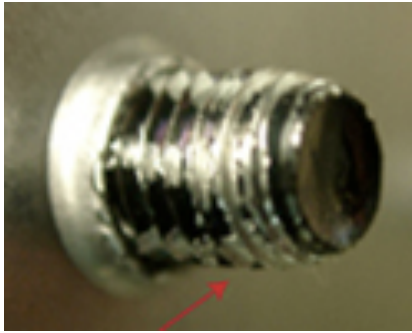


GTO High Performance Tapping Screws



Standard Tapping Screw

Challenge: To find a tapping screw capable of tapping into the new, thinner but stronger, steel sheets being introduced by the automobile industry to reduce vehicle weight and extend fuel range. Conventional tapping screws made from regular 1016~1018 grade steel were failing.



GTO Tapping Screw

Solution: GTO tapping screws (M3~M6) made from a newly developed micro-alloy steel SWCH10AM^{*1}.

Merits:

- * High surface hardness (Hv 600~ 730) but soft core hardness (Hv 350~370)
- * Fast drive time
- * Low drive torque
- * Good ductility
- * Fine grain structure minimizes risk of delayed fracture
- * Material elongation is 8~9% compared with 1~2% for conventional low carbon steels

^{*1} SWCH10AM is a product of G.T.O. Co., Ltd.



Technical Information

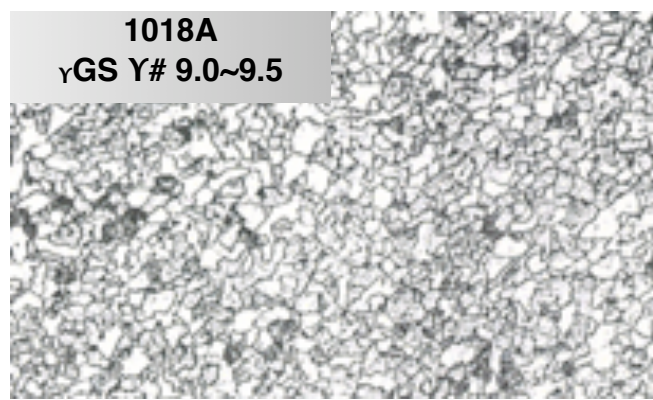
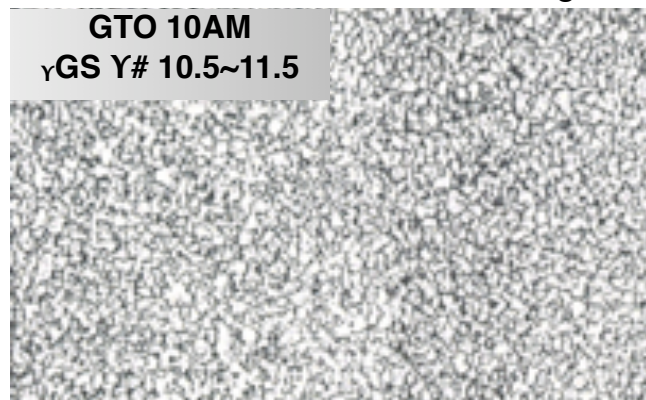
Chemistry

(% wt)

Grade	C	Si	Mn	P	S	Other
SWCH10AM	≤ 0.15	≤ 0.10	≤ 1.8	≤ 0.015	≤ 0.015	Included
SWCH18A	0.15~0.20	≤ 0.10	0.60~0.90	≤ 0.030	≤ 0.035	None

Grain Structure after Case Hardening

(x 100)



Torque Performance

Item		10AM Screws	Standard Screws
Drive Torque	Minimum	1.43 N.m (12.7 lb-in)	1.84 N.m (16.3 lb-in)
	Maximum	1.67 N.m (14.8 lb-in)	2.72 N.m (24.1 lb-in)
	Range	0.23	0.88
	Average	1.55 N.m (13.7 lb-in)	2.29 N.m (20.3 lb-in)
	Variation	0.07	0.30
	Overall	Low	High
Drive Time		Short	Long
Thread Damage		Virtually none	Threads damaged
Toughness		OK	OK



Technical Information

Surface & Core Hardness

Lot #	Sample #	Surface Harness (Hv)		Core Hardness (Hv)	
		10AM	Standard	10AM	Standard
A	1	663	533	360	323
	2	644	539	359	310
	3	629	523	359	316
	4	626	563	364	
	5	628	549	370	
B	1	637	565	357	338
	2	611	541	358	344
	3	608	533	356	325
	4	660	560	364	
	5	655	554	367	
Average		636	546	361	326

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