

Sumitomo Drive Technologies
Always on the Move

Fine Cyclo

Precision Gearboxes for Machine Tools

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Applications
Features

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Fine Cyclo

Precision Gearboxes
for Machine Tools

Applications

Applications/Quick Selector

- ★ C Series/Hollow Shaft
- ★ D Series/Angular Ball Bearings
- ★ UA Series

A Series/Reduction Kit

A Series/Cross-Roller Bearing

A Series/Tapered Roller Bearings

A Series/Shaft Output

T Series/Tapered Roller Bearings

Our Location

Features

Features/Quick Selector

- ★ F2C-C/F2C-FC
- ★ F4C-D/F4CF-D
- ★ F2CF-UA/F4CF-UA

FC-A

F1C-A

F2C-A/F2CF-A

F3C-A

F2C-T/F2CF-T

Our Production

Applications/Quick Selector

Application	Gearbox series							
	C	D	UA	A				T
	F2C(F)-C	F4C(F)-D	F2(4)C(F)-UA	FC-A	F1C-A	F2C(F)-A*	F3C-A	F2C(F)-T
Disc magazine	●	★	★	●	●	●	●	●
Chain magazine	●	★	●	●	●	●*	●	●
Pallet changer	●	★	★	●	●	●	●	●
Revolver for tool positioning	●	★	●	●	●	●	●	●
Spindle head for work spindle positioning	●	●	●	★	●	●	●	●
Main spindle drives A/B axis	★	★	●	●	●	●	●	●
Main spindle drive C axis	★	●	●	●	●	●	●	●
Swing table	●	★	●	●	●	●	●	●
Rotary table	●	★	●	●	●	●	●	●
Swing changer	★	★	●	●	●	●	●	●
Head for tube bending	●	★	★	●	●	●	●	●
Linear axes and rotative axes for rack and pinion systems	●	●	●	●	●	●	●	●

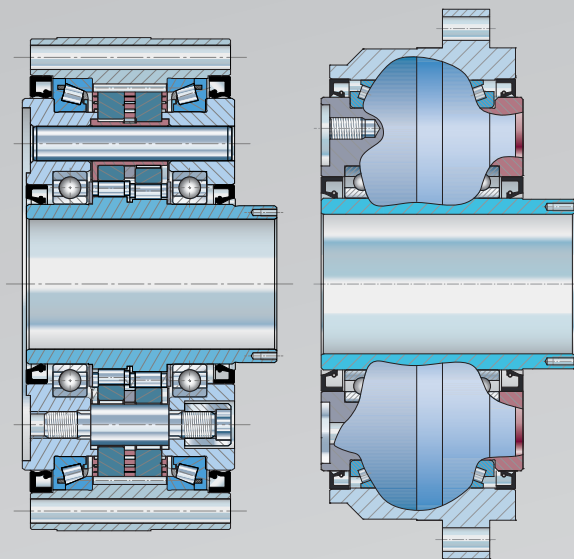
- ★ Recommended for new developments
- Outstanding ● Very good ● Good
- * For higher ratios with planetary stage

Features/Quick Selector

Features	Gearbox series							
	C	D	UA	A				T
	F2C(F)-C	F4C(F)-D	UA series	FC-A	F1C-A	F2C(F)-A	F3C-A	F2C(F)-T
No mechanical backlash	✓	✓	✓	✓	✓	✓	✓	✓
Number of stages	1	1	2	1	1	1	1	2
High torsional stiffness	●	●	●	●	●	●	●	●
Compact design	●	●	●	●	●	●	●	●
Housing can rotate	●	●	●	●	●	●	●	●
Low hysteresis loss	●	●	●	●	●	●	●	●
High torque density	●	●	●	●	●	●	●	●
High acceleration torques	●	●	●	●	●	●	●	●
High overload reserves	●	●	●	●	●	●	●	●
High efficiency	●	●	●	●	●	●	●	●
Ease of installation and ease of fitting to the motor	●	●	●	●	●	●	●	●
Long lifetime	●	●	●	●	●	●	●	●
Lifetime grease lubrication	✓	✓	■	✓	✓*	✓	✓	■
High bending moments	●	●	●	-	●	●	●	●
High moment stiffness	●	●	●	-	●	●	●	●
High radial loads	●	●	●	-	●	●	●	●
Low noise	●	●	●	●	●	●	●	●
Small moment of inertia	●	●	●	●	●	●	●	●
Accuracy	●	●	●	●	●	●	●	●
Output running tolerances	●	●	●	-	●	●	●	●
Hollow shaft bore	○	○	-	○	○	○	○	-

