

Steadiness & Innovation in Motion control

SUNG-IL MACHINERY

COMPANY PROFILE



COUPLING

CONNECTING SHAFT

SAFETY COUPLING

TIMING PULLEY

A.P. LOCK

SUPPORT UNIT FOR BALL-SCREW

SPM



Company Introduction

Company Overview

| | | | |
|--------------|-----------------------------|--|---------------|
| Company name | Sung-il Machinery Co., Ltd. | | |
| Year founded | March 1991 | Year Incorporated | February 2008 |
| CEO | Kim, Sung-Muk |  | Capital |
| Location | HQ (KOREA) | 25, Seounsandaro-1gil, Gyeonggi-do, Incheon, Korea 21072 | |
| | Chinese branch | No.229 Chengnan Road, new Wu District, Wuxi, Jiangsu, China. 214028 | |
| | Japanese branch | 8F, OnarimonPREX, 14-3 Shimbashi-6 Minato-ku, Tokyo JAPAN 105-0004 | |



Milestones

| | |
|---------|--|
| 2005.12 | ISO 9001 achieved |
| 2007.10 | Awarded a prize for: Development of excellent capital goods |
| 2012.09 | Awarded a prize for: Technology innovation |
| 2014.10 | Awarded a prize for: Government R&D assignment |
| 2015.08 | CEO appointed as the Korea Master Technicians of the month |
| 2015.09 | ISO 14001 achieved |
| 2016.09 | CEO appointed as one of Korea Master Hand for Machining assembly |
| 2017.03 | “Small Giant Company” authorized |
| 2019.07 | Relocation of business premises by combining manufacturing and sales offices (in Incheon city) |
| 2022.11 | World-Class Product authorized [High Precision Shaft Coupling] |



Steadiness & Innovation in Motion Control

Company Identity (CI)



The new CI emphasizes SUNG-IL MACHINERY's English initials. It is expected that this simplified logo will bring better branding effect while the name "SUNG-IL MACHINERY" under Korean language is kept in used. Apart from this, S.I.M is the abbreviation for "Steadiness & Innovation in Motion Control" which well-describes the primary motto of SUNG-IL MACHINERY.

World-Class Product Certified



S.I.M's High Precision Shaft Coupling is certified as a **World-Class Product** in recognition of present development of the product, outstanding technology, expertise and dedicated commitment to Korea's exports and national competitiveness.

Mission, Vision and Core Values

Mission & Vision

Mission

To bring happiness to our customer and employees through high-value-added FA products.

Vision

To become a specialized No.1 FA product maker with sustainable growth factors.

Core Value



Customer Satisfaction



Speed



Ownership



Innovation

Global Network



Certificates



ISO 9001



ISO 14001



Small & Giant Company



Small & Giant (RE) Company



Venture Business



Parts specialized Firm



INNO-BIZ



MAIN-BIZ



World-Class Product



Promising Export Firm



Small & Giant Company -
Young-man friendly

ONE STEP CLOSER TO THE CUSTOMER SIDE



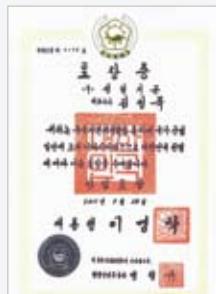
GLOBAL SALES TERRITORY

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CHN | JPN | SGP | IDN | TWN | MYS | THA | IND |
| VNM | HKG | TUR | IRN | ISR | JOR | OMN | EGY |
| DEU | ITA | ESP | RUS | SWE | FIN | GBR | POL |
| BEL | SWZ | CZE | EST | HUN | MDA | SRB | SVK |
| UKR | ROU | USA | MEX | ARG | NZL | | AUS |

Awards



Korea Master Hand



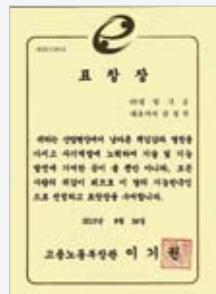
Excellent Capital Goods (President)



Technology Innovation (Prime minister)



Machinery & Robotic Industry Innovation (MoTIE)



Korea Master Technicians of the month (MoEL)



