

WIDIA™ Victory™ Shoulder Mills
VSM490™ -15 Series
ADVANCES 2015
Metric



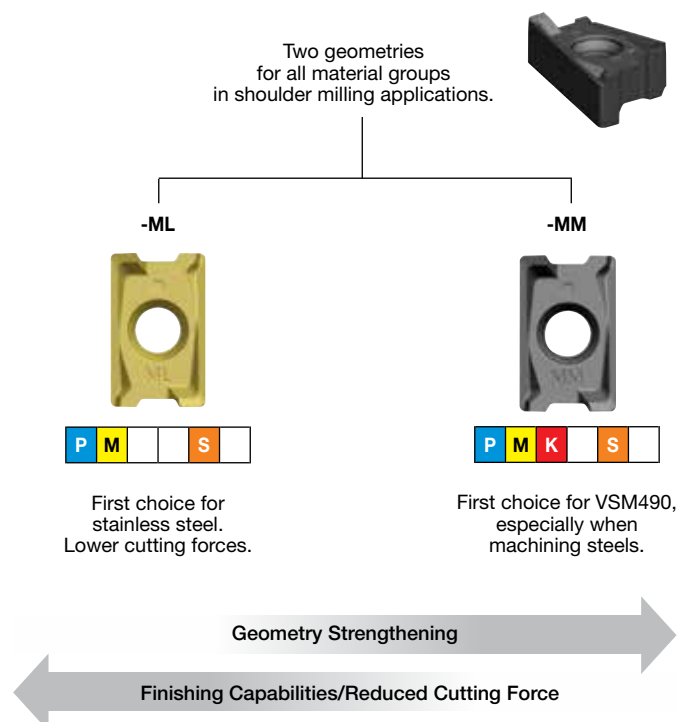
Double-Sided Shoulder Mill • VSM490™-15

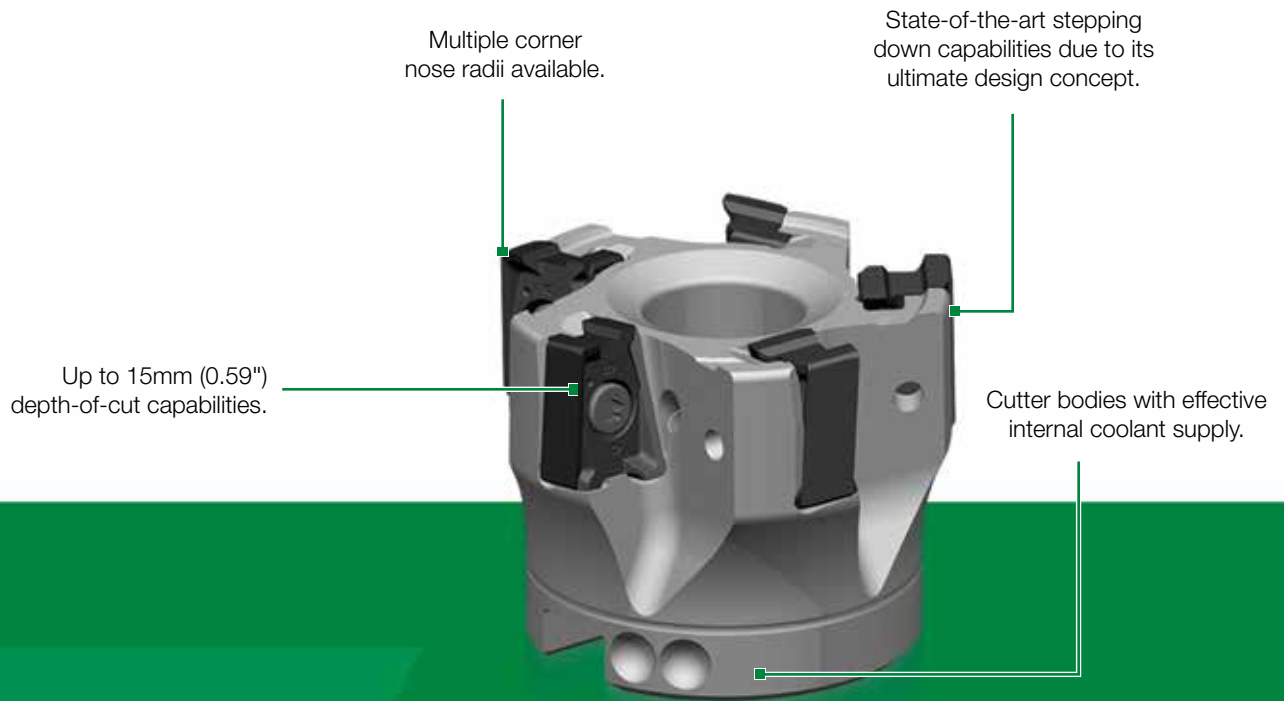
WIDIA™ Victory™ shoulder milling series (VSM series) is especially engineered to achieve excellent surface quality as well as higher material removal rates in shoulder milling applications. The VSM490 series, with its unique design, enables the tool to be applied in multiple passes (stepping down) with outstanding results. VSM490-15 is applicable in a wide range of workpiece materials: steel, cast iron, stainless steel, and titanium, from roughing to finishing applications.

