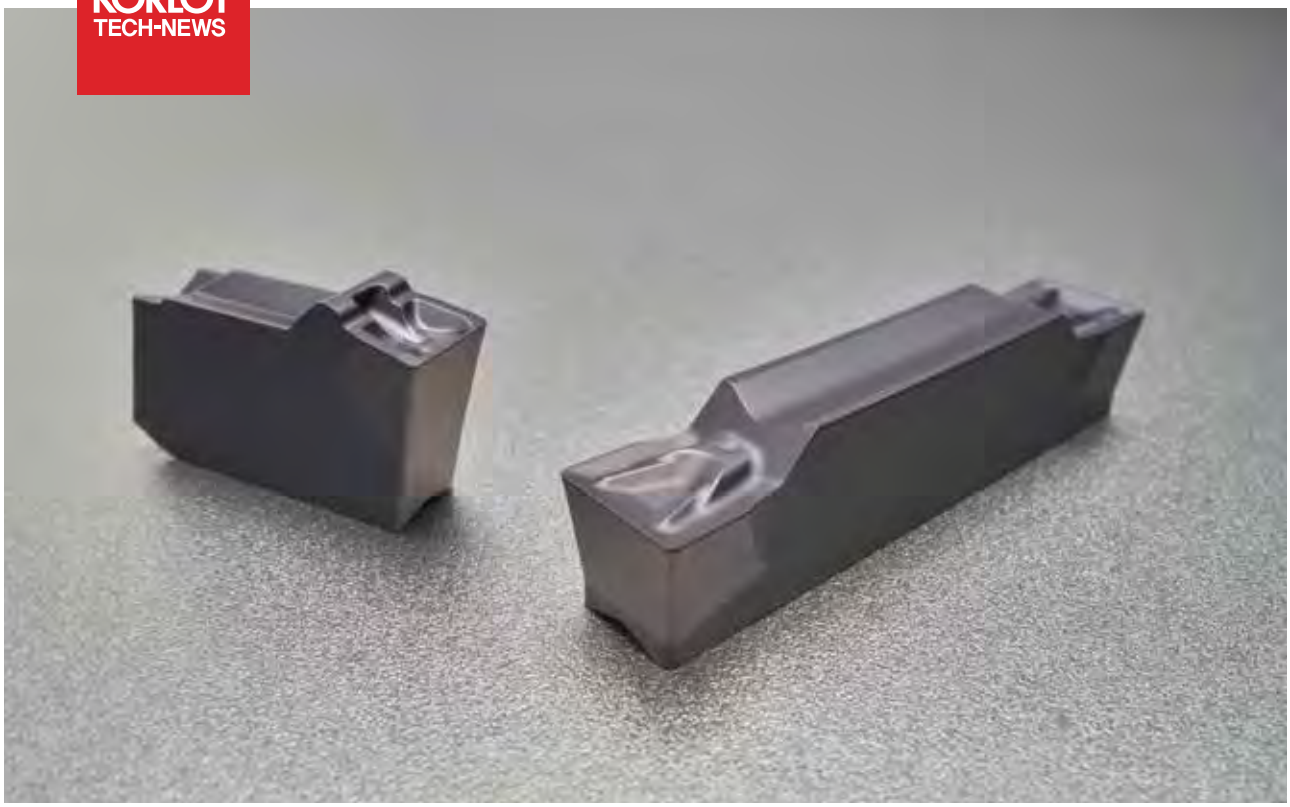
Inserts for steel grooving and parting

PC3035

KORLOY TECH-NEWS



- Stable tool life in steel grooving and parting
- Exclusive steel substrate with high toughness and lubricative coating layer with excellent wear resistance are applied.

