



End Mill for Titanium Alloy

# UVX-TI-SERIES

Volume 3



# KEY FEATURES: OSG END MILL FOR TITANIUM ALLOY



**1** Unequal spacing, variable lead  
Superior suppression of vibration

**2** Available in 4 or 5 flutes

**3** Optimal flute shape  
Smooth evacuation of chips

**4** Web Taper  
High efficient milling is achieved  
by increasing rigidity

# UVX + SAFE-LOCK™ -THE PULL OUT PROTECTION

The unique Safe-Lock™ design in cutting tools and tool holders combines a high precision press fit clamping with a positive form locking mechanism. This prevents round cutting tools from being rotated or completely pulled out from its tool holder during heavy machining. The combination of symmetrical pull out protection, highest concentricity and excellent balance of the Safe-Lock™ system, results in a vibration free machining process. This leads to a more efficient metal removal rate, that is superior when compared to conventional Milling chucks or Weldon shanked cutting tools and tool holders.



## The Safe-Lock™ design is now available on the UVX end mill series.

- For High Performance Cutting (HPC)
- Highly accurate clamping due to shrink fit technology
- High torque due to form closed clamping
- No loss of accuracy
- No pull out of the tool
- No spinning of the tool
- No damages on work piece or machine
- Groove on tool shank is directed so that tool will be pulled into the chuck (depending on direction of rotation)



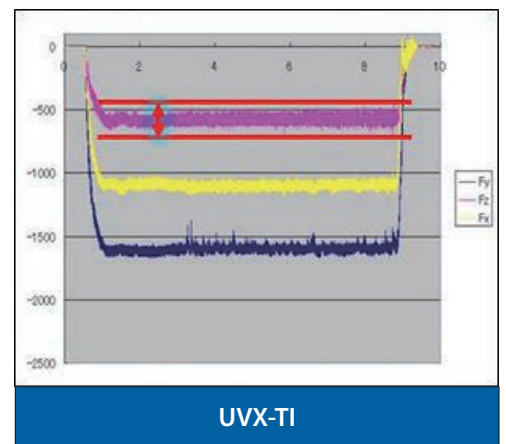
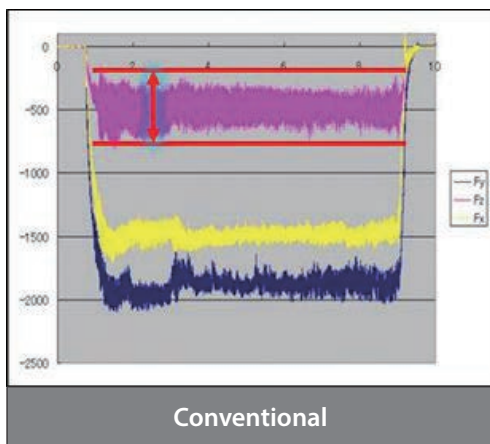
## Milling Method and Features

Stable and high efficiency milling of titanium alloy is now possible! UVX series offers solutions for slot milling to easily chatter complicated pocket milling.

	Feature	Slot Milling	Side Milling	
			Depth under 3D	Depth over 3D, under 5D
UVX-TI-5FL	Multi-purpose short type, 5FL	○	⊙	×
UVXL-TI-5FL	High efficient long type, 5FL	△	⊙	⊙

⊙ Best ○ Good × Not recommended △ Fair

Stable high feed milling is achieved by suppressing vibration with high rigidity



## Pocket Milling of UVX(L)-TI-5FL

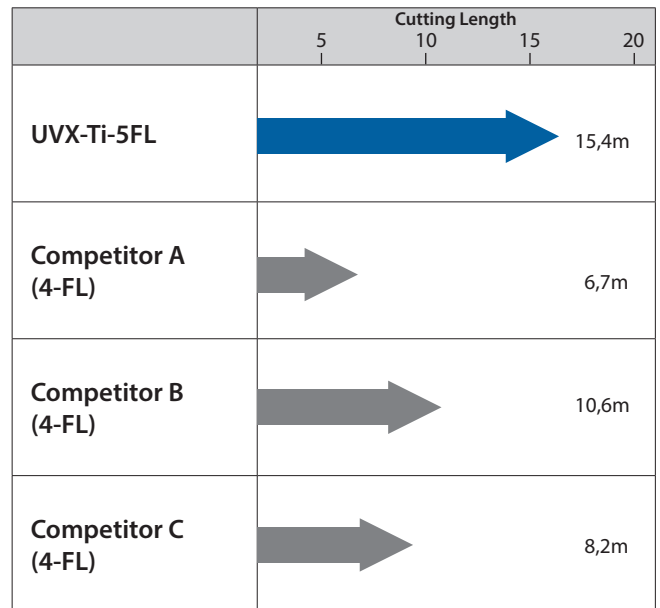
The UVX-TI Series can finish wall surfaces with single cutting and offers a seamless, beautiful cutting surface, thanks to vibration-free cutting