VSM490-15

Features and Benefits

- Double-sided strong insert with 4 cutting edges.
- High positive geometry for lower cutting forces.
- Superior wall and surface finish capabilities.
- “Stepless” solution when using multiple steps.





VSM490™-15 • Unbeatable Performance in Shoulder Milling

- “Stepless” solution.
- No mismatch when machining walls in different steps.

Innovative cutting geometry provides superior wall and surface finish.

Competitor Tool • Wall Quality



Traditional tools are designed to achieve a 90° wall, but exhibit poor performance when machining walls in multiple passes.

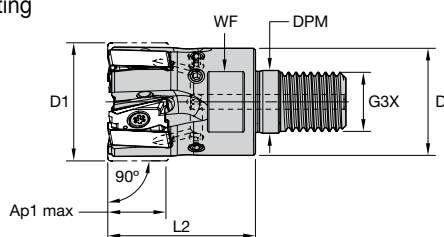
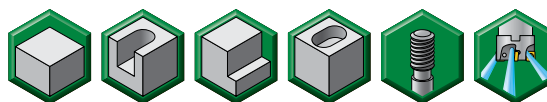
VSM490-15 • Wall Quality



VSM490-15 minimises the marks left. By increasing wall quality and avoiding a second tool, productivity increases significantly.



- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.”



■ Screw-On End Mills

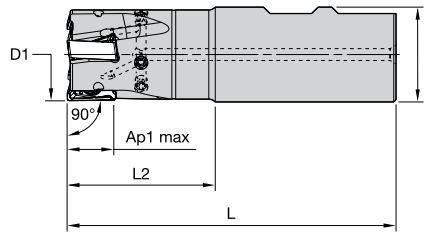
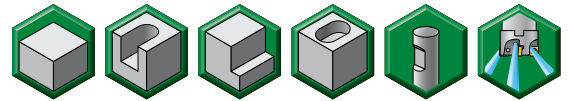
order number	catalogue number	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	kg	max RPM
5873211	VSM490D025Z02M12XN15	25	21	13	M12	32	17	15,0	2	0,18	26700
5873212	VSM490D032Z03M16XN15	32	29	17	M16	40	24	15,0	3	0,18	22000
5873213	VSM490D032Z04M16XN15	32	29	17	M16	40	24	15,0	4	0,18	22000
5873214	VSM490D035Z04M16XN15	35	29	17	M16	40	24	15,0	4	0,19	20600

■ Spare Parts



D1	insert screw	Nm	Torx Plus driver
25	MS-2071	3,5	DT15IP
32	MS-2071	3,5	DT15IP
35	MS-2071	3,5	DT15IP

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- Effective internal coolant feature, reaching the cutting edge precisely.