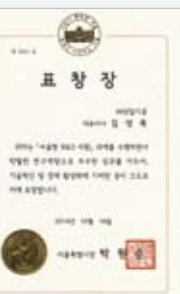
Silver Tower Medal



Honor-Badge (Korea Red-cross)



Exemplary Taxpayer (MoSF) Government R&D Assignment (Seoul City Council)



Job Creation Enterprise (Incheon)

STAY CONNECTED



Youtube

https://www.youtube.com/channel/UCd48AcciTi_xkj5lSxmQM5Q



Kakaotalk

https://pf.kakao.com/_aYTaT



Facebook

<https://business.facebook.com/ensungilfa/>



Linked-in

<https://www.linkedin.com/company/sungil-machinery-co-ltd-sim-korea/>



Major Products

01 Ultra Precision Coupling



02 Connecting Shaft



03 Safety Coupling



04 Timing Pulley



05 A.P. Lock



06 Support Unit for Ball Screw



1) Coupling

- Transmitting torque (Power)
- Absorbing misalignment
- Absorbing vibration and noise
- Electrical insulation
- Enhance the performance of the devices



SHR Series (High Performance Rubber Coupling)

SHR series is excellent for vibration absorption and helps to enhance efficiency of application allowing higher Gain figure on the servo motors.



SHR

| | | | |
|--------------------------|---|-------------------------|--------------|
| Backlash free | ☆ | Servo | ☆ |
| High Torque (Durability) | ☆ | Stepping | ☆ |
| Torsional Stiffness | ○ | Encoder | ○ |
| Vibration Absorption | ☆ | General | - |
| Misalignment Absorption | ○ | Permissible Temperature | -20°C ~ 80°C |

Application : Semi-conductor machine, SMT, Cartesian Robot, UVW Stage

SD Series (Disk Coupling)

SD series is excellent for absorbing misalignment by plate springs and is widely used on servo/step motors.



SDS



SDSS



SDW



SDWS

High Strength Aluminum Alloy

Stainless Steel

| | SDS | SDW | SDSS | SDWS |
|--------------------------|----------|-----|------|------|
| Backlash free | ☆ | ☆ | ☆ | ☆ |
| High Torque (Durability) | ○ | ○ | △ | △ |
| Torsional Stiffness | ☆ | ☆ | ○ | ○ |
| Vibration Absorption | - | - | - | - |
| Misalignment Absorption | △ | ○ | ○ | △ |
| Corrosion resistance | - | - | ☆ | ☆ |
| | Servo | ○ | ○ | ○ |
| Applicable | Stepping | ○ | ○ | ○ |
| Motors | Encoder | ○ | ○ | ○ |
| | General | - | - | - |

Application : Semi-conductor machine, SMT, Cartesian Robot, UVW Stage, Machining tool, Index Table

SAD Series (Advanced Disk Coupling)

SAD Series is more stiff and durable compared to similar sized general disk couplings (SD series) with the advanced structure in the plate springs. We provide SAD series in small/compact sizes.



SADS



SADW



SD Series



SAD Series

| | SADS | SADW |
|--------------------------|----------|------|
| Backlash free | ☆ | ☆ |
| High Torque (Durability) | ☆ | ☆ |
| Torsional Stiffness | ☆ | ☆ |
| Vibration Absorption | - | - |
| Misalignment Absorption | △ | ○ |
| | Servo | ☆ |
| Applicable | Stepping | ☆ |
| Motors | Encoder | ○ |
| | General | ○ |

Application : Semi-conductor manufacturing machine, SMT, Cartesian Robot, UVW Stage, Machine tools, Index Table

SHD Series (High Torque Disk Coupling)

SHD Series is designed to transmit high torque by adopting harder material and the advanced structure in the plate springs. We provide SHD series in mid/large sizes.



SHDS

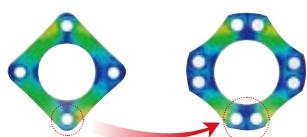


SHDW

1. Advanced version of Plate Spring shape

SD Series

SHD Series



Sung-il develops the improved version of plate spring with doubled assembly holes to disperse stress points, and it enhances both strength and stiffness to the higher extent.

