

Replaceable head type Drill

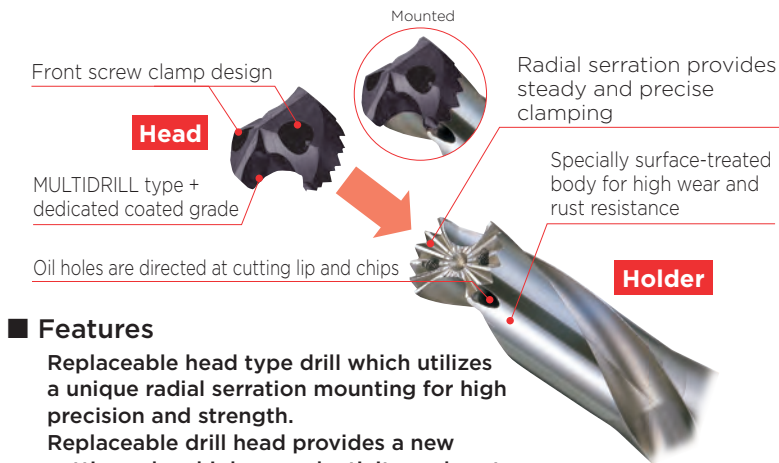
SEC-MULTIDRILL SMD series High-efficiency Drill Head MHL type

High-efficiency drilling head that delivers hole quality comparable to solid carbide drills and improves productivity

VIDEO OF
CUTTING

MHL type

Introducing a new MHL type replaceable head for the SMD series!



■ Features

Replaceable head type drill which utilizes a unique radial serration mounting for high precision and strength.
 Replaceable drill head provides a new cutting edge, higher productivity and cost efficiency with easy tool management.
 Regrinding allowance of 1.5mm to 3.0mm makes further tool cost reductions possible.



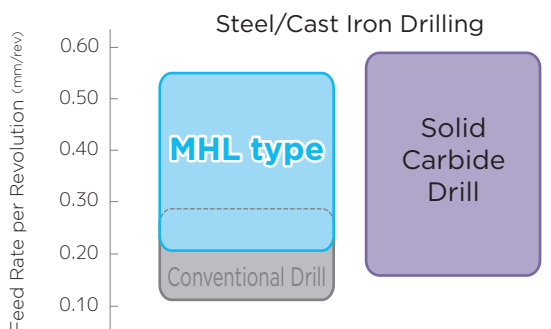
● Stable machined hole accuracy

RD THINNING and double margin with excellent guide performance ensure high centering accuracy, stable hole diameter and hole quality even with a replaceable head drill.

● Tough cutting edge

HF Coat with excellent fracture resistance and wear resistance, together with a linear cutting edge that helps prevent load concentration, helps suppress damage and reduce the frequency of tool replacement.

■ Application Range (Diameter ø14mm)



Enabling twice the conventional productivity.

Achieves productivity equivalent to solid carbide drills, even with replaceable heads.

■ Head Selection Guide

	P		K	M	S	H
Work Material	Mild Steel ($\leq 180\text{HB}$)	Carbon Steel / Alloy Steel ($\leq 45\text{HRC}$)	Cast Iron	Stainless Steel / Exotic Alloy		Hardened Steel ($\geq 45\text{HRC}$)
Feed Rate		$\leq 0.15\text{mm/rev}$ $\geq 0.15\text{mm/rev}$				
Recommended Head	MSL type		MHL type		MSL type	MTL type

■ Product Range

Head	Application	Holder (L/D)	Dia. (mm)
New MHL type	General Steel	1.5D type / 1.5DF type (1.5D)	ø12.0 to ø30.8 D type:
		M type / 3D type / 3DF type (3D)	
		L type / 5D type / 5DF type (5D)	
		D type / 8D type / 8DF type (8D)	
	Cast Iron	12D type (12D)	ø13.5 to ø30.8

For holders and other details, see Tooling News No. 435 "SEC-MULTIDRILL SMD series"

