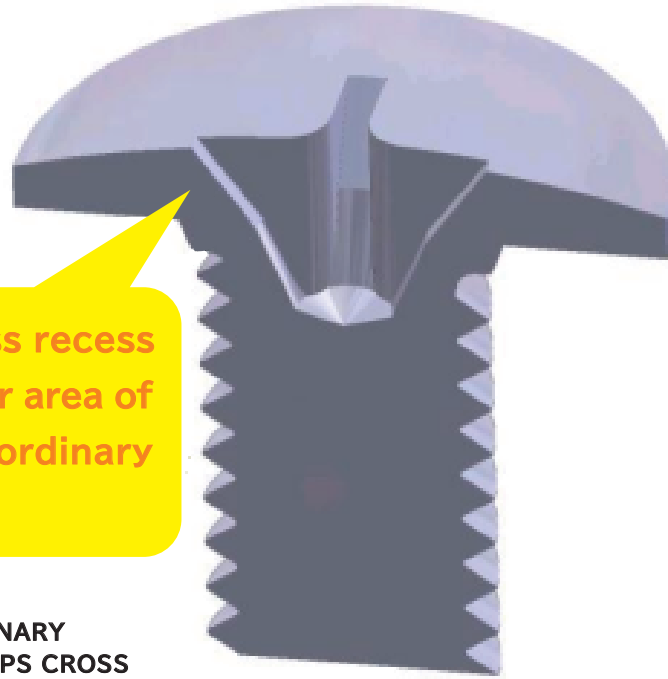
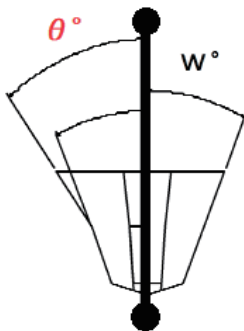


TOUGH-CROSS

Newly designed cross recess which has 20% bigger area of driven portion than ordinary cross recess.

**TOUGH-CROSS****ORDINARY
PHILIPS CROSS
RECESS**

Special features

- Prevents break and Recess ream.
- Higher torque transmission efficiency.
- Realizes head height to be lower.

It is necessary to reduce volume of head to miniaturize the products. But to set screw head into small space, cross recess must be smaller so that we can keep strength of screw. And it leads worse productivity. **TOUGH-CROSS was developed as a solution to improve productivity with remaining screw head possibly lower.**

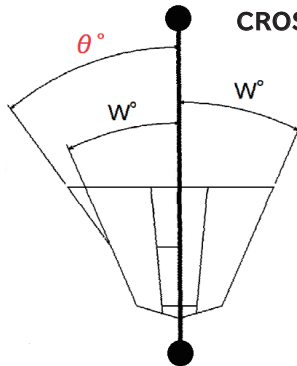
It has been realized by adding **θ angle portion.**

This solution can eliminate the loss due to rework or repair according to recess breakage.

TOUGH-CROSS

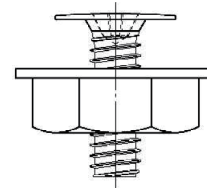
TOUGH-CROSS

**PHILIPS
CROSS RECESS**



TOUGH-CROSS has been given θ portion.

It effects anti recess ream of recess by expanding area of driving force-transmission, especially combination use with **TOUGH-CROSS special bit.**



View of installation

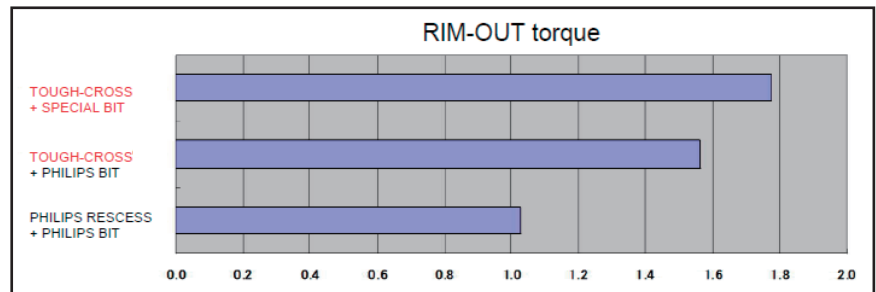
[Anti recess ream performance test result]

● Test condition

1. Test equipment : Screw driving tester AX-050 (Nittoseiko made)
Revolution : 600rpm, Thrust force 49N
2. Test piece : TOUGH-CROSS LAMIMATE M3x4
Trivalent chromate (Silver) F1 TR17525
Ordinary cross recessed LAMIMATE
Trivalent chromate (Silver) F1 S20302
3. Work : Steel M3 nut, Yellow zinc, height : 2.3mm
4. Liner : SPCC Plain washer t=1.0

*Measured recess breakage torque at the above condition.

	Data					Ave.
	1	2	3	4	5	
TOUGH-CROSS + SPECIAL BIT	1.729	1.750	1.770	1.809	1.829	1.777
TOUGH-CROSS + PHILIPS BIT	1.515	1.548	1.630	1.647	1.486	1.565
PHILIPS RECESS + PHILIPS BIT	1.164	1.043	0.909	0.947	1.076	1.028



Even though the weakest combination, Philips recess + Philips bit performs strength which exceeds 0.82N·m* of twisting strength**, allowable torque range is narrow and it may need accurate control of torque at operation.

The combination of **TOUGH-CROSS + SPECIAL BIT** has much wider allowance which provides you easy operation.

As **TOUGH-CROSS** is compatible with Philips bit, maintenance can be done by Philips bit.

*Calculated from JIS B 1051 Tensile strength of class 4.8 of screws and formula $\pi/16Xd1 \ 3 \tau$.

**For strength class 4.8 of screw.

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