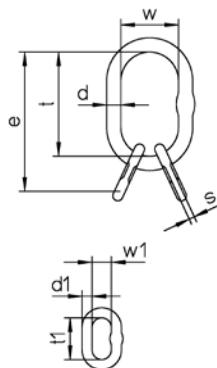


Original operating manual for Sub-Assembly G/S

Sub-Assembly G/S



Chain Ø mm	Code	Can be used to single hook acc. to DIN15401 no.	Dimensions								Weight kg	Working Load Limit 0°-45° *) kg	
			e	d	t	w	d1	t1	w1	s			
mm													
6	G/S 6		5	189	19	135	75	13	54	25	10	1.26	4,200
7+8	G/S 7/8		6	230	23	160	90	17	70	34	14	2.32	7,600
10	G/S 10		8	265	27	180	100	20	85	40	14	3.68	9,600
13	G/S 13		10	315	33	200	110	23	115	50	17	6.46	14,000
16	G/S 16		16	400	36	260	140	27	140	65	20	10.06	21,200
19	G/S 19/20		32	500	50	350	190	33	150	70	26	22.87	34,100
22	G/S 22		32	520	50	350	190	36	170	75		24.79	40,000
26	G/S 26		32	570	56	400	200	45	170	80		41.31	56,000

Static test coefficient = $2.5 \times$ the WLL of each section of the sling; Safety factor = 4

* This load capacity should not be consulted when assembling chain slings.

These Sub-Assemblies G/S are designed for the assembly of chain slings and after reading the operating manual as well as the current national norms for lifting and transporting purposes. KWB Star Alloy Sub-Assemblies G/S can be combined with suitable components (Star Alloy chains, connecting links and hooks) to build chain slings. This product meets the requirements of the EU Machinery Directive 2006/42/EC and is only to be used when taking into consideration the declaration of incorporation and after reading and understanding the operating manual. The operating manual must always be available to the user until the sub-assembly is discarded. It is updated continuously and is only valid in its latest version, which can be downloaded from the following link www.kwb-ketten.at.

Conditions of use

Use purposes: Sub-Assemblies G/S are used as head master links in 3- and 4-legs chain slings. They serve as an attachment of the lifting chain to the crane hook.

The biggest crane hook into which an assembly can be attached is defined in the table above. Analogously, they can be attached into wire rope slings.

Load: the load must act in a longitudinal direction and on the plain of the link.

The inclination angle of the adjusted chain legs must not exceed 60°. Working Load Limit values are defined in the table above – note that for wire rope slings the working load limit value defined for safety factor 4 is valid. Every ring must move freely and be aligned in the load direction.

Admissible operating temperature: -40 °C to 200 °C.

Impacts: the load must be applied without any impact or shock loading.

- Sub-Assemblies G/S must only be used by competent personnel
- Sub-Assemblies G/S must be checked before each use for visible signs of damage



Restrictions of use

Under certain conditions, the use of Sub-Assemblies G/S is restricted (see table below). The table below describes certain loads with their corresponding reduction factors. Safe working load values are calculated by multiplying the working load limit with the reduction factor defined in the table. If more restrictions of use are applicable during a lifting process, all corresponding reduction factors must be taken into account.

Reduction factors			
Temperature*	-40 °C to 200 °C	above 200 °C to 300 °C	above 300 °C to 380 °C
Reduction factor	1	0.9	0.75
	Slight impacts created, for example, when accelerating during the lifting or lowering movement	Medium impacts created, for example, when the chain is loaded but it slips while adjusting to the shape of the load	Strong impacts created, for example, when the load falls onto an unloaded chain
Impact Load			
Reduction factor	1	0.7	Impermissible

* The use at temperatures below -40 °C and above 380 °C is forbidden!

All instructions given in this operating manual assume the absence of extremely dangerous conditions. Such extremely dangerous conditions include offshore activities, lifting of people and potentially dangerous loads, such as liquid metals or nuclear material. In these cases, the admissibility and extent of the risks are to be assessed by KWB.

Reasonably foreseeable misuse

Sub-Assemblies G/S are not designed to be used with food, cosmetics or pharmaceutical products, and must not be subjected to severe corrosive influences (e.g. acids, sewage...). They must not be used in explosion-protected areas or exposed to the fumes released by acids or chemicals. They also must not be used under other circumstances as the one described in Conditions of use and Restrictions of use – e.g. transverse or flexural loading.