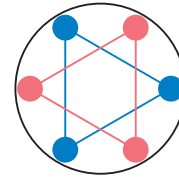
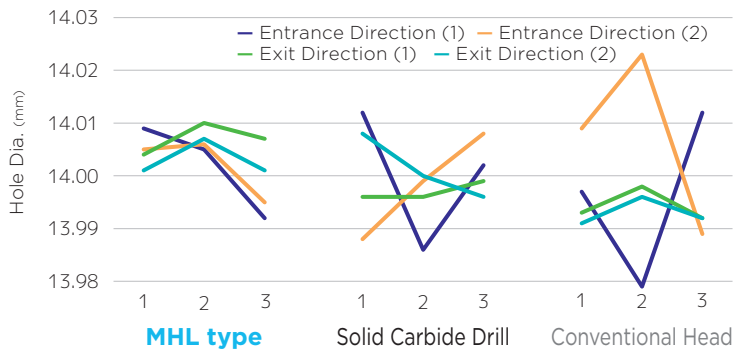


For heads and other details, see Tooling News No. 435 "SEC-MULTIDRILL SMD series"



MHL type

■ Drilled Hole Accuracy → Achieves hole diameter quality equivalent to solid carbide drills



Measured at three points with a micrometer

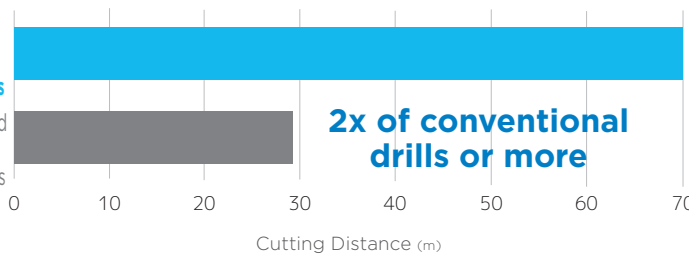
Direction (1)
Direction (2)

Machine: Vertical Machining Center HSK-A63
Work Material: S50C
Tool: $\phi 14 \times 5D$
Cutting Conditions: $v_c = 80 \text{ m/min}$ $f = 0.25 \text{ mm/rev}$ $H = 38 \text{ mm}$
Wet (Internal Coolant Supply 2MPa)

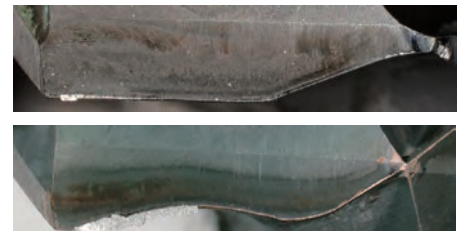
■ Long Tool Life → Contributing to productivity and reduced costs

MHL type
Recommended
Cutting Conditions

Conventional Head
Conventional
Cutting Conditions



2x of conventional
drills or more



Machine: Vertical Machining Center HSK-A63 Work Material: S50C Tool: $\phi 14 \times 5D$
Cutting Conditions
Conventional: $v_c = 80 \text{ m/min}$ $f = 0.25 \text{ mm/rev}$ $H = 38 \text{ mm}$ (Through)
Wet (Water-soluble Internal Coolant Supply 2MPa)
Recommended: $v_c = 100 \text{ m/min}$ $f = 0.4 \text{ mm/rev}$ $H = 38 \text{ mm}$ (Through)
Wet (Water-soluble Internal Coolant Supply 2MPa)

■ Recommended Cutting Conditions

(n: Spindle Speed min^{-1} v_c : Cutting Speed m/min f : Feed Rate mm/rev)

