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내경 연삭기 (Internal Grinder)
외경 연삭기 (External Grinder)
센타레스 연삭기 (Centerless Grinder)
슈퍼 피니싱기 (Super Finishing Machine)

Technical Services of Grinder



최고의 품질을 위해서 큰 정성과 진실로 최선을 다하고 있습니다.

저희 TSG는 창업 이래 연삭기 개발과 제작에만 전념하여 센타레스 연삭기, 내경연삭기, 외경연삭기, 슈퍼피니싱 머신 등 연삭기 설계에서 제작까지 다년간의 연구개발로 성장에 성장을 거듭하고 있습니다.

"꿈을 이루어 가는 기업"이라는 사훈을 중심으로 임직원이 하나되어 25년간 고정도 연삭기의 개발, 제작 및 개조, 보수의 경험을 바탕으로 국내 연삭기의 품질에 새로운 지평을 열어가고 있습니다.

TSG는 처음 시작하는 자세와 마음으로 고객의 소리에 귀 기울이며 귀사의 가슴속에 영원히 간직되는 기업이 되어 귀사의 발전에 훌륭한 동반자가 되었으면 하는 바램입니다.

감사합니다.

We are doing our best to manufacture the best quality products with our sincere minds and deeds.

TSG has specialized in the development and manufacture of grinding machine since it's establishment.

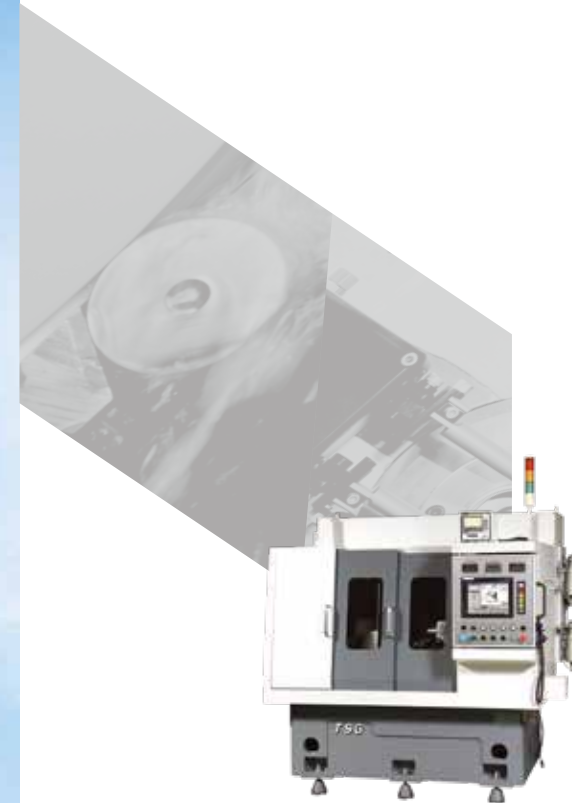
The company continues to thrive by studying and developing grinders such as centerless grinders, external grinders, internal grinders, super finishing machine, etc. from design and manufacture.

Under the company motto of "A company making a dream come true", all members of TSG open a new prospect in the domestic grinding machine based on the experience of development, manufacture, modification and repair of high precision grinding machine for almost 25 years.

TSG will listen to the opinions of our customers with the beginner's mind and attitude and become a business which gives a good impression to customers and become their excellent partners for the development of their businesses.

Thank you.

TSG 대표 이 병 순
TSG.CO.,LTD. CEO Byungsoon Lee



History

2020's ~

- 2022. 10 | 뿌리기술 전문기업 선정
- 2022. 05 | 2ROLL 1SHOE TYPE 내경연삭기 개발
- 2021. 12 | 편심 전용 내경연삭기 개발

2010's ~

- 2019. 04 | Chuck Type 내경, 외경연삭기 개발
- 2017. 10 | Superfinishing M/C 개발 (In-feed용)
- 05 | 창원공단 차룡단지로 사업장 이전
- 2016. 07 | (주)티에스지 법인전환
- 06 | Centerless grinder 개발 (Φ610 x 405외 5종)
- 2014. 03 | 내경·외경연삭기 개발(Φ120)
- 2013. 12 | Centerless Grinder 개발 (Φ450 x 200, Φ450 x 150)
- 2011. 09 | Centerless Grinder, Super Finishing M/C
- | Taper Roller 연삭라인 개발
- 2011. 02 | NC 냉간전조기 개발 (Φ140 x 45, Φ120 x 35)
- 2010. 04 | 벤처기업 인증

2000's ~

- 2009. 09 | Centerless Grinder 개발(Φ610 x 305)
- 06 | ISO/9001 인증
- 03 | INNO-BIZ 인증
- 2007. 12 | 냉장고용 Compressor Shaft 연삭라인 개발
- 2006. 10 | Centerless Grinder 개발(Φ610 x 200)
- 2005. 07 | Super Finishing M/C 개발(8 Heads)
- 2000. 08 | TSG 설립

내경연삭기(슈 지지) / INTERNAL GRINDER(SHOE TYPE) TIG-120S

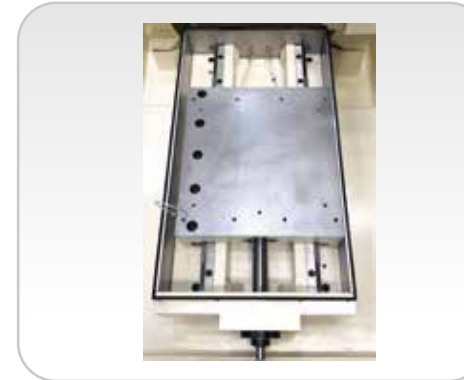
Bearing 등 단순한 형상 연삭에 유리



FEATURES

- 2 Shoes + Magnet type
- 고강성 초정밀 Linear bearing guide 적용
- 고정형 Rotary dresser 채용
- Cassette type loader 로 Setting 시간 최소화
- 다양한 고주파 스피들 채용
- 전류 감지 Gap eliminator 표준

