

Advanced
Engineering

Hitachi Tool

HITACHI
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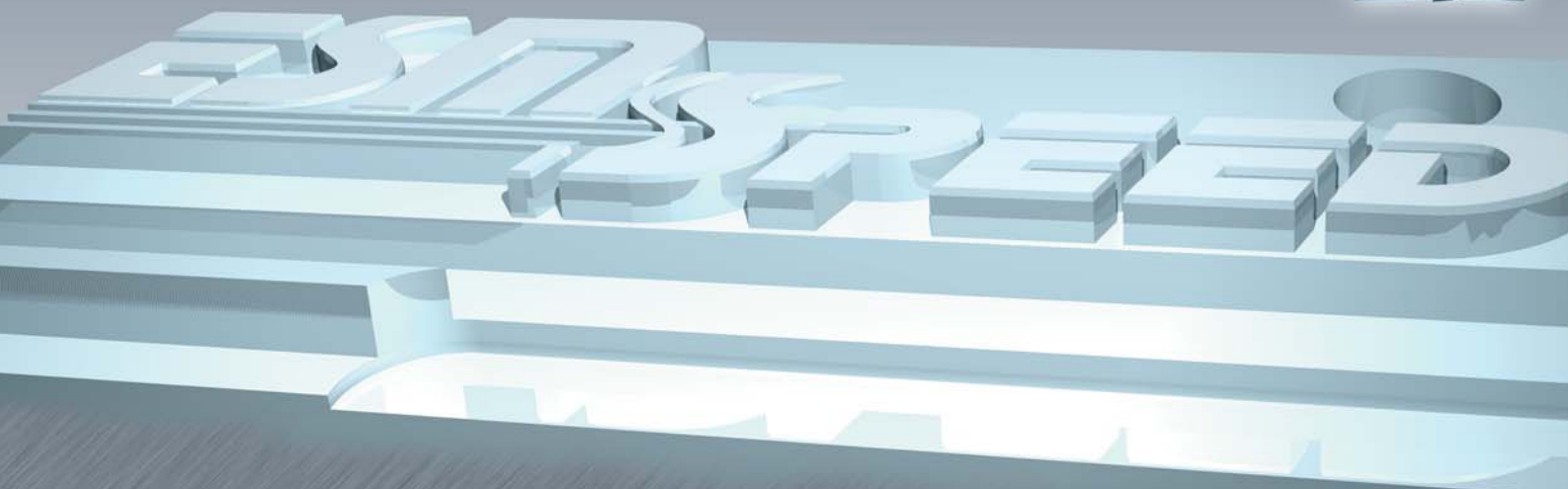
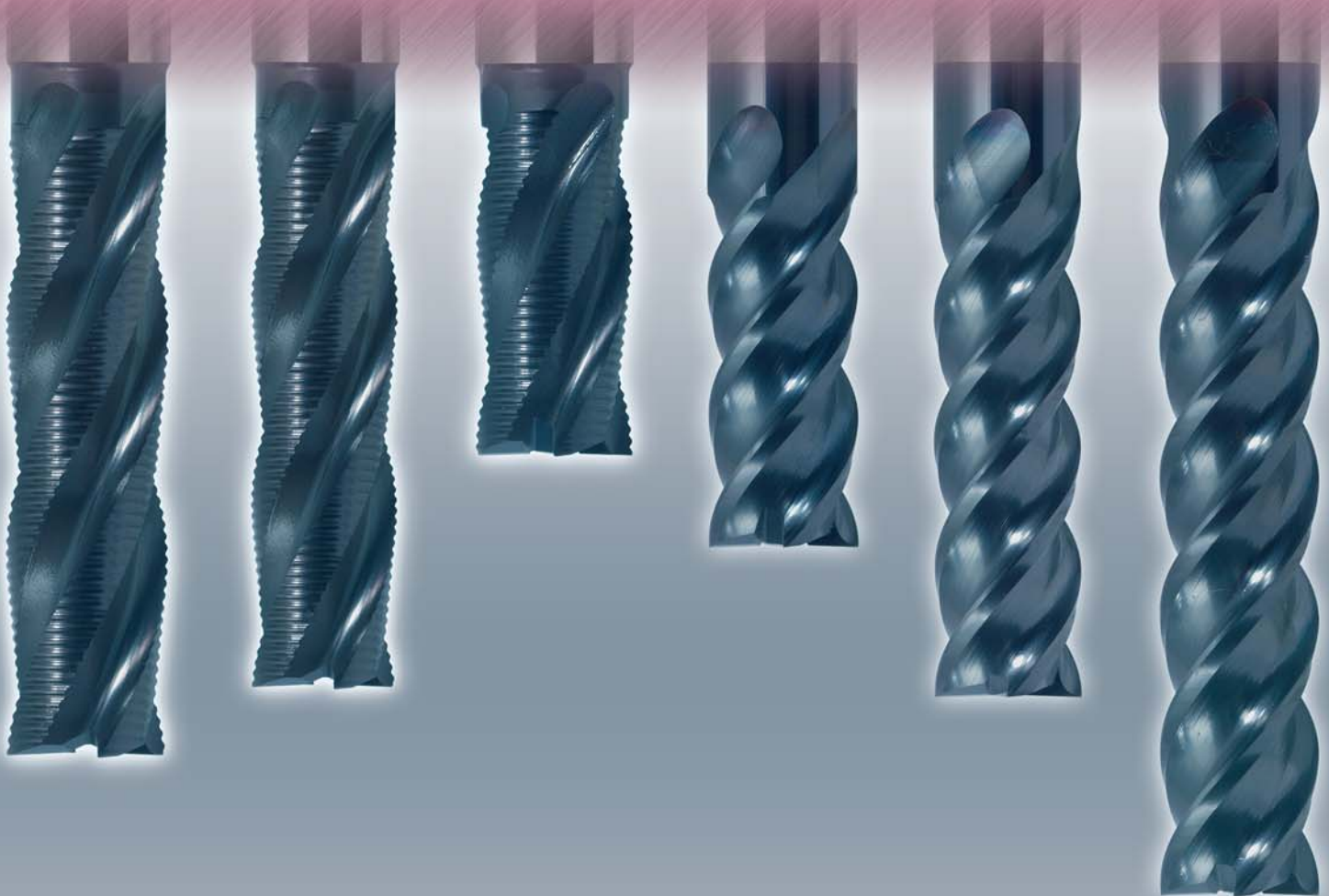
ESN
SPEED