2. Improved durability with advanced body material

SD series Body material AL2024

SHD Series Body material AL7075

| | Ratio (= AL7075 / AL2024) |
|-------------------|---------------------------|
| Yield Strength | 1.7 ~ 1.8 |
| Tensile Strength | 1.3 ~ 1.4 |
| Shearing Strength | 1.15 ~ 1.2 |
| Fatigue Strength | 1.15 ~ 1.2 |

| | SHDS | SHDW |
|--------------------------|---|------------------|
| Backlash free | ☆ | ☆ |
| High Torque (Durability) | ☆ | ☆ |
| Torsional Stiffness | ☆ | ☆ |
| Vibration Absorption | - | - |
| Misalignment Absorption | △ | ○ |
| Applicable Motors | Servo Stepping Encoder General | ○ ○ ○ ○ |

SCD Series (Concentricity Disk Coupling)

SCD Series is designed to be well-concentric with higher torsional stiffness by processing inner and outer diameter simultaneously, which enables users to install the coupling in a more precise way.



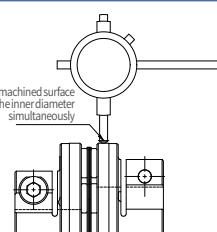
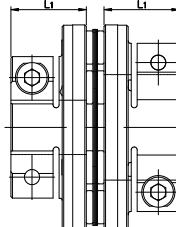
SCDS

SCDS

| | |
|---------------------------|---|
| Backlash free (Precision) | ☆ |
| High Torque (Durability) | ☆ |
| Torsional Stiffness | ☆ |
| Vibration Absorption | - |
| Misalignment Absorption | ○ |

Application : Machine tools, Chip mounters, Cartesian Robot, Solar energy equipment

How to Install



1. Remove dust or oil substances from the surface of both the coupling and the shaft.
2. Insert the shaft up to L1. Make sure the plate spring doesn't get pressed by excessive force.
3. After the shaft is inserted, pre-tighten two fastening screws alternately with limited torque, in order not to make it too loose.
4. Place a dial gauge right on the surface which is machined with the inner diameter simultaneously (see figure), and fasten the screws alternately observing the gauge variation (run-out) is less than 0.02.
5. Lastly, fasten the screws with full of fastening torque by using a torque wrench.
6. Insert the opposite shaft while paying attention to the excessive force on the plate spring and fasten screws according to the above instruction.

※ We recommend you only use the provided screws which are lubricated.

SJC Series (Jaw Coupling)

SJC series is the most excellent coupling for transmitting high torque and is durable for vibration/impact.

GR(Hytrel, Sh 98A)

RD(Hytrel, Sh 63D)



High Absorption of misalignment

High Mechanical Strength
High Mechanical Stiffness

BL(TPU, Sh 98A)

GR(Hytrel, Sh 98A)



High Damping capacity

High Torsional Stiffness
High Heat Resistance

BL (TPU, Sh98A)



GR (Hytrel, Sh98A)



RD (Hytrel, Sh63D)

| Sleeve Material | Hytrel | TPU |
|--------------------------------|---|------------------|
| | (RD/GR) | (BL) |
| Backlash free (Precision) | ○ | ○ |
| High Torque (Durability) | ☆ | ☆ |
| Torsional Stiffness | △ | △ |
| Vibration Absorption | △ | ○ |
| Misalignment Absorption | △ | △ |
| Insulation of Electric Current | ○ | ○ |
| Applicable Motors | Servo Stepping Encoder General | ○ ○ △ ☆ |
| Permissible Temperature | -20°C ~ 120°C | -20°C ~ 70°C |

Application : Machine tools, Press machine, Injection Molding machine, Pneumatic machine, Pump, Cartesian Robot, Belt Drive, Logistics facilities etc.