- 2 Shoes + Magnet type
- Linear bearing guide with ultra precision and stiffness
- Static rotary dresser
- Minimized setting time with cassette type loader
- Various HF spindle are applicable
- Current sensitive Gap eliminator



- 초정밀 고강성 Linear guide bearing 적용
 - 유종에서 Ball screw 윤활로 장수명 보증
 - Stick-slip 이 없이 Nano 절입 실현
 - 예압 조정이 가능하여 동일한 Torque 유지
 - 장기간 신뢰성 보증

- Linear guide bearing of ultra precision & stiffness are applied
 - Guarantee extreme long life of ball screw by oil lubrication
 - No stick-slip and nano feeding
 - Pre-load adjusting is possible, and keep constant torque
 - Guarantee reliability for long time

- 터치 스크린 제어반
 - 조작 용이 : 비숙련자도 손쉬운 적응
 - 연삭조건 : Model 50종 입력
 - CBN 지석 연삭 프로그램 등 다양한 조건

- Touch screen operating panel
 - Easy operation : Beginners can easily operate
 - Working parameter : 50 types
 - Various operating software. eg CBN grinding



- 다양한 고주파 Spindle
- In-process gauge 적용
- Cassette type loader
- 전류 감지 Gap eliminator 표준
- 고정밀 주축 Spindle

- Various HF spindle are applicable
- In-process gauge
- Cassette type loader
- Current sensitive gap eliminator
- Ultra precise workhead spindle

SPEC'

ITEM		TIG-120S
Support method		2 Shoes + Magnet type
Working range	Out-diameter	Ø80mm
	Width	40mm
Wheel spindle	Type	H.F spindle
	RPM	20,000~120,000rpm
Work spindle	Speed	300~3,000rpm
	Swivel angle	0~30° (Taper 내경연삭)
Slide	X Axis	Linear bearing slide
	Y Axis	Linear bearing slide
Dresser		Rotary dresser(forming & disk)
Loader		Cassette type loader
Floor size		1,800 x 1,700
Weight		4,000Kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.



내경연삭기(척 지지) / INTERNAL GRINDER(CHUCK TYPE) TIG-120C

다양한 형상 연삭에 유리

FEATURES

- Diaphragm & Air chuck
- 고강성 초정밀 Linear guide
- 고정형 Rotary dresser
- Double arm loader
- 다양한 고주파 스피들
- 전류 감지 Gap eliminator 표준
- Jaw self grinding

- Diaphragm & Air chuck
- Ultra precision and stiffness of linear guide
- Fixed rotary dresser
- Double arm loader
- Various HF spindle
- Current detecting gap eliminator is standard
- Jaw self grinding



- 다양한 연삭기능
 - 편심 연삭
 - 부분적인 내경 연삭, 외경 연삭
 - 내경 연삭
- Various grinding application
 - Eccentric grinding
 - Partial internal & external grinding
 - Internal grinding

- Double arm loader
 - Servo motor에 의한 위치 조정
 - 회전, 전후진 2축 NC 제어
 - 조작이 간편하여 Setting 용이
 - 비절삭 시간 최소화
 - Jaw에 의한 정확한 Clamping
- Double arm loader
 - Position control by servo motor
 - 2 NC-Axis control, rotating, forward and backward
 - Minimized non-processing time
 - Accurate clamping by jaw



- 고정형 양단지지 Rotary dresser
 - 고품질 : 작동 부분이 최소화
 - 고강성 : 양단지지형
 - 고풍력 : Servo motor에 의한 구동
 - 다양화 : Rotary forming dresser
- Rotary dresser with fixed both-end-support
 - High quality: Minimized acting parts
 - High stiffness: Both-end-support
 - High power: Driven by servo motor
 - Variants : Rotary forming dresser

SPEC'

ITEM		TIG-120C
Support method		Diaphragm & Air chuck
Working range	Out-diameter	Ø80mm
	Width	60mm
Wheel spindle	Type	H.F spindle
	RPM	20,000~120,000rpm
Work spindle	Speed	300~3,000rpm
	Swivel angle	0~30° (Taper 내경연삭)
Slide	X Axis	Linear bearing slide
	Y Axis	Linear bearing slide
Dresser		Rotaty dresser (forming & disk)
Loader		Double arm loader
Floor size		1,800 x 1,700
Weight		4,000Kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.