- ✓ Fulfilled ■ To be fulfilled by customer
- Outstanding ● Very good ● Good
- With hollow shaft ○ Hollow shaft available on request
- * up to #35

Series C Precision gearboxes with hollow shaft and integral tapered roller bearing



F2C-C

F2CF-C

Recommended for: Swing changers, main spindle drives, revolvers, pallet changers, spindle heads, swing tables, heads for tube bending

Special feature: The large hollow shaft diameter allows effective use of space for cables or media

- 5 sizes
- Ratios (single stage) 59/89/119
- Nominal output torques up to 4,328 Nm
- Acceleration torques up to 6,278 Nm
- Hollow shaft diameter from 49 to 99 mm
- Completely sealed and maintenance-free

F2C-C F2CF-C	Sizes				
	25	35	45	55	65
Reduction ratio					
59	•	•	•	•	•
89	•	•	•	•	•
119	•	•	•	•	•

Characteristics: Large hollow shaft, single stage

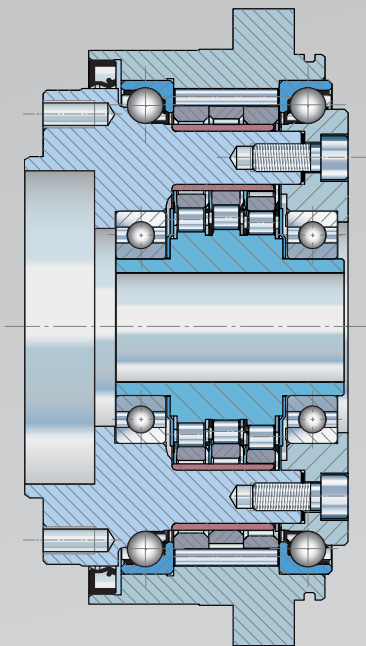
Bearings: Tapered roller bearing

F2C-C F2CF-C	Sizes				
	25	35	45	55	65
Standard housing shape	cyl	F	F	F	F
Optional housing shape	F	cyl	cyl	cyl	cyl
Special feature	Completely sealed				
Acceleration torque T_{2A}	1,030	1,962	3,188	4,316	6,278
Standard hollow shaft \varnothing	49	65	79	92	99
Advantages	Compact design, maintenance-free				
Uses / Suitability	Positioning tasks (point to point), smooth traverse applications with restricted uniformity, Standard design for intermittent operation at low input speeds				

F = Flange housing

cyl = Cylindrical housing

Series D Precision gearboxes with integral angular ball bearings



F4CF-D

Recommended for: Chain magazines, pallet changers, revolvers, main spindle drives, swing tables, swing changers, disc magazines, spindle heads, heads for tube bending

Special feature: Single stage flange gearbox with high power density and improved bearings

- 5 sizes
- Ratios (single stage) 29/59/89/119
- Nominal output torques up to 1,756 Nm
- Acceleration torques up to 3,188 Nm
- Lost motion < 1 arcmin
- Excellent cost-effectiveness
- High torques
- High permissible bending moments
- Compact design
- Customisable, through hollow shaft

F4C-D* F4CF-D	Sizes				
	15	25	30	35	45
Reduction ratio					
29	-	-	-	•	-
59	•	•	•	•	•
89	•	•	•	•	•
119	-	•	•	•	•

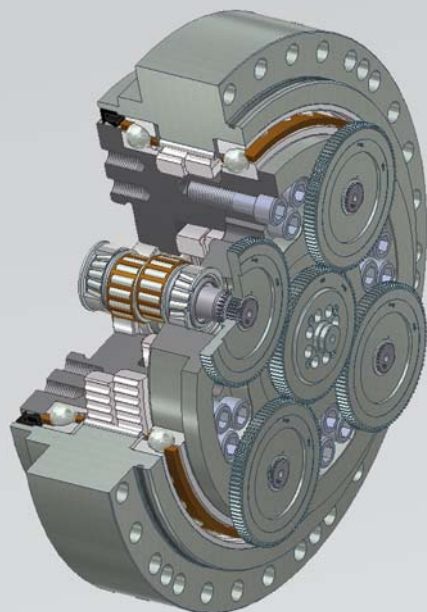
Characteristics: High power density, single stage