No. 504.2

Powder Steel End Mills

HITACHI Standard & Weldon DIN1835B

Century-Coating



© Hitachi Tool Engineering Europe GmbH



SPEED END MILLS MADE OF ESM-POWDERSTEEL **Substrate "ESM"**

ESM is a sintered powder metallurgy H.S.S. which combines the features of toughness from H.S.S. and hardness from cemented carbide.

Alloying elements contribute properties that increase the cutting tool performance.

Result in comparison with HSS-E 8%Co :

- 1 - **20%** **higher** cutting speed
- 2 - **100%** **higher** cutting feed
- 3 - **Up to 70%** **longer** tool life

CENTURY Coating is a multi-layer PVD coating process which improves cutter performance even further by :

Increasing surface Hardness	3300 HV
Raises the Oxidation temperature	850° C
Reduces coefficient of friction	0.25 µm
Maintains a coating thickness to retain sharp edges	3 – 5 µm

SPEED FRÄSER AUS ESM-PULVERSTAHL **Grundmaterial "ESM"**

ESM ist ein Pulverstahl mit den wichtigsten Eigenschaften von HSS-E und gesintertem Hartmetall.

Erhöhte Legierungsanteile mit verbessertem Resultat.

Ergebnis im Vergleich zu HSS-E 8%Co :

- 1 - **20%** **gesteigerte** Schnittgeschwindigkeit
- 2 - **100%** **gesteigerte** Vorschübe
- 3 - **Bis zu 70%** **längere** Standzeiten

CENTURY Beschichtung ist eine Multi-PVD-Schicht mit folgenden Eigenschaften :

Gesteigerte Oberflächenhärte	3300 HV
Gesteigerte Oxidationstemperatur	850° C
Reduzierter Reibungskoeffizient	0,25 µm
Geringere Kantenverrundung bei gleichbleibender Schichtdicke	3 – 5 µm

FRESAS SPEED EN ACERO SINTERIZADO ESM **Substrato "ESM"**

ESM es un HSS (acero rápido) sinterizado que combina la tenacidad del HSS y la dureza metal duro.

La aleación de elementos confiere propiedades que aumentan las prestaciones de la herramienta.

Resultados comparados con el HSS-E 8%Co :

- 1 - **20%** **mas** de velocidad de corte
- 2 - **100%** **mas** de avance
- 3 - **hasta un 70%** **mas** de duración

El acabado **CENTURY** es un recubrimiento PVD multi-capas que mejora las prestaciones de la herramienta :

Incrementando la dureza de la superficie a	3300 HV
Elevando la temperatura de oxidación a	850° C
Reduciendo el coeficiente de fricción a	0,25 µm
Manteniendo un grosor de capa que preserva el afilado de la arista en	3 – 5 µm

FRESA SPEED IN ACCIAIO IN POLVERE ESM **Materiale base "ESM"**

Un acciaio in polvere con le principali proprietà dell'acciaio superrapido e del carburo metallico sinterizzato.

Maggiori percentuali di lega con un risultato migliore.

Risultato in confronto con l'HSS-E 8%Co :

- 1 - Velocità di taglio aumentata del **20%**
- 2 - Avanzamenti maggiorati del **100%**
- 3 - Durata maggiore fino al **70%**

Il rivestimento **CENTURY** è un PVD multistrato con le seguenti proprietà :

Durezza superficiale maggiore	3300 HV
Temperatura d'ossidazione più alta	850° C
Coefficiente d'attrito inferiore	0,25 µm
Minor arrotondamento degli spigoli a spessore costante dello strato	3-5 µm

FRAISES SPEED FABRIQUÉES EN ACIER FRITTÉ ESM **Matériau "ESM"**

L'ESM est un acier HSS obtenu par frittage, ce qui associe les qualités de résistance de l'HSS et la dureté des carbures.

Les éléments de l'alliage génèrent des propriétés qui augmentent les performances de coupe.