Dia. DC (mm)	Cutting Conditions	Carbon Steel	Alloy Steel	Gray Cast Iron	Ductile Cast Iron
Up to $\phi 16.0$	v_c	60 - 100 - 120 (50 - 70 - 80)	60 - 80 - 100 (50 - 70 - 80)	60 - 80 - 120 (40 - 60 - 80)	60 - 80 - 100 (40 - 60 - 80)
	f	0.15 - 0.40 - 0.60	0.15 - 0.35 - 0.50	0.15 - 0.40 - 0.60	0.15 - 0.40 - 0.60
Up to $\phi 20.0$	v_c	60 - 100 - 120 (50 - 70 - 80)	60 - 80 - 100 (50 - 70 - 80)	60 - 80 - 120 (40 - 60 - 80)	60 - 80 - 100 (40 - 60 - 80)
	f	0.20 - 0.40 - 0.60	0.20 - 0.35 - 0.55	0.20 - 0.40 - 0.60	0.20 - 0.40 - 0.60
Up to $\phi 30.8$	v_c	60 - 100 - 120 (50 - 70 - 80)	60 - 80 - 100 (50 - 70 - 80)	60 - 80 - 120 (40 - 60 - 80)	60 - 80 - 100 (40 - 60 - 80)
	f	0.20 - 0.40 - 0.60	0.20 - 0.35 - 0.55	0.20 - 0.40 - 0.60	0.20 - 0.40 - 0.60

Min. - Optimum - Max.

Note: Where machine and workpiece rigidity are high, conditions may be increased up to the maximum.

For 8D and 12D drills, use the cutting speeds in parentheses as a guideline. Before drilling 8D and 12D holes, a guide hole of a similar diameter is recommended.

When using MQL machining or non-water-soluble coolant, reduce the cutting speed and feed rate by 20-30% and ensure sufficient cooling effects.

MHL type (Internal Coolant Supply)**MHL**Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
Steel

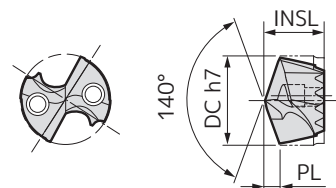
Cast Iron

Ductile
Cast Iron

*For h7 tolerance, refer to Chapter N - References in the General Catalog.

Replaceable Head

Fig 1

■ Replaceable Head MHL type Diameter $\phi 12.0$ to 17.3mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	●	SMDT 1200 MHL	6.9	2.2	SMDH120□	1
12.1	●	1210 MHL	6.9	2.2		1
12.2	●	1220 MHL	6.9	2.2		1
12.3	●	1230 MHL	6.9	2.2		1
12.4	●	1240 MHL	6.9	2.3	SMDH125□	1
12.5	●	SMDT 1250 MHL	7.1	2.3		1
12.6	●	1260 MHL	7.1	2.3		1
12.7	●	1270 MHL	7.1	2.3		1
12.8	●	1280 MHL	7.1	2.3	SMDH130□	1
12.9	●	1290 MHL	7.1	2.3		1
13.0	●	SMDT 1300 MHL	7.3	2.4		1
13.1	●	1310 MHL	7.3	2.4		1
13.2	●	1320 MHL	7.3	2.4	SMDH130□	1
13.3	●	1330 MHL	7.3	2.4		1
13.4	●	1340 MHL	7.3	2.4		1
13.5	●	SMDT 1350 MHL	7.8	2.5	SMDH140□	1
13.6	●	1360 MHL	7.8	2.5		1
13.7	●	1370 MHL	7.8	2.5		1
13.8	●	1380 MHL	7.8	2.5		1
13.9	●	1390 MHL	7.8	2.5	SMDH140□	1
14.0	●	1400 MHL	7.8	2.5		1
14.1	●	1410 MHL	7.8	2.6		1
14.2	●	1420 MHL	7.8	2.6		1
14.3	●	1430 MHL	7.8	2.6	SMDH150□	1
14.4	●	1440 MHL	7.8	2.6		1
14.5	●	1450 MHL	7.8	2.6		1
14.6	●	SMDT 1460 MHL	8.3	2.7		1
14.7	●	1470 MHL	8.3	2.7	SMDH150□	1
14.8	●	1480 MHL	8.3	2.7		1
14.9	●	1490 MHL	8.3	2.7		1
15.0	●	1500 MHL	8.3	2.7	SMDH150□	1
15.1	●	1510 MHL	8.3	2.7		1
15.2	●	1520 MHL	8.3	2.8		1
15.3	●	1530 MHL	8.3	2.8		1
15.4	●	1540 MHL	8.3	2.8	SMDH160□	1
15.5	●	1550 MHL	8.3	2.8		1
15.6	●	SMDT 1560 MHL	8.7	2.8		1
15.7	●	1570 MHL	8.7	2.9	SMDH160□	1
15.8	●	1580 MHL	8.7	2.9		1
15.9	●	1590 MHL	8.7	2.9		1
16.0	●	1600 MHL	8.7	2.9		1
16.1	●	1610 MHL	8.7	2.9	SMDH160□	1
16.2	●	1620 MHL	8.7	2.9		1
16.3	●	1630 MHL	8.7	3.0		1
16.4	●	1640 MHL	8.7	3.0		1
16.5	●	1650 MHL	8.7	3.0	SMDH170□	1
16.6	●	SMDT 1660 MHL	9.2	3.0		1
16.7	●	1670 MHL	9.2	3.0		1
16.8	●	1680 MHL	9.2	3.1		1
16.9	●	1690 MHL	9.2	3.1	SMDH170□	1
17.0	●	1700 MHL	9.2	3.1		1
17.1	●	1710 MHL	9.2	3.1		1
17.2	●	1720 MHL	9.2	3.1		1
17.3	●	1730 MHL	9.2	3.1		1