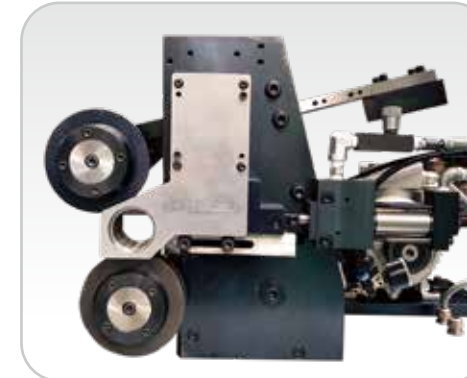
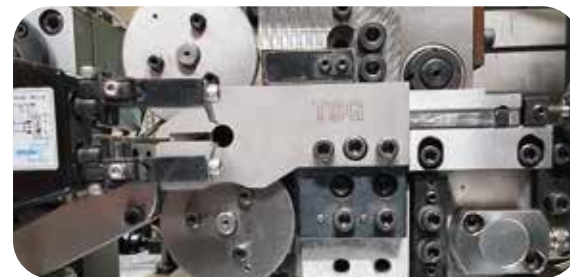
내경연삭기(ROLL 지지) / INTERNAL GRINDER(2 ROLL TYPE) TIG-80R / TIG-80RL

소형박형, 비자성체 연삭에 유리



FEATURES

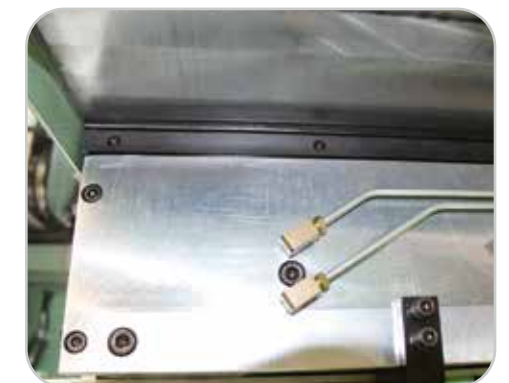
- 소형 박형 제품 유리
 - 직경 대비 길이가 긴 제품
 - 비철금속 가능
 - 단면 미연삭품 가능
 - 고속 Loader
- Small and thin products
 - Products that are long against the diameter
 - Nonferrous metal products
 - Products with ungrinded reference side
 - High Speed Loader



- 다양한 연삭 Work spindle
 - 소형 Work spindle
 - 대형 Work spindle
 - 가압 Roller 각도 조절형
 - 전면 가압 로타형
- Various grinding Work spindle
 - Small size Work spindle
 - Large size Work spindle
 - Skew type
 - Pressure rotor type

- Slide 를 전체 밀봉하여 이물질 침투 불가
 - 유중 윤활로 Slide 고정도 및 장수명 보장
 - Slide 전체가 균등하게 윤활
 - Oil 회수가 간편하여 냉각수 장수명 보증

- Prevent contaminant by sealing entire sliding surface
 - Guarantee ultra precision and stiffness of slide by oil lubrication
 - Evenly lubrication of entire slide surface
 - Easy to oil collection, guarantee long life of coolant



- Inprocess gauge 적용
 - Front fork gauge
 - Rear fork gauge
- Inprocess gauge applied
 - Front fork gauge
 - Rear fork gauge

SPEC'

ITEM		TIG-80R	TIG-80RL
Support method		2Roll 1Shoe	2Roll 1Shoe
Working range	Out-diameter	Φ6~Φ25mm	Φ25~Φ60mm
	Width	40mm	60mm
Wheel spindle	Type	H.F spindle	H.F spindle
	RPM	30,000~120,000rpm	
Work spindle	Speed	300~2,500rpm	
	Swivel angle	0~30° (Taper 내경연삭)	
Slide	X Axis	Linear bearing slide	
	Y Axis	Linear bearing slide	
Dresser		Rotary dresser, Single point Dresser	
Loader		Push loader	
Floor size		1,800 x 1,700	
Weight		4,000Kg	

※ All specifications and dimensions above are subject to change for quality improvement without notice.



외경연삭기(슈 지지) / EXTERNAL GRINDER(SHOE TYPE) TEG-510

Bearing 등 단순한 형상 연삭에 유리



FEATURES

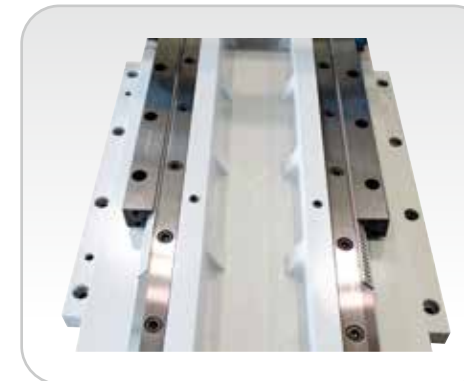
- 2 Shoes + Magnet type
 - Bed와 냉각수 통로가 분리되어 열변형 최소화
 - Angular grinding 가능 (외경+단면)
 - Rotary forming dresser 채용
 - Double arm loader 로 비삭시간 최소화
 - Wheel spindle의 다양성
-
- 2 Shoes + Magnet type
 - Minimized thermal deflection by the separated coolant drain from machine frame
 - Angular grinding enable (out-diameter + face)
 - Rotary forming dresser
 - Minimized non-processing time with double arm loader
 - Various wheel spindle are applicable



SPEC'

ITEM		TEG-510
Support method		2 Shoes + Magnet type
Working range	Out-diameter	Ø90mm
	Width	50mm
Loading range	Out-diameter	Ø130mm
	Speed	3,000m/min
Wheel spindle	O.D x Width x I.D	Ø510 x 50 x Ø254
	Type	고정밀형 : 유정압 Spindle (Hydro-static)
		저진동형 : Built-in-motor spindle
Work spindle	Speed	고강성용 : Angular bearing
		300~3,000 rpm
	Swivel angle	30° (Angular grinding)
Slide		Linear bearing slide
Dresser		Rotary forming dresser
Loader		Double arm loader
Floor size		2,300 x 1,800
Weight		4,000Kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.



