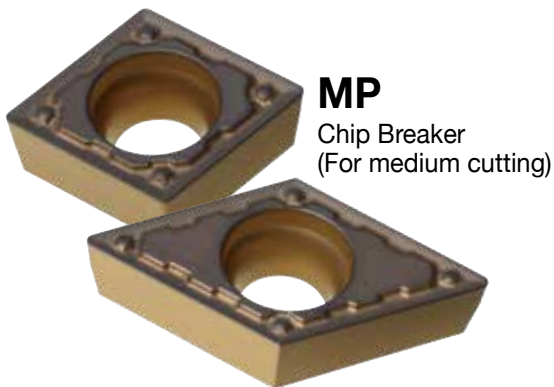


MP Chip Breaker (Positive)



Turning Insert for Machining Automobile Components

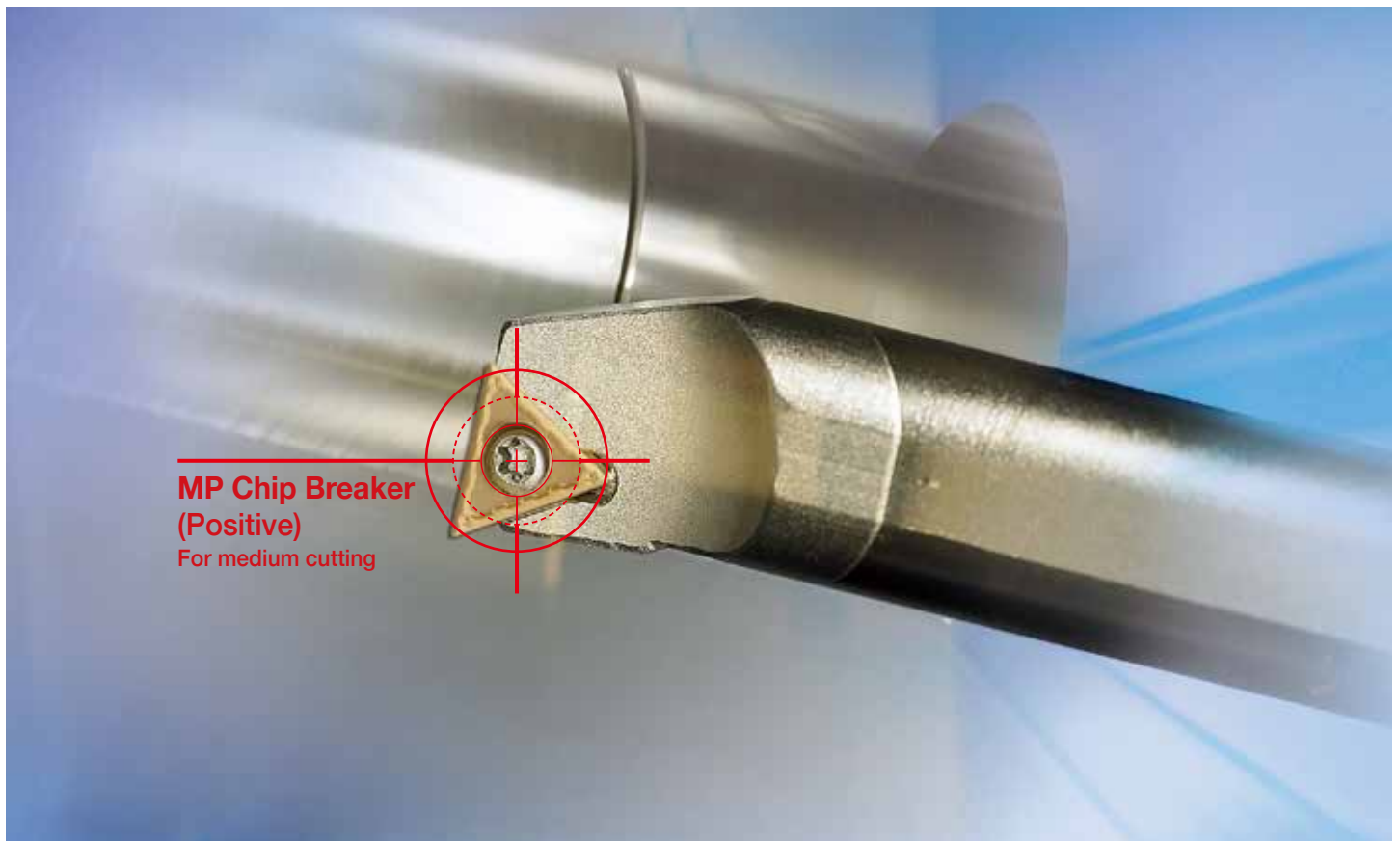
Complete turning solution for machining internal diameters in a wide range of applications

