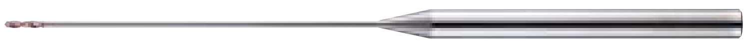
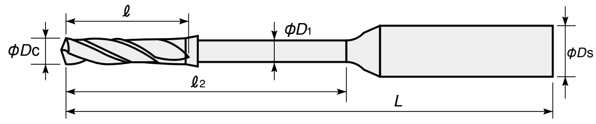
Epoch Micro Step Borer S EMSBS

for Steels / for Non-ferrous

Carbide | Micro-TH | SD





Tip angle：140°

EMSBS○○○○-○○.○-(TH/SD)

Indicate the desired coating type by adding "-SD" for SD Coating or "-TH" for TH Coating at the end of the item code.

Dia. tolerance $^{0}_{-0.005}$ h4 (mm)

Item code	Stock TH Coating	Stock SD Coating	Tool dia. Dc	Flute length ℓ	Under neck length ℓ2	L/D	Neck dia. D1	Overall length L	Shank dia. Ds
EMSBS0004-0.4-□□	●	□	0.04	0.2	0.4	10	0.033	40	3
EMSBS0004-0.8-□□	□	□	0.04	0.2	0.8	20	0.033	40	3
EMSBS0004-1.2-□□	●	□	0.04	0.2	1.2	30	0.033	40	3
EMSBS0005-0.5-□□	●	□	0.05	0.25	0.5	10	0.04	40	3
EMSBS0005-1-□□	●	□	0.05	0.25	1	20	0.04	40	3
EMSBS0005-1.5-□□	●	□	0.05	0.25	1.5	30	0.04	40	3
EMSBS0005-2-□□	□	□	0.05	0.25	2	40	0.04	40	3
EMSBS0005-2.5-□□	□	□	0.05	0.25	2.5	50	0.04	40	3
EMSBS0006-0.6-□□	●	□	0.06	0.3	0.6	10	0.05	40	3
EMSBS0006-1.2-□□	□	□	0.06	0.3	1.2	20	0.05	40	3
EMSBS0006-1.8-□□	●	□	0.06	0.3	1.8	30	0.05	40	3
EMSBS0006-2.4-□□	□	□	0.06	0.3	2.4	40	0.05	40	3
EMSBS0006-3-□□	□	□	0.06	0.3	3	50	0.05	40	3
EMSBS0007-0.7-□□	●	□	0.07	0.35	0.7	10	0.06	40	3
EMSBS0007-1.4-□□	□	□	0.07	0.35	1.4	20	0.06	40	3
EMSBS0007-2.1-□□	●	□	0.07	0.35	2.1	30	0.06	40	3
EMSBS0007-2.8-□□	□	□	0.07	0.35	2.8	40	0.06	40	3
EMSBS0007-3.5-□□	□	□	0.07	0.35	3.5	50	0.06	40	3
EMSBS0008-0.8-□□	●	□	0.08	0.4	0.8	10	0.07	40	3
EMSBS0008-1.6-□□	□	□	0.08	0.4	1.6	20	0.07	40	3
EMSBS0008-2.4-□□	●	□	0.08	0.4	2.4	30	0.07	40	3
EMSBS0008-3.2-□□	□	□	0.08	0.4	3.2	40	0.07	40	3
EMSBS0008-4-□□	□	□	0.08	0.4	4	50	0.07	40	3
EMSBS0009-0.9-□□	●	□	0.09	0.45	0.9	10	0.08	40	3
EMSBS0009-1.8-□□	□	□	0.09	0.45	1.8	20	0.08	40	3
EMSBS0009-2.7-□□	●	□	0.09	0.45	2.7	30	0.08	40	3
EMSBS0009-3.6-□□	□	□	0.09	0.45	3.6	40	0.08	40	3
EMSBS0009-4.5-□□	□	□	0.09	0.45	4.5	50	0.08	40	3
EMSBS0010-1-□□	●	□	0.1	0.5	1	10	0.09	45	3
EMSBS0010-2-□□	□	□	0.1	0.5	2	20	0.09	45	3
EMSBS0010-3-□□	●	□	0.1	0.5	3	30	0.09	45	3
EMSBS0010-5-□□	●	□	0.1	0.5	5	50	0.09	45	3
EMSBS0010-7.5-□□	□	□	0.1	0.5	7.5	75	0.09	45	3
EMSBS0010-10-□□	□	□	0.1	0.5	10	100	0.09	45	3
EMSBS0015-1.5-□□	●	□	0.15	0.75	1.5	10	0.14	50	3
EMSBS0015-3-□□	□	□	0.15	0.75	3	20	0.14	50	3
EMSBS0015-4.5-□□	●	□	0.15	0.75	4.5	30	0.14	50	3
EMSBS0015-7.5-□□	●	□	0.15	0.75	7.5	50	0.14	50	3
EMSBS0015-11.25-□□	□	□	0.15	0.75	11.25	75	0.14	50	3