- Linear guide bearing 적용
 - 초정밀 Slide, 고정도 Ball screw 사용
 - Stick-slip 없이 Nano 절입 실현
 - 장기간 신뢰성 보증
- Applying Linear guide bearing
 - Ultra precise slide, ultra stiff ball screw
 - Realize nano-feeding without stick-slip
 - Assure reliability for long term

- Auto loader
 - 고속화 : Double arm loader
 - 고중량 : Single arm loader
 - 입구측 : 회전형 Work stopper

- Auto loader
 - High speed : Double arm loader
 - Heavy duty: Single arm loader
 - Inlet : Rotary work stopper



- Wheel spindle 의 다양성
 - 고정밀형: 유정압 Spindle (Hydro-static)
 - 저진동형: Built-in-motor spindle
 - 고강성용 : Angular Bearing
- Various wheel spindle
 - Ultra precision type: Hydro-static spindle
 - Low vibration type: Built-in-motor spindle
 - Ultra stiffness type: Angular bearing



외경연삭기(척 지지) / EXTERNAL GRINDER(CHUCK TYPE) TEG-510C

다양한 형상 연삭에 유리



FEATURES

- Diaphragm & Hydraulic chuck
- Bed와 냉각수 통로가 분리되어 열변형 최소화
- Angular grinding 가능 (외경+측면)
- Rotary forming dresser 채용
- Wheel spindle의 다양성

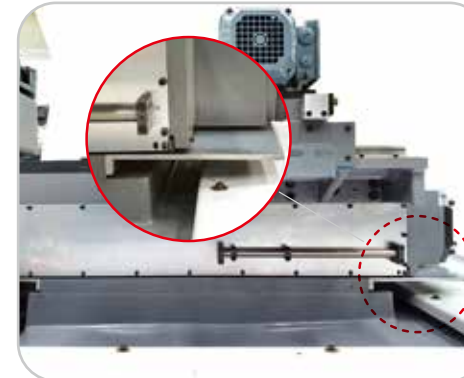
- Diaphragm & Hydraulic chuck
- Minimized thermal deflection by the separated coolant drain from machine frame
- Angular grinding enable(out-diameter + face)
- Rotary forming dresser
- Various wheel spindle are applicable



SPEC'

ITEM		TEG-510C
Support method		Diaphragm & Hydraulic chuck
Working range	Out-diameter	Ø90mm
	Width	50mm
Loading range	Out-diameter	Ø130mm
	Speed	3,000m/min
Wheel spindle	O.D x Width x I.D	Ø510 x 50 x Ø254, Ø560 x 50 x Ø254
	Type	고정밀형 : 유정압 Spindle (Hydro-static)
		저진동형 : Built-in-motor spindle
Work spindle	Speed	고강성용 : Angular bearing
		300~3,000 rpm
	Swivel angle	30° (Angular grinding)
Slide		Linear bearing slide
Dresser		Rotary forming dresser
Loader		Double arm loader
Floor size		2,300 x 1,800
Weight		4,500Kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.



- 밀폐형 Slide
 - Box형 전면 밀폐로 이물질 미투입
 - Sliding 부 틈새 Zero화
 - Slide 유증 윤활로 장수명 보증

- Enclosed Slide
 - Prevent contaminant by box type enclosed cover
 - Zeroed sliding clearance
 - Guarantee extreme long life of slide by oil mist lubrication

- 다양한 연삭 가능
 - Angular 연삭
 - 편심 연삭
 - 외경 연삭

- Various grinding application
 - Angular grinding
 - Eccentric grinding
 - External grinding



- 적용 UNIT
 - Auto balancer
 - In-process gauge
 - Rotary dresser
 - Single loader

- Applied unit
 - Auto balancer
 - In-process gauge
 - Rotary dresser
 - Single loader

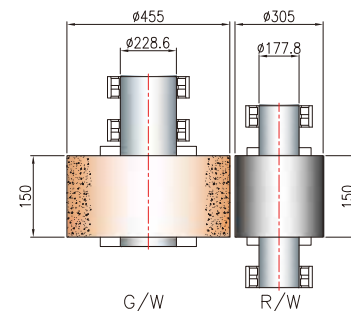


센터레스 연삭기 / CENTERLESS GRINDER TCG-150

소형 In-feed 연삭에 최고의 생산성

FEATURES

- Bed와 냉각수 통로가 분리되어 열변형 최소화
- R/W 고강성 양단지지 Spindle
- G/W, R/W Cylindrical roller bearing 채용
- 소형 In-Feed용에 적절
- 유압Tank 미사용으로 청결
- Minimized thermal deformation by deviding machine frame and coolant passage
- High stiffness R/W spindle result from both ends supporting
- Applying cylindrical roller bearing at G/W and R/W
- Suitable for in-feed grinding of small size
- Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-150
Working range	Out-diameter		Ø1.5~Ø40mm
	In-feed length		Max. 150mm
Grinding wheel	O.D x Width x I.D		Ø455 x 150 x Ø228.6mm
	Supporting type		Cantilever
Regulating wheel	O.D x Width x I.D		Ø305 x 150 x Ø177.8mm
	Supporting type		Dual supporting
	Speed modulating		Inverter
Dresser	G/W	G/W traverse	Speed control motor
		Dress advance	Servo motor / Manual
	R/W	R/W traverse	Speed control motor
		Dress advance	Servo motor / Manual
Tilting angle of R/W			-2° ~ +5°
Motor	G/W driving		7.5kw · 11kw · 15kw, 4p
	R/W driving		0.75kw, 6p, Inverter
Floor size			1,900 x 1,520mm
Weight			3,700kg

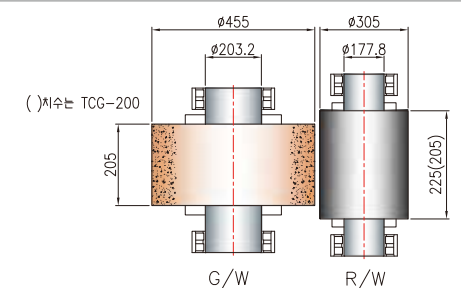
※ All specifications and dimensions above are subject to change for quality improvement without notice.