■ Weldon End Mills

order number	catalogue number	D1	D	L	L2	Ap1 max	Z	kg	max RPM
5710285	VSM490D025Z02B25XN15	25	25	89	32	15,0	2	0,28	26700
5710286	VSM490D032Z03B32XN15	32	32	111	50	15,0	3	0,58	22000
5873215	VSM490D040Z03B32XN15	40	32	111	50	15,0	3	0,65	18800

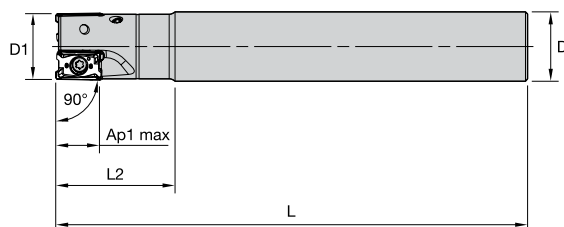
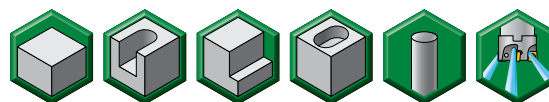
NOTE: Weldon type not recommended for finishing operations.

■ Spare Parts



D1	insert screw	Nm	Torx Plus driver
25	MS-2071	3,5	DT15IP
32	MS-2071	3,5	DT15IP
40	MS-2071	3,5	DT15IP

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- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.



■ Cylindrical End Mills

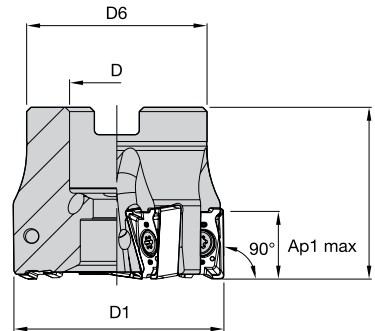
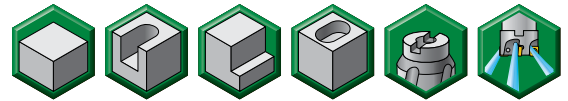
order number	catalogue number	D1	D	L	L2	Ap1 max	Z	kg	max RPM
5873216	VSM490D025Z02A25XN15L100	25	25	100	43	15,0	2	0,32	26700
5710287	VSM490D025Z02A25XN15L170	25	25	170	43	15,0	2	0,59	26700
5873217	VSM490D032Z03A32XN15L110	32	32	110	49	15,0	3	0,59	22000
5710288	VSM490D032Z03A32XN15L200	32	32	200	50	15,0	3	1,14	22000
5873218	VSM490D032Z04A32XN15L110	32	32	110	49	15,0	4	0,58	22000
5873219	VSM490D032Z04A32XN15L200	32	32	200	50	15,0	4	1,14	22000

■ Spare Parts



D1	insert screw	Nm	Torx Plus driver
25	MS-2071	3,5	DT15IP
32	MS-2071	3,5	DT15IP

- Superior wall and surface finish capabilities.
- “Stepless” solution. True 90° to run precise applications in multiple axial passes.
- Strong concept to run up to 15mm (.590") depth of cut.
- Effective internal coolant feature, reaching the cutting edge precisely.



