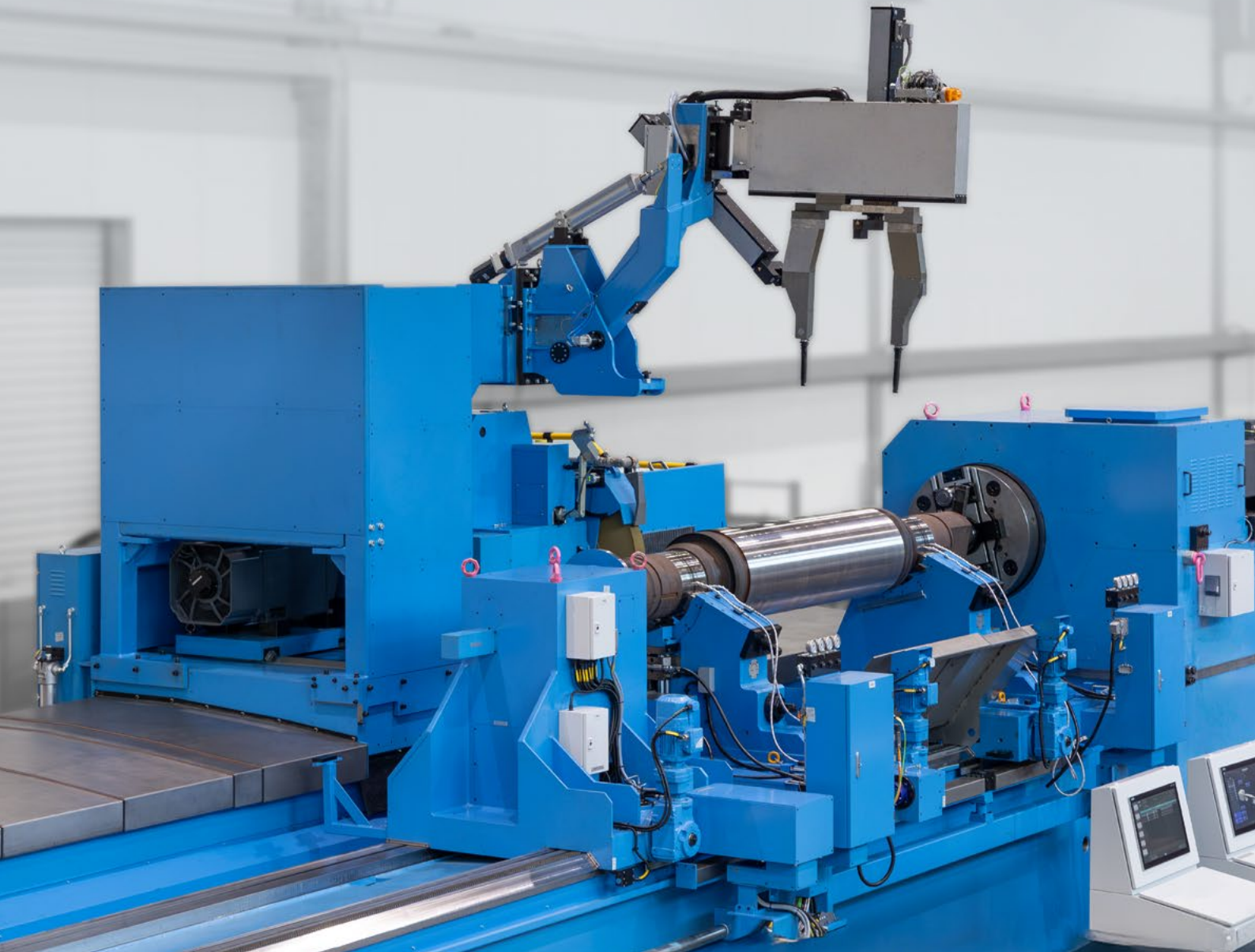


CNC Roll Grinder

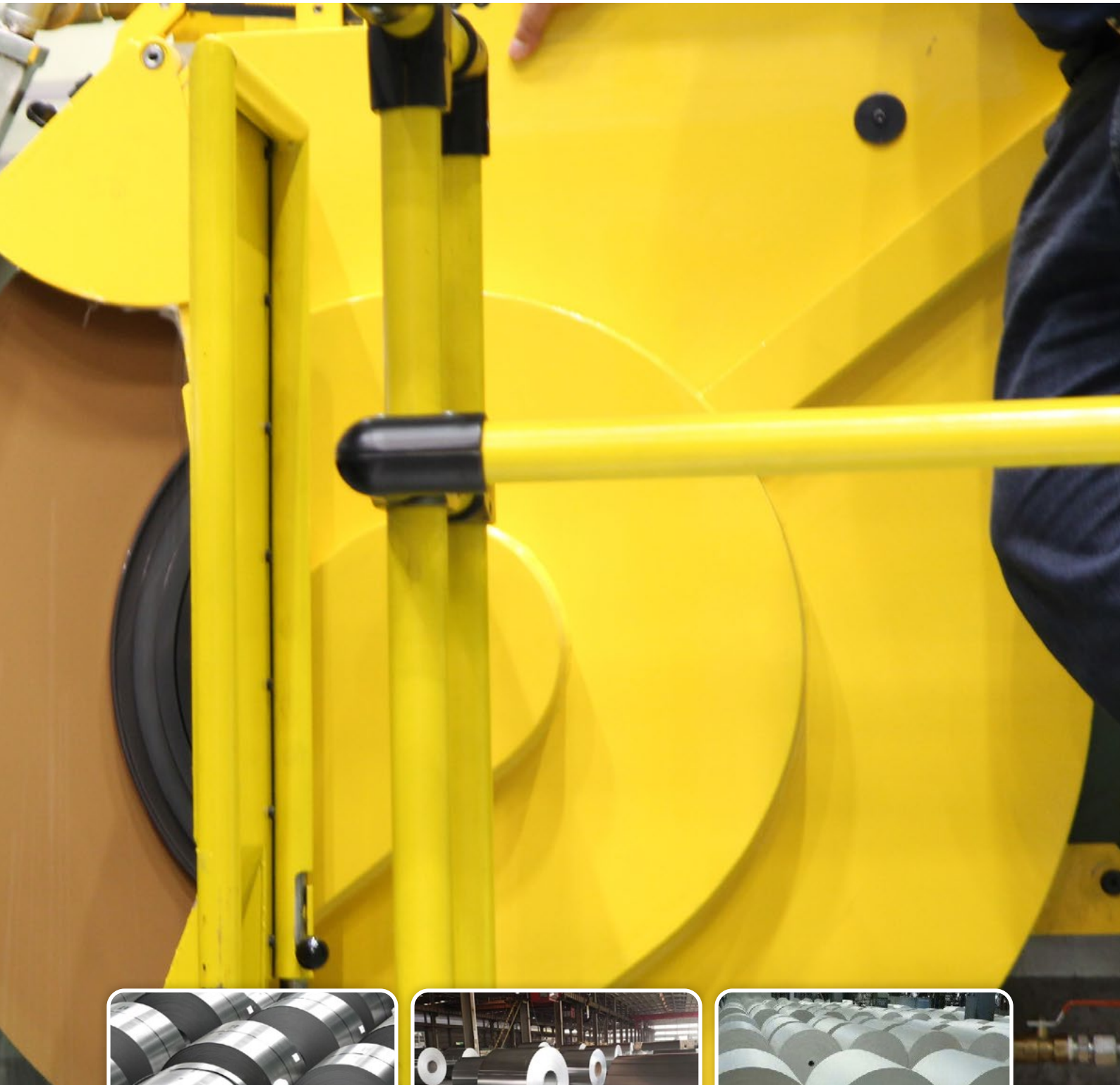
The CNC Roll Grinder is a perfect combination of up-to-date design, advanced high technology, and SANGNIM MSP's fully skilled engineering. The machine consists of a bed, headstock, tailstock, wheel head, measuring device, steady rest, accessories, and a CNC control system.





CNC Roll Grinder

This machine has been designed for various kinds of rolls in the industries like below.
