SH210/260/310/410

CNC Gear Hobbing Machine SH Series

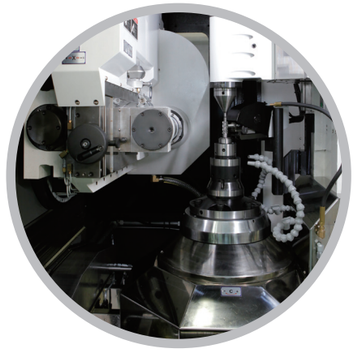
SMG
Gear Cutting
machine

SH210/260/310/410 'Cassiopeia'

For Your Future

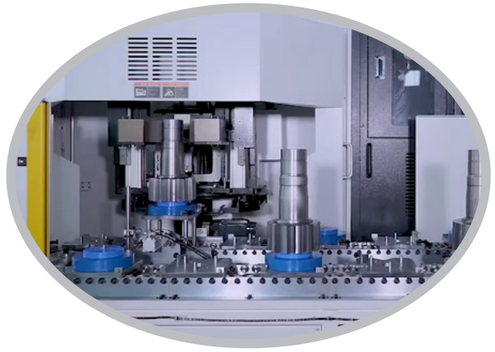
High Speed, High Accuracy, High Productivity

고속, 고정밀도, 고생산성 실현



SH210/SH260/SH310

- **Max. Workpiece Dia. Ø210/Ø260/Ø310**
  최대 가공 직경 Ø210/Ø260/Ø310
- **Max. Workpiece Module M6**
  최대 가공 모듈 M6
- **Max. Hob Speed 2,000 rpm**
  최대 호브 회전수 2,000rpm
- **Max. Table Speed 300 rpm**
  최대 테이블 회전수 300rpm
- **X,Z-Axis Rapid 12m/min**
  X,Z축 급이송속도 12m/min
- **Spindle Motor Power 12kW**
  스핀들 모터 출력 12kW



SH410

- **Max. Workpiece Dia. Ø410**
  최대 가공 직경 Ø410
- **Max. Workpiece Module M8**
  최대 가공 모듈 M8
- **Max. Hob Speed 1,000 rpm**
  최대 호브 회전수 1,000rpm
- **Max. Table Speed 200 rpm**
  최대 테이블 회전수 200rpm
- **X,Z-Axis Rapid 12m/min**
  X,Z축 급이송속도 12m/min
- **Spindle Motor Power 15kW**
  스핀들 모터 출력 15kW

Features of SH Series

- ▶ By applying Wide Slide way in the Bed and Column, supply the High Cutting resistance
  베드와 컬럼에 적용된 광폭의 안내면은 높은 절삭저항을 제공
- ▶ Realization of Zero Backlash by applying High torque Direct-Drive Motor on C-axis
  고 토크의 다이렉트 드라이브 모터 채용으로 C축 백래시 제로 실현
- ▶ Wet and Dry hobbing process on the same Machine
  습식절삭 및 건식절삭이 모두 가능
- ▶ Provides an easy and user-friendly dialogue programming environment
  쉽고 사용자 친화적인 대화형 프로그램 환경을 제공

SH210/260/310/410 'Cassiopeia'

For Your Future

Features of Sub Assembly 각 서브유니트의 특징

High rigidity hob head | 고강성 호브헤드

▶By applying Linear roller bearing to Y-axis and arbor support, it guarantees high precision while heavy cutting and enables tangential cutting

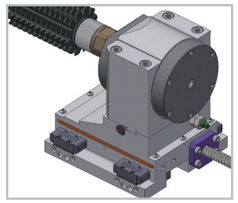
Y축 및 아버서포트부에 리니어 롤러 베어링을 적용하여 강력절삭시에도 고정밀도의 기어 가공이 가능하며, 탄젠셜 가공이 가능합니다.

▶By applying Dual Contact Hob arbor, maintain the high spindle rigidity while heavy cutting

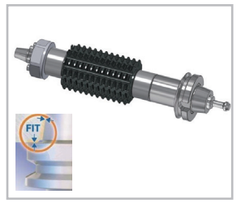
이면구속 호브아버의 적용으로 강력절삭시에도 높은 주축 강성을 유지합니다.

▶Quick and easy hob setting is possible with the Hob presetter

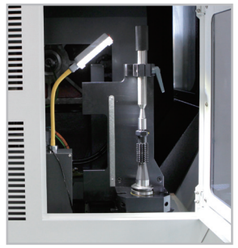
호브 프리세터 장착으로 빠르고 간편한 호브세팅이 가능합니다.



Linear roller bearing



Dual contact Hob arbor



Hob presetter

Hob head Assembly

High rigidity tail stock | 고강성 심압대

▶By using strong cast frame and high rigidity roller guide, high precision gear cutting is possible while heavy cutting

견고한 주물프레임 구조와 고강성 롤러타입 LM 가이드가 장착된 심압대는 강력절삭시에도 고정밀도의 기어가공이 가능합니다.

Tail stock Assembly

High rigidity, High torque, High precision table

| 고강성, 고토크, 고정밀도 테이블

▶ No Backlash Table with the application of High Torque Direct-Drive Motor and Precision Encoder, it guarantees high Cutting Accuracy

고 토크의 다이렉트 드라이브 모터와 정밀 엔코더를 장착한 No Backlash 테이블은 높은 가공정밀도를 보장합니다.