Résultats comparés à ceux de l'acier HSS-E à 8% de cobalt :

- 1- Vitesse de coupe augmentée de **20%**
- 2 - Avances augmentées de **100%**
- 3 - Durée de vie de l'outil prolongée de **70%**

Le revêtement **CENTURY** est obtenu par un procédé de revêtement PVD multicouche qui améliore les performances de coupe par :

Un accroissement de la dureté superficielle	3300 HV
Une élévation de la température d'oxydation	850° C
Une réduction du coefficient de frottement	0,25 µm
Un maintien de l'épaisseur de revêtement pour éviter la détérioration des arêtes de coupe	3-5 µm

Chemical Composition in % | Chemische Zusammensetzung in %
Composición química en % | Composizione chimica in % | Composition chimique en %

Material	Name	C	Cr	W	Mo	V	Co	Total%
HSS-E	M35	0.85	4.00	6.00	5.00	2.00	5.00	22.00
	M42	1.10	3.75	1.50	9.50	1.15	8.00	25.00
Powder-steel	ASP30	1.30	4.00	6.50	5.00	3.00	8.00	27.00
	ASP60	2.30	4.00	6.00	7.00	6.00	10.00	35.00
	ESM	2.00	4.00	10.00	8.00	5.00	10.00	39.00

ESM QS(W)-QL(W) Fine Mill



Roughing end mills with fine pitch ripper form for difficult materials. Short series are centre cutting up to 40mm dia. Manufactured to HITACHI standards.

Type-W

Straight shank and drive flat to DIN1835B.
Dimension: HITACHI

Typ HR mit Zylinderschaft. Profil hinterschleifen. Kurze Serie zentrumschneidend bis Ø 40 mm. Gefertigt nach HITACHI Norm.

Typ-W

Mit Mitnahmefläche nach DIN1835B.
Abmessung: HITACHI

Fresas de desbaste con paso fino para materiales difíciles. La serie corta tiene corte al centro hasta los 40mm de diámetro. Fabricadas según los standards de HITACHI.

Type-W

Mango cilíndrico con plano según DIN1835B.
Medidas: según los standards de HITACHI.

Tipo HR con codolo cilindrico. Profilo di spoglia e taglio centrale fino a Ø40mm. Fabbricato secondo norma interna HITACHI.

Tipo-W

Codolo con codolo di serraggio secondo DIN1835B.
Fabbricato secondo norma interna HITACHI.

Fraises d'ébauche à profil fin pour matériaux difficiles. Les séries courtes ont la coupe au centre jusqu'au diamètre 40mm. Elles sont fabriquées selon les normes constructeur HITACHI.

Modèle-W

Queue cylindrique avec méplat selon norme DIN1835B.
Dimensions selon normes constructeur HITACHI.

ESM HKR(W)-HKM-HKL(W) Power Helical



End mills for difficult materials. All sizes are centre cutting. Manufactured to HITACHI Standards.

Type-W

Straight shank and drive flat to DIN1835B.
Dimension: HITACHI

Super Helical Fräser. Für Schrupp- und Schlichtbearbeitungen. Alle Durchmesser zentrumschneidend.

Typ-W

Mit Mitnahmefläche nach DIN1835B.
Abmessung: HITACHI

Fresas de acabado para materiales difíciles. Todos las medidas son con corte al centro. Fabricado según los standards de HITACHI.

Type-W

Mango cilíndrico con plano según DIN1835B. Medidas: según los standards de HITACHI.

Fresa Super Helical. Per lavorazione di sgrossatura e finitura. Tutti i con taglio centrale. Fabbricato secondo norma HITACHI.

Tipo-W

Codolo con codolo di serraggio secondo DIN1835B.
Fabbricato secondo norma interna HITACHI.

Fraises pour matériaux difficiles. Tous les diamètres sont avec coupe au centre. Fabrication selon les normes constructeur HITACHI.

Modèle-W

Queue cylindrique avec méplat selon norme DIN1835B.
Dimensions selon normes constructeur HITACHI.

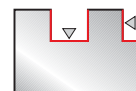
ESM Fine Mill

Fine Mill - Short
ESMQS



6 – 40 mm

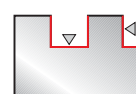
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Fine Mill - Short with Weldon DIN1835B
ESMQS-W

6 – 40 mm

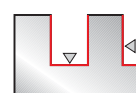
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Fine Mill - Long
ESMQL

10 – 30 mm

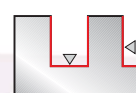
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Fine Mill - Long with Weldon DIN1835B
ESMQL-W

10 – 30 mm

9



ESM Power Helical

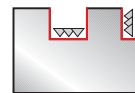


Power Helical - Regular

12 – 30 mm

10

ESMHKR



Power Helical - Regular with Weldon DIN1835B

12 – 30 mm

11

ESMHKR-W



Power Helical - Medium

12 – 30 mm

12

ESMHKM

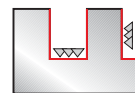


Power Helical - Long

12 – 30 mm

13

ESMHKL



Power Helical - Long with Weldon DIN1835B

12 – 30 mm

14

ESMHKL-W

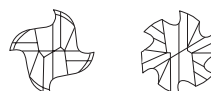


ESMQS | Fine Mill - Short

Q max High Efficient	▽ Roughing	HRC 45	No. of Teeth 4	No. of Teeth 6
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ESM Premium P/M HSS	C Century Coating
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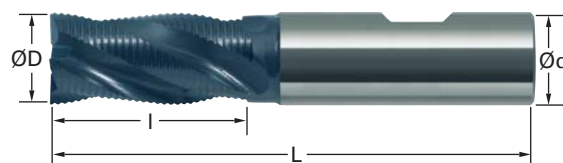
Ø6 ~ Ø12	0/-0.05
Ø16 ~ Ø40	0/-0.1
d	h6