상림엠에스피가 생산하는 roll grinder로 다양한 분야의 roll을 최고의 품질로 연삭할 수 있습니다.



Steel mill industry

제철 분야

- Roll for heavy plate
- Roll for hot rolled strip
- Roll for cold rolled strip



Aluminum & other industry

알루미늄 분야

- Aluminum plate and sheet
- Stainless steel plate
- Non-ferrous metal plate



Paper industry

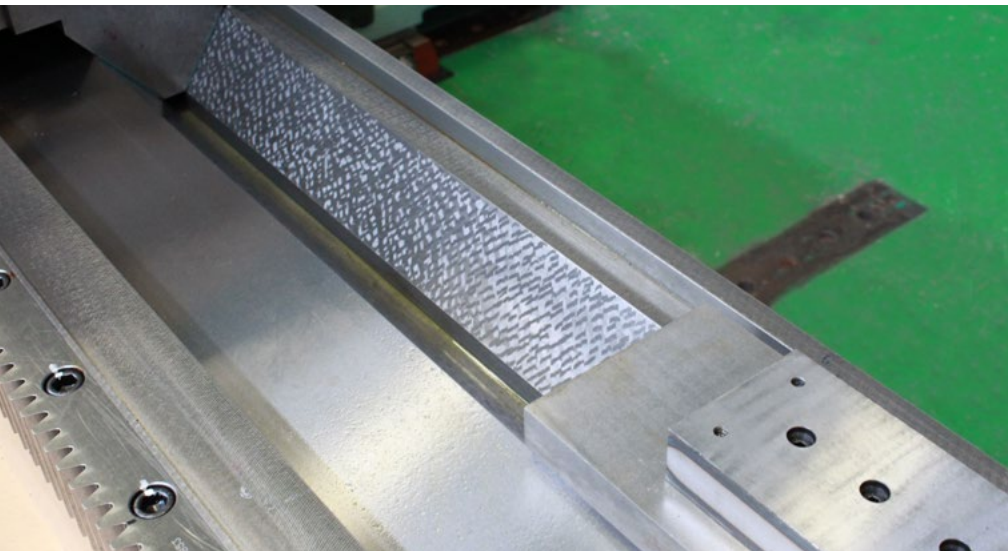
제지 분야

- Roll for paper sheet
- Roll for toilet paper

Features

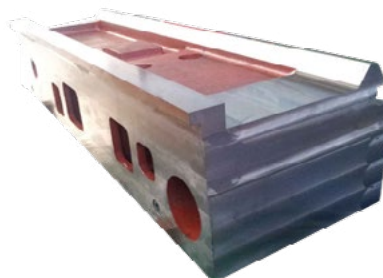
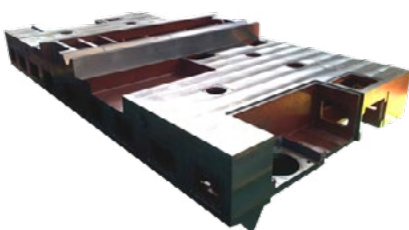
V-Groove