■ Shell Mills

order number	catalogue number	D1	D	D6	L	Ap1 max	Z	kg	max RPM
5710289	VSM490D040Z04S16XN15	40	16	37	40	15,0	4	0,20	18800
5710520	VSM490D040Z05S16XN15	40	16	37	40	15,0	5	0,19	18800
5873221	VSM490D050Z04S22XN15	50	22	42	40	15,0	4	0,28	16300
5710521	VSM490D050Z05S22XN15	50	22	42	40	15,0	5	0,28	16300
5710522	VSM490D050Z06S22XN15	50	22	42	40	15,0	6	0,28	16300
5873222	VSM490D063Z05S22XN15	63	22	50	40	15,0	5	0,50	14200
5710523	VSM490D063Z06S22XN15	63	22	50	40	15,0	6	0,49	14200
5710524	VSM490D063Z07S22XN15	63	22	50	40	15,0	7	0,48	14200
5873223	VSM490D080Z05S27XN15	80	27	60	50	15,0	5	1,03	12300
5710525	VSM490D080Z07S27XN15	80	27	60	50	15,0	7	1,03	12300
5873224	VSM490D080Z09S27XN15	80	27	60	50	15,0	9	1,04	12300
5710526	VSM490D100Z08S32XN15	100	32	80	50	15,0	8	1,61	10900
5873225	VSM490D100Z11S32XN15	100	32	80	50	15,0	11	1,64	10900
5873226	VSM490D125Z09S40XN15	125	40	90	63	15,0	9	2,96	9600
5873227	VSM490D125Z12S40XN15	125	40	90	63	15,0	12	3,11	9600
5873228	VSM490D160Z12S40XN15	160	40	110	63	15,0	12	4,80	8400

■ Spare Parts



D1	insert screw	Nm	Torx Plus driver
40	MS-2071	3,5	DT15IP
50	MS-2071	3,5	DT15IP
63	MS-2071	3,5	DT15IP
80	MS-2071	3,5	DT15IP
100	MS-2071	3,5	DT15IP
125	MS-2071	3,5	DT15IP
160	MS-2071	3,5	DT15IP

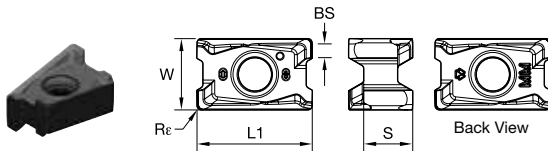
■ Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XNGU-ML	WP40PM	XNPU-ML	WP40PM	XNPU-MM	WP40PM
P3-P4	XNGU-ML	WP25PM	XNPU-MM	WP35CM	XNPU-MM	WP40PM
P5-P6	XNGU-MM	WP25PM	XNPU-MM	WP35CM	XNPU-MM	WP40PM
M1-M2	XNGU-ML	WU35PM	XNGU-ML	WU35PM	XNPU-MM	WU35PM
M3	XNGU-ML	WU35PM	XNGU-ML	WU35PM	XNPU-MM	WU35PM
K1-K2	XNPU-MM	WK15CM	XNPU-MM	WK15CM	XNPU-MM	WK15CM
K3	XNPU-MM	WK15CM	XNPU-MM	WP35CM	XNPU-MM	WP35CM
N1-N2	–	–	–	–	–	–
N3	–	–	–	–	–	–
S1-S2	XNGU-ML	WP25PM	XNGU-ML	WU35PM	XNPU-MM	WU35PM
S3	XNGU-ML	WP25PM	XNGU-ML	WU35PM	XNPU-MM	WU35PM
S4	XNGU-ML	WU35PM	XNGU-ML	WU35PM	XNPU-MM	WU35PM
H1	–	–	–	–	–	–

- -ML geometry is the first choice for machining stainless steel. With reduced cutting forces, this is recommended for improved wall finishing capabilities in steels.
- -MM is the universal geometry for VSM490-15. First choice when machining steel, as well as stainless steel and high-temp alloys in heavy applications.

● first choice
○ alternate choice

P	●	○	○	○	○	○	○
M	●	●	●	●	○	○	○
K	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○



■ XNGU-ML • Precision Finishing

catalogue number	L1	S	W	BS	Rε	cutting edges	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNGU15T604ERML	16,20	6,88	10,00	2,20	0,40	4	-	●	●	●	-	-
XNGU15T608ERML	16,20	6,88	10,00	1,80	0,80	4	-	●	●	●	-	-

■ XNGU-MM • Precision Finishing

catalogue number	L1	S	W	BS	Rε	cutting edges	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNGU15T604SRMM	16,20	6,88	10,00	2,20	0,40	4	-	●	●	●	-	-
XNGU15T608SRMM	16,20	6,88	10,00	1,90	0,80	4	-	●	●	●	-	-