ID Code	Item No.	Stock	Z	R	ØD	L	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 1	QS-6	■	4		6	15						80	6	
ES 2	QS-8	■	4		8	20						90	8	
ES 3	QS-10	■	4		10	25						100	10	
ES 4	QS-12	■	4		12	30						110	12	
ES 5	QS-16	■	4		16	35						125	16	
ES 6	QS-20	■	4		20	40						140	20	
ES 7	QS-25	■	4		25	45						160	25	
ES 8	QS-30	■	4		30	45						160	25	
ES 9	QS-32	■	6		32	55						180	32	
ES 10	QS-40	■	6		40	65						200	32	
ES 32	ES SET-0100	■			8,10,12									
ES 59	ES SET-0200	■			6,8,10,12,16,20									

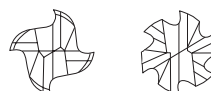
■ = Stock | Germany

ESMQS-W | Fine Mill - Short with Weldon DIN1835B

Q max High Efficient	Roughing	HRC 45	No. of Teeth 4	No. of Teeth 6
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ESM Premium P/M HSS	C Century Coating
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Ø6 ~ Ø12	0/-0.05
Ø16 ~ Ø40	0/-0.1
d	h6

ID Code	Item No.	Stock	Z	R	ØD	l	dn	l ₁	l _{n1}	l _{n2}	l _s	L	d	Type
ES 33	QS-6W	■	4		6	15						59	6	
ES 34	QS-8W	■	4		8	20						70	8	
ES 35	QS-10W	■	4		10	25						75	10	
ES 36	QS-12W	■	4		12	30						87	12	
ES 37	QS-16W	■	4		16	35						95	16	
ES 38	QS-20W	■	4		20	40						104	20	
ES 39	QS-25W	■	4		25	45						121	25	
ES 40	QS-30W	■	4		30	45						121	25	
ES 41	QS-32W	■	6		32	55						133	32	
ES 42	QS-40W	■	6		40	65						143	32	
ES 60	ES SET-0100W	■			8,10,12									
ES 61	ES SET-0200W	■			6,8,10,12,16,20									