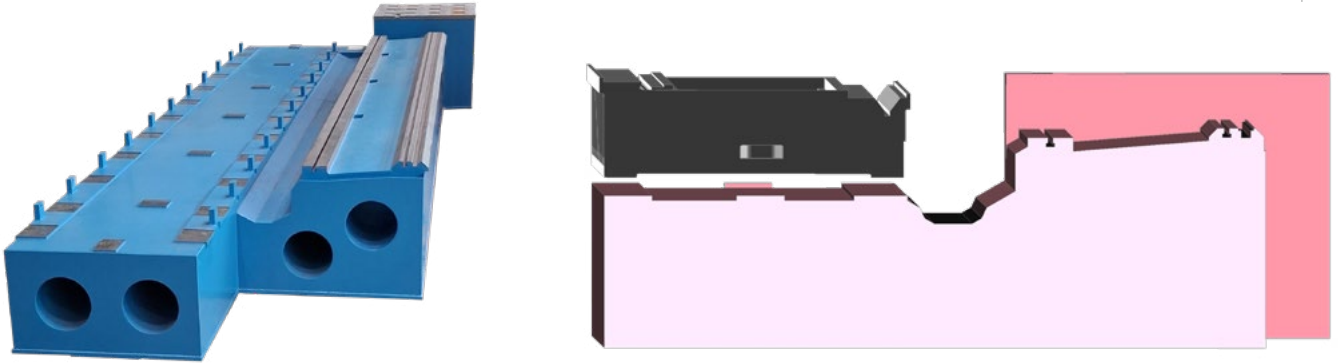
- Best system for grinding accuracy
- Continuously keeping center line
- Minimization of the thermal deformation
- Application of 76° degree at V-groove for no swimming effect in heavyweight
- Application of scraping work to the major slide ways
- roll 연삭 정확도를 위한 최고의 system
- 지속적인 center line 유지
- 열 변형에 최소화
- V-groove에 76° 각도 적용으로 고중량 조건에서도 울렁임 현상 없음
- 주요 slide way에 scraping 적용



Cast Iron Structure

- The main parts such as carriage, bed, tailstock and headstock are made of cast iron.
- Rigid structure
- High dimensional accuracy of the products
- 주요 파트인 carriage, bed, tailstock, headstock은 주물로 제작되었습니다.
- 높은 강성
- 제품의 고정밀도 유지





Monolith Bed

The existing mechanical foundation method combining concrete blocks and springs required excessive foundation construction costs from the customer. With the introduction of new technology, we simplify the machine foundation by replacing the existing concrete block type machine foundation and supply Monolith bed with even better physical properties.

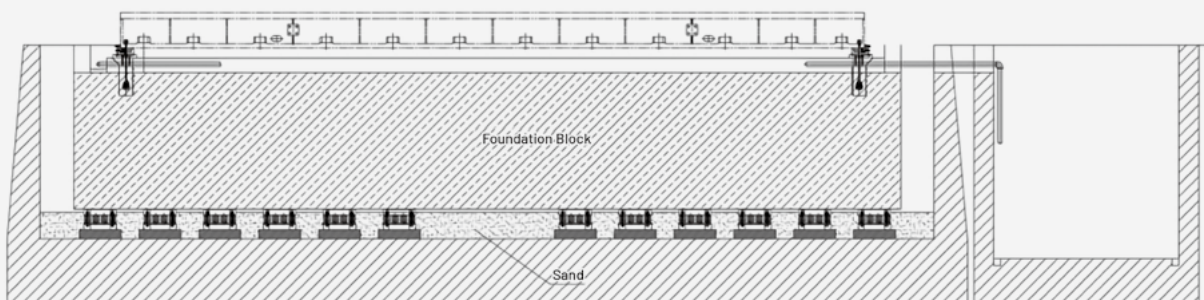
기존의 concrete block과 spring을 조합한 기계 기초 방식은 고객사에게 과도한 기초 건설비용을 요구하였습니다. 새로운 신기술의 도입으로 기존 concrete block type의 기계 기초를 대체하여 기계 기초를 단순화하고, 더욱 더 좋은 물리적 특성을 가진 monolith bed를 공급합니다.

- Reduced cost compared to concrete block type foundation
- Excellent vibration absorption effect
- No thermal deformation under normal conditions due to high heat capacity and thermal stability
- 전통적인 concrete block type 기초 대비 절감된 비용
- 탁월한 진동 흡수 효과
- 높은 열 용량 및 열 안정성으로 일반적인 조건하에 열 변형이 없음

Spring Foundation

If a customer wants to reuse an existing machine foundation or wants a concrete block type foundation, we provide a concrete block type machine foundation design through appropriate design.

고객사가 기존에 설치된 기계 기초를 재사용을 원하거나, concrete block type의 기초를 원하는 경우, 적합한 설계를 통하여 concrete block type의 기계 기초 디자인을 제공합니다.



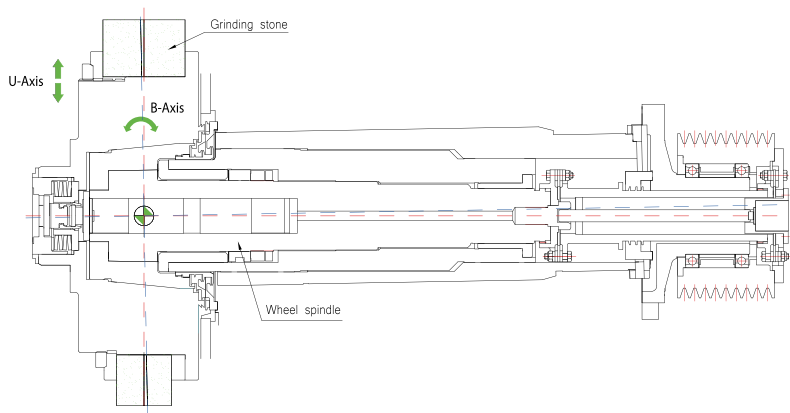


Grinding Wheel

Our grinding wheel has a special design for efficient grinding of the roll, and it has special moving axes B and U. That axes brings high grinding ability and cost reduction.

