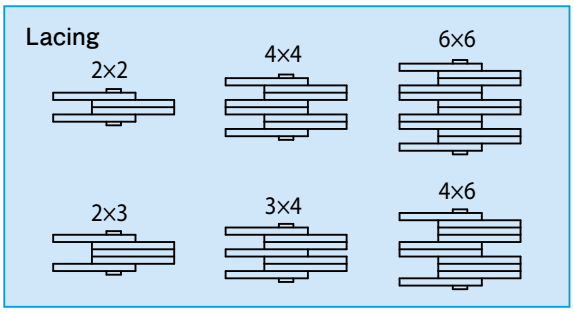
LEAF CHAINS

Leaf chain, also called a balance chain, features a simple steel structure consisting of plates and pins. This chain is used for load lifting and balancing.



Type

Leaf chain falls into two types; AL type for light loading and BL type for heavy loading.

AL type is used for applications without impact and with daily repetition of 100 times or less.

Selection

1.Determine the following items according to operating conditions,

- Chain speed
- Daily repetition of power applications
- Working load (attachment weight, inertia force, and impact force)

2.Determine chain type.

- BL type is recommended.
- Use roller chain if speed exceeds 30m/min or number of daily repetition exceeds 1000.

3.Determine chain size by the following equation.

$$\text{Working Load} \times \frac{\text{Service factor}}{\text{(Table 1)}} \times \frac{\text{Safety Factor}}{\text{(Table 2)}} \leqq \text{Min. Tensile Strength}$$

Table 1: Service factor

Type of impact	Service	Service factor
Smooth transmission	Smooth starts and stops, and moderate load change (i.e. lowering of balance-weight)	1.0
Impact to some extent	Frequent starts, stops, load changes and operations (i.e. fork lift)	1.3
Impact	Rapid starts, stops, load changes, and reversing operation (i.e. mining and construction machinery)	1.5

Table 2: Safety factor

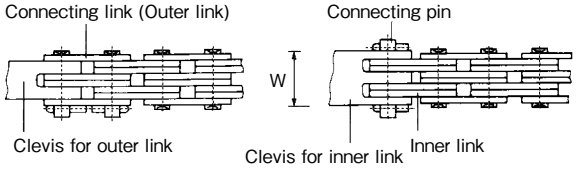
	Plate combination / No. repetition	Safety factor 2×2, 3×4, 2×3, 4×4	Safety factor 4×6, 6×6
BL type	1,000 times or less/day	8 or more	9 or more
AL type	10 times or less/day	8 or more	9 or more
	100 times or less/day	11 or more	12 or more

Notes to Selection

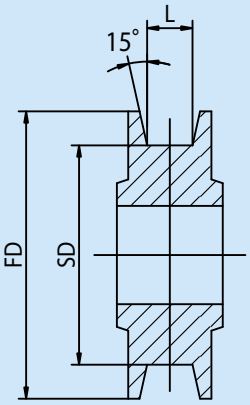
- Do not use a chain with low safety factor. Otherwise, pin will turn, resulting in dangerous chain failure.
- Perform periodic lubrication. Even when safety factor is satisfactory, insufficient lubrication will result in pin rotation.
- Safety factor of chain is defined by the related regulations, or by this bulletin, whichever is greater.

Attaching of Chains and Clevises

1. When end is outer link or connecting link:
   Outer link connector and connecting link (standard) are used.
2. When end is inner link:
   Inner link connector and connecting pin (with dimension "W") are used.



Sheave



SD (min. sheave dia.) = 5 x Chain pitch
* L (min. groove width) = 1.05 x Pin length
FD (flange dia.) = SD + Max. link plate width