■ = Stock | Germany

ESMQL | Fine Mill - Long

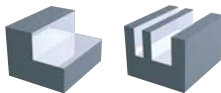
Q max
High Efficient

▽
Roughing

HRC
45

No. of Teeth
4

No. of Teeth
6



ESM
Premium
P/M HSS

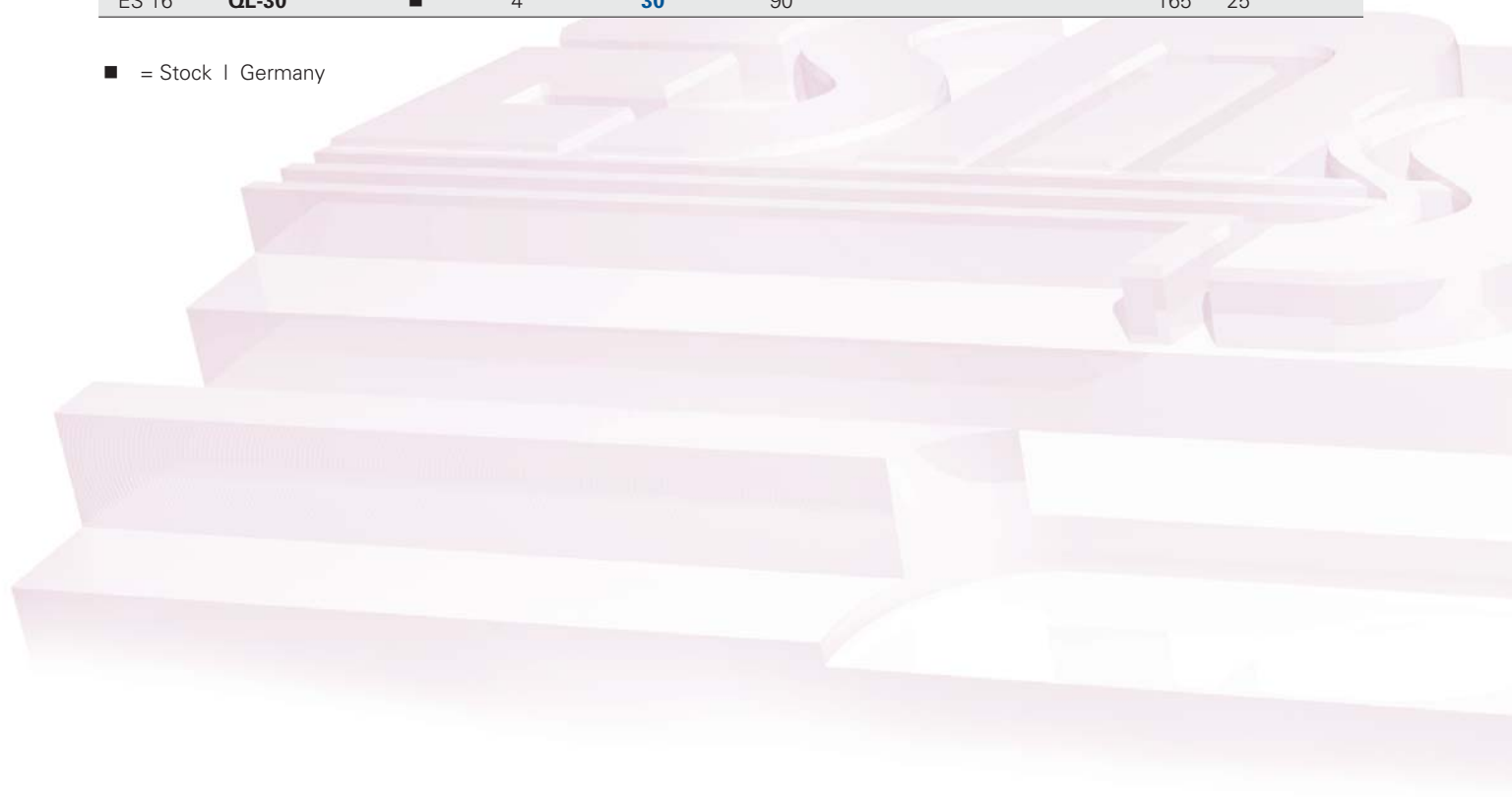
C
Century
Coating



Ø10 ~ Ø12	0/-0.05
Ø16 ~ Ø30	0/-0.1
d	h7

ID Code	Item No.	Stock	Z	R	ØD	I	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 11	QL-10	■	4		10	45						100	10	
ES 12	QL-12	■	4		12	55						110	12	
ES 13	QL-16	■	4		16	65						125	16	
ES 14	QL-20	■	4		20	75						140	20	
ES 15	QL-25	■	4		25	90						165	25	
ES 16	QL-30	■	4		30	90						165	25	

■ = Stock | Germany



ESMQL-W | Fine Mill - Long with Weldon DIN1835B

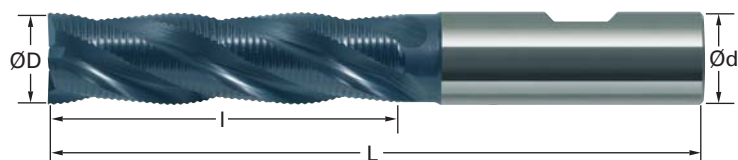
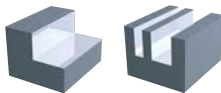
Q max
High Efficient