EMSBS0015-15-□□	□	□	0.15	0.75	15	100	0.14	50	3
EMSBS0020-2-□□	●	□	0.2	1	2	10	0.19	45	3
EMSBS0020-4-□□	□	□	0.2	1	4	20	0.19	45	3
EMSBS0020-6-□□	●	□	0.2	1	6	30	0.19	45	3
EMSBS0020-10-□□	●	□	0.2	1	10	50	0.19	45	3
EMSBS0020-15-□□	□	□	0.2	1	15	75	0.19	55	3
EMSBS0020-20-□□	□	□	0.2	1	20	100	0.19	55	3
EMSBS0030-3-□□	●	□	0.3	1.5	3	10	0.28	45	3
EMSBS0030-6-□□	□	□	0.3	1.5	6	20	0.28	45	3
EMSBS0030-9-□□	●	□	0.3	1.5	9	30	0.28	45	3
EMSBS0030-15-□□	●	□	0.3	1.5	15	50	0.28	55	3
EMSBS0030-22.5-□□	□	□	0.3	1.5	22.5	75	0.28	65	3
EMSBS0030-30-□□	□	□	0.3	1.5	30	100	0.28	65	3
EMSBS0040-4-□□	●	□	0.4	2	4	10	0.38	50	3
EMSBS0040-8-□□	□	□	0.4	2	8	20	0.38	50	3
EMSBS0040-12-□□	●	□	0.4	2	12	30	0.38	50	3
EMSBS0040-20-□□	●	□	0.4	2	20	50	0.38	60	3
EMSBS0040-30-□□	□	□	0.4	2	30	75	0.38	75	3
EMSBS0040-40-□□	□	□	0.4	2	40	100	0.38	75	3
EMSBS0050-5-□□	●	□	0.5	2.5	5	10	0.48	50	3
EMSBS0050-10-□□	□	□	0.5	2.5	10	20	0.48	50	3
EMSBS0050-15-□□	●	□	0.5	2.5	15	30	0.48	50	3
EMSBS0050-25-□□	●	□	0.5	2.5	25	50	0.48	65	3
EMSBS0050-37.5-□□	□	□	0.5	2.5	37.5	75	0.48	85	3
EMSBS0050-50-□□	□	□	0.5	2.5	50	100	0.48	85	3
EMSBS0060-6-□□	●	□	0.6	3	6	10	0.57	55	3
EMSBS0060-12-□□	□	□	0.6	3	12	20	0.57	55	3
EMSBS0060-18-□□	●	□	0.6	3	18	30	0.57	55	3
EMSBS0060-30-□□	●	□	0.6	3	30	50	0.57	75	3
EMSBS0060-45-□□	□	□	0.6	3	45	75	0.57	95	3
EMSBS0060-60-□□	□	□	0.6	3	60	100	0.57	95	3
EMSBS0070-7-□□	●	□	0.7	3.5	7	10	0.67	60	4
EMSBS0070-14-□□	□	□	0.7	3.5	14	20	0.67	60	4
EMSBS0070-21-□□	●	□	0.7	3.5	21	30	0.67	60	4
EMSBS0070-35-□□	●	□	0.7	3.5	35	50	0.67	80	4
EMSBS0070-52.5-□□	□	□	0.7	3.5	52.5	75	0.67	105	4
EMSBS0070-70-□□	□	□	0.7	3.5	70	100	0.67	105	4
EMSBS0080-8-□□	●	□	0.8	4	8	10	0.76	60	4
EMSBS0080-16-□□	□	□	0.8	4	16	20	0.76	60	4
EMSBS0080-24-□□	●	□	0.8	4	24	30	0.76	60	4
EMSBS0080-40-□□	●	□	0.8	4	40	50	0.76	85	4
EMSBS0080-60-□□	□	□	0.8	4	60	75	0.76	115	4
EMSBS0080-80-□□	□	□	0.8	4	80	100	0.76	115	4
EMSBS0090-9-□□	●	□	0.9	4.5	9	10	0.85	65	4
EMSBS0090-18-□□	□	□	0.9	4.5	18	20	0.85	65	4
EMSBS0090-27-□□	●	□	0.9	4.5	27	30	0.85	65	4
EMSBS0090-45-□□	●	□	0.9	4.5	45	50	0.85	90	4
EMSBS0090-67.5-□□	□	□	0.9	4.5	67.5	75	0.85	125	4
EMSBS0090-90-□□	□	□	0.9	4.5	90	100	0.85	125	4
EMSBS0100-10-□□	●	□	1	5	10	10	0.95	70	4
EMSBS0100-20-□□	□	□	1	5	20	20	0.95	70	4
EMSBS0100-30-□□	●	□	1	5	30	30	0.95	70	4
EMSBS0100-50-□□	●	□	1	5	50	50	0.95	100	4
EMSBS0100-75-□□	□	□	1	5	75	75	0.95	135	4
EMSBS0100-100-□□	□	□	1	5	100	100	0.95	135	4

