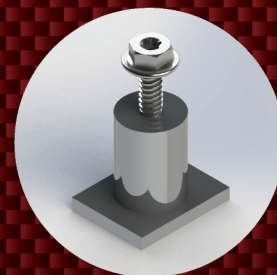
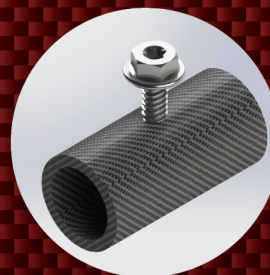


Self-tapping Screw for
Carbon Fiber Reinforced Plastics

CF-TITE™

- ✓ **Cost Reduction**
Elimination of Pre-Tapping Process
- ✓ **Weight Saving**
Elimination of insert Nuts
- ✓ **High Productivity**
Reduction of assembly time



Leading Edge Solution for **CFRP・CFRTP** Self-Tapping Assembly

Quality Starts at the First Turn

NITTO SEIKO

Performance of CF-TITE in CFRP

TECHNICAL REPORT 01

Fastening torque performance

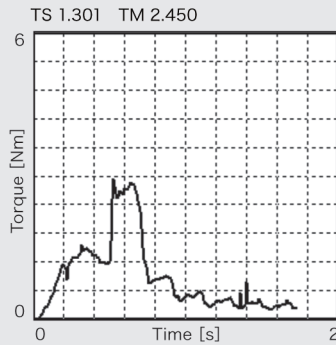
■ Tightening torque

Torque test machine AX-200 (Manufactured by Nitto Seiko Co., Ltd.) 300rpm Thrust 68.8N

■ Fastening condition

Material of mating part : CFRP Material thickness $t=2.40$ Drilled hole hole diameter $\phi 4.40$
Material of object : SECC Material thickness $t=1.0$

Tapping Screws Class 2 $\phi 5 \times 16$
Zinc + Trivalent Chromate

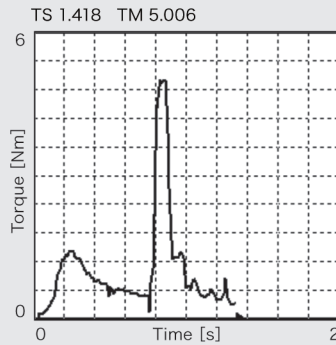


Thread forming torque (TS) 1.301

Failure torque (TM) 2.450

Drive-to-Strip torque ratio (k) 1.880

CF-TITE $\phi 5 \times 18$
Zinc + Trivalent Chromate



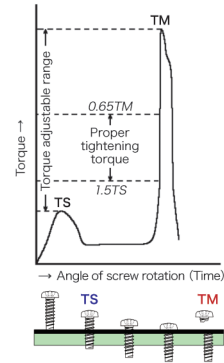
Thread forming torque (TS) 1.418

Failure torque (TM) 5.006

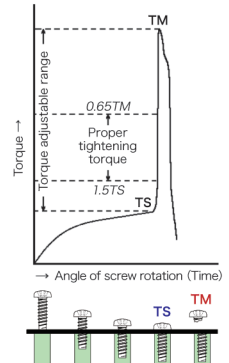
Drive-to-Strip torque ratio (k) 3.530

Point of fastening test

■ Hole shape : Through hole



■ Mating part hole shape : Blind hole



TS...Thread forming torque TM...Failure torque

Proper tightening torque = $1.5 \times TS \text{ Max.} \sim 0.65 \times TM \text{ Min.}$

Drive-to-Strip torque ratio (k) = $TM \text{ Min.} / TS \text{ Max.}$

Plastic : $k \geq 2.5$, Steel : $k \geq 3$

Guideline of easy fastening by material of mating part:

TECHNICAL REPORT 02

Effectiveness after repeated use

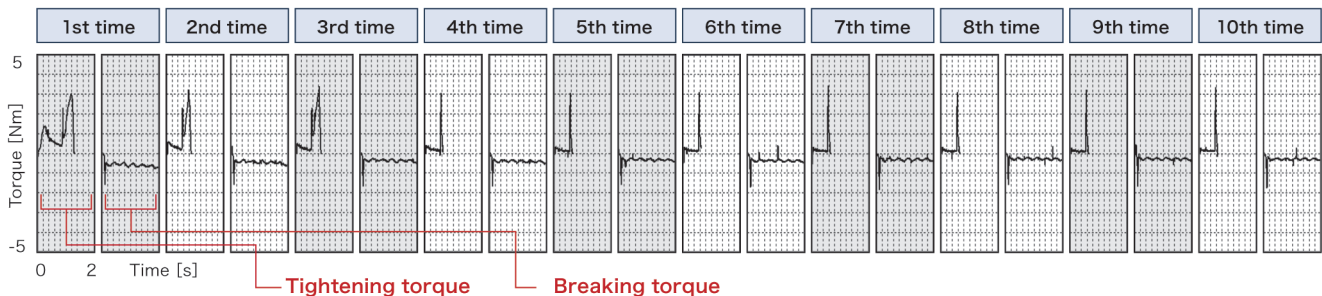
■ Initial torque

Torque test machine AX-200 (Manufactured by Nitto Seiko Co., Ltd.) 300rpm Thrust 68.8N
Initial torque: $1.70N \cdot m$ Rotation speed 300rpm Tightening set torque: $3.00N \cdot m$ Rotation speed 50rpm

■ Tightening set torque

Material of mating part : CFRP Material thickness $t=2.40$ Drilled hole hole diameter $\phi 4.40$
Material of object : SECC Material thickness $t=1.0$

	Data (N·m)										Average value
	1st time	2nd time	3rd time	4th time	5th time	6th time	7th time	8th time	9th time	10th time	
Tightening torque	3.013	3.201	3.377	3.060	3.048	3.084	3.435	3.072	3.236	3.353	3.14
Breaking torque	1.595	1.583	1.641	1.677	1.595	1.688	1.817	1.559	1.677	1.735	1.62
Loosening torque ratio η (%)	52.94	49.45	48.59	54.80	52.33	54.73	52.90	50.75	51.82	51.74	51.54



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