센터레스 연삭기 / CENTERLESS GRINDER TCG-200 / 200L

G/W R/W 양단지지 Spindle로 최고의 생산성 및 고정도

FEATURES

- Bed와 냉각수 통로가 분리되어 열변형이 최소화
- G/W, R/W 고강성 양단지지 Spindle
- G/W, R/W Cylindrical roller bearing 채용
- R/W Wheel 폭이 길어 Setting 용이 (TCG-200L)
- 중소형 In-feed, Thru-feed용에 적절
- 유압Tank 미사용으로 청결
- Minimized thermal deformation by deviding machine frame and coolant passage
- High stiffness G/W R/W spindle result from both ends supporting
- Applying cylindrical roller bearing at G/W and R/W
- Easy to set due to the wider length of R/W
- Suitable for in-feed and thru-feed grinding for middle and small size products
- Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-200		TCG-200L	
Working range	Out-diameter		Ø1.5~Ø50mm			
	In-feed length		Max. 200mm			
Grinding wheel	O.D x Width x I.D		Ø455 x 205 x Ø203.2mm			
	Supporting type		Dual supporting			
Regulating wheel	O.D x Width x I.D		Ø305 x 205 x Ø177.8mm		Ø305 x 225 x Ø177.8mm	
	Supporting type		Dual supporting			
	Speed modulating		Inverter			
Dresser	G/W	G/W traverse	Speed control motor			
		Dress advance	Servo motor / Manual			
	R/W	R/W traverse	Speed control motor			
		Dress advance	Servo motor / Manual			
Tilting angle of R/W			-2° ~ +5°			
Motor	G/W driving		7.5kw · 11kw · 15kw, 4p			
	R/W driving		0.75kw, 6p, Inverter			
Floor size			1,900 x 1,520mm			
Weight			4,300kg			

※ All specifications and dimensions above are subject to change for quality improvement without notice.

센터레스 연삭기 / CENTERLESS GRINDER TCG-200B

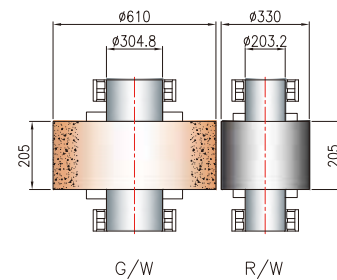
중대형 In-feed 연삭에 최고의 생산성



FEATURES

- G/W, R/W 고강성 양단지지 Spindle
- G/W, R/W Cylindrical roller bearing 채용
- 중절삭용 Centerless grinder
- 유압Tank 미사용으로 청결

- High stiffness G/W R/W spindle result from both ends supporting
- Applying cylindrical roller bearing at G/W and R/W
- High stiffness grinding
- Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-200B
Working range	Out-diameter		Ø2 ~ Ø120mm
	In-feed length		Max.200mm
Grinding wheel	O.D x Width x I.D		Ø610 x 205 x Ø304.8mm
	Supporting type		Dual supporting
Regulating wheel	O.D x Width x I.D		Ø330 x 205 x Ø203.2mm
	Supporting type		Dual supporting
	Speed modulating		Inverter
Dresser	G/W	G/W traverse	Speed control motor
		Dress advance	Servo motor / Manual
	R/W	R/W traverse	Speed control motor
		Dress advance	Manual
Tilting angle of R/W			-2° ~ +5°
Motor	G/W driving		11kw, 4p
	R/W driving		1.5kw, 6p, Inverter
Floor size			3,040 x 1,920mm
Weight			6,800kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.

센터레스 연삭기 / CENTERLESS GRINDER TCG-250

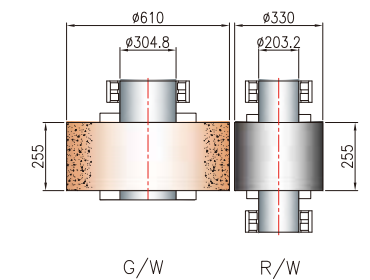
중대형 In-feed, Thru-feed 연삭에 최고의 생산성



FEATURES

- R/W 고강성 양단지지 Spindle
- G/W, R/W Cylindrical roller bearing 채용
- 중절삭용 Centerless grinder
- 유압Tank 미사용으로 청결

- High stiffness R/W spindle result from both ends supporting
- Applying cylindrical roller bearing at G/W and R/W
- High stiffness grinding
- Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-250
Working range	Out-diameter		Ø2 ~ Ø120mm
	In-feed length		Max. 250mm
Grinding wheel	O.D x Width x I.D		Ø610 x 255 x Ø304.8mm
	Supporting type		Cantilever
Regulating wheel	O.D x Width x I.D		Ø330 x 255 x Ø203.2mm
	Supporting type		Dual supporting
	Speed modulating		Inverter
Dresser	G/W	G/W traverse	Speed control motor
		Dress advance	Servo motor / Manual
	R/W	R/W traverse	Speed control motor
		Dress advance	Manual
Tilting angle of R/W			-2° ~ +5°
Motor	G/W driving		15kw, 4p
	R/W driving		1.5kw, 6p, Inverter
Floor size			3,040 x 1,920mm
Weight			6,800kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.