▽
Roughing

HRC
45

No. of Teeth
4

No. of Teeth
6



ESM
Premium
P/M HSS

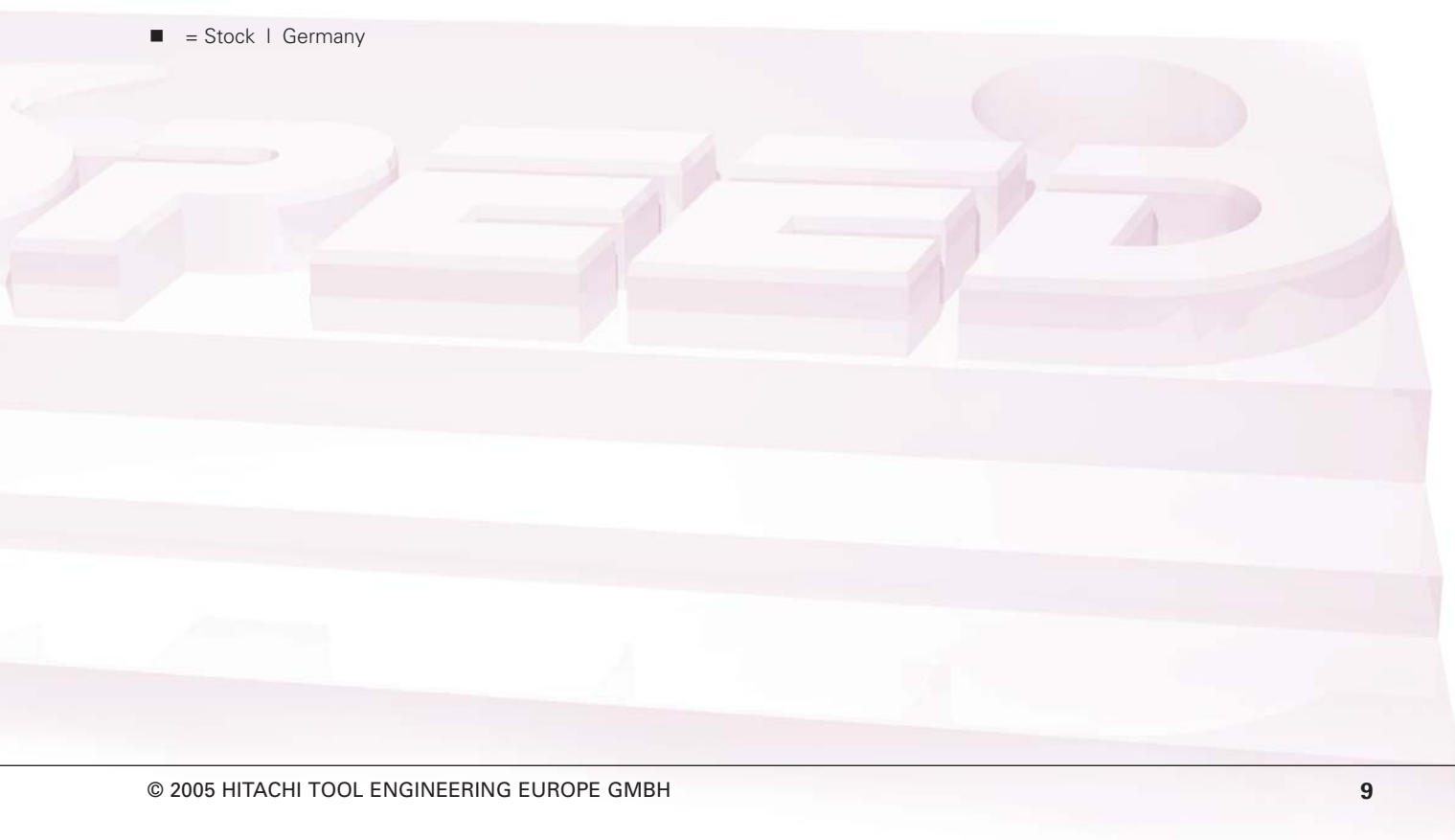
C
Century
Coating



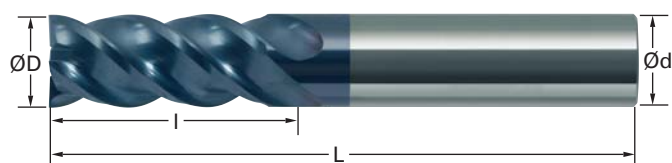
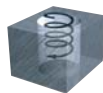
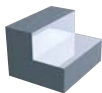
Ø10 ~ Ø12	0/-0.05
Ø16 ~ Ø30	0/-0.1
d	h7

ID Code	Item No.	Stock	Z	R	ØD	I	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 43	QL-10W	■	4		10	45						100	10	
ES 44	QL-12W	■	4		12	55						110	12	
ES 45	QL-16W	■	4		16	65						125	16	
ES 46	QL-20W	■	4		20	75						140	20	
ES 47	QL-25W	■	4		25	90						165	25	
ES 48	QL-30W	■	4		30	90						165	25	

■ = Stock | Germany



ESMHKR | Power Helical - Regular



ØD	0/-0.03
d	h7

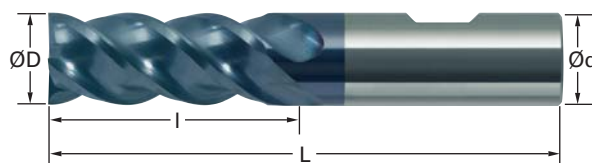
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ES 17	HKR-12	■	4		12	30						95	12	
ES 18	HKR-16	■	4		16	42						110	16	
ES 19	HKR-20	■	4		20	45						125	20	
ES 20	HKR-25	■	4		25	50						140	25	
ES 21	HKR-30	■	4		30	55						145	25	