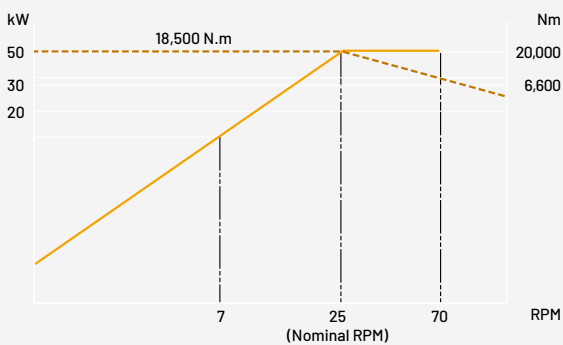
상림엠에스피가 개발한 Grinding wheel은 roll의 연삭을 손쉽게 하도록 설계되었으며, 특수한 이동축인 B축과 U축을 가지고 있습니다. 이 축은 높은 연삭 성능과 원가 절감을 가져옵니다.

- Special design of B&U-axes
- Precise approach control from wheel to roll surface
- Application of disc coupling for prevention of vibration
- 상림엠에스피의 특수한 B&U 축 설계
- wheel에서 roll 표면까지의 정밀한 접근 제어
- 진동 방지를 위한 disc coupling 적용

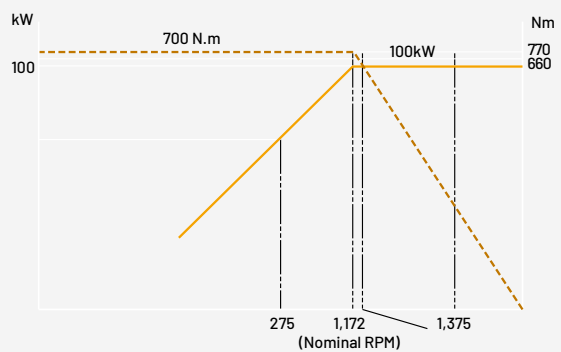


Torque diagram

+ Faceplate of work roll grinder



+ Wheel head of work roll grinder





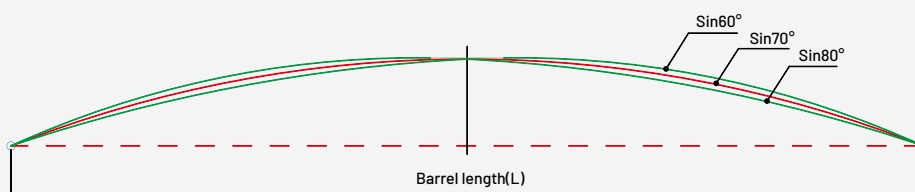
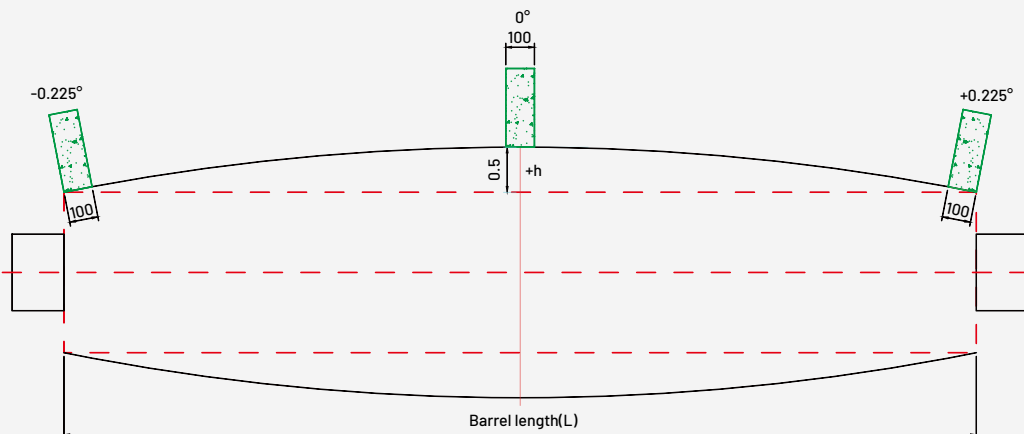
B&U-Axes

- Working at the center line of the grinding wheel
- High rigid structure
- Application of the hydrostatic guiding system
- 40% time reduction in comparison with other makers in case of CVC roll grinding
- 20% reduction of the wheel wear

- grinding wheel 중심선 상에서 작동
- 고강성 구조
- hydrostatic guiding system 적용
- CVC roll 연삭의 경우 타 maker 대비 가공 시간 40% 절감
- 슷돌 마모 20% 절감



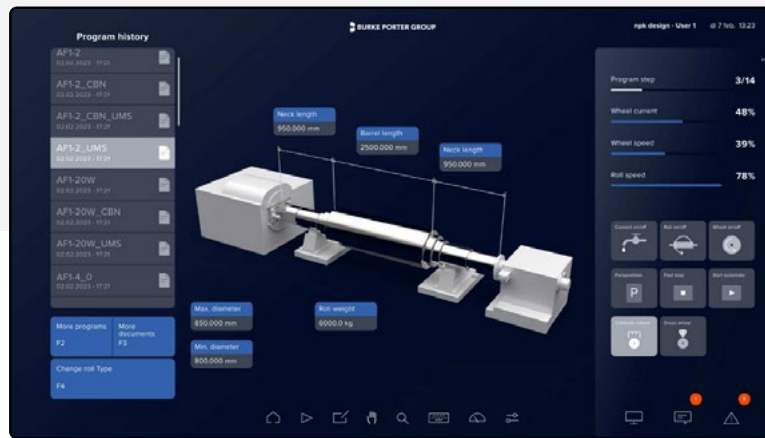
Curve shape



GPC – Grind Process Control

Our roll grinders are equipped with GPC, a control program exclusively for roll grinders from Kleinknecht, Germany. Experience the best program for grinding based on Siemens, with a modern design of HMI, touch operation and familiar and easy operation functions like those of common home appliances or car control systems.

상림엠에스피의 roll grinder에는 독일 Kleinknecht 사의 roll grinder 전용 control 프로그램인 GPC 를 장착합니다. touch 작동 방식과 일반적인 가전 제품 또는 자동차 제어 system처럼 친숙하고 쉬운 조작 기능을 갖추고 현대적으로 설계된 HMI를 가진 Siemens 기반으로 제작된 grinding을 위한 최상의 program을 경험해 보십시오.