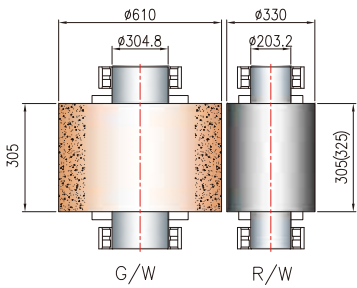
센터레스 연삭기 / CENTERLESS GRINDER
TCG-300 / TCG-300L

중대형 In-feed 연삭에 최고의 생산성



FEATURES

- G/W, R/W 고강성 양단지지 Spindle
 - G/W, R/W Cylindrical roller bearing 채용
 - R/Wheel 폭이 길어 Setting 용이 (TCG-300L)
 - 초강성 Bed에 의한 중절삭용
 - 유압Tank 미사용으로 청결
- High stiffness G/W R/W spindle result from both ends supporting
 - Applying cylindrical roller bearing at G/W and R/W
 - Easy to set due to the wider length of R/W (TCG-300L)
 - High stiffness grinding
 - Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-300		TCG-300L	
Working range	Out-diameter		Ø3 ~ Ø150mm			
	In-feed length		Max. 300mm			
Grinding wheel	O.D x Width x I.D		Ø610 x 305 x Ø304.8mm			
	Supporting type		Dual supporting			
Regulating wheel	O.D x Width x I.D		Ø330 x 305 x Ø203.2mm		Ø330 x 325 x Ø203.2mm	
	Supporting type		Dual supporting			
	Speed modulating		Inverter			
Dresser	G/W	G/W traverse	Speed control motor			
		Dress advance	Servo motor / Manual			
	R/W	R/W traverse	Speed control motor			
		Dress advance	Manual			
Tilting angle of R/W			-2° ~ +5°			
Motor	G/W driving		15kw · 22kw, 4p			
	R/W driving		1.5kw, 6p, Inverter			
Floor size			3,040 x 1,920mm			
Weight			7,000kg			

※ All specifications and dimensions above are subject to change for quality improvement without notice.

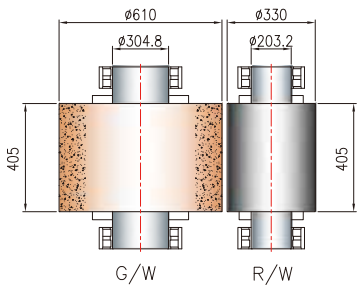
센터레스 연삭기 / CENTERLESS GRINDER
TCG-400

대형 Thru-feed 연삭에 최고의 생산성



FEATURES

- Bed와 냉각수 통로가 분리되어있어 열변형 최소화
 - G/W, R/W 고강성 양단지지 Spindle
 - G/W, R/W Cylindrical roller bearing 채용
 - 중절삭용 Centerless
 - 유압Tank 미사용으로 청결
- Minimized thermal deformation by deviding machine frame and coolant passage
 - High stiffness G/W R/W spindle result from both ends supporting
 - Applying cylindrical roller bearing at G/W and R/W
 - High stiffness grinding
 - Keep clean by eliminating hydraulic tank



SPEC'

ITEM			TCG-400
Working range	Out-diameter		Ø3 ~ Ø150mm
	In-feed length		Max. 400mm
Grinding wheel	O.D x Width x I.D		Ø610 x 405 x Ø304.8mm
	Supporting type		Dual supporting
Regulating wheel	O.D x Width x I.D		Ø330 x 405 x Ø203.2mm
	Supporting type		Dual supporting
	Speed modulating		Inverter
Dresser	G/W	G/W traverse	Speed control motor
		Dress advance	Servo motor / Manual
	R/W	R/W traverse	Speed control motor
		Dress advance	Manual
Tilting angle of R/W			-2° ~ +5°
Motor	G/W driving		22kw · 30kw · 37kw, 4p
	R/W driving		1.5kw, 6p, Inverter
Floor size			3,040 x 1,920mm
Weight			8,000kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.

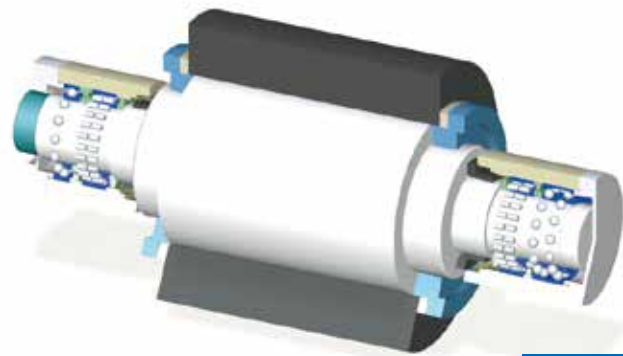
양단지지 G/W, R/W SPINDLE

초정밀 복열 원통 Roller Bearing으로 지지

- 강성의 극대화 : 직경 방향의 간극이 "Zero"에 근접하여 연삭저항에 따른 변위가 적고 중삭 가공이 가능
- 안정된 회전정도 : Spindle의 흔들림을 최소화하여 가공능률과 가공정도를 비약적으로 향상
- 온도 상승 최저 : 24시간 연속 운전시에도 온도 상승은 10°C 이하로써 발열에 따른 변화가 없음
- 윤활유 관리 용이 : 윤활은 그리스 밀봉으로 주유가 불필요함
- 보수 간편 : Spindle unit가 호환성이 있고, 또한 Bearing 교체가 용이함

Supported With Ultra Precision Double Row Cylindrical Roller Bearings

- Maximized stiffness : Small deformation from grinding resistance and the rough grinding is possible because the radial clearance is nearly 'zero'.
- Stabilized rotational precision : Grinding efficiency and accuracy are improved remarkably by minimizing runout of spindle.
- Minimized thermal fluctuation : No influence for heating because temperature will rise below 10 degree even it run 24 hours continuously.
- Easy lubrication : Grease lubrication is applied, so there is no need to fill lubrication oil any more.
- Easy maintenance : Spindle unit has a compatibility, and bearing is able to be replaced easily.