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TECH-NEWS

Inserts for steel grooving and parting

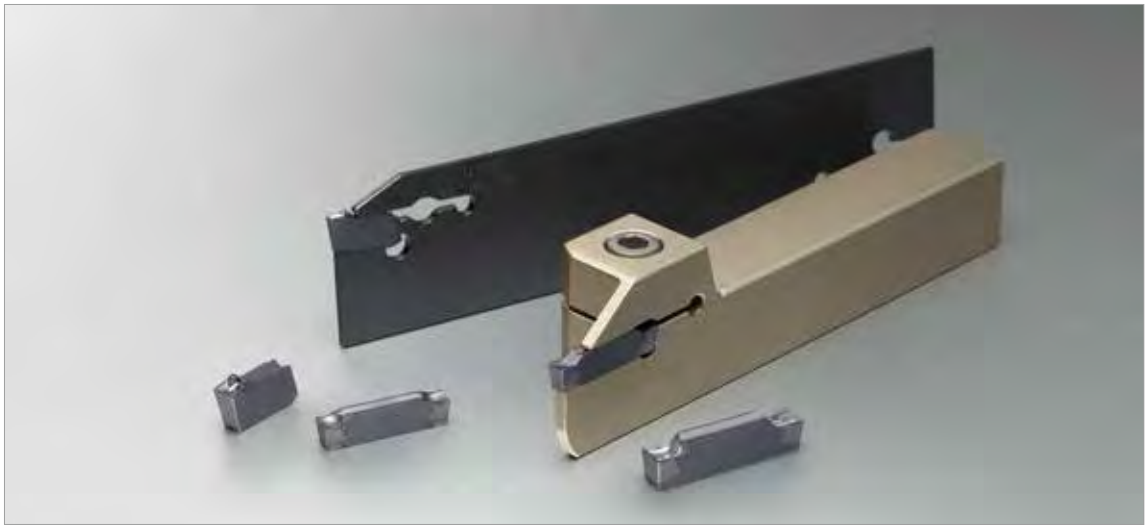
PC3035

In grooving and parting, tools are easily fractured and get wear from chattering due to narrow and long insert in high speed cutting. In addition, spindle, shaft and bearing parts demanding grooving and parting generally applied heat treatment have characteristics that surface is hard and substrate is soft. This feature occurs unstable tool life due to repeated chipping, welding and eliminating.

KORLOY newly launches the exclusive grade **PC3035** which shows higher productivity in steel grooving and parting.

PC3035 is exclusive steel grooving and parting with high toughness substrate application maximized chipping resistance and fracture resistance to deal with frequent interruption while its application. It also adopted high hardness PVD coating with a lubricative surface treatment so it realized stable machinability with its enhanced welding resistance and chipping resistance even for the bearing steel machining.

PC3035 is the next generation grade solution from KORLOY well known for its fine technology in steel grooving and parting and it provides high productivity and stable cutting quality.



Stable tool life

- Optimal for grooving and parting with the application of its exclusive substrate for steel cutting and the after treatment of lubrication.

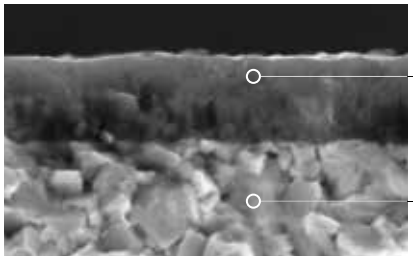
High productivity in high speed and high feed cutting

- Enhanced productivity by good wear resistance coating layer

Features system

- Suitable substrate for steel grooving and parting and good wear resistance coating layer
- Application of coating surface treatment improving welding resistance and chipping resistance

Substrate for steel grooving and parting and PVD coating technology

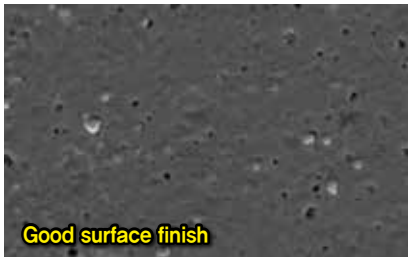


Enhanced wear resistance by high hardness TiAlN coating layer

Improved wear resistance

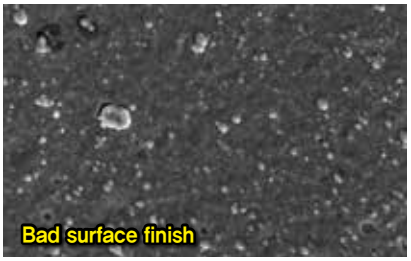
Application of high toughness substrate technique which is optimized for steel machining