Bearings: Angular ball bearings

* under development

F4C-D* F4CF-D	Sizes				
	15	25	30	35	45
Standard housing shape	F-flange				
Housing shape under development	cylindrical				
Special features	Hollow shaft possible, input side seal by means of motor adapter				
Acceleration torque T_{2A}	417	883	1,226	1,717	3,188
Maximum hollow shaft \varnothing with keyway	14	20	27	32	41
Maximum hollow shaft \varnothing for smooth motor shaft	19	24	24	32	38
Maximum hollow shaft \varnothing	19	24	32	35	45
Advantages	Compact design, high torques and bending moments, high moment stiffness and accuracy compared to F2C-A, maintenance-free				
Uses / Suitability	Positioning tasks (point to point), smooth traverse applications with medium to high uniformity, standard design for intermittent operation				

Series UA Multi-stage precision gearboxes with increased power density for track guided applications. Highest precision and accuracy requirements. With optimised curve profile and spur wheel pre-stage.



UA 115

Recommended for: Pallet changers, heads for tube bending, swing changers, disc magazines, chain magazines, swing tables

Special feature: Gearboxes with high positioning and path accuracy, even with highly fluctuating dynamic conditions

- 6 sizes
- Multi-stage gear ratios
- Nominal output torques up to 16,685 Nm
- Acceleration torques up to 30,000 Nm
- EMERGENCY OFF torque 60,000 Nm
- Bending moment 44,000 Nm
- Lost Motion < 1arcmin
- Very smooth-running
- High efficiency, even at low speeds
- Low vibration

Optional: Motor fitting on request

UA Series	Sizes					
	F4CF-UA			F2CF-UA		F4CS-UA
	25	35	45	65	80	115*
Reduction ratio						
66	-	-	-	-	-	●
76	-	-	-	-	-	●
82	●	●	●	-	-	-
99	-	●	●	-	-	-
100	●	-	-	-	-	-
121	-	●	●	●	-	-
122	-	-	-	-	●	-
124	●	-	-	-	-	-
141	-	●	●	-	-	-
144	-	-	-	●	-	-
145	●	-	-	-	-	-
146	-	-	-	-	●	-
166	-	●	●	-	-	-
171	-	-	-	●	-	-
173	●	-	-	-	-	-
177	-	-	-	-	●	-
181	-	●	●	-	-	-
204	-	-	-	-	●	-
214	-	-	-	●	-	-
249	-	-	-	●	-	-
259	-	-	-	-	●	-

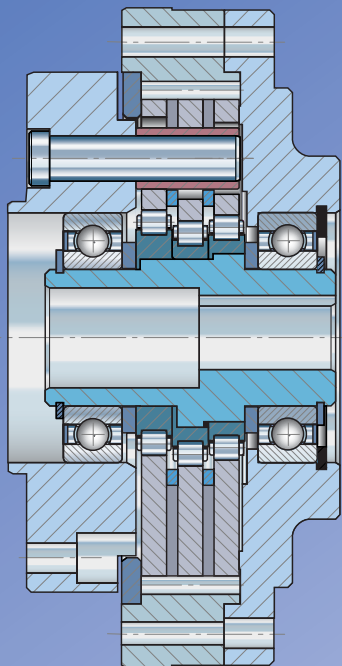
Characteristics: Flange version, *high ratios depending on pre-stage

Bearings: F2CF-UA = With integral tapered roller bearings
 F4CF-UA = With integral angular ball bearings

UA Series	Sizes					
	F4CF-UA			F2CF-UA		F4CS-UA
	25	35	45	65	80	115
Standard housing shape	F-flange					
Special features	Involute gear pre-stage, input side sealing possible					
Acceleration torque T_{2A}	1,250	2,250	3,300	8,575	12,500	30,000
Maximum hollow shaft Ø with keyway or smooth motor shaft	⌘	⌘	⌘	⌘	⌘	⌘
Advantages	High rotational and moment stiffness, very high accuracy, small inertia, compact design, output side sealed					
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with medium to high uniformity, standard design, suitable for continuous operation					