Tool	UVX-TI-5FL	UVXL-TI-5FL
Size	∅ 16 X R3	∅ 12 X R1
Work Material	Ti-6Al-4V	
Cutting Speed	55 m/min (1.100 min <sup>-1</sup> )	70 m/min (1.850 min <sup>-1</sup> )
Feed Rate	550 mm/min (0,1 mm/t)	650 m/min (0.07 min <sup>-1</sup> )
Milling Method	Pocket Milling	
Depth of Cut	ap=16 mm ae=9,6 mm	ap=45 mm ae=0,2 mm
M.R.R.	85 cm <sup>3</sup> /min	6 cm <sup>3</sup> /min
Coolant	Water Soluble	
Overhang Length	50 mm	
Machine	5-axis Machining Center (HSK-A63)	

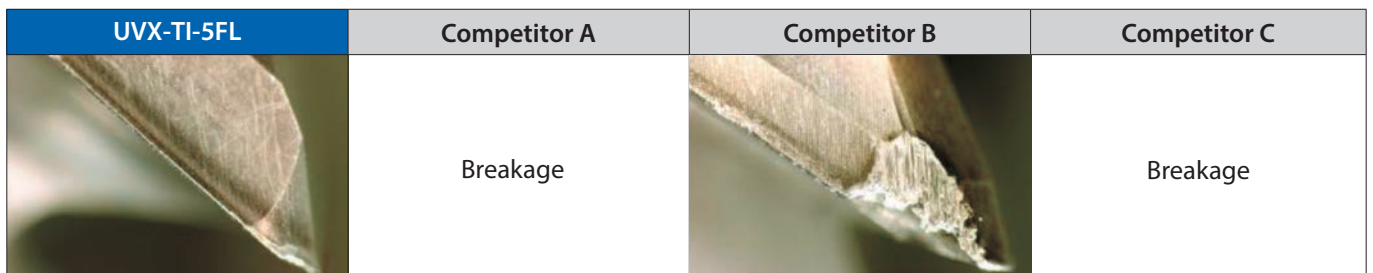


## Long Tool Life of UVX-TI-5FL

Tool	UVX-TI-5FL Ø 12 X R 1
Work Material	Ti-6Al-4V (35HRC)
Cutting Speed	100 m/min (2.500 min <sup>-1</sup> )
Feed Rate	625 mm/min (0,05 mm/t)
Milling Method	Side Milling
Depth of Cut	ap=6,35 mm (0,5D) ae=3,81 mm (0,3D)
Coolant	Water Soluble
Machine	Vertical Machining Center (BT40)



## After 10,5m of Milling



The UVX-TI-5FL has outstanding resistance against fracture and can cut materials with excellent stability.

## UVXL-TI-5FL Superior efficiency of side milling

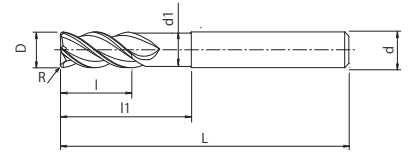
	General cutting condition	Condition with max. feed rate
Tool	UVXL-TI-5FL Ø 12 X R 1	
Work Material	Ti-6Al-4V (32HRC)	
Cutting Speed	70 m/min (1.857 min <sup>-1</sup> )	70 m/min (1.857 min <sup>-1</sup> )
Feed Rate	1.114 mm/min (0,12 mm/t)	3.157 mm/min (0,34 mm/t)
Milling Method	Side Milling	
Depth of Cut	ap=0,48 mm ae=1,2 mm	
M.R.R.	64cm <sup>3</sup> /min	182cm <sup>3</sup> /min
Coolant	Water Soluble	
Machine	Horizontal Machining Center (BT40)	
Holder	Shrink Holder	



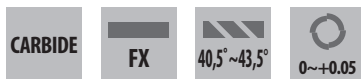
Deep side milling of titanium alloy with UVXL-TI-5FL Ø12. Under the cutting cond. of maximized feed rate, astounding result of M.R.R. = 182 cm<sup>3</sup>/min and fz=0.34 mm/t were achieved.