■ XNPU-ML • Utility Roughing

catalogue number	L1	S	W	BS	Rε	cutting edges	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNPU15T608ERML	16,10	6,88	10,00	1,90	0,80	4	-	●	●	●	-	-

■ XNPU-MM • Utility Roughing

catalogue number	L1	S	W	BS	Rε	cutting edges	WK15PM	WP25PM	WU35PM	WP40PM	WK15CM	WP35CM
XNPU15T608SRMM	16,10	6,88	10,00	1,90	0,80	4	●	●	●	●	●	●
XNPU15T612SRMM	16,10	6,88	10,00	1,50	1,20	4	●	●	●	●	●	●
XNPU15T616SRMM	16,10	6,88	10,00	1,10	1,60	4	●	●	●	●	●	●

■ Recommended Starting Speeds [m/min]

Material Group		WK15PM			WP25PM			WU35PM			WP40PM			WK15CM			WP35CM		
P	1	-	-	-	330	285	270	260	230	215	300	260	250	-	-	-	455	395	370
	2	-	-	-	275	240	200	220	190	160	250	220	180	-	-	-	280	255	230
	3	-	-	-	255	215	175	200	170	140	230	200	160	-	-	-	255	230	205
	4	-	-	-	225	185	150	180	150	120	210	170	140	-	-	-	190	175	160
	5	-	-	-	185	170	150	150	135	120	170	160	140	-	-	-	260	230	210
	6	-	-	-	165	125	100	130	100	80	150	120	90	-	-	-	160	135	-
M	1	-	-	-	205	180	165	170	150	135	200	170	160	-	-	-	205	185	155
	2	-	-	-	185	160	130	155	130	110	180	150	130	-	-	-	185	160	140
	3	-	-	-	140	120	95	115	100	80	130	120	90	-	-	-	145	130	115
K	1	270	245	215	230	205	185	-	-	-	-	-	-	420	385	340	295	265	240
	2	210	190	175	180	160	150	-	-	-	-	-	-	335	295	275	235	210	190
	3	175	160	145	150	135	120	-	-	-	-	-	-	280	250	230	195	175	160
N	1-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	40	35	25	35	30	25	40	40	30	-	-	-	-	-	-
	2	-	-	-	40	35	25	35	30	25	40	40	30	-	-	-	-	-	-
	3	-	-	-	50	40	25	45	35	25	50	40	30	-	-	-	-	-	-
	4	-	-	-	70	50	35	60	45	30	70	50	40	-	-	-	-	-	-
H	1	-	-	-	120	90	70	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type.

As the average chip thickness goes higher the speed should be decreased.

Recommended Starting Feeds

■ Recommended Starting Feeds [mm]

Light Machining	General Purpose	Heavy Machining
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Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40–100%			
-ML	0.17	0.33	0.46	0.13	0.24	0.33	0.09	0.18	0.25	0.08	0.16	0.22	0.08	0.14	0.20	-ML
-MM	0.23	0.40	0.64	0.17	0.29	0.46	0.13	0.22	0.35	0.11	0.19	0.30	0.10	0.18	0.28	-MM

NOTE: Use "Light Machining" values as starting feed rate.

VSM490-15 Starter Kits

Order a VSM490 Kit and experience the next level of shoulder milling!

Order one of our starter kits and test the performance of our new VSM490-15 platform. The kits are set up to serve the majority of shoulder milling applications and workpiece materials, delivered with a cutter body as well as 20 inserts from a premium WIDIA™ grade. Detailed order information can be found in the table below.