■ = Stock | Germany



ESMHKR-W | Power Helical - Regular with Weldon DIN1835B

 Roughing	 Semi-Finishing	 Finishing	HRC 45	No. of Teeth 4
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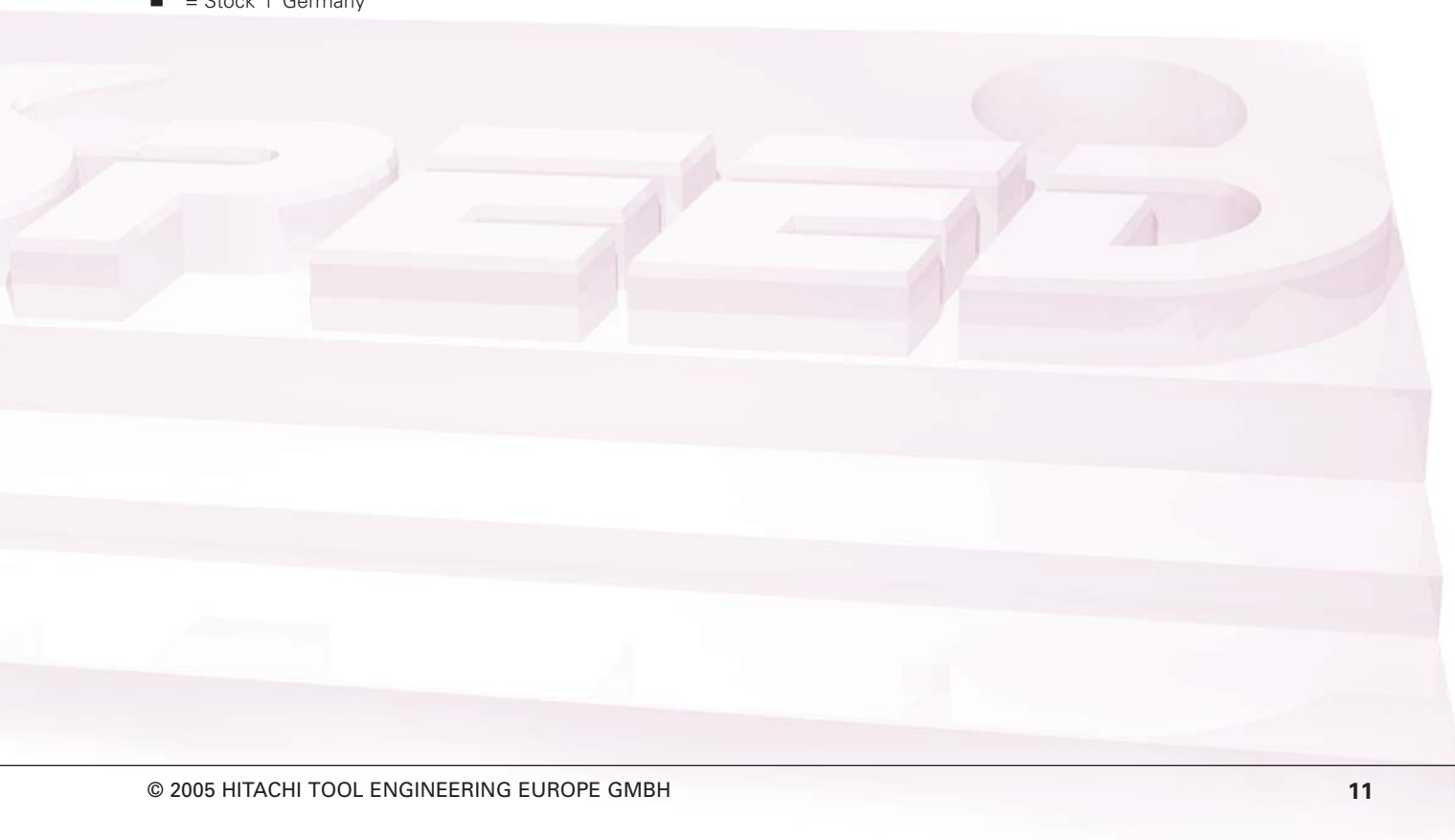
ESM Premium P/M HSS	C Century Coating
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ØD	0/-0.03
d	h7

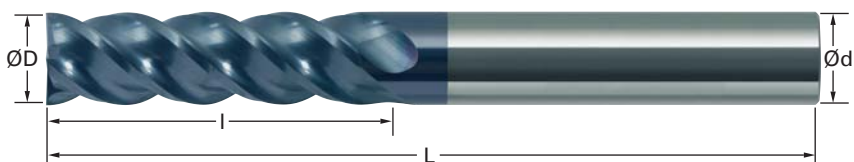
ID Code	Item No.	Stock	Z	R	ØD	l	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 49	HKR-12W	■	4		12	30						87	12	
ES 50	HKR-16W	■	4		16	42						103	16	
ES 51	HKR-20W	■	4		20	45						110	20	
ES 52	HKR-25W	■	4		25	50						124	25	
ES 53	HKR-30W	■	4		30	55						125	25	

■ = Stock | Germany



ESMHKM | Power Helical - Medium

 Roughing	 Semi-Finishing	 Finishing	HRC 45	No. of Teeth 4
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ESM Premium P/M HSS	C Century Coating
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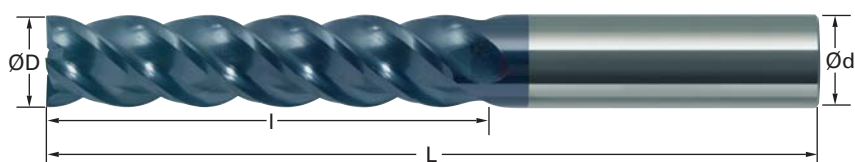
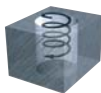
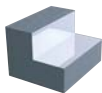
ØD	0/-0.03
d	h7

ID Code	Item No.	Stock	Z	R	ØD	I	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 22	HKM-12	■	4		12	45						120	12	
ES 23	HKM-16	■	4		16	55						140	16	
ES 24	HKM-20	■	4		20	65						165	20	
ES 25	HKM-25	■	4		25	75						195	25	
ES 26	HKM-30	■	4		30	80						200	25	