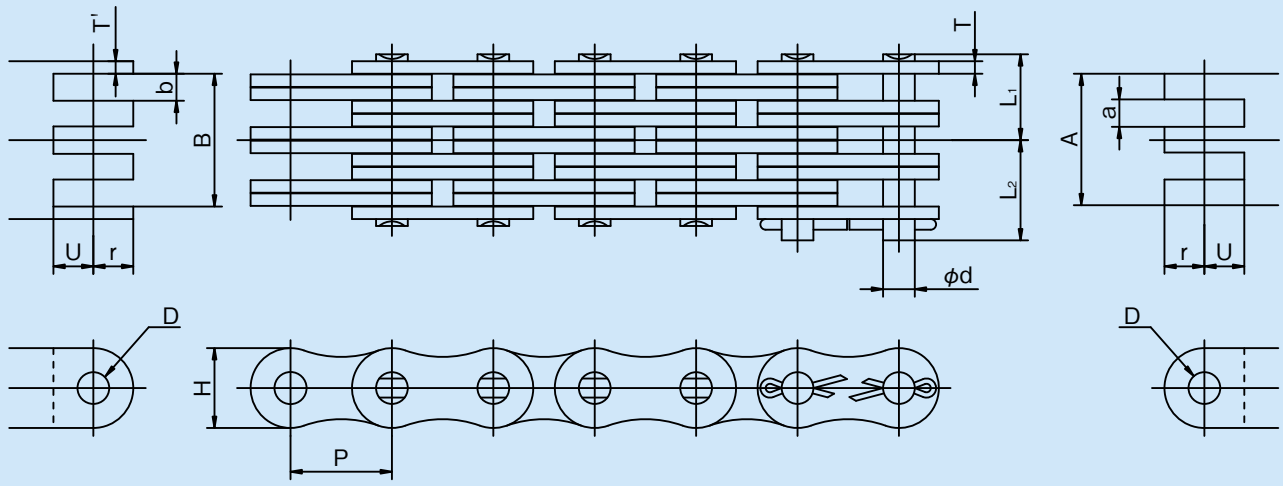
(*): Connecting pin cannot be engaged with sheave.

LEAF CHAINS (AL Series)

Leaf Chain Operating Notes

1. Lubricate leaf chain periodically to avoid rotation of pin and reduce wear for extended service life.
   Recommended oil: SAE30 - SAE40
   Lubrication intervals: Determined to keep lubricant left on sliding portion between pin and inner link plate.
   Lubrication method: Lubrication into space between link plates when chain is loosened.
2. Avoid use of chain in corrosive environment.
3. Measure chain length periodically to check for wear and elongation.
   If elongation reaches its limit (3%), immediately replace chain.

■ AL Series



T' must be thicker than link plate.

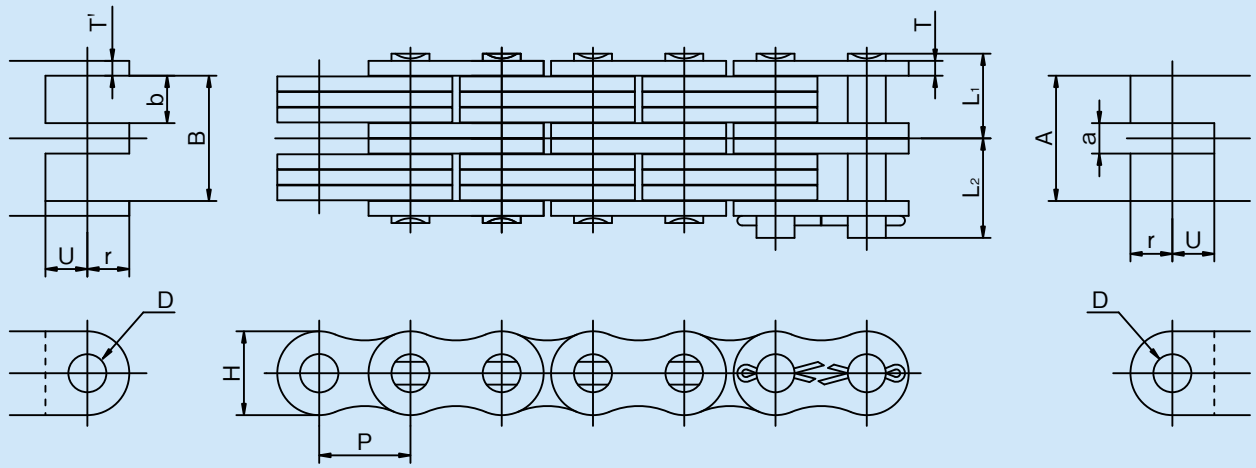
○ Dimensions [Unit: mm]