Coating surface treatment technology



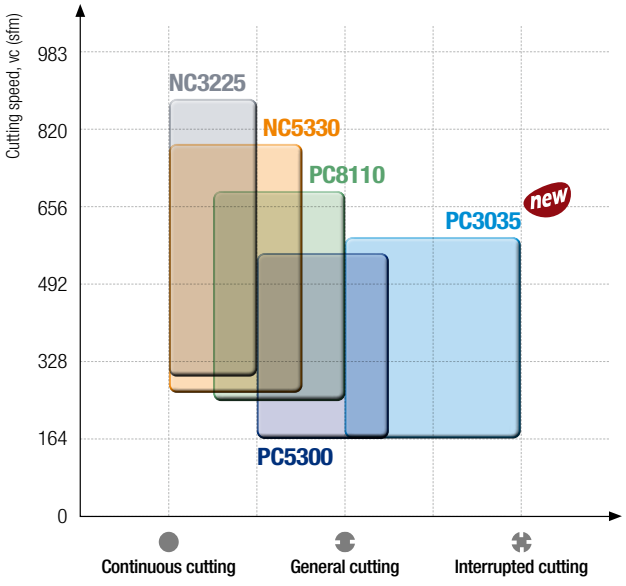
[PC3035]

Improved welding resistance and chipping resistance



[Existing grade]

Application range



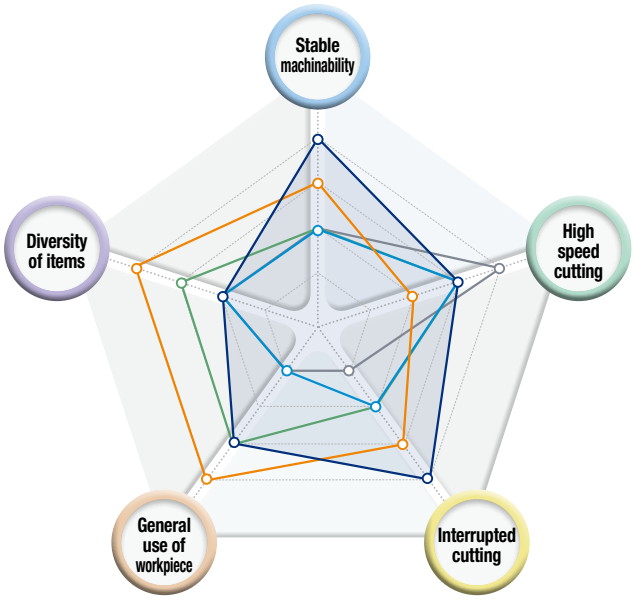
Application range	Grade	vc (m/min)
Continuous, high speed	NC3225	90 - 270
Continuous, medium speed	NC5330	80 - 240
Low interrupted, medium speed	PC8110	75 - 210
Low interrupted, low speed	PC5300	50 - 170
Interrupted, medium speed	PC3035 new	50 - 180

Recommended cutting conditions

Workpiece					Specific cutting force kc1 (N/mm²)	Brinell hardness (HB)	Parting and grooving	
							PC3035	
ISO	Workpiece materials		ISO	AISI			vc (m/min)	fn (mm/rev)
P	Unalloyed steel	C = 0.1-0.25%	C25	1025	1500	125	180	0.05
							140	**0.10**
							100	0.12
		C = 0.25-0.55%	C35	1035	1600	150	180	0.05
							130	**0.10**
							95	0.12
		C = 0.55-0.80%	C55	1055	1700	229	170	0.05
							130	**0.10**
							90	0.12
	Low-alloy steel	Non-hardened	42CrMo4	4140	1700	180	140	0.05
							100	**0.08**
							60	0.10
		Hardened and tempered	-	4145	2050	350	90	0.05
							65	**0.08**
							40	0.10
	High-alloy steel	Annealing	-	D2	1950	200	120	0.05
							80	**0.08**
							50	0.10
		Hardened tool steel	X40CrMoV5-1	H13	3000	352	90	0.05
							65	**0.08**
							40	0.10
	High-carbon chrome steel (Bearing steel)	Annealed	B1	52100	1950	201	160	0.05
							120	**0.08**
							80	0.10

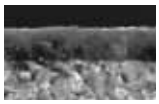
Grade for selection guide

PC3035 PC5300 PC8110 NC5330 NC3225



PC3035 new

- Good wear resistance and stable machinability
- Suitable for steel cutting

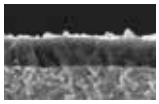


PC5300

- Good wear resistance and suitable for interrupted cutting
- Universal grade

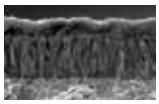
PC8110

- Good wear resistance and suitable for continuous cutting
- For hard-to-cut materials and cast iron cutting