Grade: ACH70

Recommended Cutting Conditions **P.3**■ Replaceable Head MHL type Diameter $\phi 17.4$ to 22.7mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	●	SMDT 1740 MHL	9.2	3.2	SMDH170□	1
17.5	●	1750 MHL	9.2	3.2		1
17.6	●	SMDT 1760 MHL	9.6	3.2	SMDH180□	1
17.7	●	1770 MHL	9.6	3.2		1
17.8	●	1780 MHL	9.6	3.2		1
17.9	●	1790 MHL	9.6	3.3		1
18.0	●	1800 MHL	9.6	3.3	SMDH180□	1
18.1	●	1810 MHL	9.6	3.3		1
18.2	●	1820 MHL	9.6	3.3		1
18.3	●	1830 MHL	9.6	3.3		1
18.4	●	1840 MHL	9.6	3.3	SMDH190□	1
18.5	●	1850 MHL	9.6	3.4		1
18.6	●	SMDT 1860 MHL	10.1	3.4		1
18.7	●	1870 MHL	10.1	3.4		1
18.8	●	1880 MHL	10.1	3.4	SMDH190□	1
18.9	●	1890 MHL	10.1	3.4		1
19.0	●	1900 MHL	10.1	3.5		1
19.1	●	1910 MHL	10.1	3.5		1
19.2	●	1920 MHL	10.1	3.5	SMDH200□	1
19.3	●	1930 MHL	10.1	3.5		1
19.4	●	1940 MHL	10.1	3.5		1
19.5	●	1950 MHL	10.1	3.5		1
19.6	●	SMDT 1960 MHL	10.5	3.6	SMDH200□	1
19.7	●	1970 MHL	10.5	3.6		1
19.8	●	1980 MHL	10.5	3.6		1
19.9	●	1990 MHL	10.5	3.6		1
20.0	●	2000 MHL	10.5	3.6	SMDH210□	1
20.1	●	2010 MHL	10.5	3.7		1
20.2	●	2020 MHL	10.5	3.7		1
20.3	●	2030 MHL	10.5	3.7		1
20.4	●	2040 MHL	10.5	3.7	SMDH210□	1
20.5	●	2050 MHL	10.5	3.7		1
20.6	●	SMDT 2060 MHL	11.0	3.8		1
20.7	●	2070 MHL	11.0	3.8		1
20.8	●	2080 MHL	11.0	3.8	SMDH210□	1
20.9	●	2090 MHL	11.0	3.8		1
21.0	●	2100 MHL	11.0	3.8		1
21.1	●	2110 MHL	11.0	3.8		1
21.2	●	2120 MHL	11.0	3.9	SMDH220□	1
21.3	●	2130 MHL	11.0	3.9		1
21.4	●	2140 MHL	11.0	3.9		1
21.5	●	2150 MHL	11.0	3.9		1
21.6	●	SMDT 2160 MHL	11.0	3.9	SMDH220□	1
21.7	●	2170 MHL	11.0	3.9		1
21.8	●	2180 MHL	11.0	4.0		1
21.9	●	2190 MHL	11.0	4.0		1
22.0	●	2200 MHL	11.0	4.0	SMDH220□	1
22.1	●	2210 MHL	11.0	4.0		1
22.2	●	2220 MHL	11.0	4.0		1
22.3	●	2230 MHL	11.0	4.1		1
22.4	●	2240 MHL	11.0	4.1	SMDH220□	1
22.5	●	2250 MHL	11.0	4.1		1
22.6	●	2260 MHL	11.0	4.1		1
22.7	●	2270 MHL	11.0	4.1		1