KCM Chain No.	Pitch P	Plate			Pin			Min. Tensile Strength kN (kgf)	1-m chain weight (kg)	End connector						
		Lacing	Thickness T	Height H	Outside diameter ϕd	Caulked L_1	Pinned L_2			D Min.	r Max.	U Min.	A Max.	a Min.	B Min.	b Min.
KCM AL422		2×2				3.93	6.13	16.7(1,700)	0.34				3.04	—	—	
KCM AL444	12.70	4×4	1.5	10.1	3.97	6.98	9.18	33.3(3,400)	0.68	4.00	6.35	5.72	9.47	3.39	9.82	3.39
KCM AL466		6×6				10.05	12.25	50.0(5,100)	1.03				15.90		16.25	
KCM AL522		2×2				5.2	7.15	27.5(2,800)	0.61				4.03	—	—	
KCM AL544	15.875	4×4	2.0	12.6	5.09	9.3	11.25	54.9(5,600)	1.18	5.11	7.92	7.14	12.50	4.44	12.91	4.44
KCM AL566		6×6				13.4	15.35	82.4(8,400)	1.76				20.97		21.38	
KCM AL644	19.05	4×4	2.4	15.0	5.96	11.15	13.85	76.5(7,800)	1.70	5.98	9.53	8.56	14.69	5.23	15.19	5.23
KCM AL666		6×6				16.13	18.83	114.7(11,700)	2.53				24.65		25.15	
KCM AL844	25.40	4×4	3.2	19.7	7.94	14.43	17.53	129.4(13,200)	2.92	7.96	12.70	11.43	19.80	7.00	20.40	7.00
KCM AL866		6×6				20.93	24.35	194.2(19,800)	4.35				33.20		33.80	
KCM AL1044	31.75	4×4	4.0	24.8	9.54	18.6	21.55	196.1(20,000)	4.65	9.56	15.88	14.27	24.49	8.63	25.19	8.63
KCM AL1066		6×6				26.8	29.75	294.2(30,000)	6.94				41.05		41.75	
KCM AL1244	38.10	4×4	4.8	30.0	11.11	22.1	25.5	282.4(28,000)	6.70	11.14	19.05	17.14	29.30	10.30	30.10	10.30
KCM AL1266		6×6				31.9	35.3	423.6(43,200)	9.99				49.10		49.90	

NOTES: - Dimension "U", groove depth, excludes rounded area.
- It is required that end connector is made of alloy steel (SCM435, etc.) and properly heat treated to hardness of HRC 40 – 45.

LEAF CHAINS (BL Series)

■ BL Series



T' must be thicker than link plate.

○ Dimensions [Unit: mm]

KCM Chain No.	Pitch P	Plate			Pin			Min. Tensile Strength kN (kgf)	1-m chain weight (kg)	End connector						
		Lacing	Thickness T	Height H	Outside diameter φd	Caulked L_1	Pinned L_2			D Min.	r Max.	U Min.	A Max.	a Min.	B Min.	b Min.
KCM BL423		2×3				6.22	8.18	23.50(2,400)	0.73				6.05	—	—	6.53
KCM BL434	12.7	3×4	2.0	11.7	5.09	8.27	10.23	35.30(3,600)	1.02	5.11	6.35	6.35	10.27	2.21	10.77	4.41
KCM BL446		4×6				11.35	13.30	47.10(4,800)	1.44				16.50	4.41	17.13	6.53
KCM BL523		2×3				7.42	10.13	39.20(4,000)	1.13				7.20	—	—	7.76
KCM BL534	15.875	3×4	2.4	14.6	5.96	9.92	12.63	58.80(6,000)	1.56	5.98	7.92	7.92	12.22	2.62	12.80	5.24
KCM BL546		4×6				13.62	16.33	78.50(8,000)	2.22				19.64	5.24	20.36	7.76
KCM BL623		2×3				9.55	12.65	63.70(6,500)	1.82				9.62	—	—	10.31
KCM BL634	19.05	3×4	3.2	17.5	7.94	12.80	15.90	95.60(9,750)	2.52	7.96	9.53	9.53	16.30	3.48	17.01	6.96
KCM BL646		4×6				17.67	20.78	127.50(13,000)	3.57				26.19	6.96	27.06	10.31
KCM BL823		2×3				12.45	15.40	103.00(10,500)	2.97				11.90	—	—	12.73
KCM BL834	25.4	3×4	4.0	23.0	9.54	16.55	19.50	154.90(15,800)	4.11	9.56	12.70	12.70	20.16	4.30	21.01	8.59
KCM BL846		4×6				22.70	25.65	205.90(21,000)	5.82				32.38	8.59	33.43	12.73
KCM BL1023		2×3				14.75	18.15	141.20(14,400)	4.43				14.22	—	—	15.21
KCM BL1034	31.75	3×4	4.8	28.9	11.11	19.65	23.05	215.70(22,000)	6.17	11.14	15.88	15.88	24.09	5.13	25.11	10.26
KCM BL1046		4×6				27.00	30.40	282.40(28,800)	8.78				38.70	10.26	39.96	15.21
KCM BL1223		2×3				17.25	21.25	186.30(19,000)	6.35				16.74	—	—	17.87
KCM BL1234	38.1	3×4	5.6	35.0	12.71	23.00	27.00	299.10(30,500)	8.71	12.74	19.05	19.05	28.35	6.03	29.51	12.05
KCM BL1246		4×6				31.62	35.63	372.70(38,000)	12.37				45.53	12.05	46.97	17.87

NOTES: - Dimension "U", groove depth, excludes rounded area.
- It is required that end connector is made of alloy steel (SCM435, etc.) and properly heat treated to hardness of HRC 40 – 45.