- **Excellent Tool Life**

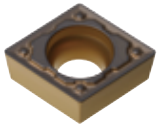
Reduced cutting load brings stable tool life with the use of sharp cutting edges.

- **Stable Chip Control**

Increased productivity with stable chip control at varying cutting conditions and uneven surfaces



MP Chip Breaker (Positive)



MP Chip Breaker

For medium
cutting

High Performance Internal Turning Insert For Machining Forged Steel and Bearing Steel

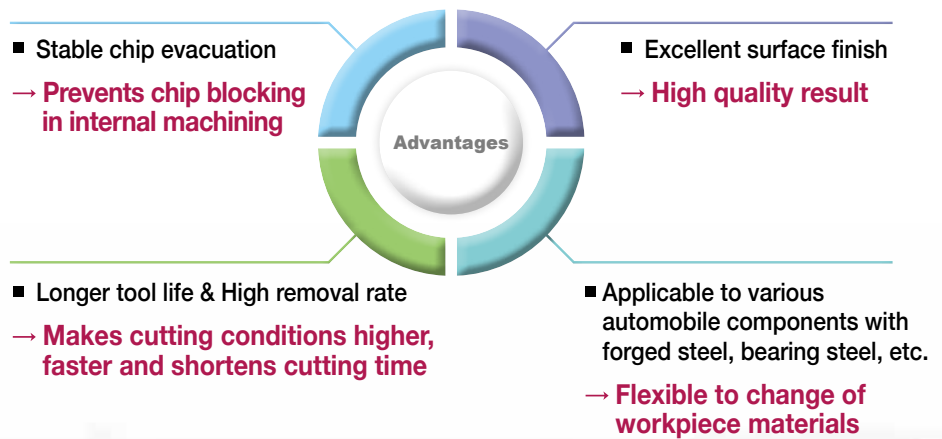
The surface of forged steel that is commonly used for automobile parts is hard and tough while the inside is soft. Bearing steels also have the same characteristics of high toughness and hardness. Machining these kinds of steel repeatedly causes built-up edge and edge chipping, which is one of the main causes of reduced productivity and unstable tool life.

Mass production of automobile parts requires faster cutting speeds, higher feeds, and much longer tool life than ever before.

KORLOY has recently released a new ISO **single-sided MP chip breaker** that shows excellent performance in internal machining of automobile components. It provides stable chip evacuation and tool life by the use of insert geometries specialized for machining forged steel, bearing steel, etc. The MP chip breaker is the best solution for automobile components as well as general machine components.

The single-sided MP chip breaker reduces cutting loads due to sharp cutting edges and wide chip pockets when machining outer surface of hardened materials such as forged steel. Its special three dimensional geometries enables smooth chip evacuation by producing good chip curls even on rugged surfaces.

In addition, it largely contributes to increased productivity with the expectation of stable tool life and excellent surface finish.



MP Chip Breaker [Positive (for medium cutting)]



- A single-sided chip breaker for forged steel of automobile parts and normal steel.
- Sharp cutting edges and wide chip pockets enable low cutting loads and improved surface finish and tool life.
- Three dimensional two step dots perform stable chip control even in machining uneven surfaces.