Dual supported wheel spindle (G/W, R/W)

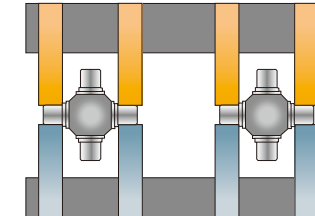


다양한 제품에 대한 대응력

In-feed grinding

고성능 자동화로 동시에 2~3ea 연삭 가능
Simultaneous grinding two or three workpieces by high performed automation

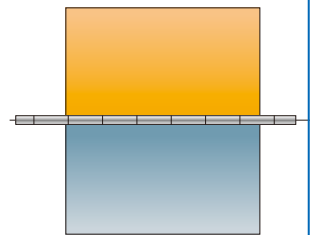
- Handle joint spider
- Valve spool
- Water pump shaft



Through-feed grinding

모델 변경이 빨라 고효율이고 고품질 실현
High efficiency and high quality by fast workpiece change and setting

- Pinion shaft
- Piston pin
- Carbide parts



슈퍼피니싱기 / SUPER FINISHING TRS-500 / 660 / 660R

저비용 초정밀 품질의 Super finishing

FEATURES

- 쌍곡선체 Feed-roll 사용
 - 지석과 제품이 평행으로 가공
- 지석마모 검출
- 좌우 상하 대칭으로 Air Bearing 채용
 - 부분 마모시 상호보완
- Hyperbolic curve feed roller
 - Workpieces can go through stones parallel
- Air bearings are applied in left-right and topbottom symmetrically
 - Mutual compatibility when partially worn



SPEC'

ITEM		TRS-500	TRS-660	TRS-660R
Working range	Outer diameter	Ø2 ~ Ø60mm		
	Length	Max. 500mm	Max. 660mm	Max. 30mm
Workpiece supplying		Thru- feed (Feed roll)		
Oscillation	Slide	Air bearing slide		
	Stroke	0 ~ 3mm (Cam exchange)		
	Frequency	100 ~ 2,000cpm (Inverter control)		
Stone head	Stone pressure	Air cylinder		
	Unit	6 Heads	8 Heads	
Feed roll	Out diameter	Ø70 ~ Ø110		Ø120 ~ Ø180
	Shape	Hyperbolic curve feed roller		Feed roll for tapered roller
Motor	Feed box	2.2kw, 4p	3.7kw, 4p	
	Oscillation	0.75kw, 4p	1.5kw, 4p	
Floor size		1,580 x 990mm	1,580 x 990mm	
Weight		2,500kg	3,200kg	

※ All specifications and dimensions above are subject to change for quality improvement without notice.

슈퍼피니싱기 / SUPER FINISHING TRS-500ST

다단 제품 Super finishing 가능

FEATURES

- 단부착 제품 Super finishing
- 양끝단 Crowning S/F
- 제품 단속적으로 공급되어도 S/F
- 지석 마모 검출
- Super finishing for the multistep workpiece
- Crowning S/F at both ends
- Continuous S/F even workpiece supplying intermittent
- Stone wear detacting



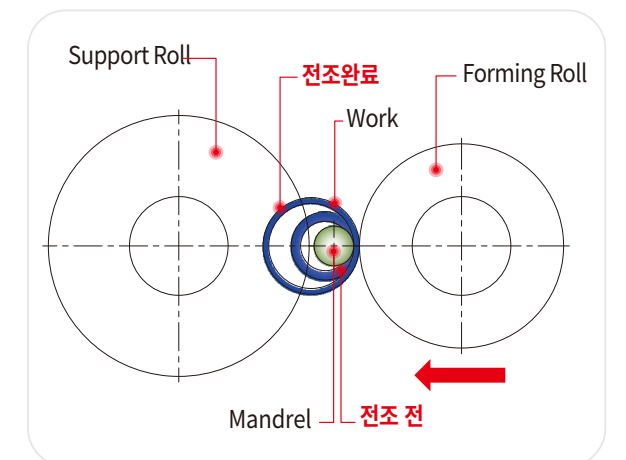
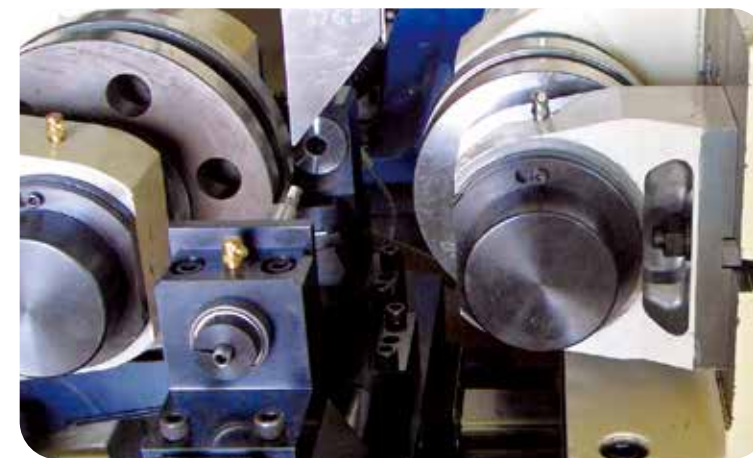
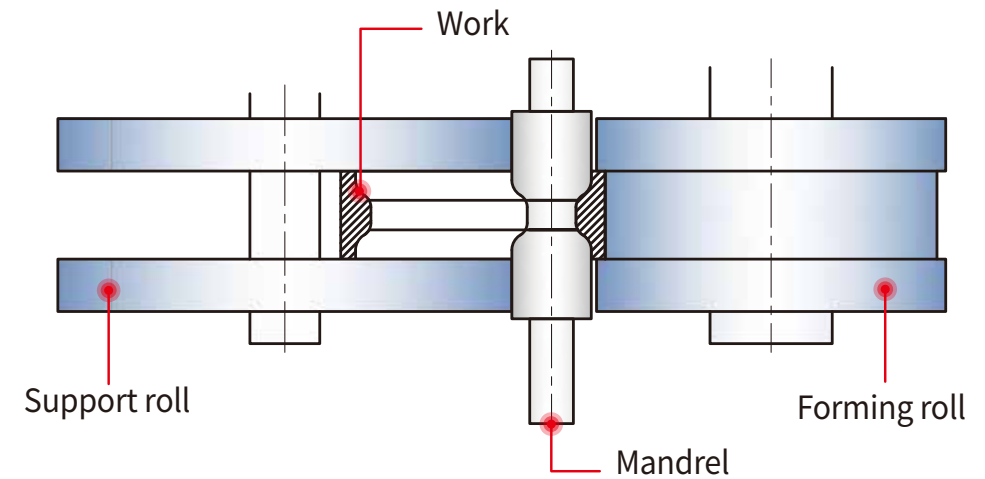
SPEC'