SFC Series (Urethane Flexible Coupling)

SFC series is flexible with Urethane material and is excellent for absorbing misalignment, however it is relatively less-durable.



| | | | |
|--------------------------------|-----------------------|----------|-----------------------|
| Vibration Absorption | <input type="radio"/> | Servo | - |
| Misalignment Absorption | <input type="radio"/> | Stepping | - |
| Insulation of Electric Current | <input type="radio"/> | Encoder | <input type="radio"/> |

4) Connecting Shaft

Combined set of coupling + Ground shaft

- 3 different parts (2 Couplings, 1 ground shaft) are separately needed.
- Bigger laboring required
- Hard to keep the appropriate straightness between couplings and a ground shaft

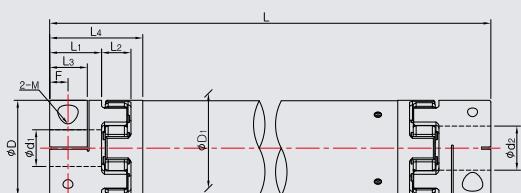
Connecting Shaft ✓

- 1 Whole piece structure
- Simple installation
- Easy and handy maintenance
- The pipe (middle shaft) with high stiffness

Better

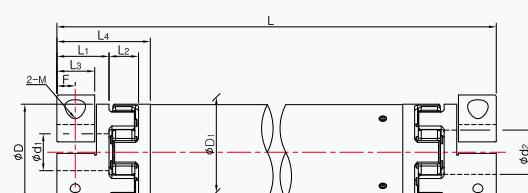
How to determine the proper length(L)

General Side-clamp Type



$$L(\text{Total Length}) = L_s(\text{distance between shafts}) + 2L_1$$

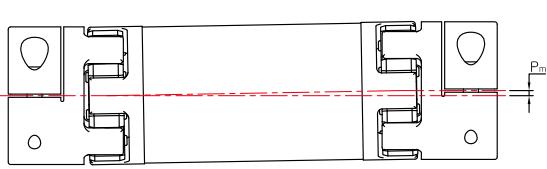
Side-clamp Hub Split Type



$$L(\text{Total Length}) = L_s(\text{distance between shafts}) + 2L_3$$

※ Side-clamp Hub Split type is commonly used for connecting shaft in regards to an easier maintenance.

How to calculate permissible parallel misalignment



$$P_m = (L - 2(L_1 + L_2)) \times \tan \frac{A_m}{2}$$

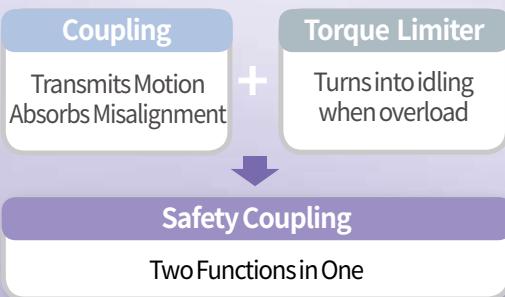
P_m = Permissible parallel misalignment

L = Total length

A_m = Permissible angular misalignment of connecting shaft
(= 2 x coupling's value)

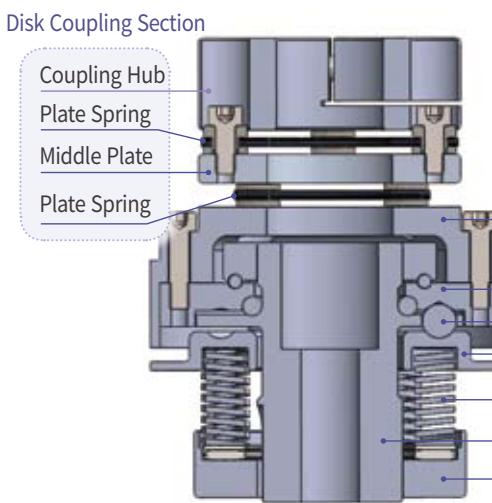
- The value calculated by the above formula is maximum permissible parallel misalignment in the allowable range of motion transmission, which means sleeves of SJCL and plate spring of SHDL may still get worn down even within the range of permissible parallel misalignment.
- The P_m value shrinks by $1/2$ when there are both angular and parallel misalignment at the same time.
- It is recommended to use at the $1/3$ value of P_m for longer lifespan, as well as keep the shafts located in line as straight as possible.
- If you need any further assistance, please contact Sung-il Customer Service team for more details.