Features of MP Chip Breaker (Positive)

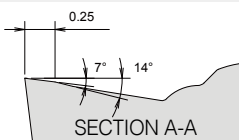
3D chip breaker of two step dots

- Stable chip control in machining uneven surfaces
- Higher stability of chip curls at varying depth of cuts and feeds

Stronger edge

- Higher stability against sudden impact during operation

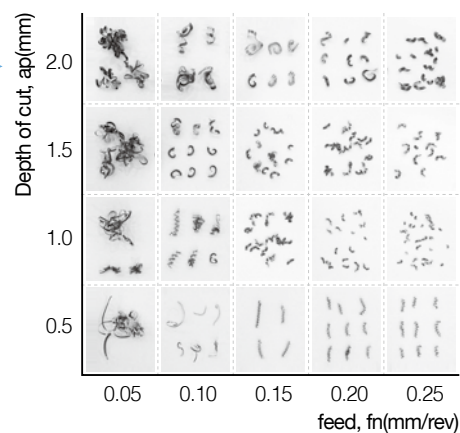
Sharp cutting edges and wide chip pockets



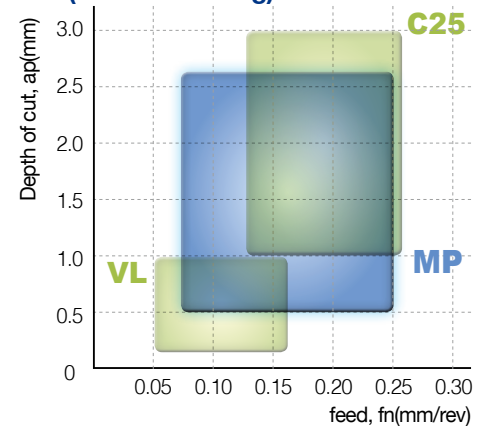
- Improved cutting performance and reduced cutting loads
- Stable chip curls in various workpieces

Cutting Performance

- Higher stability of chip curls even at varying cutting conditions



Application Range (Medium cutting)

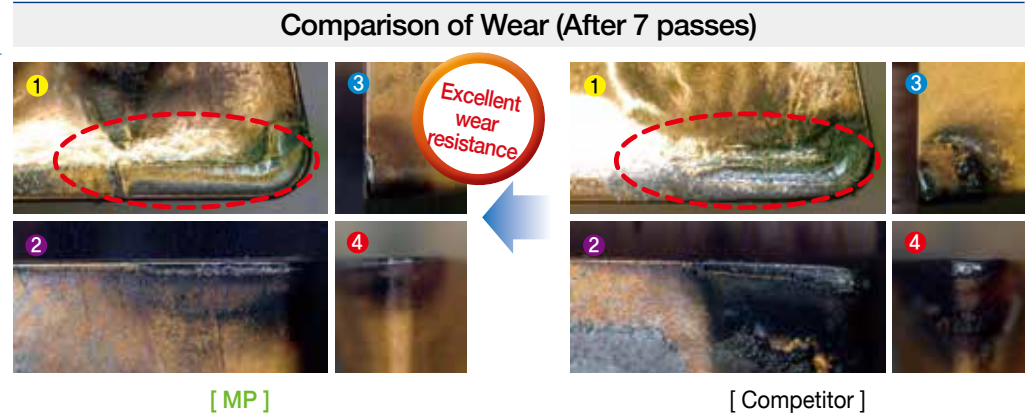
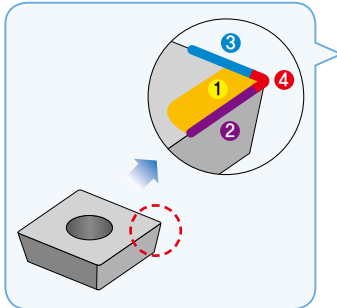


- Workpiece 42CrMo4 (Alloy steel), Ø100, External machining
- Cutting conditions $vc(m/min) = 250$, $ap(mm) = 0.5 \sim 2.5$, $fn(mm/rev) = 0.05 \sim 0.25$, wet
- Tools CCMT09T308-MP