HMI – Home screen

Overview and direct access to last roll grind protocols

롤 그라인딩 작업의 개요 표시

- Check grinding data and measured curves
- Fast access to all programs and grinding data, individual folder structure like Windows
- 연삭 data 및 측정 곡선을 확인
- 모든 program 및 연삭 data에 대한 빠른 접근, Windows와 같은 개별 폴더 구조

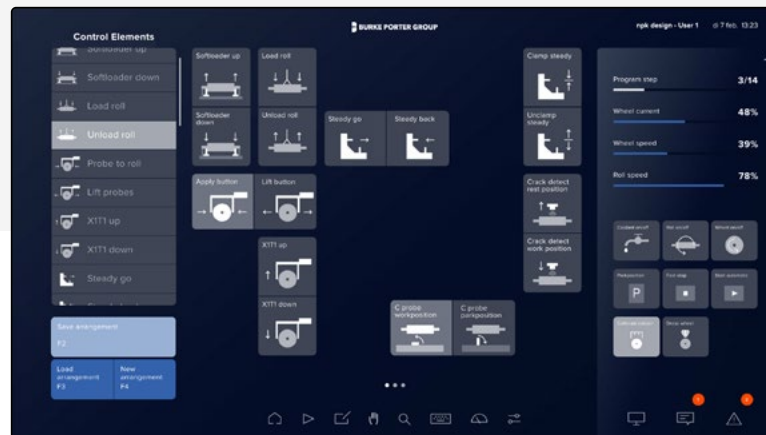
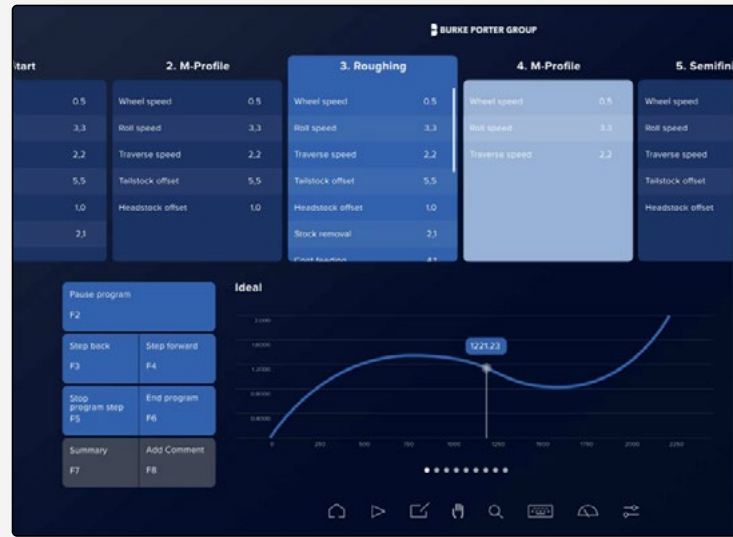
Overview of inserted roll and basic roll data

장착된 롤 데이터 개요

- Dashboard for direct controls and information about current grinder status
- Hint to messages and warnings by red color notifications
- 현재 grinding 상태에 대한 직접적인 제어 및 정보를 제공하는 dashboard
- 빨간색으로 알람 및 메시지, 경고에 대한 해결 방법 제공

HMI – Automatic Operation Mode

- Representation of the grinding steps as a horizontal sequence.
- Visual highlighting of the active and the following step.
- Navigation and control by shortcut keys or moving by hand.
- Direct access to the most important parameters.
- Swapping through different types of curves(measured, deviation, roll inspection results, current fluctuation, ...).
- 연삭 단계를 수평 순서로 표현합니다.
- 연삭 중인 단계와 다음 단계를 시각적으로 강조 표시합니다.
- 단축키를 사용하거나 touch 방식으로 이동하여 탐색 및 제어할 수 있습니다.
- 중요한 parameter에 직접 access 합니다.
- 다양한 유형의 곡선 표시(측정, 편차, roll 검사 결과, 전류 변동 등)