# UVX-TI-4FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 4 flutes, variable helix and unequal spacing, also with corner radius



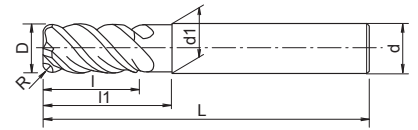
Milling | Solid carbide

EDP	Z	D	R	L	l	l1	d	d1	Price
8555120	4	12	-	90	24	36	12	11,5	
8555121	4	12	1	90	24	36	12	11,5	
8555122	4	12	1,5	90	24	36	12	11,5	
8555123	4	12	2	90	24	36	12	11,5	
8555124	4	12	2,5	90	24	36	12	11,5	
8555125	4	12	3	90	24	36	12	11,5	
8555126	4	12	4	90	24	36	12	11,5	
8555160	4	16	-	100	32	48	16	15,5	
8555161	4	16	1	100	32	48	16	15,5	
8555162	4	16	1,5	100	32	48	16	15,5	
8555163	4	16	2	100	32	48	16	15,5	
8555164	4	16	2,5	100	32	48	16	15,5	
8555165	4	16	3	100	32	48	16	15,5	
8555166	4	16	4	100	32	48	16	15,5	
8555200	4	20	-	120	40	60	20	19,5	
8555201	4	20	1	120	40	60	20	19,5	
8555202	4	20	1,5	120	40	60	20	19,5	
8555203	4	20	2	120	40	60	20	19,5	
8555204	4	20	2,5	120	40	60	20	19,5	
8555205	4	20	3	120	40	60	20	19,5	
8555206	4	20	4	120	40	60	20	19,5	
8555207	4	20	5	120	40	60	20	19,5	
8555250	4	25	-	140	50	75	25	24,5	
8555251	4	25	1	140	50	75	25	24,5	
8555252	4	25	1,5	140	50	75	25	24,5	
8555253	4	25	2	140	50	75	25	24,5	
8555254	4	25	2,5	140	50	75	25	24,5	
8555255	4	25	3	140	50	75	25	24,5	
8555256	4	25	4	140	50	75	25	24,5	
8555257	4	25	5	140	50	75	25	24,5	
8555258	4	25	6	140	50	75	25	24,5	

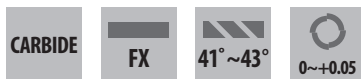


# UVX-TI-5FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, variable helix and unequal spacing, also with corner radius



Milling | Solid carbide

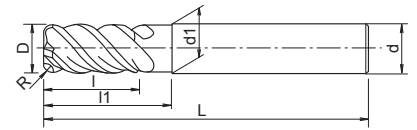
EDP	Z	D	R	L	l	l1	d	d1	Price
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8555321	5	12	1	90	24	36	12	11,5	
8555322	5	12	1,5	90	24	36	12	11,5	
8555323	5	12	2	90	24	36	12	11,5	
8555324	5	12	2,5	90	24	36	12	11,5	
8555325	5	12	3	90	24	36	12	11,5	
8555326	5	12	4	90	24	36	12	11,5	
8555360	5	16	-	100	32	48	16	15,5	
8555361	5	16	1	100	32	48	16	15,5	
8555362	5	16	1,5	100	32	48	16	15,5	
8555363	5	16	2	100	32	48	16	15,5	
8555364	5	16	2,5	100	32	48	16	15,5	
8555365	5	16	3	100	32	48	16	15,5	
8555366	5	16	4	100	32	48	16	15,5	
8555400	5	20	-	120	40	60	20	19,5	
8555401	5	20	1	120	40	60	20	19,5	
8555402	5	20	1,5	120	40	60	20	19,5	
8555403	5	20	2	120	40	60	20	19,5	
8555404	5	20	2,5	120	40	60	20	19,5	
8555405	5	20	3	120	40	60	20	19,5	
8555406	5	20	4	120	40	60	20	19,5	
8555407	5	20	5	120	40	60	20	19,5	
8555450	5	25	-	140	50	75	25	24,5	
8555451	5	25	1	140	50	75	25	24,5	
8555452	5	25	1,5	140	50	75	25	24,5	
8555453	5	25	2	140	50	75	25	24,5	
8555454	5	25	2,5	140	50	75	25	24,5	
8555455	5	25	3	140	50	75	25	24,5	
8555456	5	25	4	140	50	75	25	24,5	
8555457	5	25	5	140	50	75	25	24,5	
8555458	5	25	6	140	50	75	25	24,5	