MP Chip Breaker (Positive)

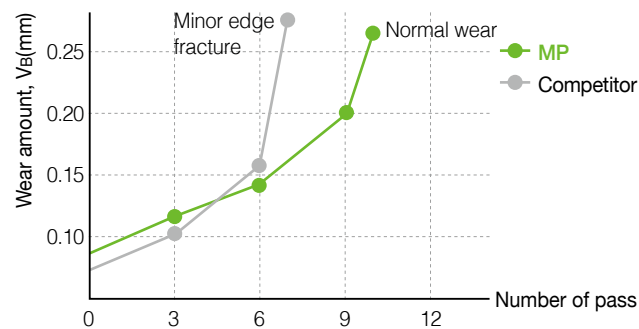
➤ Cutting Performance (Evaluation of wear resistance)

- Workpiece 42CrMo4 (Alloy steel), Ø30, Internal machining
- Cutting conditions $vc(m/min) = 200$, $ap(mm) = 1.5$, $fn(mm/rev) = 0.2$, wet
- Tools CCMT09T304-MP (NC3220)



- Longer tool life due to lower cutting force at minor cutting edges by the use of wider chip breakers than competitor's

Comparison Graph of Wear Amount (V_B)

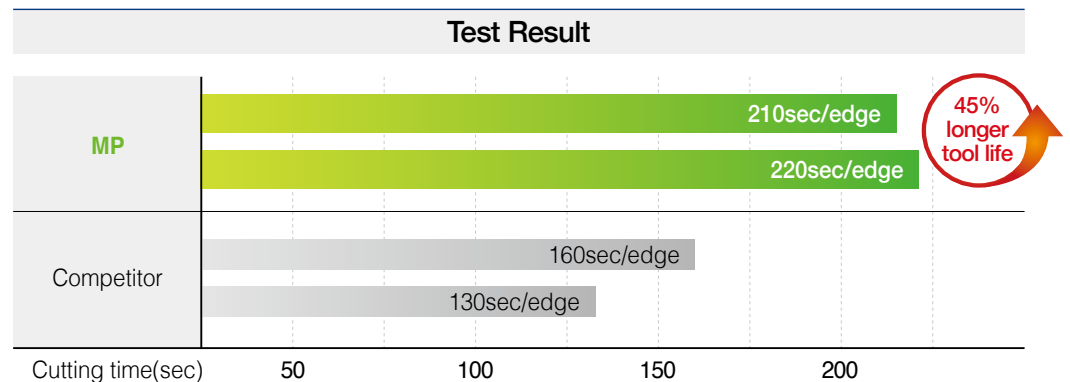


➤ Cutting Performance (Evaluation of toughness)

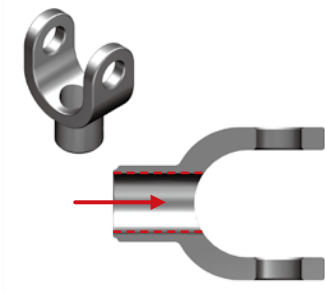
- Workpiece C45 (Carbon steel), Ø100 (4 grooves), External machining
- Cutting conditions $vc(m/min) = 100$, $ap(mm) = 0.5$, $fn(mm/rev) = 0.1$, wet
- Tools CCMT09T308-MP (NC3225)



- NC3225 has **45% longer tool life** than competitor's (P25).
- MP Chip breaker ensures **stable tool life** between corners **due to effective chip control**.