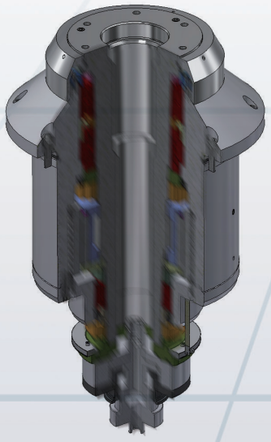
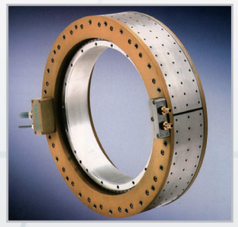


Table Assembly

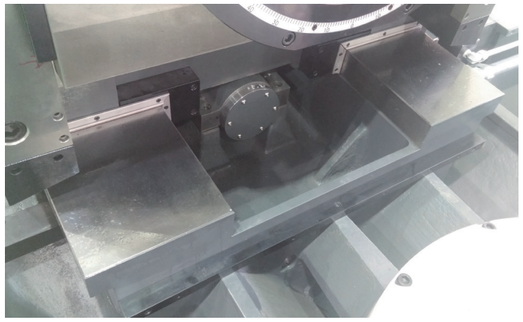


High Torque
Direct-Drive Motor

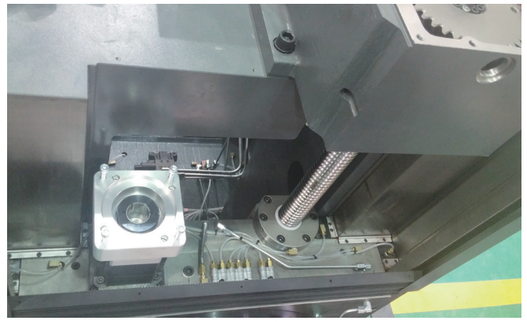
Precision Encoder

Features of Machine body 기계본체부의 특징

Angled Wide Slide Way | 각형구조의 광폭 안내면



X-axis Slide Way

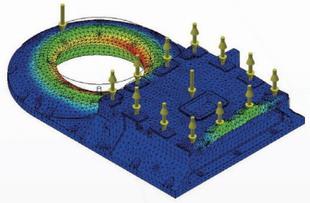


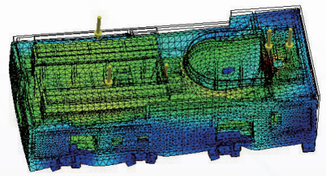
Z-axis Slide Way

▶With the adoption of the Wide Slideway angled structure into the bed and column, it allows precise work based on the lowered surface pressure and high cutting resistance

베드와 컬럼에 각형구조의 광폭 안내면을 채택하여 면압이 낮고 절삭저항이 높아 고정도 작업이 가능합니다.

Optimized Structure | 최적화된 프레임구조

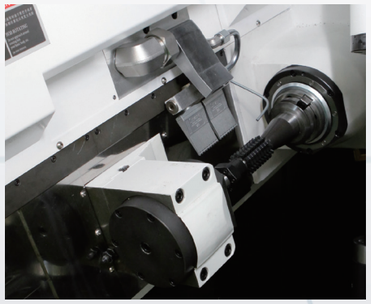




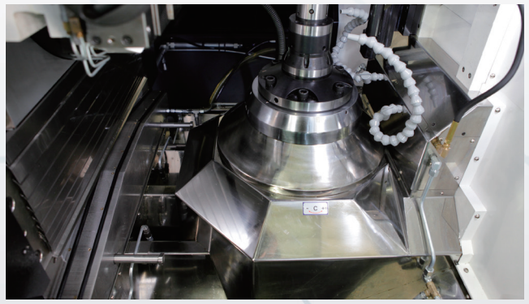
▶Optimized Structure by Structural Analysis (FEM)

FEM 구조해석에 의한 최적화된 프레임구조

Support Wet cutting and Dry cutting | 절삭유 가공과 무절삭유 드라이컷팅 지원



High pressure air nozzle & Coolant nozzle



Inner SUS guard

▶This machine is Designed for Wet or Dry Cutting / 이 기계는 절삭유 가공과 무절삭유 드라이컷팅이 동시에 가능합니다.

▶Slope type bed provide the best Chip disposal condition / 급경사 구조의 베드는 최상의 칩처리 조건을 제공합니다.

▶High pressure air nozzle and SUS guard on the bed provide Optimized Dry cutting system and High Thermal stability / 고압 에어노즐과 Bed 상면에 설치된 SUS 커버는 최적화된 드라이컷팅 시스템과 높은 열적 안정성을 제공합니다.