3) Safety Coupling

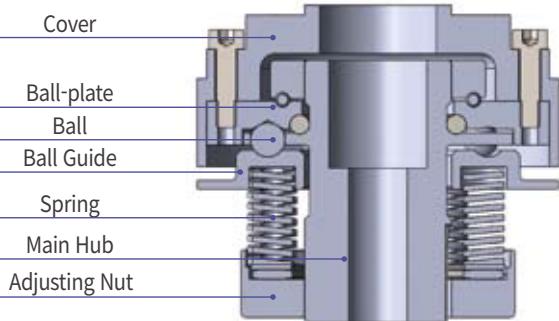


Structure

Disk Coupling Attached Type (STL)



Flange Type (STL-F)



Product Features

- 1. Wide range of standard preset torque values
- 2. Absorption of misalignment by plate springs. (Disk Coupling attached type Only)
- 3. Easier torque adjustment with an adjusting nut and an indicator of spring pressure amount
- 4. Various assembly options according to each clamping objects

4) Timing Pulley

High Accuracy

- Timing Pulley has minimized backlash and it leads to high accuracy.

High Torque

- The unique structure of Timing Pulley (teeth) lessens slip possibility and makes it suitable for higher torque applications.

High Speed Rotation

- Designed to be used with higher RPM applications since it rarely has vibration and noise issue.



Clamping Methods and Product Features

SPA A.P.LOCK



How to work: By the taper-ring structure of A.P.Lock, when screws are fastened in a correct way, the inner surface shrinks inwards so it tightens the shaft. At the same time, the outer surface becomes expanding outwards so it clamps Timing Pulley tightly.

Feature: With high clamping force itself, it doesn't require any other complementary methods e.g. keyway.

Self-centering function

I TYPE

O TYPE

SPB TAPER BUSHING



How to work: By the taper-ring structure of Taper bushing, when screws are fastened in a correct way, the inner surface shrinks inwards so it tightens the shaft.

Feature: With high clamping force itself, it doesn't require any other complementary methods e.g. keyway.

Easy and handy installation

I TYPE

O TYPE

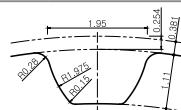
SC SIDE-CLAMP



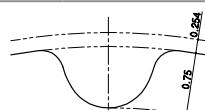
How to work: Clamp with fastening screws in a vertical way to the shaft and make the hub's inner surface shrink inwards so it tightens the shaft.

Feature: Easy and handy installation

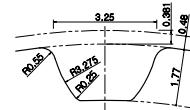
Tooth Profile



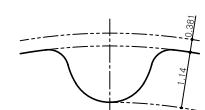
S3M (Pitch: 3.0mm)



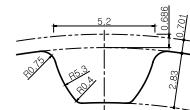
2GT (Pitch: 2.0mm)



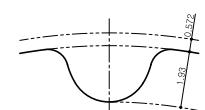
55M (Pitch: 5.0mm)



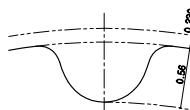
3GT (Pitch: 3.0mm)



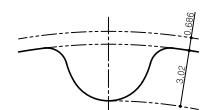
88M (Pitch: 8.0mm)



5GT (Pitch: 5.0mm)



1.5GT (Pitch: 1.5mm)



8YU (Pitch: 8.0mm)

※ For more details, please refer to the latest full version of product catalog.

Made-To-Order Process

Sung-il Machinery can conduct Made-To-Order processes (customization) for Timing Pulley upon our customers' requests.



Various Materials/Surface Treatment Options

| Material | | Surface Treatment |
|------------------------------|------|----------------------------|
| High Strength Aluminum Alloy | AL20 | White Anodizing |
| | AL60 | Hard Anodizing |
| | AL70 | Black Anodizing |
| STEEL | | Electroless Nickel Plating |
| Stainless Steel | | Electro-polishing |

Various Tooth Profile Shapes

| | |
|-------------|---|
| Trapezoidal | MXL, XL, L, H AT5, AT10, (D)T5, (D)T10 1.5GT, 2GT, 3GT, 5GT, 8YU, 8MGT, 14MGT S2M, S3M, S5M, S8M, S14M |
| Curvilinear | P3M, P5M, P8M RPP5, RPP8 |
| | MA3, MA5, MA8 |
| | HTD5M, HTD8M, HTD14M |
| | |

※ Please do not hesitate to contact us even for other Made-To-Order cases apart from the above categories.
※ Please make sure we discuss in advance prior to firm order placement.