Grade: ACH70

Recommended Cutting Conditions **P.3**

*The MHL type can be mounted on the following holders.

- SMD series (Internal Coolant Supply) Side Lock Flat/No Flange
- SMD series (Internal Coolant Supply) Side Lock Flat/Flange
- SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

*Dimensions for the MHL type set are equivalent to those for MTL type / MSL type / MEL type sets.

*Cannot be mounted on the B3 type holder for SMD series bridge.

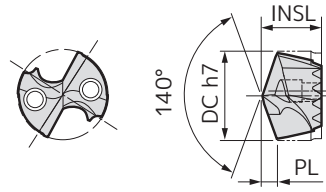
● mark: Standard stocked item Blank: Made-to-order item

MHL type (Internal Coolant Supply)

*For h7 tolerance, refer to Chapter N - References in the General Catalog.

Replaceable Head

Fig 1

■ Replaceable Head MHL type Diameter $\varnothing 22.8$ to 28.1mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8		SMDT 2280 MHL	11.0	4.1	SMDH220□	1
22.9		SMDT 2290 MHL	11.0	4.2		1
23.0	●	2300 MHL	11.0	4.2		1
23.1		2310 MHL	11.0	4.2		1
23.2		2320 MHL	11.0	4.2		1
23.3		2330 MHL	11.0	4.2		1
23.4		2340 MHL	11.0	4.3		1
23.5	●	2350 MHL	11.0	4.3		1
23.6		2360 MHL	11.0	4.3		1
23.7		2370 MHL	11.0	4.3		1
23.8		2380 MHL	11.0	4.3		1
23.9		SMDT 2390 MHL	11.0	4.3		1
24.0	●	2400 MHL	11.0	4.4		1
24.1		2410 MHL	11.0	4.4		1
24.2		2420 MHL	11.0	4.4		1
24.3		2430 MHL	11.0	4.4		1
24.4		2440 MHL	11.0	4.4		1
24.5	●	2450 MHL	11.0	4.5		1
24.6		2460 MHL	11.0	4.5		1
24.7		2470 MHL	11.0	4.5		1
24.8		2480 MHL	11.0	4.5		1
24.9		SMDT 2490 MHL	11.3	4.5		1
25.0	●	2500 MHL	11.3	4.5		1
25.1		2510 MHL	11.3	4.6		1
25.2		2520 MHL	11.3	4.6		1
25.3		2530 MHL	11.3	4.6		1
25.4		2540 MHL	11.3	4.6		1
25.5	●	2550 MHL	11.3	4.6		1
25.6		2560 MHL	11.3	4.7		1
25.7		2570 MHL	11.3	4.7		1
25.8		2580 MHL	11.3	4.7		1
25.9		SMDT 2590 MHL	11.7	4.7		1
26.0	●	2600 MHL	11.7	4.7		1
26.1		2610 MHL	11.7	4.7		1
26.2		2620 MHL	11.7	4.8		1
26.3		2630 MHL	11.7	4.8		1
26.4		2640 MHL	11.7	4.8		1
26.5	●	2650 MHL	11.7	4.8		1
26.6		2660 MHL	11.7	4.8		1
26.7		2670 MHL	11.7	4.9		1
26.8		2680 MHL	11.7	4.9		1
26.9		SMDT 2690 MHL	12.2	4.9		1
27.0	●	2700 MHL	12.2	4.9		1
27.1		2710 MHL	12.2	4.9		1
27.2		2720 MHL	12.2	4.9		1
27.3		2730 MHL	12.2	5.0		1
27.4		2740 MHL	12.2	5.0		1
27.5	●	2750 MHL	12.2	5.0		1
27.6		2760 MHL	12.2	5.0		1
27.7		2770 MHL	12.2	5.0		1
27.8		2780 MHL	12.2	5.1		1
27.9		SMDT 2790 MHL	12.6	5.1		1
28.0	●	2800 MHL	12.6	5.1		1
28.1		2810 MHL	12.6	5.1		1