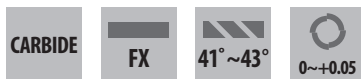


# UVX-TI-5FL SAFE-LOCK®

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, variable helix and unequal spacing, also with corner radius
- SafeLock shank

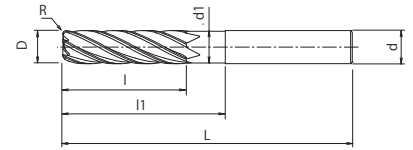


Milling | Solid carbide

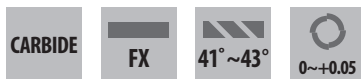
EDP	Z	D	R	L	l	l1	d	d1	Price
48247120	5	12	-	90	24	36	12	11,5	
8555670	5	12	1	90	24	36	12	11,5	
48247123	5	12	1,5	90	24	36	12	11,5	
48247124	5	12	2	90	24	36	12	11,5	
48247125	5	12	2,5	90	24	36	12	11,5	
8555671	5	12	3	90	24	36	12	11,5	
48247127	5	12	4	90	24	36	12	11,5	
48247160	5	16	-	100	32	48	16	15,5	
8555672	5	16	1	100	32	48	16	15,5	
48247163	5	16	1,5	100	32	48	16	15,5	
48247164	5	16	2	100	32	48	16	15,5	
48247165	5	16	2,5	100	32	48	16	15,5	
8555673	5	16	3	100	32	48	16	15,5	
48247167	5	16	4	100	32	48	16	15,5	
48247200	5	20	-	120	40	60	20	19,5	
8555674	5	20	1	120	40	60	20	19,5	
48247203	5	20	1,5	120	40	60	20	19,5	
48247204	5	20	2	120	40	60	20	19,5	
48247205	5	20	2,5	120	40	60	20	19,5	
8555675	5	20	3	120	40	60	20	19,5	
48247207	5	20	4	120	40	60	20	19,5	
8555676	5	20	5	120	40	60	20	19,5	
48247250	5	25	-	140	50	75	25	24,5	
8555677	5	25	1	140	50	75	25	24,5	
48247253	5	25	1,5	140	50	75	25	24,5	
48247254	5	25	2	140	50	75	25	24,5	
48247255	5	25	2,5	140	50	75	25	24,5	
8555678	5	25	3	140	50	75	25	24,5	
48247257	5	25	4	140	50	75	25	24,5	
8555679	5	25	5	140	50	75	25	24,5	
48247259	5	25	6	140	50	75	25	24,5	

# UVXL-TI-5FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, long length of cut, variable helix and unequal spacing, also with corner radius



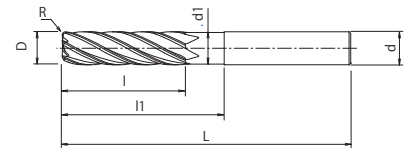
EDP	Z	D	R	L	l	l1	d	d1	Price
8555520	5	12	-	110	48	60	12	11,5	
8555521	5	12	1	110	48	60	12	11,5	
8555522	5	12	1,5	110	48	60	12	11,5	
8555523	5	12	2	110	48	60	12	11,5	
8555524	5	12	2,5	110	48	60	12	11,5	
8555525	5	12	3	110	48	60	12	11,5	
8555526	5	12	4	110	48	60	12	11,5	
8555560	5	16	-	130	64	80	16	15,5	
8555561	5	16	1	130	64	80	16	15,5	
8555562	5	16	1,5	130	64	80	16	15,5	
8555563	5	16	2	130	64	80	16	15,5	
8555564	5	16	2,5	130	64	80	16	15,5	
8555565	5	16	3	130	64	80	16	15,5	
8555566	5	16	4	130	64	80	16	15,5	
8555600	5	20	-	160	80	100	20	19,5	
8555601	5	20	1	160	80	100	20	19,5	
8555602	5	20	1,5	160	80	100	20	19,5	
8555603	5	20	2	160	80	100	20	19,5	
8555604	5	20	2,5	160	80	100	20	19,5	
8555605	5	20	3	160	80	100	20	19,5	
8555606	5	20	4	160	80	100	20	19,5	
8555607	5	20	5	160	80	100	20	19,5	
8555650	5	25	-	190	100	125	25	24,5	
8555651	5	25	1	190	100	125	25	24,5	
8555652	5	25	1,5	190	100	125	25	24,5	
8555653	5	25	2	190	100	125	25	24,5	
8555654	5	25	2,5	190	100	125	25	24,5	
8555655	5	25	3	190	100	125	25	24,5	
8555656	5	25	4	190	100	125	25	24,5	
8555657	5	25	5	190	100	125	25	24,5	
8555658	5	25	6	190	100	125	25	24,5	