Under-neck length (ℓ2) conforms to through-hole drilling depth.

Applicable work material

Coating	Mild steel SS	Carbon steel S○○C	Alloy steel SCM, SCr	Heat-treated steel SKD SKS	Tool steel ~40HRC	Hardened steel ~45HRC	Hardened steel 45HRC~	Stainless steel SUS	Inconel	Cast iron FC	Ductile cast iron FCD	Aluminium alloy Al	Copper alloy Cu
TH	◎	○	◎	◎	◎	◎	○	◎	○	○	○	○	○
SD												◎	◎

Re-grinding compatibility range

Item code	Dc (mm)
EMSBS-TH	(N/A)
EMSBS-SD	(N/A)

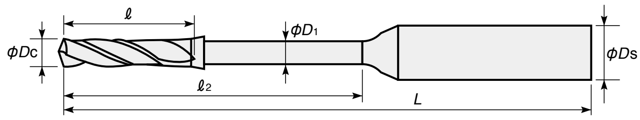
●：Stocked Items. □：Stocked by specified distributor. Contact with our sales department.

Epoch Micro Step Borer S EMSBS

Manufactured upon request only.

We can deliver the size to match customer needs.
Manufactured upon request only.

Carbide Micro-TH SD



EMSBS○○○○-○○-□□ ℓ2:Designation of under neck length; (B) Designation of coating

Dia. tolerance $^{0}_{-0.005}$ h4 (mm)