⌘ For exact data, please enquire to **Sumitomo (SHI) Cyclo Drive Germany GmbH**

Series A Precision gearboxes without output bearing



Recommended for: Pallet changers, spindle head

Special feature: User can make use of existing bearings, hollow shaft possible, compact construction

- 6 sizes
- Ratios (single stage) 29/59/89/119/179
- Can be customised to fit individual designs
- Smaller occupied space
- Nominal output torques up to 5,140 Nm
- Acceleration torques up to 7,610 Nm
- Input speeds up to 6,150 min⁻¹
- Lost Motion < 1 arcmin
- Motor coupling with intermediate flange

Optional: Fitting of motors without key by clamp ring design

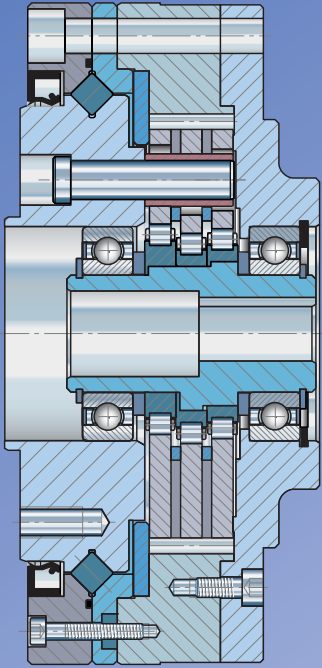
FC-A	Sizes					
	15	25	35	45	65	75
Reduction ratio						
29	-	•	•	•	•	•
59	•	•	•	•	•	•
89	•	•	•	•	•	•
119	-	•	•	•	•	•
179	-	-	-	•	•	-

Characteristics: Reduction kit, hollow shaft possible, single stage

Bearings: Gearboxes without output bearings

FC-A	Sizes					
	15	25	35	45	65	75
Standard housing shape	cylindrical					
Special features	Reduction kit without integral bearing and seal					
Acceleration torque T_{2A}	335	721	1,390	2,910	5,130	7,610
Maximum hollow shaft Ø with keyway	14	19	24	32	45	50
Maximum hollow shaft Ø for smooth motor shaft	14	19	24	32	38	48
Maximum hollow shaft Ø	16	24	32	38	55	64
Advantages	Compact design, can be incorporated in customer's design and bearing system, maintenance-free reduction kit					
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with medium uniformity. standard design for intermittent operation					

Series A Precision gearboxes, flange version with cross-roller bearing on output side



Recommended for: Linear axes and rotational axes for rack and pinion systems

Special feature: High rigidity, compact design

- 6 sizes
- Ratios (single stage) 29/59/89/119/179
- Nominal output torques up to 5,140 Nm
- Acceleration torques up to 7,610 Nm
- Input speeds up to 6,150 min⁻¹
- Lost Motion < 1 arcmin
- Motor coupling with intermediate flange

Optional: Fitting of motors without key by clamp ring design

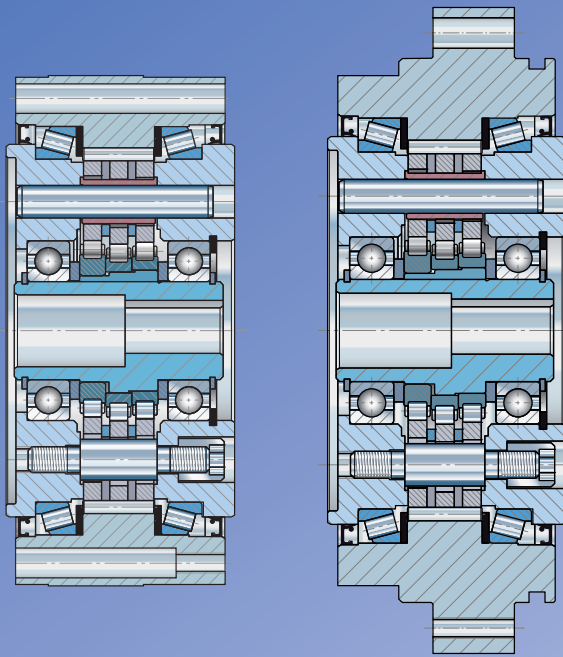
F1C-A	Sizes					
	15	25	35	45	65	75
Reduction ratio						
29	-	•	•	•	•	•
59	•	•	•	•	•	•
89	•	•	•	•	•	•
119	-	•	•	•	•	•
179	-	-	-	•	•	-