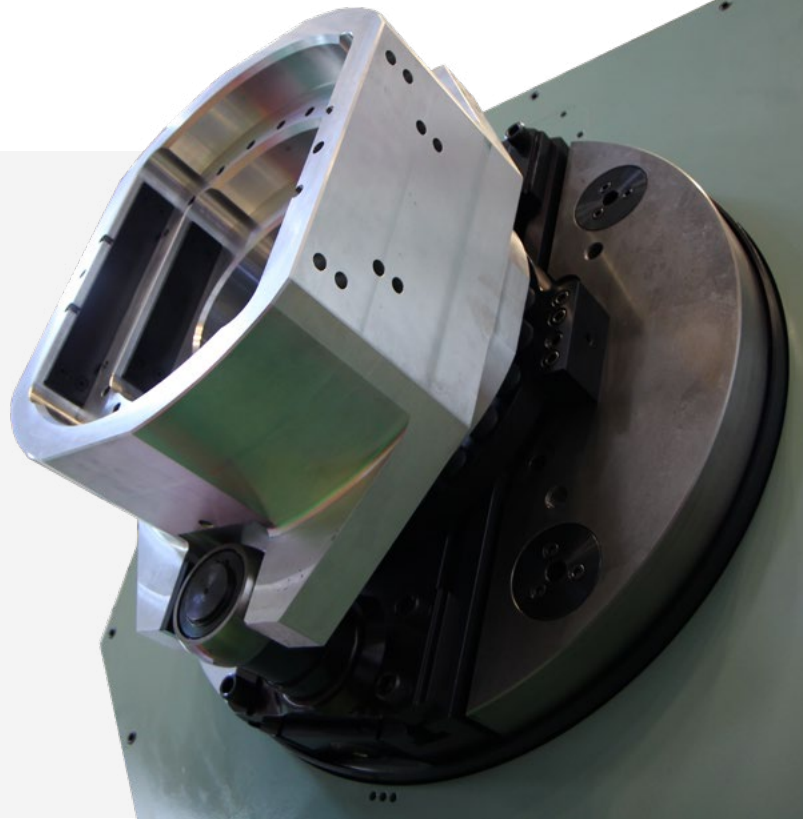


HMI – Manual / Jog Operation Mode

- Each operator can create his own configuration of this page(several existing pages are indicated by the dots) - Known procedure from consumer electronics.
- Function can be dragged and dropped from a library onto a position and fixes itself in the grid - The library is only displayed during configuration.
- The function is displayed via text and simple unique pictograms.
- 각 운영자는 이 page에 대한 자신만의 구성을 만들 수 있습니다. (여러 기존 page는 점으로 표시됨) 일반적인 전자 제품처럼 편리하게 작동합니다.
- 기능은 library에서 특정 위치로 끌어서 놓을 수 있으며 grid에서 자체적으로 수정됩니다. library는 구성 중에만 표시됩니다.
- 기능은 text와 간단하고 고유한 그림 문자를 통해 표시됩니다.

Driving Dog

- Optimized design for quick roll setting
- By applying step shape, various types of rolls can be set quickly without changing aluminum housing.
- 빠른 roll setting을 위한 최적의 설계
- 고객사 roll 구조에 맞는 계단 형상 채움으로 aluminum housing 변경 없이 각각 다른 형상의 roll을 신속히 setting 가능



Steady / Chock Rest

We supply various steady rests and chock rests in hot & cold rolling mill abiding by customer's needs on the basis of the accumulated steady rest manufacture know-how.

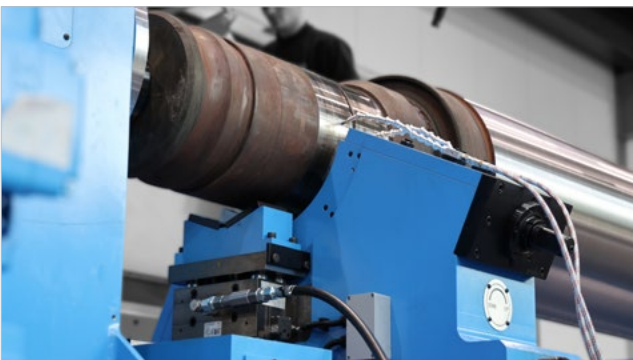
다수의 Steady rest 제작을 통해 얻은 노하우를 바탕으로 고객사에 적합한 열연, 냉연용 steady rest와 chock rest를 공급해 드립니다.

+ For cold rolling mill

+ For hot rolling mill

- Steady rest for high precise grinding in cold rolling mill hydrostatic, hydrodynamics
- 고정밀 연삭에 적합한 냉연용 steady rest

- Chock rest for quick grinding in hot rolling mill
- 신속한 중절삭에 적합한 열연용 chock rest



Measuring Device

- Application of Heidenhain measuring system
- Measuring device and carriage are integrated as one body for compact structure
- Minimization of temperature influence and deformation despite long-term use, maintenance of high accuracy.
- Heidenhain measuring system 적용
- measuring device와 carriage가 일체형으로 구성되어 compact한 구조
- 장기간 사용에도 온도의 영향이나 변형이 적어 고정도 유지 가능



Measuring Caliber

- Depending on the customer's preference, a measuring caliber from WMG can be installed as an option.
- 고객사의 선호에 따라 option으로 WMG사의 measuring caliber 를 장착할 수 있습니다.

Retrofit & Modernization

기계 개조 및 현대화

The original machine foundation can be maintained, greatly improving the machine's efficiency, output and product quality, and contributing to carbon neutrality as the basic machine castings are still used.

원래의 기계 기초를 유지하며 기계의 효율성, 생산성 및 제품 품질을 크게 향상시키고, 기본 기계 주물을 그대로 사용하므로 탄소 중립에 기여합니다.



+ Before

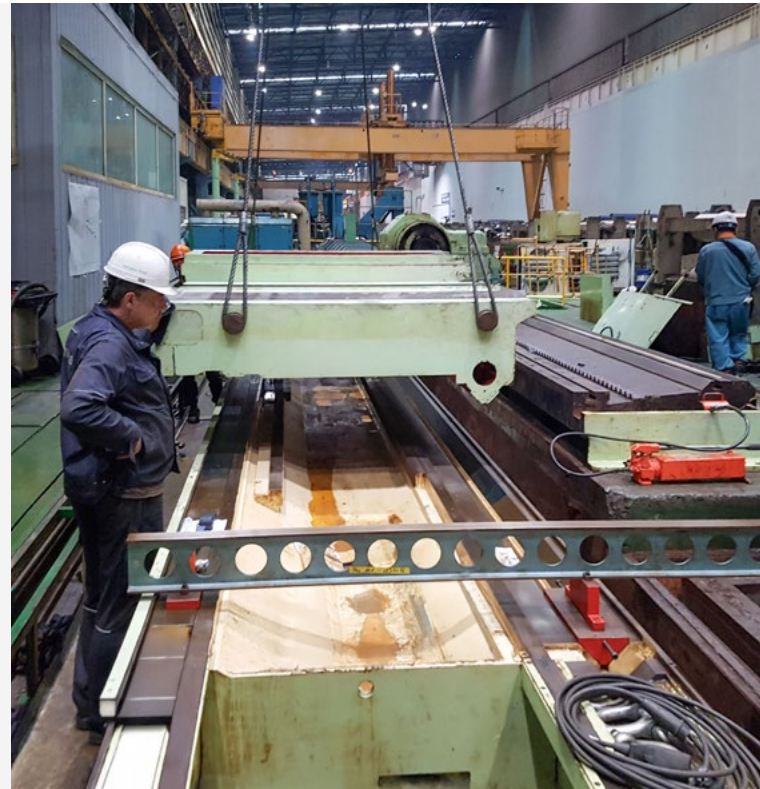


+ After

Retrofit & modernization suggested by Sangnim:

상림엠에스피는 아래와 같이 기계의 개조 및 현대화 작업을 수행합니다.