NC5330

- Stable cutting in high speed machining
- Universal grade



NC3225

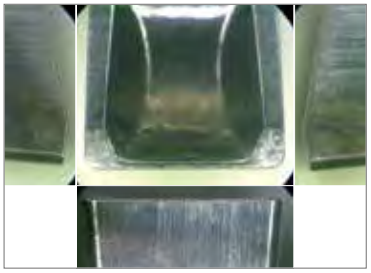
- Good wear resistance and suitable for high speed cutting
- Suitable for steel cutting

Grade	Stable machinability	High speed cutting	Interrupted cutting	General use of workpiece	Diversity of items
PC3035 new	★★★★	★★★	★★★★	★★★	★★
PC5300	★★★	★★	★★★	★★★★	★★★★
PC8110	★★	★★★	★★	★	★★
NC5330	★★	★★★	★★	★★★	★★★
NC3225	★★	★★★★	★	★	★★

Performance evaluation

Fracture resistance

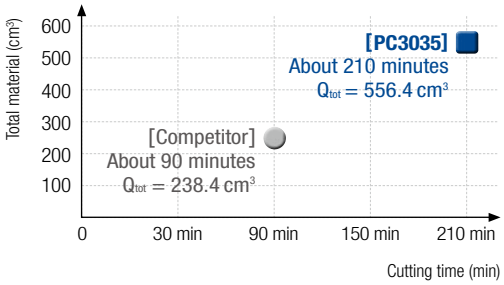
Workpiece	Alloy steel (42CrMo4)
Cutting conditions	vc = 100 m/min · fn = 0.15 mm/rev · ap = 5.0 mm
Tools	**Insert** KGMN300-02-R (PC3035) **Holder** KGEHR2525-3-T10



[PC3035]

[Competitor]

Material removal rate Q (cm³/min): 2.7



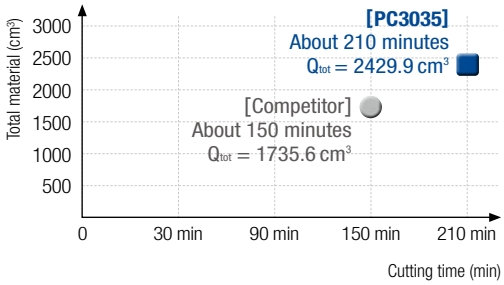
Wear resistance

Workpiece	Bearing steel (100Cr6)
Cutting conditions	vc = 180 m/min · fn =0.15 mm/rev · ap = 5.0 mm
Tools	**Insert** KGMN300-02-R (PC3035) **Holder** KGEHR2525-3-T10

[PC3035]

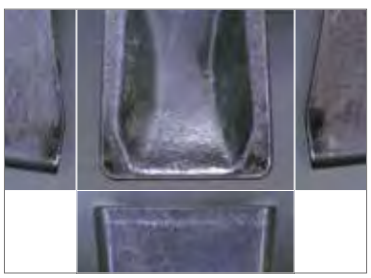
[Competitor]

Material removal rate Q (cm³/min): 11.6



Wear resistance

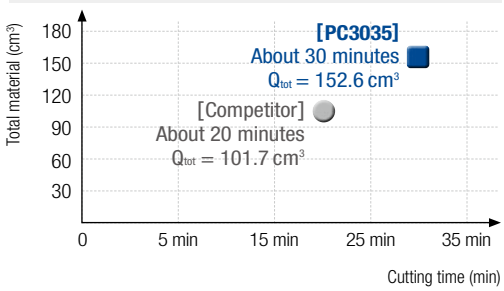
Workpiece	Alloy steel (42CrMo4)
Cutting conditions	vc = 114 m/min · fn = 0.04 mm/rev· ap = 9.0 mm
Tools	**Insert** KGMN200-02-R (PC3035) **Holder** KGEHR1212-2-D25A



[PC3035]

[Competitor]

Material removal rate Q (cm³/min): 5.1

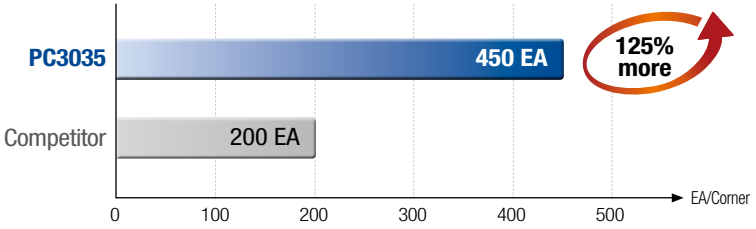


Application examples

Carbon steel (C45)