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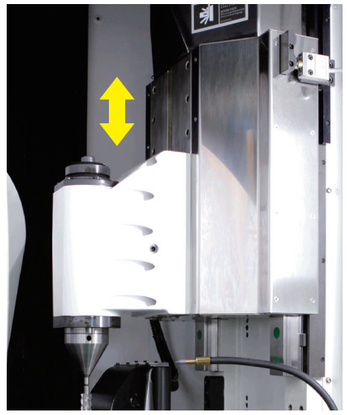
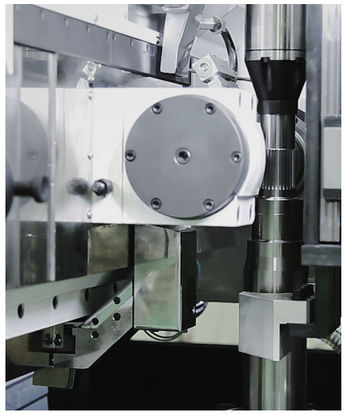
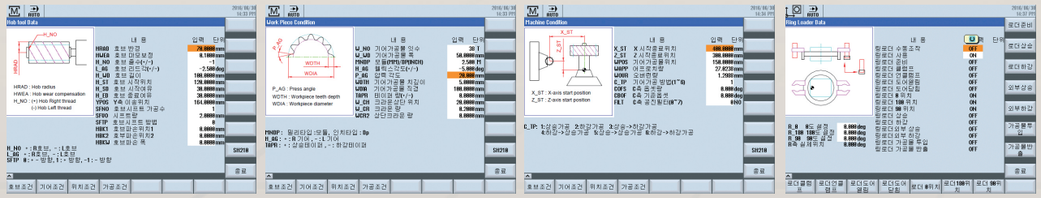
Long Shaft Cutting | 긴 샤프트 기어의 가공

▶It is designed to adjust tailstock position for long shaft cutting and up to 650mm shaft can be automated using ring loader

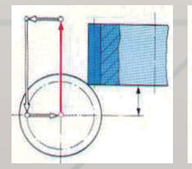
긴샤프트의 가공을 위해서 테일스톡의 위치조정이 가능하도록 되어 있으며, 링로더를 사용하여최대 650mm의 샤프트를 자동화 할 수 있습니다.

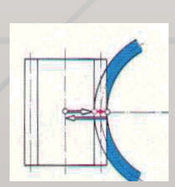
Dialogue Program and Hobbing Cycle | 대화형 프로그램 및 호빙사이클

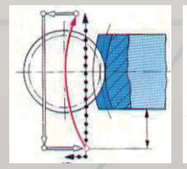


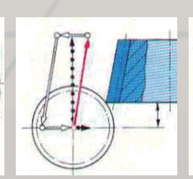
▶By utilizing the Easy dialogue programming environment, additional programming is not necessary and gear processing is easy with just the input of specifications of hob cutter, workpiece, and cutting condition

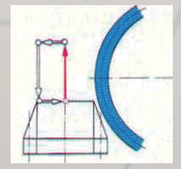
자체 개발된 쉽고 간편한 대화형 프로그래밍 환경 채용으로 별도의 프로그램이 필요 없으며, 호브커터 및 가공기어의 사양, 절삭조건의 입력 만으로 쉽게 기어가공이 가능합니다.

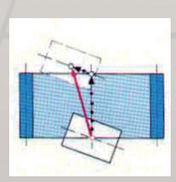

Axial cutting


Radial cutting


Crown cutting


Taper cutting


Tangential cutting

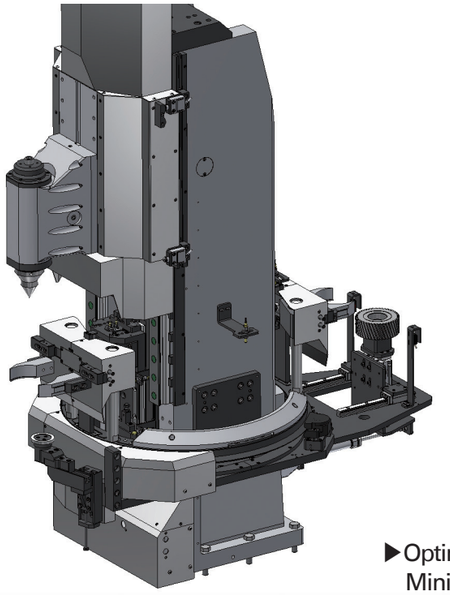

Diagonal cutting

▶This machine can use not only crown gears and taper gears, but also all hobbing cycles applied to gear cutting (axial cutting, radial cutting, tangential cutting and diagonal cutting)

이 기계는 크라운기어나 테이퍼기어 뿐만아니라, 기어가공에 적용되는 모든 호빙사이클이 사용 가능 합니다.
(축방향 가공, 반경방향 가공, 접선방향 가공 및 대각선방향 가공)

Optional Accessories 특별부속품

Automation | 자동화


STD. Ring Loader

Stocker Conveyor

▶Optimized Ring Loader and Stocker Conveyor guarantees Minimum space and maximum Productivity

최적화된 링로더와 적재 컨베어는 자동화시 최소한의 설치면적과 최대의 생산성을 보장합니다.

Gantry & Stocker

In/Out Stocker

▶ Various In/out stocker are Possible

다양한가공물 적재장치 부착이 가능합니다.