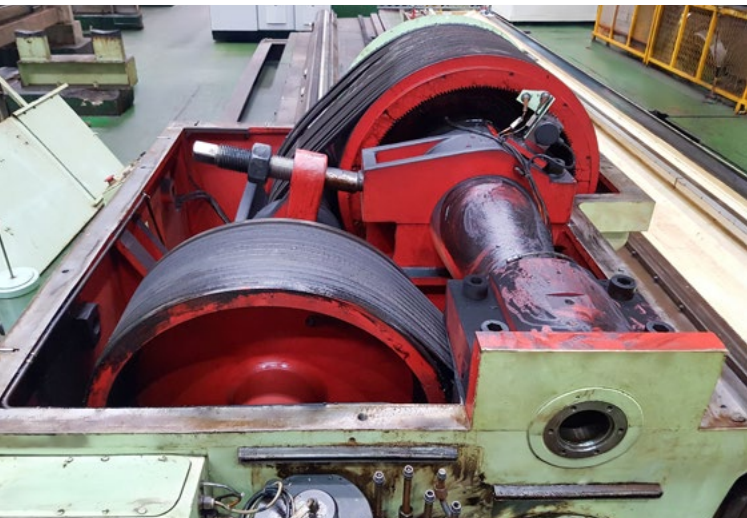
- Complete overhaul and replacement of all mechanical, electrical and hydraulic systems
- Completely new SIEMENS electrical system with modern AC motors/servo motors and measuring devices
- Special accessories tailored to each grinding task.
- 기계, 전기 및 유압 system의 전체 점검 및 교체
- 최신 AC motor /servo motor 및 측정 장치를 갖춘 완전히 새로운 SIEMENS 전기 system
- 각 연삭 작업에 맞춰진 특수 accessory 공급



Retrofit & modernization is possible for the machine manufacturers below

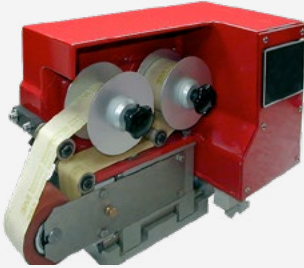
아래와 같은 기계 maker의 retrofit & modernization 작업 수행이 가능합니다.

- Herkules
- Pomini
- Waldrich Siegen
- Georg
- Toshiba(Shibaura)
- Others



Accessories

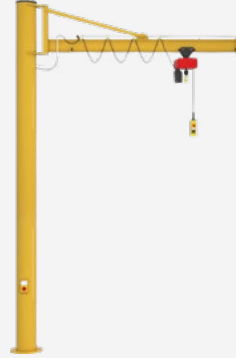
We supply lots of customized accessories for various customers to perform efficient machine operation and machining. 고객사에 적합한 다양한 accessory들을 효율적인 장비 운용과 가공을 위하여 공급하고 있습니다.



+ Superfinishing attachment



+ Roughness measuring device



+ Jib crane



+ Auto balancer

Automatic Wheel Changer

- Special design for easy replacement of grinding wheel
- Safe and quick replacement of grinding wheel with hydraulic system
- grinding wheel 교환을 용이하게 하기 위한 special design
- 유압 system을 적용하여 안전하고 신속한 grinding wheel 교체

ECT/UT

- Equipment for detecting roll crack
- Optimized design without interference part abiding by customer's various roll types
- roll crack 탐상 장비
- 고객사의 다양한 roll 조건에 따른 간섭부를 제거한 최적의 설계 제공



Specification

Specification		SRW(Work Roll)	SRB(Backup Roll)
Working range	Distance between centers(A)	6,000 mm(263 in.)	6,000 mm(263 in.)
	Range of roll diameter(B)	∅ 446~1,100 mm(18~43 in.)	∅520~1,600 mm(20~63 in.)
	Roll weight in steady rest	30 tons(66,000 lbs)	60 tons(132,000 lbs)
Headstock	Headstock motor power	51 kW(69 Hp)	51 kW(69 Hp)
	Speed range of faceplate	7~70 rpm	7~70 rpm
	Torque at faceplate	16,000 Nm(11,800 lbft)	19,000 Nm(14,000 lbft)
Tailstock	Quill stroke	150 mm(5.9 in.)	150 mm(5.9 in.)
Grinding wheel	Grinding wheel motor	100 kW(136 Hp)	100 kW
	Grinding wheel speed	275~1,375 rpm	275~1,600 rpm
	Bore	508 mm(20 in.) 304.8 mm(12 in.)	508 mm(20 in.) 304.8 mm(12 in.)
Feed rate	Z-axis	6~6,000 mm/min (0.2~236 in./min)	6~6,000 mm/min (0.2~236 in./min)
	X-axis	1~1,000 mm/min (0.04~39 in./min)	1~1,000 mm/min (0.04~39 in./min)
	U-axis	50 mm/min(2 in./min)	50 mm/min(2 in./min)
Measuring	Diameter range	400~1,100 mm(16~43 in.)	520~1,600 mm(20~63 in.)
Control system		Siemens	Siemens
Measuring system		Heidenhain / Fagor	Heidenhain / Fagor

* Sangnim can also produce roll grinders with specifications other than those listed above.

