



High-efficiency thread mill with end-cutting edge for non-ferrous metals

# AT-2 R-SPEC

Volume 1



# KEY FEATURES: AT-2 R-SPEC

## Super high-efficiency threading "ThreadRacer"



**1 Left-hand cut configuration**  
Climb milling  
\*Counterclockwise spindle rotation

**2 With end-cutting edge**  
Helical drilling + threading  
can be done simultaneously

**3 Oil hole**  
Superior chip evacuation  
(Tool DC = Ø4,6 or more)

**DLC-IGUSS coating**  
Welding prevention &  
long tool life

**4 Special cutting edge  
shape**  
Bending of the tool can  
be controlled

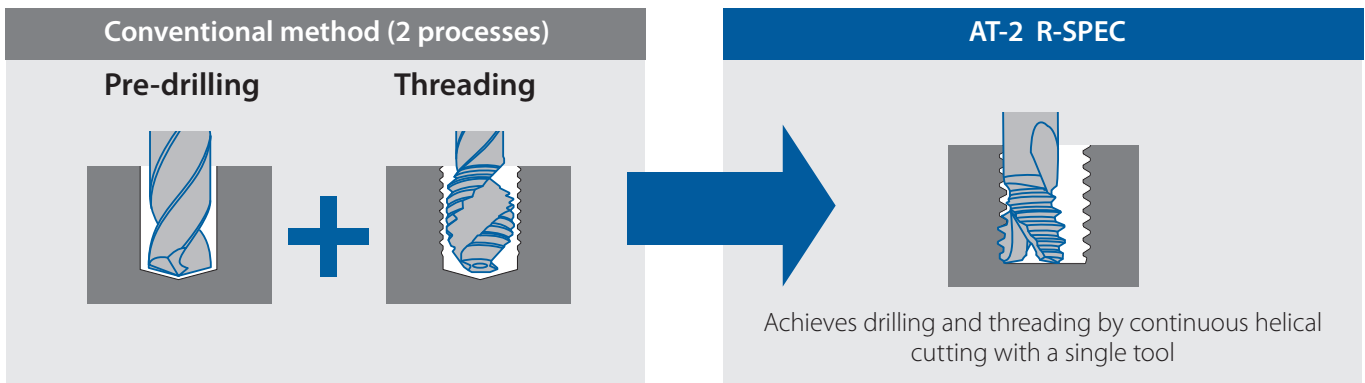
**5 2 Flutes**  
Wide chip room

**6 Roughing teeth (2 ridges)**  
Higher efficiency by load  
distribution



# AT-2 R-SPEC: THREADRACER

## Threading time can be dramatically reduced!

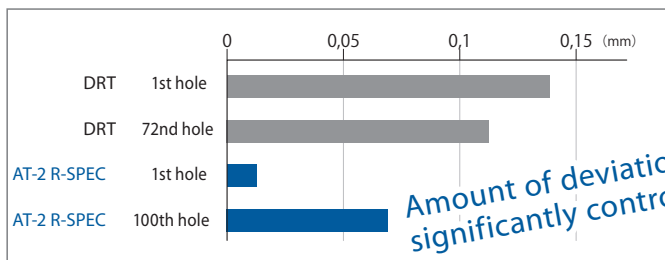


## Useful for preventing shifting of cutting position in cast hole!



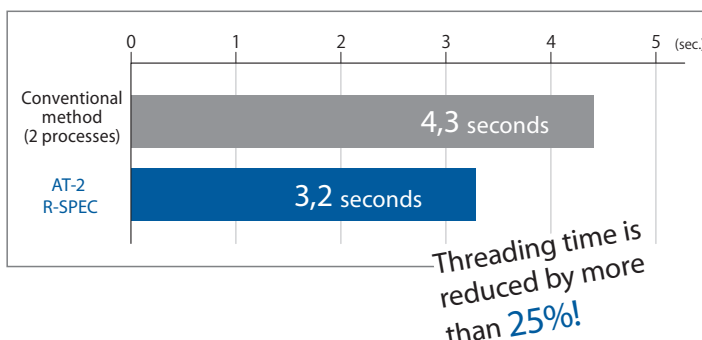
Rough position settings and inclined nature of cast holes can cause position shifting in following processes...

## Comparison of hole position accuracy with drill tap (DRT)



M8x1,25 Depth 18mm AC material  
 Cutting test by shifting the axial center of  $\varnothing 4,3$  pilot hole by 0,7 mm  
 Drill tap:  $V_c=100\text{m/min}, f=1.25\text{mm/rev}$   
 AT-2 R-SPEC:  $V_c=220\text{m/min}, f=1.2\text{mm/rev}$

## Threading time comparison with conventional method (includes non-cutting time)



M6x1 Threading length 10mm ADC12 material  
 Conventional drill:  $V_c=126\text{m/min}, f=0.6\text{mm/rev}$   
 Tap:  $V_c=94\text{m/min}$  (ATC: 1 time)  
 AT-2 R-SPEC:  $V_c=220\text{m/min}, f=1.2\text{mm/rev}$

## Possible to thread with air-blow!

**Q.** Cutting oil sometimes cannot be used for machining aircraft and electrical parts...

**A.** Water-soluble coolant is generally recommended. However, air-blow can also be used when a pre-drilled hole is made to enhance chip separation and restrain welding of the DLC coating.