Robot Automation

Customized Automation Line

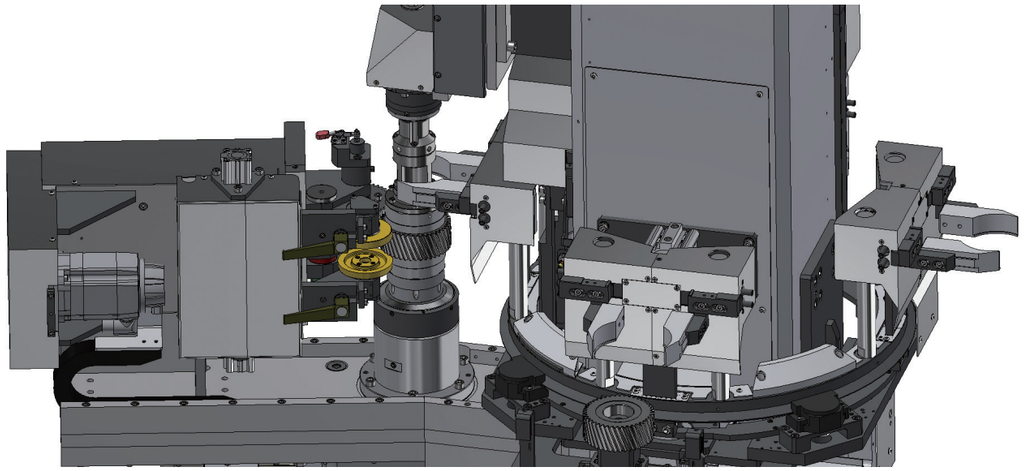
▶Various automation of customer specification is possible (Robot, Gantry loader, Customized Automation Line)

고객 사양의 다양한 자동화가 가능합니다. (로보트, 갠트리로더, 고객사양의 자동화 라인)

SH210/260/310/410 'Cassiopeia'

For Your Future

Chamfering & Deburring Device | 챔퍼링 & 디버링 장치



4-Station Ring Loader & Chamfering/Deburring Device

▶The rotary chamfering / deburring device installed inside the machine with a high-speed 4-station ring loader provides maximum cost savings and space saving to customers with its compact design.

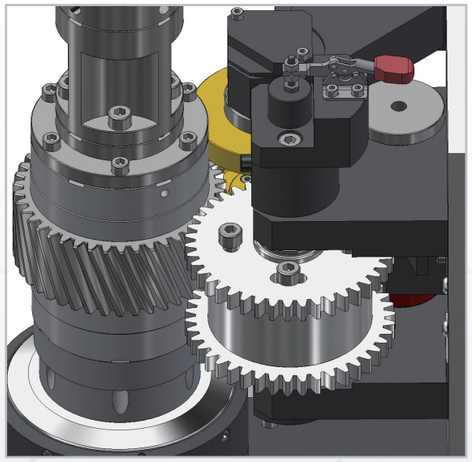
고속 4-스테이션 링로더와 함께 기계내부에 설치되는 로터리 챔퍼링/디버링 장치는 컴팩트한 디자인으로 고객에게 최대한의 비용절감 효과와 공간절약 효과를 제공합니다.

▶Since the chamfering / deburring process is performed simultaneously with the hobbing process, the cycle time is not increased.(time-parallel)

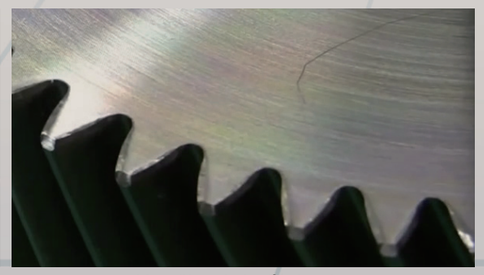
호빙 가공과 동시에 챔퍼링/디버링 공정이 행해지기 때문에 사이클 타임이 증가하지 않습니다. (병렬시간 수행)

▶Provide Completely integrated process with centralized control.

중앙 집중식 제어로 완전하게 통합된 프로세스를 제공합니다.

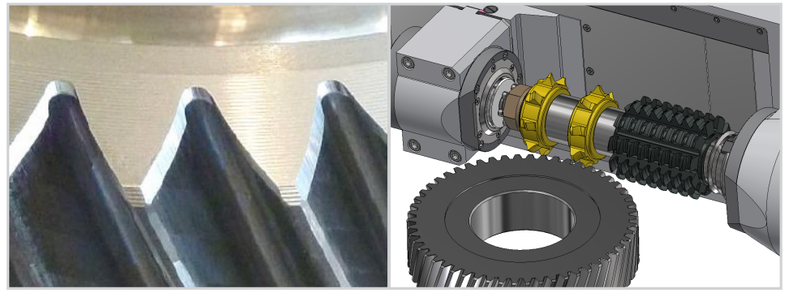


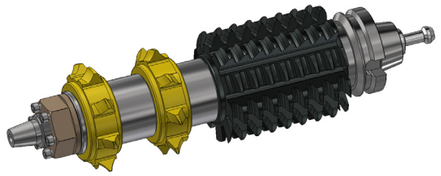
Before Chamfering/Deburring

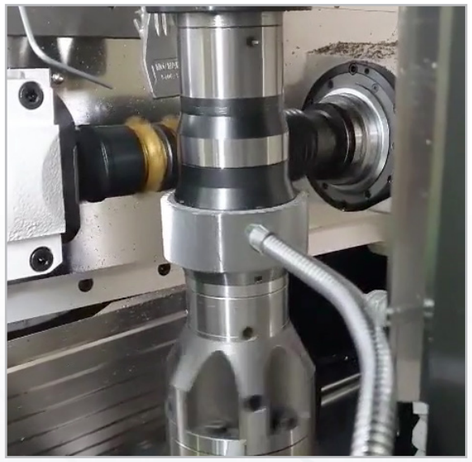


After Chamfering/Deburring

Support the Chamfer cut | 챔퍼컷 지원







▶Chamfer cut function for high-quality chamfering after hobbing is supported.