Milling | Solid carbide

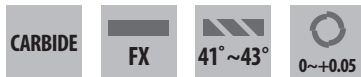


# UVXL-TI-5FL SAFE-LOCK®

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, long length of cut, variable helix and unequal spacing, also with corner radius
- SafeLock shank



Milling | Solid carbide

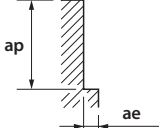
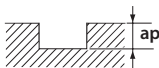
EDP	Z	D	R	L	l	l1	d	d1	Price
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8555680	5	12	1	110	48	60	12	11,5	
48248123	5	12	1,5	110	48	60	12	11,5	
48248124	5	12	2	110	48	60	12	11,5	
48248125	5	12	2,5	110	48	60	12	11,5	
8555681	5	12	3	110	48	60	12	11,5	
48248127	5	12	4	110	48	60	12	11,5	
48248160	5	16	-	130	64	80	16	15,5	
8555682	5	16	1	130	64	80	16	15,5	
48248163	5	16	1,5	130	64	80	16	15,5	
48248164	5	16	2	130	64	80	16	15,5	
48248165	5	16	2,5	130	64	80	16	15,5	
8555683	5	16	3	130	64	80	16	15,5	
48248167	5	16	4	130	64	80	16	15,5	
48248200	5	20	-	160	80	100	20	19,5	
8555684	5	20	1	160	80	100	20	19,5	
48248203	5	20	1,5	160	80	100	20	19,5	
48248204	5	20	2	160	80	100	20	19,5	
48248205	5	20	2,5	160	80	100	20	19,5	
8555685	5	20	3	160	80	100	20	19,5	
48248207	5	20	4	160	80	100	20	19,5	
8555686	5	20	5	160	80	100	20	19,5	
48248250	5	25	-	190	100	125	25	24,5	
8555687	5	25	1	190	100	125	25	24,5	
48248253	5	25	1,5	190	100	125	25	24,5	
48248254	5	25	2	190	100	125	25	24,5	
48248255	5	25	2,5	190	100	125	25	24,5	
8555688	5	25	3	190	100	125	25	24,5	
48248257	5	25	4	190	100	125	25	24,5	
8555689	5	25	5	190	100	125	25	24,5	
48248259	5	25	6	190	100	125	25	24,5	

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

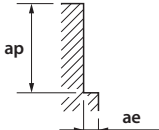
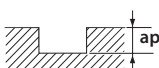
## UVX-TI-4FL / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

	Side milling		Slotting							
Vc	60 ~ 80 m/min		30 ~ 50 m/min							
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)						
12	1.900	680	1.350	270						
16	1.400	500	990	200						
20	1.100	480	800	190						
25	900	400	640	150						
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,8 Dc</td> <td>0,2 Dc</td> </tr> </table>	ap	ae	≤ 1,8 Dc	0,2 Dc		<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>≤ 1 Dc</td> </tr> </table>	ap	≤ 1 Dc
ap	ae									
≤ 1,8 Dc	0,2 Dc									
ap										
≤ 1 Dc										

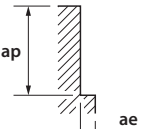
## UVX-TI-5FL / UVX-TI-5FL-HB / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

