OPERATING INSTRUCTIONS
LIFTING POINTS THI-EYE
TWN 1490

Original in the sense of 2006/42/EC

1. DESCRIPTION AND INTENDED USE

THIELE weld-on lifting points THI-EYE according TWN 1490 are intended for attachment to steel structures and components, e.g. with chain slings in accordance with EN 818-4. (TWN = THIELE factory standard)

The lifting points consist of a forged body with a central opening. They are 100 % load-bearing in all directions.

THIELE lifting points meet EC Machinery Directive 2006/42/EC requirements and feature a safety factor of at least 4 based on working load limit (WLL).

The lifting points are marked with the working load limit (WLL), manufacturer's mark, CE mark and traceability code.

THI-EYE can be hot-dip galvanised together with the entire welded structure when welded on.

THI-EYE can be hot-dip galvanised or electrogalvanised in the welded state together with the entire welded mounting assembly.

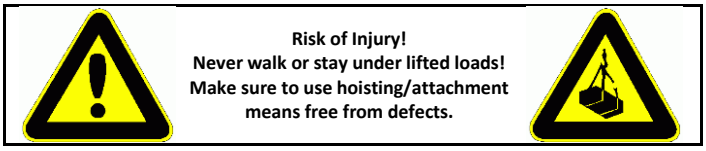
THIELE lifting points are designed to withstand 20 000 dynamic load changes under maximum load conditions. In the event of higher loads (e.g. multi-shift/automatic operation) the working load limit must be reduced.

Lifting points must exclusively be used

- within the limits of their permissible working load limit,
- for permissible attachment modes and inclination angles,
- within the temperature limits prescribed,
- with properly laid welding seams.

The working load limits depending on the type of sling can be found in the table in Chapter 4.
The THI-EYE can also be used as lashing points. If the THI-EYE are used **exclusively** for lashing, the maximum lashing capacity (LC) is calculated by doubling the working load limit to LC = 2 x WLL.
Alternate use for lifting and lashing is only permitted up to the load corresponding to the working load limit (WLL), i.e. LC = WLL! Even a single lasing load above the working load limit (LC > WLL) makes the further use as a lifting point impermissible.
As a rule, lifting points are not permitted for the transportation of persons.

2. SAFETY NOTES



- Operators, fitters, and maintenance personnel must in particular observe the operating instructions also from the used sling chain assemblies, documentations DGUV V 1, DGUV R 109-017 and DGUV I 209-013 issued by the German Social Accident Insurance (DGUV), as well as the operating instructions of the loads concerning advise for lifting.
- In the Federal Republic of Germany, the operational safety ordinance (BetrSichV) has to be implemented and the technical rule for industrial safety TRBS 1201, in particular Annex 1, Chapter 2 "Special regulations for the use of working equipment for lifting loads" must be observed.
- Outside the Federal Republic of Germany the specific provisions issued locally in the country where the items are used must also be observed.
- The directions given in these operating instructions and specified documentations relating to safety, assembly, operation, inspection, and maintenance must be made available to the respective persons.
- Make sure these operating instructions are available in a place near the product during the time the equipment is used. Please contact the manufacturer if replacements are needed. See also chapter 9.
- When performing work make sure to wear your personal protective equipment!
- **Improper assembly and use may cause personal injury and/or damage to property.**
- Assembly and removal as well as inspection and maintenance must exclusively be carried out by skilled and authorized persons.
- Structural changes are impermissible (e.g. welding on of additional parts, grinding).
- **Operators must carry out a visual inspection before each use.**
- **Ensure that slings or lashing equipment suspended in the eyelet can always move freely in any angular position.**
- Never put to use worn-out, bent or damaged lifting points.
- Only lift loads the mass of which is less than or equal to the working load limit of the lifting points.
- Do not use force when mounting/positioning the lifting points.
- Only lift loads that are freely movable and not attached or fastened.
- Do not start lifting before you have made sure the load has been correctly attached.
- Make sure no one including you (operator) is in the way of the moving load (hazard area).
- During lifting/hoisting make sure your hands or other body parts do not come into contact with hoisting means. Only remove hoisting means manually (use your hands).
- Avoid impacts, e.g. due to abruptly lifting loads with chain in slack condition.
- Never move a suspended load over persons.
- Never cause suspended loads to swing.
- Always monitor a suspended load.
- Put the load only down in flat places/sites where it can be safely deposited.
- Take care for sufficient place for the personnel to move when choosing the route of transportation and storage location. Danger to life and risk of injury by crushing hazards.
- In the event of doubts about the use, inspection, maintenance or similar things contact your safety officer or the manufacturer.
- The reuse of welded-on and later detached lifting points is not permitted.