Cutting conditions vc = 134 m/min · fn = 0.1 mm/rev · ap = 3.4 mm

Tools Insert KGMN400-03-R (PC3035) Holder KGEHR2525-4-T10

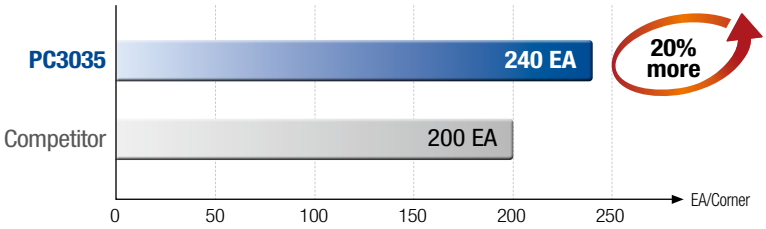


» 125% longer tool life than competitor

Bearing steel (100Cr6)

Cutting conditions vc = 70 m/min · fn = 0.08 mm/rev · ap =1.05 mm

Tools Insert KGGN3-2.15-R0.4 (PC3035) Holder KGEHR2525-3-T10

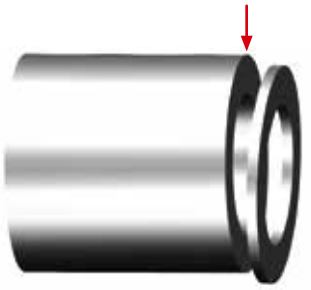


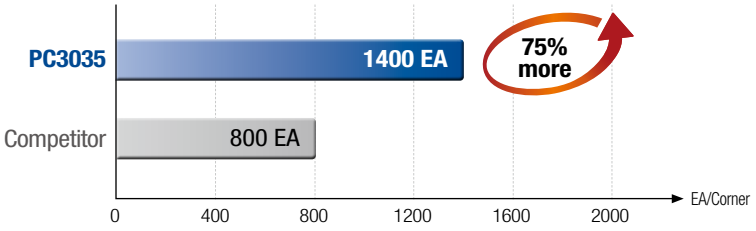
» 20% longer tool life than competitor

Bearing steel (100Cr6)

Cutting conditions vc = 101 m/min · fn = 0.04-0.06 mm/rev · ap 8.09 mm

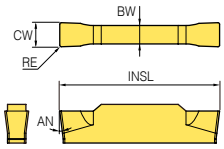
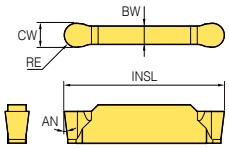
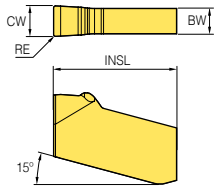
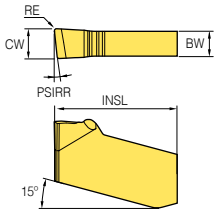
Tools Insert KGMN200-02-R (PC3035) Holder KGEHR1212-2-D25A