■ VSM490-15 Starter Kits • Metric

order number	catalogue number	Cutter Diameter/Flutes	Material Group	Application Range	content				
					Cutter	quantity	insert	Grade	quantity
5966234	VSM490KITCD25Z02WP40PM	25z2	P	∇∇	VSM490D025Z02A25XN15L170	1	XNPU15T608SRMM	WP40PM	20
5966235	VSM490KITCD32Z03WP40PM	32z3	P	∇∇	VSM490D032Z03A32XN15L200	1	XNPU15T608SRMM	WP40PM	20
5966236	VSM490KITSD40Z04WP40PM	40z4	P	∇∇	VSM490D040Z04S16XN15	1	XNPU15T608SRMM	WP40PM	20
5966237	VSM490KITSD50Z05WP40PM	50z5	P	∇∇	VSM490D050Z05S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966238	VSM490KITSD50Z06WP40PM	50z6	P	∇∇	VSM490D050Z06S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966239	VSM490KITSD63Z06WP40PM	63z6	P	∇∇	VSMv490D063Z06S22XN15	1	XNPU15T608SRMM	WP40PM	20
5966240	VSM490KITSD80Z07WP40PM	80z7	P	∇∇	VSM490D080Z07S27XN15	1	XNPU15T608SRMM	WP40PM	20
5966251	VSM490KITSD100Z08WP40PM	100z8	P	∇∇	VSM490D100Z08S32XN15	1	XNPU15T608SRMM	WP40PM	20
5966252	VSM490KITCD25Z02WU35PM	25z2	M+S	∇∇∇	VSM490D025Z02A25XN15L170	1	XNGU15T608ERML	WU35PM	20
5966253	VSM490KITCD32Z03WU35PM	32z3	M+S	∇∇∇	VSM490D032Z03A32XN15L200	1	XNGU15T608ERML	WU35PM	20
5966255	VSM490KITSD40Z04WU35PM	40z4	M+S	∇∇∇	VSM490D040Z04S16XN15	1	XNGU15T608ERML	WU35PM	20
5966256	VSM490KITSD50Z05WU35PM	50z5	M+S	∇∇∇	VSM490D050Z05S22XN15	1	XNGU15T608ERML	WU35PM	20
5966257	VSM490KITSD50Z06WU35PM	50z6	M+S	∇∇∇	VSM490D050Z06S22XN15	1	XNGU15T608ERML	WU35PM	20
5966258	VSM490KITSD63Z06WU35PM	63z6	M+S	∇∇∇	VSM490D063Z06S22XN15	1	XNGU15T608ERML	WU35PM	20
5966259	VSM490KITSD80Z07WU35PM	80z7	M+S	∇∇∇	VSM490D080Z07S27XN15	1	XNGU15T608ERML	WU35PM	20
5966260	VSM490KITCD25Z02WK15PM	25z2	K	∇	VSM490D025Z02A25XN15L170	1	XNPU15T608SRMM	WK15PM	20
5966261	VSM490KITCD32Z03WK15PM	32z3	K	∇	VSM490D032Z03A32XN15L200	1	XNPU15T608SRMM	WK15PM	20
5966262	VSM490KITSD40Z04WK15PM	40z4	K	∇	VSM490D040Z04S16XN15	1	XNPU15T608SRMM	WK15PM	20
5966263	VSM490KITSD50Z05WK15PM	50z5	K	∇	VSM490D050Z05S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966264	VSM490KITSD50Z06WK15PM	50z6	K	∇	VSM490D050Z06S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966265	VSM490KITSD63Z07WK15PM	63z7	K	∇	VSM490D063Z07S22XN15	1	XNPU15T608SRMM	WK15PM	20
5966266	VSM490KITSD80Z09WK15PM	80z9	K	∇	VSM490D080Z09S27XN15	1	XNPU15T608SRMM	WK15PM	20
5966267	VSM490KITSD100Z11WK15PM	100z11	K	∇	VSM490D100Z11S32XN15	1	XNPU15T608SRMM	WK15PM	20

∇ Heavy/Roughing
∇∇ Medium
∇∇∇ Light machining/Finishing

WIDIA™ Victory™ Shoulder Mills

VSM490™-15 Series

ADVANCES 2015

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