5) A.P. Lock

- High transmittable torque than similar sized Couplings
- Excellent space utilization with parallel installation
- Self-centering function
- Various options of material / surface treatment available



PRODUCT INDEX

| Series | SAPL-A Series | | | SAPL-B Series | SAPL-C Series |
|---------------|------------------------------------|-----------------------------------|---------------|---------------|---------------|
| Model | SAPL-A | SAPL-AK | SAPL-AS | SAPL-B | SAPL-C |
| Body Material | STEEL | S45C (Electroless Nickel Plating) | SUS304 | STEEL | STEEL |
| Shape | | | | | |
| Series | SAPL-C Series | | SAPL-D Series | | |
| Model | SAPL-CK | SAPL-CS | SAPL-D1 | SAPL-D2 | SAPL-D3 |
| Body Material | STEEL (Electroless Nickel Plating) | SUS304 | STEEL | STEEL | STEEL |
| Shape | | | | | |
| Series | SAPL-D Series | SAPL-T Series | SAPL-R Series | SAPC Series | SAPA Series |
| Model | SAPL-D4 | SAPL-T | SAPL-R | SAPC | SAPA |
| Body Material | STEEL | STEEL | STEEL | AL-7075-T6 | AL-7075-T6 |
| Shape | | | | | |

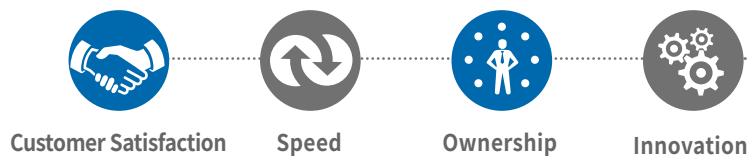
3) Support Unit for Ball-screw

- High accuracy, no need of additional adjustment
- Handy application design by standardized bearings
- Easy installation even at small and narrow areas
- With the inner oil seal ring, it prevents foreign material and leak of grease



PRODUCT INDEX

| Motor Bracket Unit | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|
| Series | C-SBU | O-SBU | E-SBU | S-SBU | | | |
| Use for | FIXED SIDE (CLEAN) | FIXED SIDE (OPEN) | FIXED SIDE (ECONOMY) | SUPPORTED SIDE | | | |
| Shape |  |  |  |  | | | |
| Ball Screw Support Unit | | | | | | | |
| Series | EK | EF | BK | BF | BK-G | | |
| Use for | FIXED SIDE | SUPPORTED SIDE | FIXED SIDE | SUPPORTED SIDE | FIXED SIDE | | |
| Shape |  |  |  |  |  | | |
| Ball Screw Support Unit | | | | | | | |
| Series | AK | AF | FK | FF | FK-G | | |
| Use for | FIXED SIDE | SUPPORTED SIDE | FIXED SIDE | SUPPORTED SIDE | FIXED SIDE | | |
| Shape |  |  |  |  |  | | |
| Ball Screw Support Unit | | | | | | | |
| Series | CK | CF | WBK | SWBK | SWBK-G | | |
| Use for | FIXED SIDE | SUPPORTED SIDE | FIXED SIDE (MINIATURE) | FIXED SIDE (HIGH LOAD) | FIXED SIDE (HIGH LOAD) | | |
| Shape |  |  |  |  |  | | |
| Lock-Nut | | | | Bearing Unit | | | |
| Series | RN | RNSS | RNSB | ZN | HLRN | SBS | SBD |
| Shape |  |  |  |  |  |  |  |



HQ (KOREA)

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Website: www.sungilfa.co.kr/eng
 Email: ovsales1@sungilfa.co.kr

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Quick access to
 SIM (QR)