Application Examples of Automobile Parts



Steering system (T-yoke)

- Workpiece C45 (Carbon steel)
- Cutting conditions $vc(m/min) = 160$, $ap(mm) = 0.8$, $fn(mm/rev) = 0.2$, wet
- Tools CCMT09T304-MP (NC3225)

MP (NC3225)

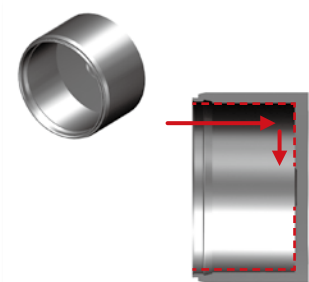
80ea/edge

Competitor A (P25)

60ea/edge

30%
more

- ➔ Increased productivity and stable tool life due to excellent chip control
30% longer tool life than competitor A



Steering system (Outer-cup)

- Workpiece 20Cr4(H) (Cold forging)
- Cutting conditions $vc(m/min) = 135$, $ap(mm) = 0.5 \sim 1.0$, $fn(mm/rev) = 0.32$, wet
- Tools DCMT11T304-MP (NC3225)

MP (NC3225)

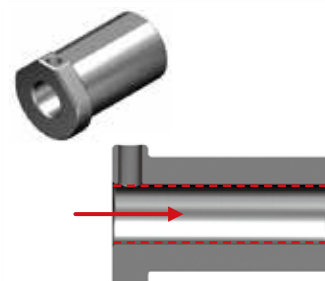
320ea/edge

Competitor B (P25)

260ea/edge

20%
more

- ➔ Excellent surface finish in internal machining due to sharp cutting edges
20% longer tool life than competitor B



Machine tool (Tool sleeve)

- Workpiece C45 (Carbon steel)
- Cutting conditions $vc(m/min) = 200$, $ap(mm) = 0.5 \sim 2.0$, $fn(mm/rev) = 0.15$, wet
- Tools CCMT09T304-MP (NC3215)

MP (NC3215)

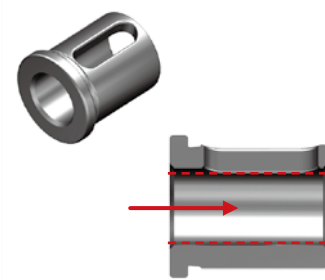
65ea/edge

Competitor C (P15)

50ea/edge

20%
more

- ➔ Extended insert life when finishing and roughing due to reduced cutting force
20% longer tool life than competitor C



Machine tool (Tool sleeve)

- Workpiece C45 (Carbon steel)
- Cutting conditions $vc(m/min) = 150$, $ap(mm) = 0.5 \sim 1.5$, $fn(mm/rev) = 0.25$, wet
- Tools CCMT09T308-MP (NC3225)

MP (NC3225)

140ea/edge

Competitor D (P25)

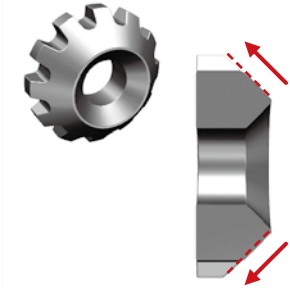
120ea/edge

15%
more

- ➔ Stable tool life in interrupted cutting of internal diameters due to reinforced cutting edges
15% longer tool life than competitor D

MP Chip Breaker (Positive)

Application Examples of Automobile Parts



Automotive gear (Transmission part)

- Workpiece C45 (Cold forging)
- Cutting conditions $vc(m/min) = 185$, $ap(mm) = 0.4$, $fn(mm/rev) = 0.1$, wet
- Tools CCMT09T304-MP (CN2500)

MP (CN2500)

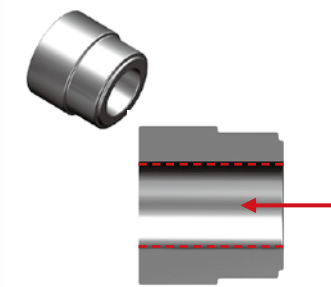
1,300ea/edge

Competitor E (P25)

800ea/edge

40%
more

➔ Increased tool life when machining outer surface of forged steels due to excellent cutting performance
40% longer tool life than competitor E



Oil port (Engine part)

- Workpiece C45 (Cast steel)
- Cutting conditions $vc(m/min) = 90$, $ap(mm) = 0.5$, $fn(mm/rev) = 0.1$, wet
- Tools CCMT060204-MP (NC3225)