Order code	Kind of coating (B)	Size (mm) ℓ_2/Dc	Tool dia. Dc	Flute length ℓ	Neck dia. D_1	Under neck length ℓ_2	Overall length L: $\ell_2/Dc<35$	Overall length L: $\ell_2/Dc<65$	Overall length L: $\ell_2/Dc\geqq65$	Shank dia. Ds
EMSBS0004-(A)-(B)	**TH/SD**	Value of 30 or less	**0.04**	0.2	0.033	Value can be specified freely.	40			3
EMSBS0005-(A)-(B)	**TH/SD**	Value of 50 or less can be specified.	**0.05**	0.25	0.04		40			3
EMSBS0006-(A)-(B)	**TH/SD**		**0.06**	0.3	0.05		40			3
EMSBS0007-(A)-(B)	**TH/SD**		**0.07**	0.35	0.06		40			3
EMSBS0008-(A)-(B)	**TH/SD**		**0.08**	0.4	0.07		40			3
EMSBS0009-(A)-(B)	**TH/SD**		**0.09**	0.45	0.08		40			3
EMSBS0010-(A)-(B)	**TH/SD**	Value of 100 or less can be specified.	**0.1**	0.5	0.09		45			3
EMSBS0015-(A)-(B)	**TH/SD**		**0.15**	0.75	0.14		50			3
EMSBS0020-(A)-(B)	**TH/SD**		**0.2**	1	0.19		45		55	3
EMSBS0030-(A)-(B)	**TH/SD**		**0.3**	1.5	0.28		45	55	65	3
EMSBS0040-(A)-(B)	**TH/SD**		**0.4**	2	0.38		50	60	75	3
EMSBS0050-(A)-(B)	**TH/SD**		**0.5**	2.5	0.48		50	65	85	3
EMSBS0060-(A)-(B)	**TH/SD**		**0.6**	3	0.57		55	75	95	3
EMSBS0070-(A)-(B)	**TH/SD**		**0.7**	3.5	0.67		60	80	105	4
EMSBS0080-(A)-(B)	**TH/SD**		**0.8**	4	0.76		60	85	115	4
EMSBS0090-(A)-(B)	**TH/SD**		**0.9**	4.5	0.85		65	90	125	4
EMSBS0100-(A)-(B)	**TH/SD**		**1**	5	0.95		70	100	135	4

Ratio to cutting conditions for different L/D

Adjust cutting conditions according to the following ratios based on the cutting conditions for L/D=10 on next page.

L/D	Revolution	Feed rate	Step
20 times or less	100%	100%	100%
30 times or less	100%	100%	100%
40 times or less	90%	90%	100%
50 times or less	80%	80%	100%
60 times or less	65%	65%	100%

L/D	Revolution	Feed rate	Step
70 times or less	55%	55%	100%
80 times or less	40%	40%	100%
90 times or less	35%	35%	100%
100 times or less	30%	30%	100%

Ordering method

The under neck length and coating can be freely selected according to the application.

Selecting under neck length — Please specify the under neck length using (drilling depth + tool diameter) as criteria.

Selecting coating — In general, SD should be selected for non-ferrous materials, and TH should be selected for other materials.

【Example 1】 For example, when drilling a hole in SUS304 that is φ0.3mm in diameter with a drilling depth of 15mm, specify a tool with a diameter of φ0.3mm and a under neck length of 15.3mm (Drilling depth + tool diameter).

Order code : **EMSBS0030-15.3-TH**

(Note) For products with tool dimensions other than those listed above, separate consultation is needed. Please contact our sales office.