» 75% longer tool life than Competitor

Stock item

Application	Picture	Designation		Coated	Dimensions (mm)						Geometries
				PC3035	CW	RE	INSL	PSIRR	BW	AN	
Grooving		KGMN	200-02-L	●	2.0	0.2	20	-	1.7	7	
			300-02-L	●	3.0	0.2	20	-	2.3	7	
			400-02-L	●	4.0	0.2	20	-	2.3	7	
			500-03-L	●	5.0	0.3	25	-	4.1	7	
Grooving · parting		KGMN	200-02-R	●	2.0	0.2	20	-	1.7	7	
			300-02-R	●	3.0	0.2	20	-	2.3	7	
			400-03-R	●	4.0	0.3	20	-	3.3	7	
Grooving · turning		KGMN	200-02-T	●	2.0	0.2	20	-	1.7	7	
			300-02-T	●	3.0	0.2	20	-	2.3	7	
			300-04-T	●	3.0	0.4	20	-	2.3	7	
			400-04-T	●	4.0	0.4	20	-	3.3	7	
			400-08-T	●	4.0	0.8	20	-	3.3	7	
			500-04-T	●	5.0	0.4	25	-	4.1	7	
			500-08-T	●	5.0	0.8	25	-	4.1	7	
			600-04-T	●	6.0	0.4	25	-	5.1	7	
			600-08-T	●	6.0	0.8	25	-	5.1	7	
			800-08-T	●	8.0	0.8	30	-	6.1	7	
Relief profiling		KRMN	200-C	●	2.0	1.0	20	-	1.7	7	
			300-C	●	3.0	1.5	20	-	2.2	7	
			400-C	●	4.0	2.0	20	-	4.0	7	
			500-C	●	5.0	2.5	25	-	5.0	7	
			600-C	●	6.0	3.0	25	-	6.0	7	
Parting off		KSP	200-020-N	●	2.0	0.20	11.0	-	1.6	-	
			300-020-N	●	3.0	0.20	12.0	-	2.5	-	
			400-025-N	●	4.0	0.25	12.5	-	3.3	-	
			500-025-N	●	5.0	0.25	13.5	-	4.5	-	
			600-035-N	●	6.0	0.35	14.5	-	5.3	-	
Parting off		KSP	200R-6D-N	●	2.0	0.20	11.0	6°	1.6	-	
			200L-6D-N	○	2.0	0.20	11.0	6°	1.6	-	
			300R-6D-N	●	3.0	0.20	12.1	6°	2.5	-	
			300L-6D-N	○	3.0	0.20	12.1	6°	2.5	-	
			400R-4D-N	●	4.0	0.25	12.6	4°	3.3	-	
			400L-4D-N	○	4.0	0.25	12.6	4°	3.3	-	

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.

Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.

- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.

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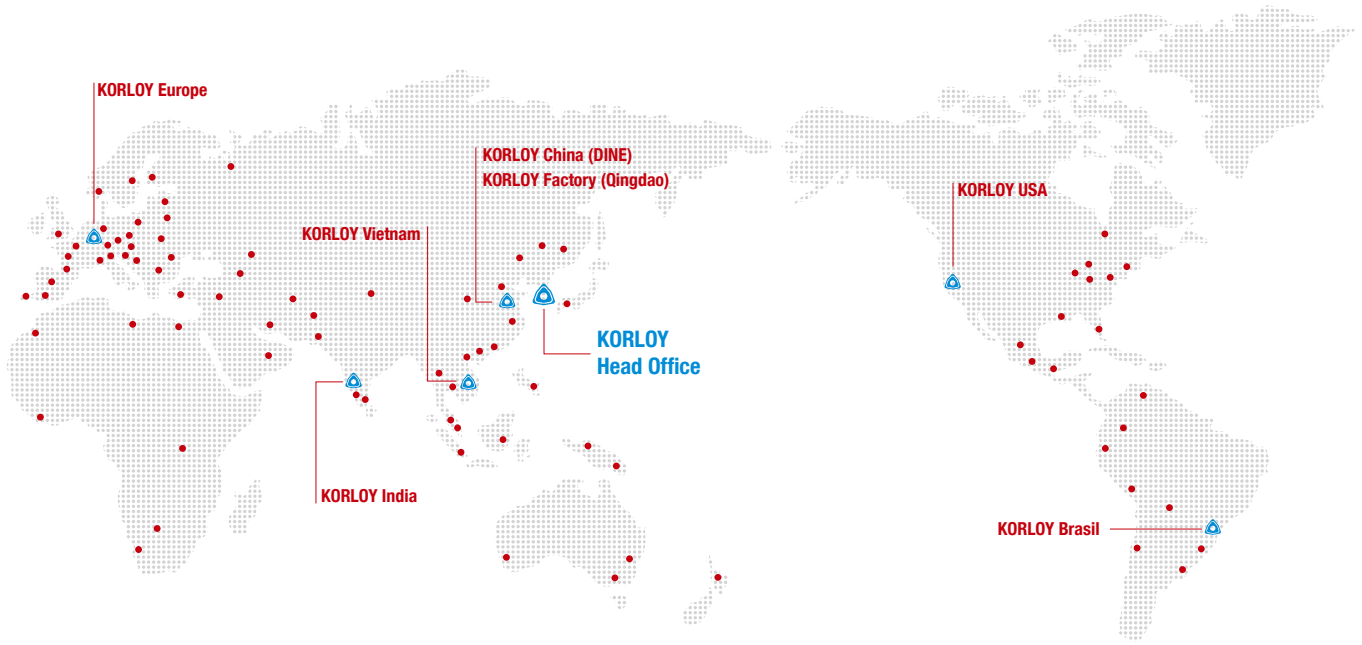

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