THIELE will not be responsible for damage caused through non-observance of the instructions, rules, standards and notes indicated!

Working under the influence of drugs and alcohol (including residual alcohol) as well as medicines that impair the senses is strictly prohibited!

3. COMMISSIONING

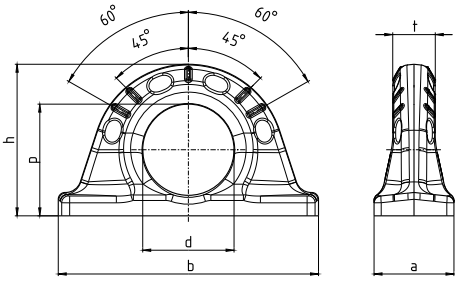
Prior to using the components for the first time make sure that

- the lifting points comply with the order and have not been damaged,
- test certificate, statement of compliance and operating instructions are at hand,
- markings correspond with what is specified in the documentation,
- inspection deadlines and the qualified persons for examinations are determined,
- visibility and functional testing are carried out and documented,
- the documentation is safely kept in an orderly manner.

Dispose of the packing in an environmentally compatible way according to local rules

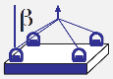
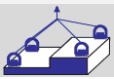
4. TECHNICAL DATA

4.1 Dimensions



Nominal size WLL	Article no.	Dimensions [mm]						Mass
		a	b	t	h	d	p	[kg]
1,6 t	F32305	30	100	16	58	35	42	0,5
3,2 t	F32300	41	137	19	80	50	60	1,0
5,0 t	F32301	51	172	26	99	60	73	2,1
10,0 t	F32302	70	228	37	133	80	98	5,2
20,0 t	F32303	90	272	50	180	115	140	10,5
31,5 t	F32304	108	320	62	208	130	160	18,5

4.2 Working load limits depending on the application

Attachment mode	Inclination angle β	Number of legs	Nominal size 1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t
	0° ±7°	1	1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t
	0° ±7°	2	3,2 t	6,4 t	10,0 t	20,0 t	40,0 t	63,0 t
	90° ±7°	1	1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t
	90° ±7°	2	3,2 t	6,4 t	10,0 t	20,0 t	40,0 t	63,0 t
	15° - 45°	2	2,25 t	4,5 t	7,0 t	14,1 t	28,3 t	44,5 t
	45° - 60°	2	1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t
	Asymmetric	2	1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t
	15° - 45°	3 / 4	3,4 t	6,8 t	10,6 t	21,2 t	42,4 t	66,8 t
	45° - 60°	3 / 4	2,4 t	4,8 t	7,5 t	15,0 t	30,0 t	47,2 t
	Asymmetric	3 / 4	1,6 t	3,2 t	5,0 t	10,0 t	20,0 t	31,5 t

5. ASSEMBLY

5.1 Preparations

The mounting location for each lifting point has to ensure that

- the load can take the forces including test loads safely to be applied without suffering deformation,
- no areas of danger are created (crushing point, shearing point),
- transportation is not restrained by overhang,
- lifting accessories will not be bypassed,
- incorrect use is avoided,
- the suspension gear cannot be damaged, for example by sharp edges,
- the lifting points can be used easily.

Make sure the welding surfaces are grinded down, flat, dry, free of impurity, flawless and weldable (material see ISO/TR 15608 table 1, group 1). Make sure the weld area at the component is able to absorb the input force without safety reducing deformation.

Make sure the weld seam area at the component is large enough for the lifting points to be safely attached by welding.

5.2 Welding instructions

Welding instructions relating to the THI-EYE body (1.6758/23MnNiCrMo5-4) to be attached to C22, S235, S355 or similar components.

The following general welding instructions must be observed:

- EN ISO 2560 — Welding consumables – Covered electrodes for manual arc Welding of non-alloy and fine grain steel
- EN ISO 14341 — Welding consumables – Wire electrodes and weld deposits for gas shield metal arc welding of non-alloy and fine grain steel
- ISO 3834-2 — Quality requirements for fusion welding of metallic materials
- EN 1011-1, 2 — Welding – recommendations for welding of metallic materials
- EN ISO 9606-1 — Qualification testing of welders – fusion welding
- DVS 0702-1 / 0711 — Factsheet - Requirements for operation and personnel
- SEW 088 — Weldable non-alloy and low-alloy steels – Recommendations for processing, in particular for fusion welding

Start tack-welding or welding in the centre of a long side.