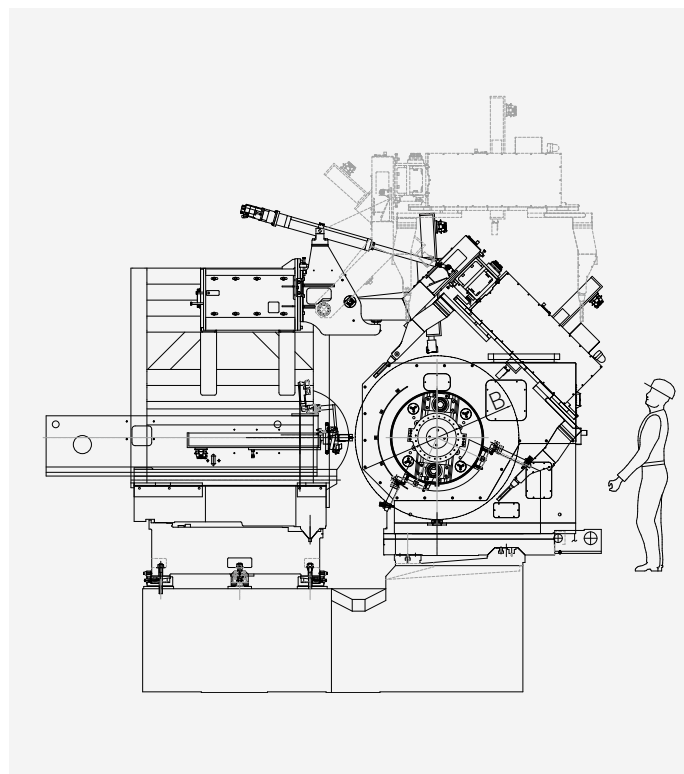
상기 사양 외의 규격이 다른 사이즈의 Roll grinder도 생산합니다.

Basic Accessories

- Standard steady rest
- Roll driver
- Roll measuring unit
- X & Z-axis telescopic cover
- Work light
- Patrol ramp [red, green, yellow]
- Leveling block & anchor bolt

Optional Accessories

- Crack detector [ECT/UT]
- Slewing crane
- U 1-axis function
- Chock tilting device
- Coolant unit and filtering system
- Roughness measuring device
- B-axis function
- Drying & oiling unit

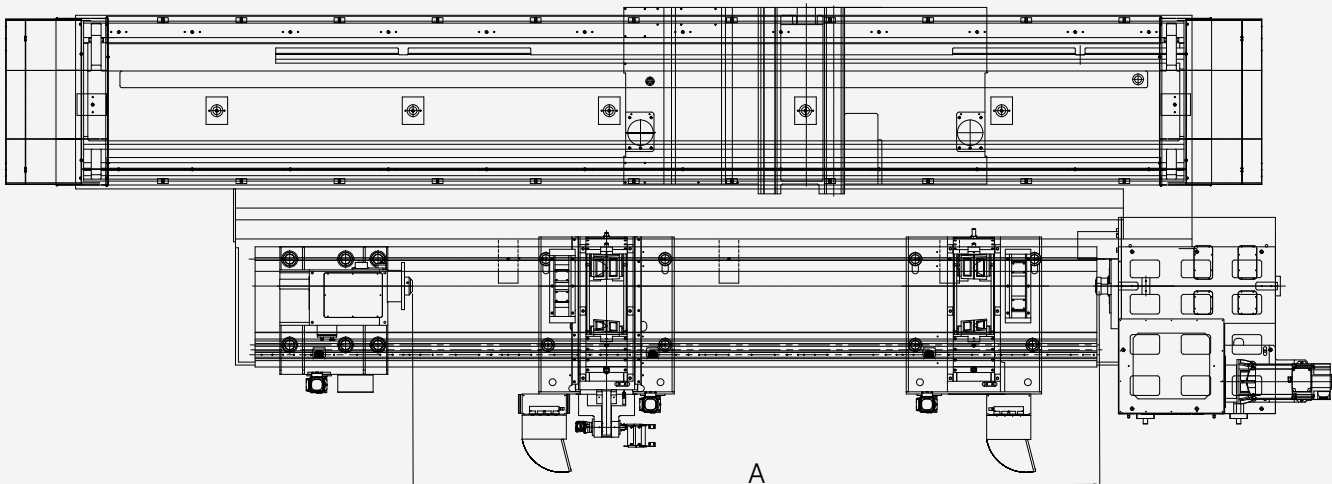


Specification

Specification		SRC(Combi Roll)	SRT(Thick Plate Roll)
Working range	Distance between centers(A)	7,500 mm(295 in.)	13,500 mm(236 in.)
	Range of roll diameter(B)	250~1,600 mm(10 ~63 in.)	900~2,500 mm(35~98 in.)
	Roll weight in steady rest	60 tons(132,000 lbs)	300 tons(660,000 lbs)
Headstock	Headstock motor power	71 kW(95 Hp)	200 kW(268 Hp)
	Speed range of faceplate	7~70 rpm	5~50 rpm
	Torque at faceplate	24,000 Nm(17,700 lbft)	103,000 Nm(75,960 lbft)
Tailstock	Quill stroke	150 mm(5.9 in.)	1,000 mm(39 in.)
Grinding wheel	Grinding wheel motor	100 kW	170 kW(227 Hp)
	Grinding wheel speed	275~1,600 rpm	400~1,600 rpm
	Bore	508 mm(20 in.) 304.8 mm(12 in.)	508 mm(20 in.) 304.8 mm(12 in.)
Feed rate	Z-axis	6~6,000 mm/min (0.2~236 in./min)	6~6,000 mm/min (0.2~236 in./min)
	X-axis	1~1,000 mm/min (0.04~39 in./min)	1~1,000 mm/min (0.04~39 in./min)
	U-axis	50 mm/min(2 in./min)	50 mm/min(2 in./min)
Measuring	Diameter range	250~1,600 mm(10~63 in.)	900~2,500 mm(15~43 in.)
Control system		Siemens	Siemens
Measuring system		Heidenhain / Fagor	Heidenhain / Fagor

※ Sangnim can also produce roll grinders with specifications other than those listed above.

상기 사양 외의 규격이 다른 사이즈의 Roll grinder도 생산합니다.





(주)상림엠에스피 홈페이지를 방문해보세요.
Visit our website!
www.sangnim.com



(주)상림엠에스피 | SANGNIM MSP Co., Ltd.

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