Grade: ACH70

Recommended Cutting Conditions **P.3**

*The MHL type can be mounted on the following holders.

- SMD series (Internal Coolant Supply) Side Lock Flat/No Flange
- SMD series (Internal Coolant Supply) Side Lock Flat/Flange
- SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

*Dimensions for the MHL type set are equivalent to those for MTL type / MSL type / MEL type sets.

*Cannot be mounted on the B3 type holder for SMD series bridge.

■ Replaceable Head MHL type Diameter $\varnothing 28.2$ to 30.8mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2		SMDT 2820 MHL	12.6	5.1		1
28.3		2830 MHL	12.6	5.2		1
28.4		2840 MHL	12.6	5.2		1
28.5	●	2850 MHL	12.6	5.2		1
28.6		2860 MHL	12.6	5.2		1
28.7		2870 MHL	12.6	5.2		1
28.8		2880 MHL	12.6	5.2		1
28.9		SMDT 2890 MHL	13.1	5.3		1
29.0	●	2900 MHL	13.1	5.3		1
29.1		2910 MHL	13.1	5.3		1
29.2		2920 MHL	13.1	5.3		1
29.3		2930 MHL	13.1	5.3		1
29.4		2940 MHL	13.1	5.4		1
29.5	●	2950 MHL	13.1	5.4		1
29.6		2960 MHL	13.1	5.4		1
29.7		2970 MHL	13.1	5.4		1
29.8		2980 MHL	13.1	5.4		1
29.9		SMDT 2990 MHL	13.5	5.4		1
30.0	●	3000 MHL	13.5	5.5		1
30.1		3010 MHL	13.5	5.5		1
30.2		3020 MHL	13.5	5.5		1
30.3		3030 MHL	13.5	5.5		1
30.4		3040 MHL	13.5	5.5		1
30.5	●	3050 MHL	13.5	5.6		1
30.6		3060 MHL	13.5	5.6		1
30.7		3070 MHL	13.5	5.6		1
30.8		3080 MHL	13.5	5.6		1

Grade: ACH70

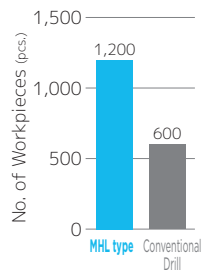
Recommended Cutting Conditions **P.3**

● mark: Standard stocked item Blank: Made-to-order item

MHL type

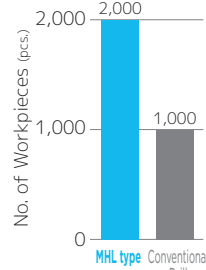
■ Application Examples

Steel SNCM439 Cylinder Component		MHL type	Conventional Drill
Compound Lathe	Drill	ø26.21-3D*	ø26.21-3D
	vc (m/min)	123	123
	f (mm/rev)	0.43	0.23
	Coolant	Wet (Water-soluble, Internal Coolant Supply)	Wet (Water-soluble, Internal Coolant Supply)
	Results	Improved efficiency and longer tool life compared to the conventional drill	



*Made-to-Order Product

Steel SCM415 Machine Component		MHL type	Conventional Drill
	Drill	ø30.5-3D	ø30.5-3D
	vc (m/min)	70	70
	f (mm/rev)	0.30	0.30
	Coolant	Wet (Water-soluble, Internal Coolant Supply)	Wet (Water-soluble, Internal Coolant Supply)
	Results	Achieves improved stability and longer tool life even under the same conditions as the conventional drill	



MEMO



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

< SAFETY NOTES >

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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