Epoch Micro Step Borer S EMSBS

EMSBS

Item Code	Tool dia. (mm)	Under neck length (mm)	L/D	1			2			3			4			5		
				Aluminium, Resin, Acrylic			Carbon steels (180～250HB)			Stainless steels (25～35HRC)			Pre-hardened steels (35～45HRC)			Hardened steels (45～55HRC)		
				Revolution n min^{-1}	Feed rate v_f mm/min	Step Feed (mm)	Revolution n min^{-1}	Feed rate v_f mm/min	Step Feed (mm)	Revolution n min^{-1}	Feed rate v_f mm/min	Step Feed (mm)	Revolution n min^{-1}	Feed rate v_f mm/min	Step Feed (mm)	Revolution n min^{-1}	Feed rate v_f mm/min	Step Feed (mm)
EMSBS0004-0.4-□□	0.04	0.4	10	39,789	80	0.004	35,810	72	0.004	31,831	64	0.004	27,852	56	0.0028	23,873	24	0.002
EMSBS0004-1.2-□□	0.04	1.2	30	39,789	80	0.004	35,810	72	0.004	31,831	64	0.004	27,852	56	0.0028	23,873	24	0.002
EMSBS0005-0.5-□□	0.05	0.5	10	38,197	76	0.005	31,831	64	0.005	28,648	57	0.005	25,465	51	0.0035	22,282	22	0.0025
EMSBS0005-1-□□	0.05	1	20	38,197	76	0.005	31,831	64	0.005	28,648	57	0.005	25,465	51	0.0035	22,282	22	0.0025
EMSBS0005-1.5-□□	0.05	1.5	30	38,197	76	0.005	25,465	51	0.005	22,918	46	0.005	20,372	41	0.0035	17,825	18	0.0025
EMSBS0006-0.6-□□	0.06	0.6	10	37,136	74	0.006	29,178	58	0.006	26,526	53	0.006	23,873	48	0.0042	21,221	21	0.003
EMSBS0006-1.8-□□	0.06	1.8	30	37,136	74	0.006	29,178	58	0.006	26,526	53	0.006	23,873	48	0.0042	21,221	21	0.003
EMSBS0007-0.7-□□	0.07	0.7	10	36,378	73	0.007	27,284	55	0.007	25,010	50	0.007	22,736	45	0.0049	20,463	20	0.0035
EMSBS0007-2.1-□□	0.07	2.1	30	36,378	73	0.007	27,284	55	0.007	25,010	50	0.007	22,736	45	0.0049	20,463	20	0.0035
EMSBS0008-0.8-□□	0.08	0.8	10	35,810	72	0.008	27,852	56	0.008	25,863	52	0.008	23,873	48	0.0056	21,884	22	0.004
EMSBS0008-2.4-□□	0.08	2.4	30	35,810	72	0.008	27,852	56	0.008	25,863	52	0.008	23,873	48	0.0056	21,884	22	0.004
EMSBS0009-0.9-□□	0.09	0.9	10	35,368	71	0.009	26,526	53	0.009	24,757	50	0.009	22,989	46	0.0063	21,221	21	0.0045
EMSBS0009-2.7-□□	0.09	2.7	30	35,368	71	0.009	26,526	53	0.009	24,757	50	0.009	22,989	46	0.0063	21,221	21	0.0045
EMSBS0010-1-□□	0.1	1	10	35,014	105	0.01	25,465	76	0.01	23,873	72	0.01	22,282	67	0.007	20,690	41	0.005
EMSBS0010-3-□□	0.1	3	30	35,014	105	0.01	25,465	76	0.01	23,873	72	0.01	22,282	67	0.007	20,690	41	0.005
EMSBS0010-5-□□	0.1	5	50	28,011	84	0.01	20,372	61	0.01	19,099	57	0.01	17,825	53	0.007	16,552	33	0.005
EMSBS0015-1.5-□□	0.15	1.5	10	25,465	76	0.015	23,343	70	0.015	21,221	64	0.015	20,160	60	0.0105	19,099	38	0.0075
EMSBS0015-4.5-□□	0.15	4.5	30	25,465	76	0.015	23,343	70	0.015	21,221	64	0.015	20,160	60	0.0105	19,099	38	0.0075
EMSBS0015-7.5-□□	0.15	7.5	50	20,372	61	0.015	18,674	56	0.015	16,977	51	0.015	16,128	48	0.0105	15,279	31	0.0075
EMSBS0020-2-□□	0.2	2	10	23,873	95	0.02	20,690	83	0.02	19,099	76	0.02	17,507	70	0.014	16,711	50	0.01
EMSBS0020-6-□□	0.2	6	30	23,873	95	0.02	20,690	83	0.02	19,099	76	0.02	17,507	70	0.014	16,711	50	0.01
EMSBS0020-10-□□	0.2	10	50	19,099	76	0.02	16,552	66	0.02	15,279	61	0.02	14,006	56	0.014	13,369	40	0.01