호빙후 고품질의 챔퍼가공을 할수 있는 챔퍼컷기능이 지원됩니다.

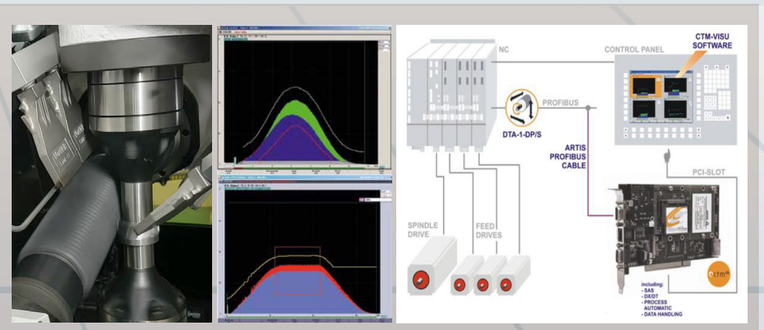
▶Using 3D simulation, it checks the interference between chamfer cut cutter, hob cutter and workpiece, and supports the customer to easily and efficiently perform the chamfer cut.

3D 시뮬레이션을 통하여 챔퍼컷 커터와 호브커터와 공작물간의 간섭을 확인하고 고객이 쉽고 효율적으로 챔퍼컷 가공을 할수 있도록 지원합니다.

Tool Monitering System | 공구모니터링기능

▶By monitoring the wear and breakage of the hob using tool monitoring system,tool life can be optimized.

공구 모니터링 기능을 통하여, 호브의 마모 및 파손을 모니터링 함으로써, 호브수명을 최적화 할 수 있습니다.

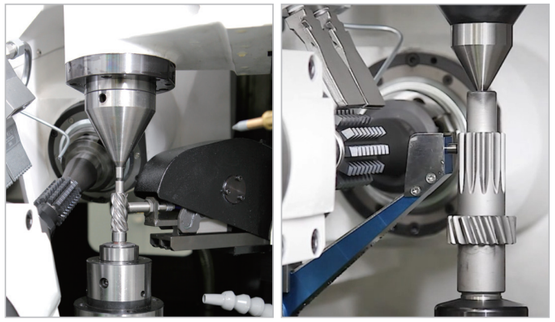


SH210/260/310/410 'Cassiopeia'

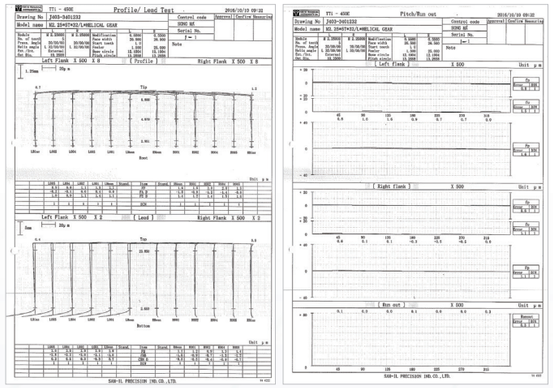
For Your Future

Optional Accessories 특별부속품

Skiving unit | 스카이빙 장치



Skiving Sensing unit



Tooth profile chart(Module 2.25, Number of teeth 5EA, Helix angle 32°)

▶By applying Skiving Sensing unit,
High quality Skiving is possible.

치홈 센싱 장치의 부착으로 고품질의 스카이빙이 가능합니다.