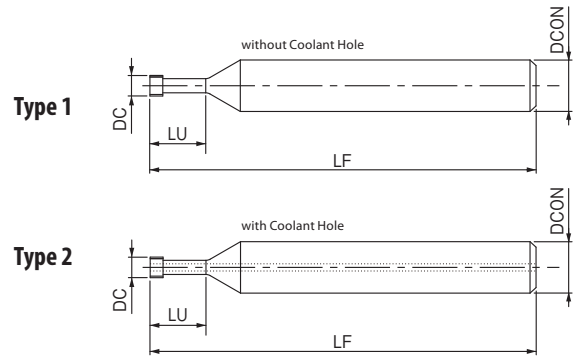


# AT-2 R-SPEC 2D Type

Threading | Thread milling | Metric



- First choice in quality and performance
- Thread milling without pre-drilled hole
- DLC-IGUSS coating
- Left-hand (spindle rotation left)
- Direction of tool feed: right (clockwise)
- 2 flutes for large chip room. Coolant-through from M6.



Threading | Thread milling



EDP	Minimum Cutting Bore Ø	TP	DC	LF	Maximum threading length	LU	DCON	ZEFP	Type	Price
8331220	M3	0,5	2,4	50	6	7,75	6	2	1	
8331221	M4	0,7	3,1	50	8	10,45	6	2	1	
8331222	M5	0,8	4	50	10	12,8	6	2	1	
8331223	M6	1	4,6	50	12	15,5	6	2	2	
8331224	M8	1,25	6,2	70	16	20,38	8	2	2	
8331225	M10	1,5	7,5	80	20	25,25	10	2	2	
8331226	M12	1,75	9	80	24	30,13	10	2	2	

Metric

# AT-2 R-SPEC 2,5D Type

Threading | Thread milling | Metric



EDP	Minimum Cutting Bore Ø	TP	DC	LF	Maximum threading length	LU	DCON	ZEFP	Type	Price
8331227	M3	0,5	2,4	50	7,5	9,25	6	2	1	
8331228	M4	0,7	3,1	50	10	12,45	6	2	1	
8331229	M5	0,8	4	50	12,5	15,3	6	2	1	
8331230	M6	1	4,6	50	15	18,5	6	2	2	
8331231	M8	1,25	6,2	70	20	24,38	8	2	2	
8331232	M10	1,5	7,5	80	25	30,25	10	2	2	
8331233	M12	1,75	9	80	30	36,13	10	2	2	

# CUTTING CONDITIONS

Threading | Thread milling | Cutting conditions

## AT-2 R-SPEC

		Aluminum Alloy Casting AC4C - ADC Water Soluble						Wrought Aluminum Alloy Magnesium Alloy A5052 - A7075 - AZ91 - AZ80A Water Soluble						Copper Alloy C1100 Water Soluble					
Vc		100~300m/min						100~300m/min						100~300m/min					
Type		2 X D Type			2,5 X D Type			2 X D Type			2,5 X D Type			2 X D Type			2,5 X D Type		
Thread Size	DC	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)
M 3 X 0,5	2,4	13.263	1.592	0,3	13.263	1.592	0,3	13.263	159	0,03	13.263	159	0,03	13.263	159	0,03	13.263	159	0,03
M 4 X 0,7	3,1	14.375	1.941	0,3	14.375	1.941	0,3	14.375	194	0,03	14.375	194	0,03	14.375	194	0,03	14.375	194	0,03
M 5 X 0,8	4	15.915	1.910	0,3	12.732	1.528	0,3	15.915	255	0,04	12.732	204	0,04	15.915	255	0,04	12.732	204	0,04
M 6 X 1	4,6	15.224	2.842	0,4	11.072	2.067	0,4	15.224	284	0,04	11.072	207	0,04	15.224	284	0,04	11.072	207	0,04
M 8 X 1,25	6,2	12.322	2.218	0,4	8.214	1.479	0,4	12.322	277	0,05	8.214	185	0,05	12.322	277	0,05	8.214	185	0,05
M 10 X 1,5	7,5	10.186	2.037	0,4	6.791	1.358	0,4	10.186	255	0,05	6.791	170	0,05	10.186	255	0,05	6.791	170	0,05
M 12 X 1,75	9	8.488	1.698	0,4	5.659	1.132	0,4	8.488	212	0,05	5.659	141	0,05	8.488	212	0,05	5.659	141	0,05

1. AT-2 R-SPEC is only for milling internal threads.
2. This cutting condition table shows standard values. When machining, it is recommended to use the program created by the NC code generator software ThreadPro.
3. Please select "Single-feed" for the path type in ThreadPro. Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
4. Tool vibrations should be kept at a minimum level for maximum accuracy.
5. When machining magnesium alloy materials, please use the coolant oil recommended by the coolant oil manufacturer. Please also properly dispose the cutting chips to prevent fire hazards.
6. Spindle rotation must be counterclockwise due to the left-hand cut configuration.

### Note

Bottom shape of finished hole is as depicted in the right picture. Please make sure that it is acceptable based on the cutting instruction in advance.



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