■ = Stock | Germany



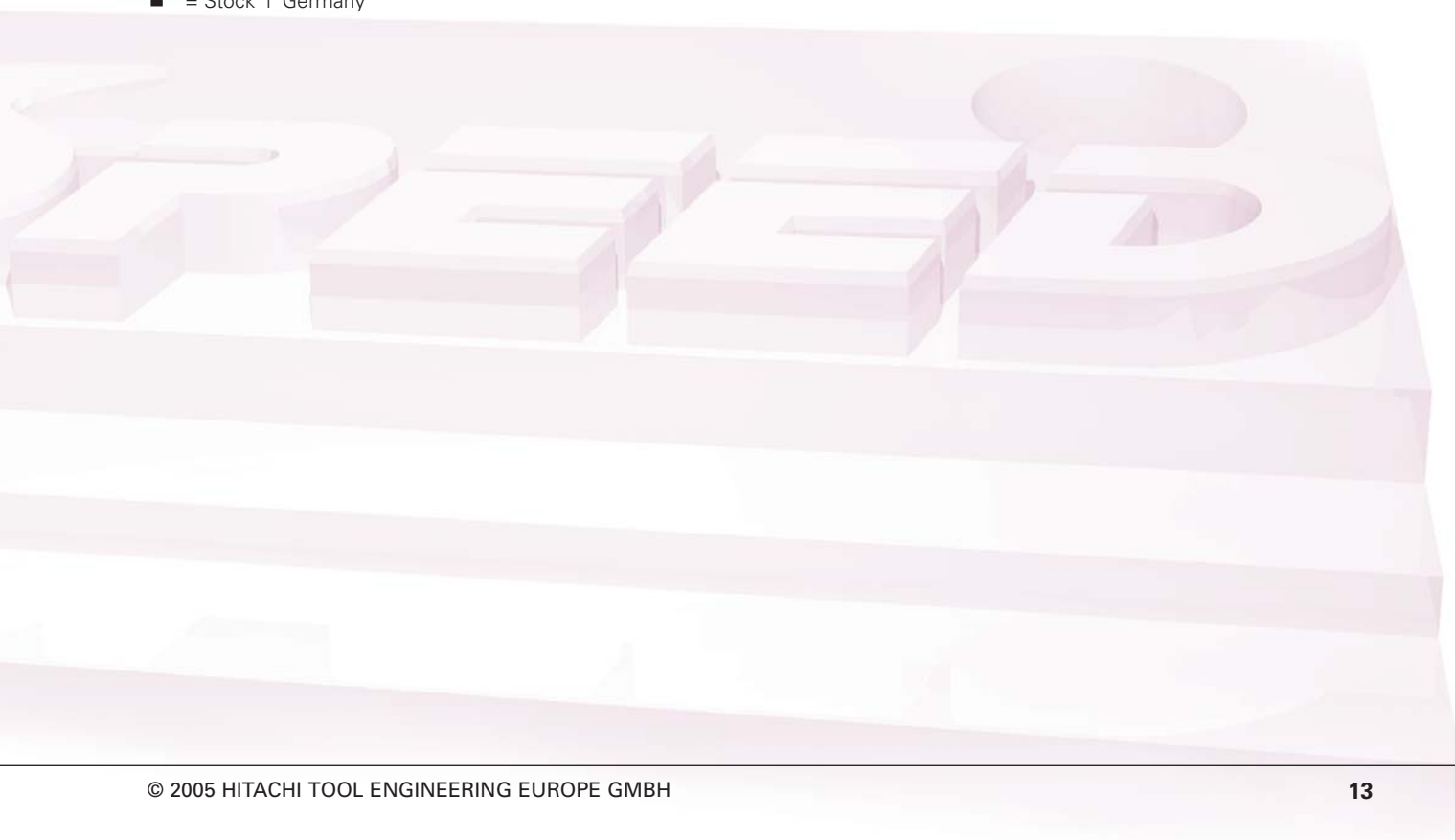
ESMHKL | Power Helical - Long



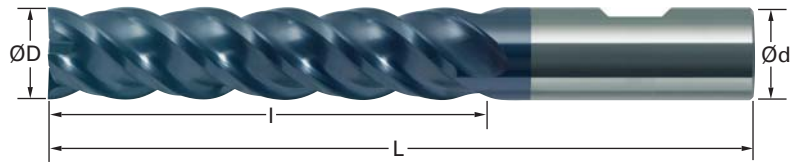
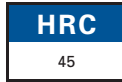
ØD	0/-0.03
d	h7

ID Code	Item No.	Stock	Z	R	ØD	L	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 27	HKL-12	■	4		12	55						120	12	
ES 28	HKL-16	■	4		16	65						140	16	
ES 29	HKL-20	■	4		20	85						165	20	
ES 30	HKL-25	■	4		25	100						195	25	
ES 31	HKL-30	■	4		30	105						200	25	

■ = Stock | Germany



ESMHKL-W | Power Helical - Long with Weldon DIN1835B



ØD	0/-0.03
d	h7

ID Code	Item No.	Stock	Z	R	ØD	l	dn	I ₁	I _{n1}	I _{n2}	I _s	L	d	Type
ES 54	HKL-12W	■	4		12	55						112	12	
ES 55	HKL-16W	■	4		16	65						126	16	
ES 56	HKL-20W	■	4		20	85						150	20	
ES 57	HKL-25W	■	4		25	100						174	25	
ES 58	HKL-30W	■	4		30	105						175	25	

■ = Stock | Germany



Product Range

Solid Carbide End Mills

Epoch21

MINIATURE

3D-Cut

CARBIDE

Indexable Milling Tools

**Indexable
Milling**

ESM Speed End Mills
EMC Power Drills

ESM SPEED

Milling Chucks

**Milling
Chucks**

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 **Hitachi Tool Engineering Europe GmbH**

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