Oil Mist Collector
집진장치

Magnetic Chip Separator & Coolant Tank
마그네틱 칩세퍼레이터 & 절삭유 탱크

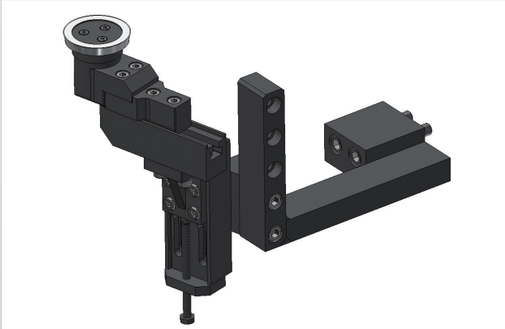
Coolant Oil Cooler | 절삭유 쿨링장치

Used for wet cutting.
절삭유 가공시 사용

MQL unit (MQL장치) - Minimum Quentity Lubrication

Used for dry cutting.
드라이컷팅시 사용

Deburring unit | 버제거장치



Hob Arbor | 호브아버

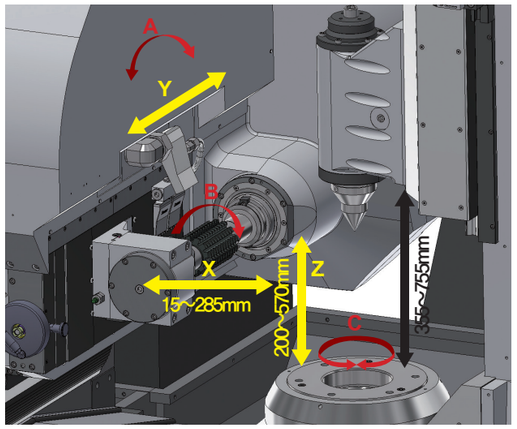
Hob Cutter/Chamfering Cutter
호브커터/챔퍼링커터

Hobbing Jig/Chamfering Jig
호빙지그/챔퍼링지그

Machine Specification 기계사양

Model		SH210	SH260	SH310	SH410
Machine Capacity	**기계능력**				
Max. Workpiece Dia. (Automation)	최대가공경(자동화)	Φ210 mm	Φ260 mm	Φ310 mm	Φ410 mm
Max. Workpiece Dia. (Manual)	최대가공경(수동)	Φ350 mm	Φ350 mm	Φ350 mm	Φ410 mm
Max. Module	최대모듈	M6	M6	M6	M8
Max. Table Speed	최대 테이블 회전수	300 rpm	300 rpm	300 rpm	200 rpm
Table Dia.	테이블 직경	Φ240 mm	Φ240 mm	Φ240 mm	Φ330 mm
Base Jig Dia.	베이스지그 직경	Φ130 mm	Φ170 mm	Φ210 mm	Φ260 mm
Hob Head	**호브헤드**				
Max. Hob Dia. Length	최대호브직경/길이	Φ180/220 mm	Φ180/220 mm	Φ190/230 mm	Φ190/230 mm
Max. Hob Speed	최대 호브 회전수	2000 rpm	2000 rpm	1500 rpm	1000 rpm
		(Opt.1000rpm, 1500rpm)	(Opt.1000rpm, 1500rpm)	(Opt.1000rpm, 2000rpm)	(Opt.1500rpm, 2000rpm)
Max. Hob Shift (Y-axis) Travel	호브 시프트(Y축) 이송량	200 mm	200 mm	210 mm	210 mm
Hob Swivel Angle	호브 회전각도	±45°	±45°	±45°	±45°
Hob Arbor Taper	호브아버 테이퍼	BBT #40	BBT #40	BBT #40	BBT #40
Hob Spindle Output	호브스핀들 출력	12 kW	12 kW	12 kW	15 kW
Working Range	**작업영역**				
X-axis Travel (Radial)	X축 이송량	270(15~285) mm	270(15~285) mm	270(15~285) mm	290(15~305) mm
Z-axis Travel (Axial)	Z축 이송량	370(200~570) mm (Opt. 600(200~800)mm)	370(200~570) mm (Opt. 600(200~800)mm)	370(200~570) mm (Opt. 600(200~800)mm)	370(150~520) mm (Opt. 600(150~750)mm)
Tail stock Center Travel	심압대 센터 이송량	400(355~755)mm	400(355~755)mm	400(355~755)mm	400(305~705)mm
Rapid	**급이송속도**				
X-axis Rapid (Radial)	X축 급이송속도	12 m/min	12 m/min	12 m/min	12 m/min
Z-axis Rapid (Axial)	Z축 급이송속도	12 m/min	12 m/min	12 m/min	12 m/min
Y-axis Rapid (Tangential)	Y축 급이송속도	5 m/min	5 m/min	5 m/min	5 m/min
Other Specification	**기타사양**				
Number of Axes	제어축수	6(X,Y,Z,A,B,C)	6(X,Y,Z,A,B,C)	6(X,Y,Z,A,B,C)	6(X,Y,Z,A,B,C)
CNC Control System	CNC 시스템	Siemens 840D SL	Siemens 840D SL	Siemens 840D SL	Siemens 840D SL
Full splash guard type	풀커버 타입	Close top	Open top	Open top	Open top
Floor Space (L x W x H)	설치면적(L x W x H)	2741 x 3238 x 2970 mm	2741 x 3238 x 2990 mm	2741 x 3238 x 2990 mm	2776 x 3329 x 2990 mm
Machine Weight	기계중량	9500 kg	9500 kg	9500 kg	11000 kg

Working Area 가공영역



- ▶ **X Radial slide movement**
  컬럼 전후진축
- ▶ **Y Tangential slide movement**
  호브시프트(탄젠셜)축
- ▶ **Z Vertical slide movement**
  호브헤드 상하이송축
- ▶ **A Hob head swivel**
  호브헤드 선회축
- ▶ **B Hob spindle rotation**
  호브스핀들 회전축
- ▶ **C Work table rotation**
  워크테이블 회전축