Characteristics: Single stage

Bearings: Cross-roller bearing

F1C-A	Sizes					
	15	25	35	45	65	75
Standard housing shape	cylindrical					
Special features	Sealed gearboxes, maintenance-free reduction kit, from size 45, the bearing requires re-greasing					
Acceleration torque T_{2A}	335	721	1,390	2,910	5,130	7,610
Maximum hollow shaft Ø with keyway	14	19	24	32	45	50
Maximum hollow shaft Ø for smooth motor shaft	14	19	24	32	38	48
Maximum hollow shaft Ø	16	24	32	38	55	64
Advantages	Size 45 high moment stiffness compared with F2C-A45, from size 45, large cross-roller bearing on output side					
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with medium uniformity. Standard design for intermittent operation					

Series A Precision gearboxes, flange version with integral tapered roller bearings



F2C-A

F2CF-A

Recommended for: Disc magazines, chain magazines, pallet changers, revolvers, main spindle drives, swing tables, swing changers, heads for tube bending, linear axes and rotational axes for rack and pinion systems

Special feature: Low noise, high rigidity, compact design

- 4 sizes
- Ratios (single stage) 29/59/89/119/179
- Tapered roller bearings with high permissible bending moments
- Nominal output torques up to 1,830 Nm
- Acceleration torques up to 2,910 Nm
- Input speeds up to 6,150 min⁻¹
- Lost Motion < 1 arcmin
- Motor coupling with intermediate flange

Optional: Fitting of motors without key by clamp ring design

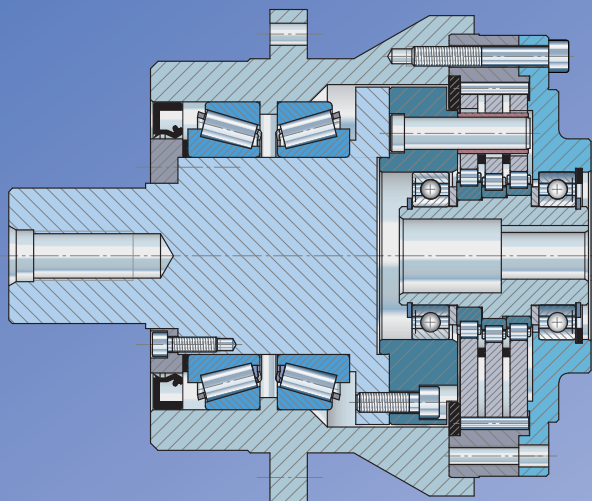
F2C-A F2CF-A	Sizes			
	15	25	35	45
Reduction ratio				
29	-	•	•	•
59	•	•	•	•
89	•	•	•	•
119	-	•	•	•
179	-	-	-	•

Characteristics: Single stage

Bearings: Tapered roller bearing

F2C-A F2CF-A	Sizes			
	15	25	35	45
Standard housing shape	cylindrical and F-flange			
Special features	Sealed gearboxes, universal mounting			
Acceleration torque T_{2A}	335	721	1,390	2,910
Maximum hollow shaft Ø with keyway	14	19	24	32
Maximum hollow shaft Ø for smooth motor shaft	14	19	24	32
Maximum hollow shaft Ø	16	24	32	38
Advantages	Compact design, sizes 15 to 35 higher bending moments and moment stiffness compared to F1C-A. Output via ring gear (housing) possible, maintenance-free			
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with medium uniformity. Standard design for intermittent operation			

Series A Precision gearboxes with output shaft and tapered roller bearings



Recommended for: Linear axes and rotational axes for rack and pinion systems, chain magazines, heads for tube bending, pallet changers

Special feature: Allows high radial forces

- 6 sizes
- Ratios (single stage) 29/59/89/119/179
- Nominal output torques up to 5,140 Nm
- Acceleration torques up to 7,610 Nm
- Input speeds up to 6,150 min⁻¹
- Lost motion < 1 arcmin
- Motor coupling with intermediate flange