EMSBS0030-3-□□	0.3	3	10	15,915	64	0.03	14,854	59	0.03	13,793	55	0.03	12,732	51	0.021	12,202	37	0.015
EMSBS0030-9-□□	0.3	9	30	15,915	64	0.03	14,854	59	0.03	13,793	55	0.03	12,732	51	0.021	12,202	37	0.015
EMSBS0030-15-□□	0.3	15	50	12,732	51	0.03	11,884	48	0.03	11,035	44	0.03	10,186	41	0.021	9,762	29	0.015
EMSBS0040-4-□□	0.4	4	10	13,528	54	0.04	12,335	49	0.04	11,937	48	0.04	11,539	46	0.028	10,743	43	0.02
EMSBS0040-12-□□	0.4	12	30	13,528	54	0.04	12,335	49	0.04	11,937	48	0.04	11,539	46	0.028	10,743	43	0.02
EMSBS0040-20-□□	0.4	20	50	10,823	43	0.04	9,868	39	0.04	9,549	38	0.04	9,231	37	0.028	8,594	34	0.02
EMSBS0050-5-□□	0.5	5	10	10,823	54	0.05	9,868	49	0.05	9,549	48	0.05	9,231	46	0.035	8,594	43	0.025
EMSBS0050-15-□□	0.5	15	30	10,823	54	0.05	9,868	49	0.05	9,549	48	0.05	9,231	46	0.035	8,594	43	0.025
EMSBS0050-25-□□	0.5	25	50	8,658	43	0.05	7,894	39	0.05	7,639	38	0.05	7,385	37	0.035	6,875	34	0.025
EMSBS0060-6-□□	0.6	6	10	9,019	54	0.06	8,223	49	0.06	7,958	48	0.06	7,692	46	0.042	7,162	43	0.03
EMSBS0060-18-□□	0.6	18	30	9,019	54	0.06	8,223	49	0.06	7,958	48	0.06	7,692	46	0.042	7,162	43	0.03
EMSBS0060-30-□□	0.6	30	50	7,215	43	0.06	6,578	39	0.06	6,366	38	0.06	6,154	37	0.042	5,730	34	0.03
EMSBS0070-7-□□	0.7	7	10	7,730	54	0.07	7,048	49	0.07	6,821	48	0.07	6,594	46	0.049	6,139	43	0.035
EMSBS0070-21-□□	0.7	21	30	7,730	54	0.07	7,048	49	0.07	6,821	48	0.07	6,594	46	0.049	6,139	43	0.035
EMSBS0070-35-□□	0.7	35	50	6,184	43	0.07	5,639	39	0.07	5,457	38	0.07	5,275	37	0.049	4,911	34	0.035
EMSBS0080-8-□□	0.8	8	10	6,764	54	0.08	6,167	49	0.08	5,968	48	0.08	5,769	46	0.056	5,371	43	0.04
EMSBS0080-24-□□	0.8	24	30	6,764	54	0.08	6,167	49	0.08	5,968	48	0.08	5,769	46	0.056	5,371	43	0.04
EMSBS0080-40-□□	0.8	40	50	5,411	43	0.08	4,934	39	0.08	4,775	38	0.08	4,615	37	0.056	4,297	34	0.04
EMSBS0090-9-□□	0.9	9	10	6,013	54	0.09	5,482	49	0.09	5,305	48	0.09	5,128	46	0.063	4,775	43	0.045
EMSBS0090-27-□□	0.9	27	30	6,013	54	0.09	5,482	49	0.09	5,305	48	0.09	5,128	46	0.063	4,775	43	0.045
EMSBS0090-45-□□	0.9	45	50	4,810	43	0.09	4,386	39	0.09	4,244	38	0.09	4,103	37	0.063	3,820	34	0.045
EMSBS0100-10-□□	1	10	10	5,411	54	0.1	4,934	49	0.1	4,775	48	0.1	4,615	46	0.07	4,297	43	0.05
EMSBS0100-30-□□	1	30	30	5,411	54	0.1	4,934	49	0.1	4,775	48	0.1	4,615	46	0.07	4,297	43	0.05
EMSBS0100-50-□□	1	50	50	4,329	43	0.1	3,947	39	0.1	3,820	38	0.1	3,692	37	0.07	3,438	34	0.05

- This standard cutting condition table is intended as reference cutting conditions.
  The conditions should be adjusted as necessary according to the actual conditions of machined shape, purpose, machine used, etc.
- In general, water-soluble or oil-based coolant should be used to ensure chip removal.
- Always use with a G83 program (Peck drilling cycle).
- Under-neck length (ℓ_2) conforms to through-hole drilling depth.
- When drilling through holes, drill the through hole to a depth of between 20% and 30% of the diameter from the tip of the tool.
  Ex.: For work thickness T=4mm and tool= Ø0.5×5mm,
  drilling depth should be 4.14mm (from tip of tool).