Standard Accessories 표준부속품

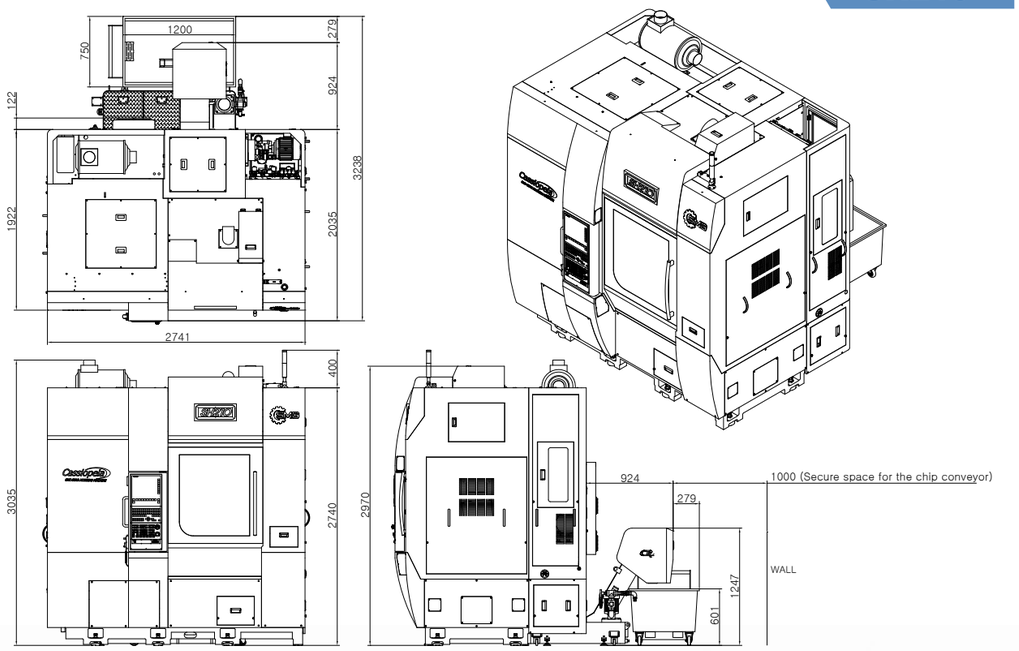
- Machine Body / 기계본체
- Full Splash Guard / 풀 커버
- Inner SUS Cover & Air blow / 내부 SUS 커버
- Hob Arbor Set / 호브 아버 세트(Ø32)
- Wet & Dry Cutting System / 절삭유 & 드라이컷팅 장치
- Hydraulic Unit / 유압유니트
- Lubricating Pump & Tank / 자동윤활장치
- C-axis Oil Cooler / C축 오일쿨러
- LED Work Light / LED 작업등
- Standard Base Jig / 표준 베이스 지그
- Hob Presetter / 호브 셋팅 장치
- Standard tools & Box / 표준공구박스
- Ele. Cabinet Air conditioner / 전장박스 에어컨
- UPS Set for Retract / 정전 급속후퇴 장치
- Leveling bolt & Base plate / 설치용 부품
- Operating Manual / 취급설명서
- MPG(Manual Pulse Generator) / 수동 펄스 제너레이터

Optional Accessories 특별부속품

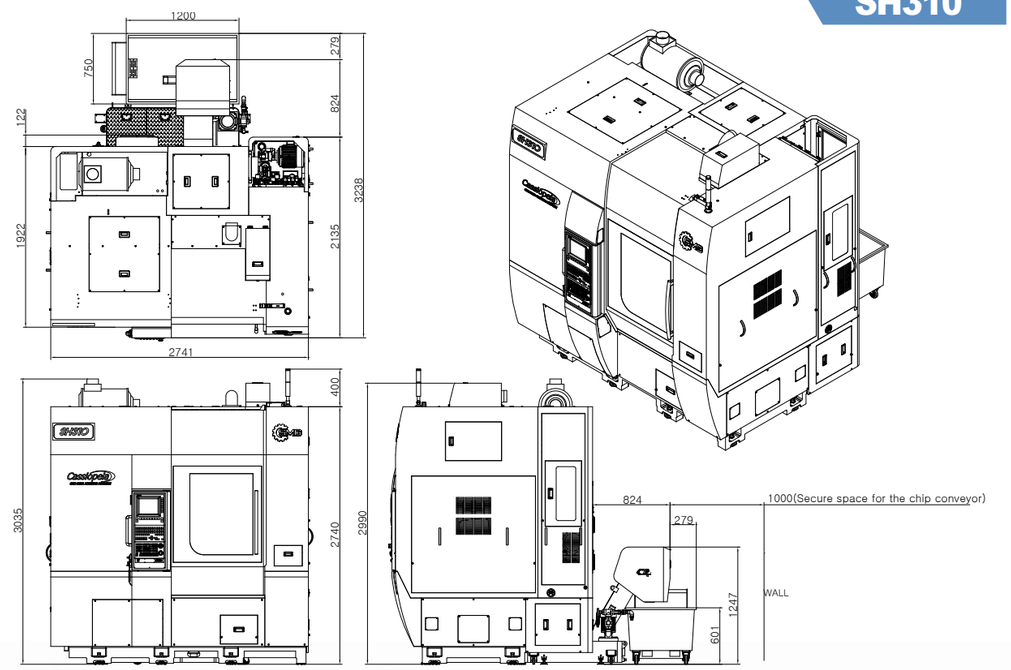
- Oil Mist Collector / 집진장치
- Hob Arbor Set / 호브 아버 세트
- Magnet Chip Separator & CoolantTank / 마그네트 칩 세퍼레이터 & 절삭유 탱크
- Auto Door / 오토도어
- Deburring unit / 버제거 장치
- Work Rest / 방진구
- Coolant Oil Cooler / 절삭유 쿨링장치
- MQL(Minimum Quantity Lubrication) Unit/MQL 장치
- Skiving unit / 스카이빙 유니트
- Z-axis Stroke Extension(370mm->600mm) / Z축 스트로크 증대 (370mm->600mm)
- Tool Monitering System / 툴 모니터링 시스템
- Linear Scale(X-axis) / 리니어 스케일(X축)
- Air Catching System / 에어 착좌 시스템
- Transformer / 트랜스포머
- STD. Ring Loader / 표준 링로더
- 4-Station Ring loader / 4-위치 링로더
- Stocker Conveyor(Pallet tyep) / 소재 적재 컨베어(파레트타입)
- Chamfering & Deburring Device / 챔퍼링 & 디버링 장치
- Chamfering Jig / 챔퍼링 지그
- Chamfering Cutter / 챔퍼링 커터
- Hobbing Jig / 호빙지그
- Hob Cutter / 호브커터
- Chamfer Cut Function / 챔퍼컷 기능
- Chamfer Cut Cutter / 챔퍼컷 커터
- Automation / 자동화 시스템

