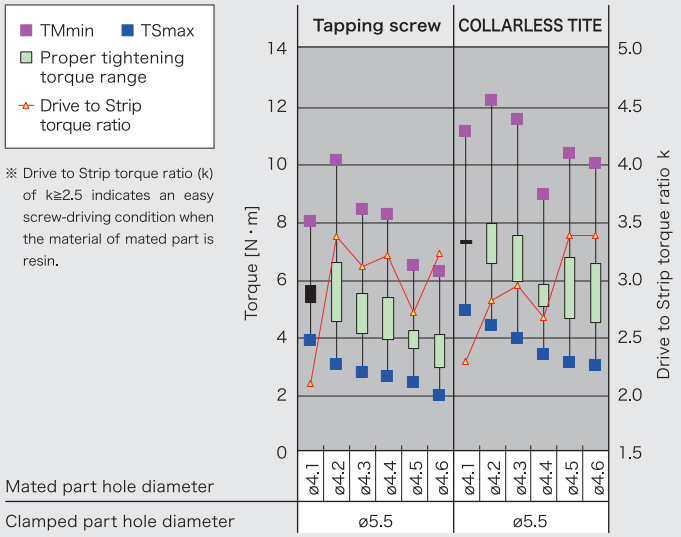
Axial force test results of 'COLLARLESS TITE'



TECHNICAL REPORT 01 Comparison of screw-driving performance

Testing machine Torque testing machine AX-200 made by NITTOSEIKO
Thrust force 68.6N Revolution speed 300rpm

- Mated part : 66 Nylon(PA66) Sheet thickness t=15.0 Hole diameter ø4.1～4.6
- Clamped part : 66 Nylon(PA66) Sheet thickness t=8.0 Hole diameter ø5.5
- Screws used : ■ COLLARLESS TITE ø5×22(14) Trivalent chromate
  Drawing number:DR453
  ■ Tapping screw Φ5×22(14) Trivalent chromate
  Drawing number:DR457



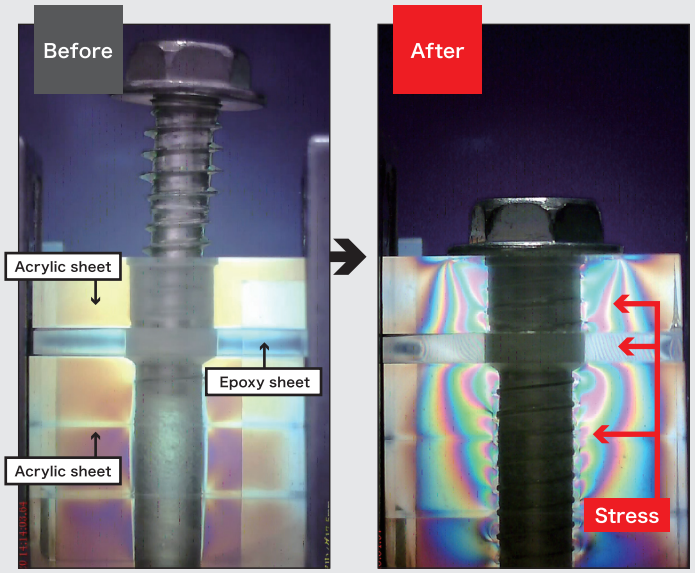
※ Drive to Strip torque ratio (k) of k≧2.5 indicates an easy screw-driving condition when the material of mated part is resin.

TECHNICAL REPORT 02 Stress validation by photoelasticity

Photoelasticity is an experimental method for analyzing the stress distribution in materials. When polarized light is directly applied to a photoelastic material, it creates a phase difference in the birefringent polarized light depending on the degree of strain, which appears as interference fringes.

Test conditions

- Mated part : Acrylic sheet Sheet thickness t=5.0 Used three overlapping sheets
  Hole diameter ø4.7
- Clamped part : ■ Acrylic sheet Sheet thickness t=5.0 Hole diameter ø5.8
  ■ Epoxy sheet Sheet thickness t=3.0 Hole diameter ø6.5
- Screws used : COLLARLESS TITE ø5×22(14) Trivalent chromate
  Drawing number:DR453



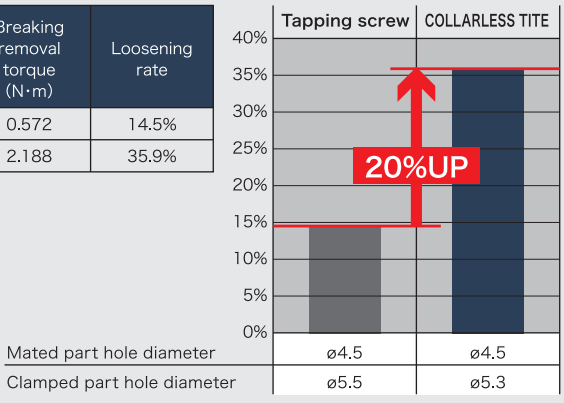
TECHNICAL REPORT 03 Comparison of loosening rate after thermal degradation

Testing machine Torque testing machine AX-200 made by NITTOSEIKO Thrust force 68.6N

Test conditions

- Mated part : 66 Nylon(PA66) Sheet thickness t=15.0
  Hole diameter ø4.5
- Clamped part : 66 Nylon(PA66) Sheet thickness t=8.0
  ■ COLLARLESS TITE Hole diameter ø5.3
  ■ Tapping screw Hole diameter ø5.5
- Set Torque : ■ COLLARLESS TITE ■ Initial tightening torque 4.50N・m Revolution speed 300rpm
  ■ Final tightening torque 5.97N・m Revolution speed 60rpm
  ■ Tapping screw ■ Initial tightening torque 3.00N・m Revolution speed 300rpm
  ■ Final tightening torque 3.87N・m Revolution speed 60rpm
- Screws used : ■ COLLARLESS TITE ø5×22(14) Trivalent chromate Drawing number:DR453
  ■ Tapping screw ø5×22(14) Trivalent chromate Drawing number:DR457
- Temperature environment : Left in 120°C environment for 50 hours

Screws used	Tightening torque (N・m)	Breaking removal torque (N・m)	Loosening rate
Tapping screw	3.944	0.572	14.5%
COLLARLESS TITE	6.087	2.188	35.9%



NITTOSEIKO CO.,LTD.

Fastener Division
Global Sales Section

Website : https://www.nittoseiko.co.jp/en.html

【Website】 【Inquiry Form】

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