	Side milling		Slotting							
Vc	60 ~ 80 m/min		30 ~ 50 m/min							
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)						
12	1.900	855	1.350	340						
16	1.400	630	990	250						
20	1.100	600	800	240						
25	900	500	640	192						
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,8 Dc</td> <td>0,2 Dc</td> </tr> </table>	ap	ae	≤ 1,8 Dc	0,2 Dc		<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>≤ 1 Dc</td> </tr> </table>	ap	≤ 1 Dc
ap	ae									
≤ 1,8 Dc	0,2 Dc									
ap										
≤ 1 Dc										

## UVXL-TI-5FL / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

	Side milling					
Vc	60 ~ 80 m/min					
Ø	S (min <sup>-1</sup> )	F (mm/min)				
12	2.100	1.050				
16	1.600	920				
20	1.270	760				
25	1.020	587				
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 3,75 Dc</td> <td>0,1 Dc</td> </tr> </table>	ap	ae	≤ 3,75 Dc	0,1 Dc
ap	ae					
≤ 3,75 Dc	0,1 Dc					

Milling | Endmills



Cutting conditions

## SWEDEN

Branch office of OSG SCANDINAVIA  
Abrahams Gränd 8  
295 35 Bromölla  
Sweden  
Tel: +46 40 41 22 55  
Fax: +46 40 41 32 55  
osg@osg-scandinavia.com

## OSG SCANDINAVIA

(For Scandinavian countries)  
Langebjergvaenget 16  
4000 Roskilde  
Denmark  
Tel.: +45 46 75 65 55  
Fax: +45 46 75 67 00  
osg@osg-scandinavia.com

## OSG NETHERLANDS

Bedrijfsweg 5 - 3481 MG Harmelen  
Postbus 50 - 3480 DB Harmelen  
The Netherlands  
Tel.: +31 348 44 2764  
Fax: +31 348 44 2144  
info@osg-nl.com

## OSG UK

Shelton house, 5 Bentalls  
Pipps Hill Ind Est, Basildon Essex SS14 3BY  
United Kingdom  
Tel.: +44 845 305 1066  
Fax: +44 845 305 1067  
sales@osg-uk.com

## OSG EUROPE LOGISTICS

Avenue Lavoisier 1  
B-1300 Z.I. Wavre - Nord  
Belgium  
Tel.: +32 10 23 05 07  
Fax: +32 10 23 05 11  
info@osgeurope.com

## OSG BELUX

Avenue Lavoisier 1  
B-1300 Z.I. Wavre - Nord  
Belgium  
Tel.: +32 10 23 05 11  
Fax: +32 10 23 05 31  
info@osg-belgium.com

## OSG IBERICA

Bekolarra 4  
E - 01010 Vitoria-Gasteiz  
Spain  
Tel.: +34 945 242 400  
Fax: +34 945 228 883  
osg.iberica@osg-ib.com

## OSG FRANCE

Parc Icade, Paris Nord 2  
Immeuble "Le Rimbaud"  
22 Avenue des Nations  
CS66191 - 93420 Villepinte  
France  
Tel.: +33 1 49 90 10 10  
Fax: +33 1 49 90 10 15  
sales@osg-france.com





#### SLOVAKIA

Branch office of OSG Belgium s.a.  
Tel: +32 10 23 05 04  
Fax: +32 10 23 05 31  
info@osg-belgium.com

#### OSG POLAND

Spółdzielcza 57  
05-074 Halinów  
Poland

#### OSG RUSSIA

Butlerova street, 17B, office 5069  
117342 Moscow  
Russia  
Tel: +7 (495) 150 41 54  
info@osg-russia.com

#### ROMSAN INTERNATIONAL CO. SRL

Reprezentant Exclusiv OSG  
23-25, Nerva Traian Street  
031044 Bucuresti  
România  
Tel: +40 021 322 07 47  
Fax: +40 021 321 56 00  
romsan.int@romsan.ro

#### OSG TURKEY

Rami Kişla Cad.No:56 Eyüp  
Istanbul 34056  
Turkey  
Tel:+90 212 565 24 00  
Fax: +90 212 565 44 00  
info@osg-turkey.com

#### OSG ITALIA

Via Cirenaiica n. 52 int. 61/63  
I - 10142 Torino  
Italy  
Tel.: +39 0117705211  
Fax: +39 0117071402  
info@osg-italia.it