Machine layout 기계외형도

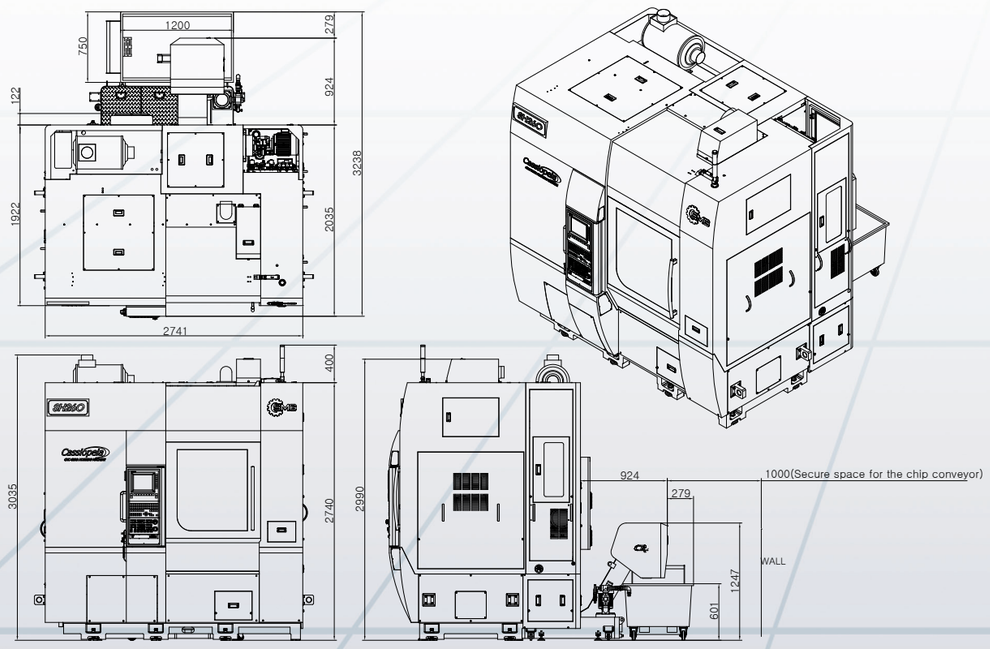
SH210



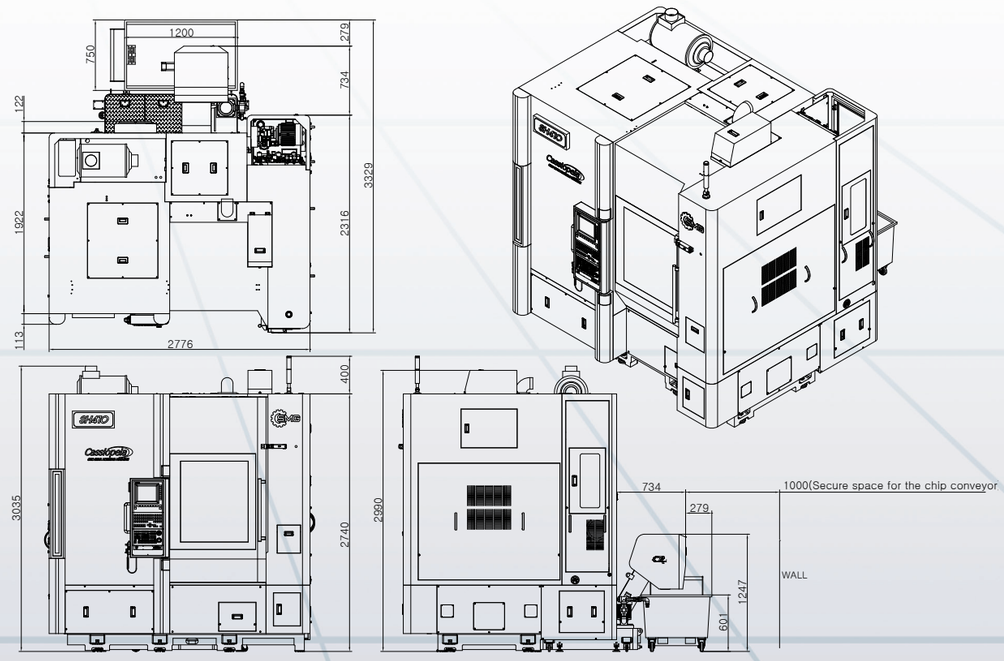
SH310



SH260



SH410



SMG는 고객의 기어 가공 요구에 대한 솔루션을 제공합니다.
SMG provides solutions for your gear cutting needs.

Song Ma Co.,Ltd

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