MP (NC3225)

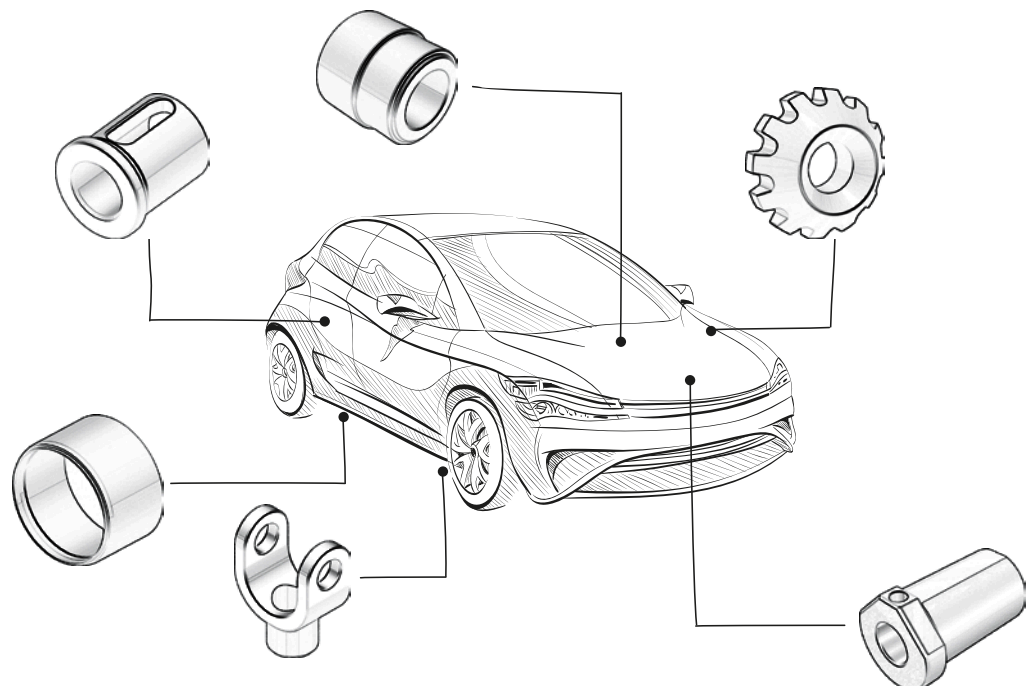
1,850ea/edge

Competitor F (P25)


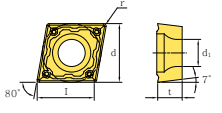

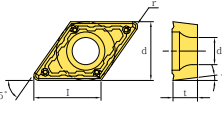

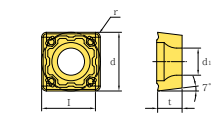

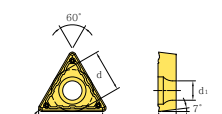

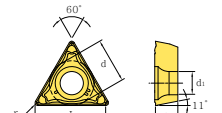

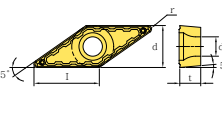

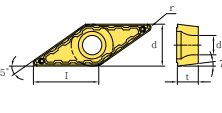
1,050ea/edge

40%
more

➔ Excellent tool life and stable chip control in internal machining of small components
40% longer tool life than competitor F