#### OSG GERMANY

Karl-Ehmann-Str. 25  
D - 73037 Göppingen  
Germany  
Tel.: +49 7161 6064 - 0  
Fax: +49 7161 6064 - 444  
info@osg-germany.de



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#### **OSG EUROPE LOGISTICS**

Avenue Lavoisier 1  
B-1300 Z.I. Wavre - Nord - Belgium  
Tel: +32 10 23 05 07  
Fax: +32 10 23 05 51  
info@osgeurope.com

#### **OSG BELUX**

Avenue Lavoisier 1  
B-1300 Z.I. Wavre - Nord - Belgium  
Tel: +32 10 23 05 11  
Fax: +32 10 23 05 31  
info@osg-belgium.com

#### **OSG FRANCE**

Parc Icade, Paris Nord 2  
Immeuble "Le Rimbaud"  
22 Avenue des Nations  
CS66191 - 93420 Villepinte - France  
Tel: +33 1 49 90 10 10  
Fax: +33 1 49 90 10 15  
sales@osg-france.com

#### **OSG NETHERLANDS**

Bedrijfsweg 5 - 3481 MG Harmelen  
Tel: +31 348 44 2764  
Fax: +31 348 44 2144  
info@osg-nl.com

#### **OSG UK**

Shelton house, 5 Bentalls  
Pipps Hill Ind Est, Basildon Essex SS14 3BY  
Tel: +44 845 305 1066  
Fax: +44 845 305 1067  
sales@osg-uk.com

#### **SLOVAKIA**

Branch office of OSG Europe Logistics s.a.  
Tel (SK) +421 2 4329 1295  
Tel (BE) +32 10 23 05 07  
Fax (BE) +32 10 23 05 51  
sales-osgsvk@osgeurope.com

#### **OSG POLAND Sp. z.o.o.**

Spółdzielcza 57  
05-074 Halinów - Poland  
Tel: +22 760 82 71  
Fax: +22 760 82 71  
osg@osg-poland.com

#### **OSG GERMANY**

Karl-Ehmann-Str. 25  
D - 73037 Göppingen - Germany  
Tel: +49 7161 6064 - 0  
Fax: +49 7161 6064 - 444  
info@osg-germany.de

#### **OSG SCANDINAVIA**

(For Scandinavian countries)  
Langebjergvaenget 16  
4000 Roskilde - Denmark  
Tel: +45 46 75 65 55  
Fax: +45 46 75 67 00  
osg@osg-scandinavia.com

#### **SWEDEN**

Branch office of OSG SCANDINAVIA  
Abrahams Gränd 8  
295 35 Bromölla - Sweden  
Tel: +46 40 41 22 55  
Fax: +46 40 41 32 55  
osg@osg-scandinavia.com

#### **OSG IBERICA**

Bekolarra 4  
E - 01010 Vitoria-Gasteiz - Spain  
Tel: +34 945 242 400  
Fax: +34 945 228 883  
osg.iberica@osg-ib.com

#### **RUSSIA**

Butlerova street, 17B, office 5069  
117342 Moscow - Russia  
Tel: +7 (495) 150 41 54  
info@osg-russia.com

#### **OSG TURKEY**

Rami Kişla Cad.No:56 Eyüp  
Istanbul 34056 - Turkey  
Tel:+90 212 565 24 00  
Fax: +90 212 565 44 00  
info@osg-turkey.com

#### **ROMSAN INTERNATIONAL CO. SRL**

Reprezentant Exclusiv OSG  
23-25, Nerva Traian Street  
031044 Bucuresti - România  
Tel: +40 021 322 07 47  
Fax: +40 021 321 56 00  
romsan.int@romsan.ro

#### **AUSTRIA**

Branch office of OSG GERMANY  
Messestraße 11  
A-6850 Dornbirn  
Tel: +49 7161 6064-0  
Fax: +49 7161 6064-444  
info@osg-germany.de

#### **OSG ITALIA**

Via Cirenaiica n. 52 int. 61/63  
I - 10142 Torino - Italy  
Tel: +39 0117705211  
Fax: +39 0117071402  
info@osg-italia.it

#### **Vischer & Bolli AG**

Im Schossacher 17  
CH-8600 Dübendorf  
Schweiz  
Tel.: +41 44 802 15 15  
Fax: +41 44 802 15 95  
info@vb-tools.com

#### **OSG EUROPE LOGISTICS S.A.**

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