Assembly instructions

The assembly process may only be executed by a qualified person. Sub-Assemblies G/S can be combined by means of Connecting Links with other KWB Star Alloy (G10) chain sling components – especially Star Alloy chains – to form 3- or 4-leg chain slings (maximum 2 chain legs in each small link). The assignment of the right chain dimension is determined by the product code. That is, G/S 10, for example, is to be used with Star Alloy 10 mm chains. When repairing Super Alloy (G8) chain slings, Sub-Assemblies G/S can also be used as long as a misinterpretation of the right WLL by the user is excluded – e.g. by means of a unified coloration and correct identification. It is vital to pay attention to the right working load limit marking of the whole system (WLL on identification tag). The weakest part will determine the working load limit. The lifting accessory into which the sub-assembly is to be incorporated must be declared in conformity with the provisions of the Directive 2006/42/EC. Only non-damaged parts must be assembled. Defective Sub-Assemblies G/S must not be used and used sub-assemblies must be inspected before the assembly process as described below under the section Maintenance, Inspections and Repairs.

Safety precautions to be taken by the user

Gloves must be worn during the whole process. When using Sub-Assemblies G/S under conditions with restrictions of use, working load limit values must be reduced by the above reduction factors in order to assure the required security level.

Residual risks

Overloading because of exceeding the working load limit or not reducing the working load limit when influences under severe conditions such as temperature, asymmetry, edge load or impact occur, can lead to failure on the sub-assembly. Other factors are unsatisfactory adjustment, transgression of the permitted angle of inclination, strong vibrations with heavy load, transverse loading or the use of uninspected sub-assemblies. In such cases, the load could fall causing injuries or fatalities among the workers who operate or work near the lifting equipment.

How to act in case of accidents or damages

After deformation of the Sub-Assemblies G/S because of overloading or other extraordinary events, take the lifting assembly out of service for inspection or repair by a qualified person.

Maintenance, Inspections and Repairs

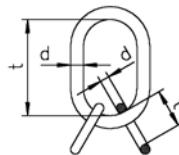
Maintenance: Sub-Assemblies G/S shall be cleaned regularly, dried when in contact with wet atmospheres and protected from corrosion, e.g. lightly oiled.

Inspections: Sub-Assemblies G/S need to be inspected in a clean condition – they must not contain oil, dirt or rust. Painting is only permissible if an evaluation of the sub-assembly condition is possible. When cleaning, do not subject Sub-Assemblies G/S to processes which cause material embrittlement (e.g. pickling), overheating (e.g. flame cleaning), material abrasion (e.g. sand blasting), etc. Surface cracks or other defects must not be covered. Sub-Assemblies G/S must be checked before each use for visible signs of damage. Once a year an inspection must be carried out by a competent person. However, this period must be shortened in view of the conditions of use – e.g. because of frequent use with maximum load capacity or under conditions with restrictions of use, wear or corrosion. It is recommended to subject Sub-Assemblies G/S every two years to a crack test. There are different ways of crack testing: subjecting the sub-assembly to a load test with 2 times the working load limit, followed by a visual inspection, a magnetic crack test or a dye-penetration method.

Withdrawal:

- Broken parts, deformation, notches, cracks of all types
- Signs of heat (e.g. discoloration or coating-burn off)
- In the case of doubts about the safety and correct functioning of the sub-assembly
- Unrecognizable identification marking
- If wear or excessive corrosion occurs and the tolerable change of measurement is transgressed (see following table)

Measure	Maximal permitted change
d	-10 %
t	+10 %



Repair:

Sub-Assemblies G/S are only to be repaired by a qualified person. Welding, heat treatments, as well as the straightening of bent sub-assemblies are not permitted. Inspections and repairs have to be documented and the corresponding reports have to be retained during the service life of the Sub-Assembly G/S.

Storage

KWB Star Alloy Sub-Assemblies G/S shall be stored cleaned, dried, protected from corrosion, e.g. lightly oiled. While stored, they must not be exposed to corrosive, mechanical or thermal influences.

Declaration of incorporation

In accordance with the requirements established in Annex II, part B, of the EU Machinery Directive 2006/42/EC for components in lifting accessories:

This is to inform you that the product mentioned in this original operating manual is designed to be incorporated in lifting accessories complying with all essential requirements of the EU Machinery Directive 2006/42/EC. This product must not be put into service until the final lifting accessory into which it is to be incorporated has been declared in conformity with the provisions of the Directive 2006/42/EC. Moreover, it is a precondition that this operating manual has been read and understood. This declaration has no legal effect if any changes to the product are introduced without KWB's approval.

Following essential safety and health requirements of Annex I of the Directive are applied and fulfilled:
1.1.3, 1.3.4, 1.5.4, 4.1.2.3, 4.1.2.5, 4.3, 4.4.1.

Additionally, we declare that the relevant technical documentation is compiled in accordance with part B of Annex VII and will be transmitted electronically due to a well-founded request by the national competent authority.

The person authorised to compile the technical documentation:
DI Bernhard Oswald; Mariazeller Straße 143; A-8605 Kapfenberg

Klagenfurt, 2011-09-01

KWB Ketten Austria GmbH
Stefan Duller