Optional: Splined output shaft, fitting of motors without key by clamp ring design

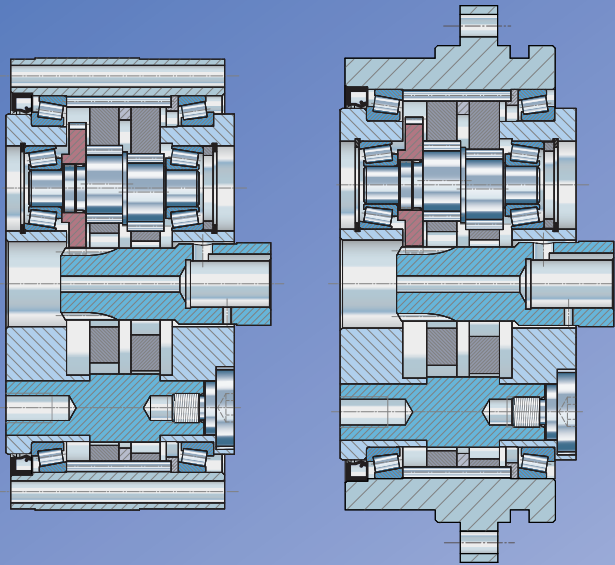
F3C-A	Sizes					
	15	25	35	45	65	75
Reduction ratio						
29	-	•	•	•	•	•
59	•	•	•	•	•	•
89	•	•	•	•	•	•
119	-	•	•	•	•	•
179	-	-	-	•	•	-

Characteristics: Single stage

Bearings: Tapered roller bearing

F3C-A	Sizes					
	15	25	35	45	65	75
Standard housing shape	Flange					
Special features	Universal mounting, sealed gearboxes					
Acceleration torque T_{2A}	335	721	1,390	2,910	5,130	7,610
Maximum hollow shaft Ø with keyway	14	19	24	32	45	50
Maximum hollow shaft Ø for smooth motor shaft	14	19	24	32	38	48
Advantages	Very stiff output bearings for high radial forces, maintenance-free					
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with medium uniformity. Standard design for intermittent operation					

Series FT Precision gearboxes for track controlled applications. For high precision and accuracy requirements. With optimised curve profile and integral spur wheel pre-stage.



F2C-T

F2CF-T

Recommended for: Heads for tube bending, pallet changers, disc magazines

Special feature: Gearboxes with high positioning and tracking precision, even under highly fluctuating dynamic conditions

- 7 sizes
- Integral spur wheel pre-stage
- Ratios (double stage) 81/118.5/141/171
- Nominal output torques up to 6,140 Nm
- Acceleration torques up to 11,000 Nm
- Input speeds up to 8,460 min⁻¹
- Lost Motion < 0.5 arcmin
- Very smooth running
- High efficiency, even at low speeds
- Low vibration
- Motor coupling with intermediate flange

Optional: Fitting of motors without key by clamp ring design

F2C-T F2CF-T	Sizes						
	155	255	355	455	555	655	755
Reduction ratio							
81	•	•	•	•	•	•	•
118.5	•	•	•	•	•	•	•
141	•	•	•	•	•	•	•
171	-	-	-	•	•	•	•

Characteristics: Two-stage reduction

Bearings: Tapered roller bearing

F2C-T F2CF-T	Sizes						
	155	255	355	455	555	655	755
Standard housing shape	cylindrical and F-flange						
Special features	Involute gear pre-stage, sealing and grease filling by customer, input pinion bearing not in gearbox						
Acceleration torque T_{2A}	417	1,030	1,960	3,190	4,910	7,850	11,000
Maximum hollow shaft Ø with keyway	14	17	22	28	28	35	35
Advantages	High torsional and moment stiffness, very high accuracy, small inertia and compact design, high torsional stiffness, low hysteresis loss						
Uses / Suitability	Positioning tasks (point to point) and smooth traverse applications with high uniformity. Standard design, suitable for continuous operation						

Our Location

Advantages for our European Fine Cyclo customers:

- Optimum customer focus with the closest possible co-operation from the earliest development phase
- A highly skilled team of engineers develops the best solution for your application



Our Location

Our Production

Manufacturing to the latest technical standards, to ensure the highest quality

- Short distances
- Short delivery times
- Minimised risk



Our Production