Available Stock

Insert shape	Designation		Stock											Dimensions (mm)					Cutting conditions		
			CVD					PVD			Cermet			l	d	t	r	d ₁	Depth of cut ap (mm)	Feed fn (mm/rev)	Figure
			NC3010	NC3215	NC3220	NC3225	NC5330	PC5300	PC5400	PC8110	CC1500	CN1500	CN2500								
	CCMT	060202-MP	●	●		●	●	●	●	●	●	●	●	6.2	6.35	2.38	0.2	2.8	0.20~1.50	0.04~0.12	
		060204-MP		●		●	●	●	●	●	●	●	●	6.0	6.35	2.38	0.4	2.8	0.30~1.50	0.05~0.15	
		09T302-MP	●	●		●	●	●	●	●	●	●	●	9.4	9.525	3.97	0.2	4.4	0.30~2.00	0.07~0.15	
		09T304-MP	●	●	●	●	●	●	●	●	●	●	●	9.2	9.525	3.97	0.4	4.4	0.50~2.50	0.08~0.25	
		09T308-MP	●	●	●	●	●	●	●	●	●	●	●	8.8	9.525	3.97	0.8	4.4	0.50~2.50	0.10~0.30	
	DCMT	070202-MP		●		●	●	●	●	●	●	●	●	7.5	6.35	2.38	0.2	2.8	0.12~1.80	0.04~0.12	
		070204-MP		●		●	●	●	●	●	●	●	●	7.3	6.35	2.38	0.4	2.8	0.30~1.80	0.05~0.15	
		070208-MP		●		●	●	●	●	●	●	●	●	6.8	6.35	2.38	0.8	2.8	0.30~1.80	0.08~0.22	
		11T302-MP	●	●	●	●	●	●	●	●	●	●	●	11.4	9.525	3.97	0.2	4.4	0.30~2.00	0.04~0.15	
		11T304-MP	●	●	●	●	●	●	●	●	●	●	●	11.2	9.525	3.97	0.4	4.4	0.50~2.30	0.08~0.20	
		11T308-MP	●	●	●	●	●	●	●	●	●	●	●	10.8	9.525	3.97	0.8	4.4	0.50~2.30	0.10~0.30	
	SCMT	09T304-MP		●		●				●			9.1	9.525	3.97	0.4	4.4	0.30~2.80	0.05~0.25		
		09T308-MP		●		●	●			●			8.7	9.525	3.97	0.8	4.4	0.50~2.80	0.10~0.30		
		120408-MP												11.9	12.7	4.76	0.8	5.5	0.80~3.50		0.15~0.35
	TCMT	110202-MP		●		●	●			●			10.5	6.35	2.38	0.2	2.8	0.20~1.50	0.03~0.12		
		110204-MP		●		●	●			●			10.0	6.35	2.38	0.4	2.8	0.20~15.0	0.05~0.15		
		110208-MP		●		●	●			●			9.0	6.35	2.38	0.8	2.8	0.25~2.00	0.10~0.28		
		16T304-MP	●	●	●	●	●	●	●	●	●	●	●	15.5	9.525	3.97	0.4	4.4	0.30~2.50		0.08~0.20
		16T308-MP	●	●	●	●	●	●	●	●	●	●	●	14.5	9.525	3.97	0.8	4.4	0.50~2.50		0.10~0.30
		16T312-MP		●	●	●	●							13.5	9.525	3.97	1.2	4.4	0.50~2.50		0.20~0.40
	TPMT	110304-MP						●	●		●	●	●	10.0	6.35	3.18	0.4	3.4	0.20~1.50	0.05~0.20	
		-												-	-	-	-	-	-	-	
		-													-	-	-	-	-	-	
	VBMT	160404-MP	●	●	●	●	●	●	●	●	●	●	●	15.6	9.525	4.76	0.4	4.4	0.30~2.00	0.08~0.20	
		160408-MP	●	●	●	●	●	●	●	●	●	●	●	14.6	9.525	4.76	0.8	4.4	0.50~2.30	0.10~0.25	
		160412-MP		●	●	●	●	●	●			●	●	13.5	9.525	4.76	1.2	4.4	0.50~2.30	0.10~0.35	
	VCMT	160404-MP		●		●				●			15.6	9.525	4.76	0.4	4.4	0.30~2.00	0.08~0.20		
		160408-MP		●		●				●			14.6	9.525	4.76	0.8	4.4	0.50~2.30	0.10~0.25		
		160412-MP												13.5	9.525	4.76	1.2	4.4	0.50~2.30		0.10~0.35

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