ITEM		TRS-500ST
Working range	Outer diameter	Ø2 ~ Ø60mm
	Length	Max. 500mm
Workpiece supplying		Thru- feed (Feed roll)
Oscillation	Slide	Air bearing slide
	Stroke	0 ~ 3mm (Cam exchange)
	Frequency	100 ~ 2,000cpm (Inverter control)
Stone head	Stone pressure	Air cylinder
	Unit	6 Heads
Feed roll	Out diameter	Ø70 ~ Ø110
	Shape	Hyperbolic curve feed roller
Motor	Feed box	2.2kw, 4p
	Oscillation	0.75kw, 4p
Floor size		1,580 x 990mm
Weight		2,500kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.

냉간전조기 / COLD ROLLING & FORMING MACHINE TRM-120 / TRM-130B

초고속 냉간 Ring 성형전조기



설비개요

- 원통형상의 제품을 MANDREL과 성형 ROLL에 의해 냉간으로 내경과 외경을 확장하거나 형상을 전조하는 기계.

전조품질

- 소성 가공에 따른 METAL FLOW가 형성되어 열처리 변형이 적으며 치수가 안정되고 내마모성이 크게 향상.

원가절감

- 재료 수율이 베어링의 경우 20~30% 향상.
- 저가, C/T 단축, 냉간 소성 가공으로 TOOL의 수명이 장시간.

냉간전조 범위

- 제품은 외경으로 약 20%정도 확관 전조.

치수 제어

- NC CONTROLLER에서 다단계로 범위를 설정하여 제어.
- 상황에 따라서 SIZING이 부착되어 최종 치수 수정이 가능.

SPEC'

ITEM		TRM-120	TRM-130B
Working range	Maximum OD after rolling	Ø20 ~ Ø120mm	Ø25 ~ Ø140mm
	Maximum width after rolling	Max. 35mm	Max. 45mm
Oscillation	Feeding Sys	Screw + Reducer	
	Feeding Control	NC Control	
	Slide	L.M Guide	
	Roll Size	Max. Ø180mm	Max. Ø200mm
Support Roll Size		Max. Ø250mm	Max. Ø320mm
Mandrel Slide		L.M Guide	
Loader		Air Cylinder + L.M Slide	Air Cylinder + L.M Slide
Back up Roll		Not applied	Applied
Sizing		Option	Option
Motor	Roll Driving	Cyclo Reducer 11kw, 4p	Cyclo Reducer 15kw, 4p
	Hyd' Tank	2.2kw	2.2kw
Floor Size(Hyd' tank Included)		2,900 x 1,900mm	2,900 x 1,900mm
Weight		3,600kg	6,600kg

※ All specifications and dimensions above are subject to change for quality improvement without notice.

RETROFIT

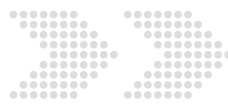
최소의 투자로 최고의 효과

Retrofit 실적

1) Centerless grinder

Model : 3CW-RM (KOYO)

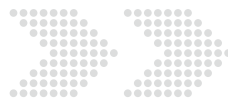
- 정도복원 (Slide연삭, Scraping, Spindle bearing교체 外)
- 전기 Part 전량 교체 外



2) Double disk grinder

Model : 2D-760 (KOYO)

- 제품공급장치 신규제작
- 정도복원 (Slide연삭, Scraping, Spindle bearing교체 外)
- In-feed : Ball screw + Servo motor



3) Internal grinder

Model : T-118 (TOYO)

- 유압식 -> Fanuc NC개조
- 정도복원 (Slide연삭, Scraping, Spindle bearing교체 外)
- In-feed : Ball screw + Servo motor



MEMO