Ensure the THI-EYE lie flat without an air gap during tack-welding.

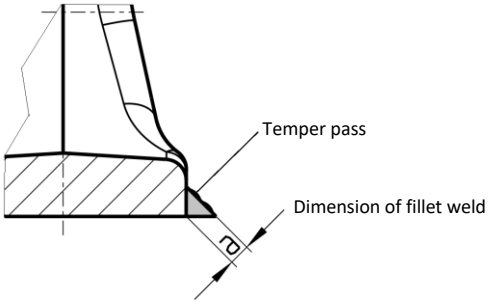
Take care for an accurate cleaning of the root run.

For corrosion protection, ensure that the weld seam is closed all the way round.

Take care to avoid end crater.

Continue the welding within one heat.

5.3 Geometry data weld seams



Nominal size	Fillet weld a_{min} ≈ [mm]	Total length [cm]	Volume appr. [cm³]
1,6 t	4	25	4,0
3,2 t	6	34	12,2
5,0 t	7	43	21,1
10,0 t	8	57	36,5
20,0 t	12	68	97,9
31,5 t	15	80	180

5.4 Miscellaneous

1. Minimum notched-bar impact strength values of ISO-V specimens KV = 27 J at -40 °C (e.g. S355J4G3 or S355NL, EN10025)
2. When selecting material grades other than those listed above please contact the base material and filler metal manufacturers for information.
3. The responsible welding supervisor on site must make sure the welding current is correctly adjusted to suit the given welding position.
4. A procedure check is recommended to confirm the selected settings

5.5 Post heat treatment

The welded lifting points together with the entire welding group can be subjected to a one-off stress relief heat treatment at ≤ 600 °C for a maximum of 1 hour in the unloaded state.

5.6 Hot-dip galvanising

Hot-dip galvanising of the entire welded assembly is possible under the following conditions:

- Before galvanising, the surface must be cleaned promptly by blasting.
- Only non-electrolytic or anodic alkaline cleaners should be used. Pickling is not permitted.
- Cleaning times should be kept as short as possible.
- When hot-dip galvanising, a maximum process temperature of 500 °C must not be exceeded.

5.7 Welding process MAG

Welding process	Metal active gas welding (MAG) EN ISO 9606-1; No. 135		
Welding groove	See sketch, taking into account EN ISO 9692-1		
Quality grade	For all layers according to EN ISO 5817 – C		
Wire electrode	EN ISO 14341-A:2011: ISO 14341-A-G 46 4 M21 3Si1 Possible alternatives must be selected and checked by the welding supervisor on site.		
Welding position	EN ISO 9606-1: PA, PB, PC, PF		
Preheating of parent metal	Thickness ≥ 20 mm: 150 °C		
Interpass temperature	≤ 400 °C		
Postweld heat treatment	Thickness ≥ 40 mm: Tempering at 400 °C or apply quenching and tempering layer technology		
Pass	Root run	Intermediate run/ Final run	Temper pass
Wire electrode diameter	1 mm	1,2 mm	1 or 1,2 mm
Welding current (=)	130 – 200 A	135 – 290 A	See root run or stringer pass. Note: The quench and temper layer must only be applied to the weld metal. Contact with the base metal must be avoided.
Electrode polarity	(= +)	(= +)	
Voltage	19 – 25 V	19 – 32 V	
Shield gas ISO 14175; M21	10 – 12 l/min	12 – 14 l/min	
Kind of pass	Stringer pass	Stringer pass	

5.8 Manual welding process MMA

Welding process	Manual metal arc welding (MMA) EN ISO 9606-1; No. 111			
Welding groove	See sketch, taking into account EN ISO 9692-1			
Quality grade	For all layers according to EN ISO 5817 - C			
Wire electrode	EN ISO 2560 A:2010: min. ISO 2560-A-E 38 4 B 42 H5 [1)] Possible alternatives must be selected and checked by the welding supervisor on site.			
Welding position	EN ISO 9606-1: PA, PB, PC, PF			
Preheating of parent metal	Thickness ≥ 20 mm: 150 °C			
Interpass temperature	≤ 400 °C			
Postweld heat treatment	Thickness ≥ 40 mm: Tempering at 400 °C or apply quenching and tempering layer technology			
Pass	Root run	Intermediate run/ Final run	Alternative final run	Temper pass
Wire electrode diameter	2,5 mm	3,2 mm	4,0 mm	2,5 or 3,2 or 4,0 mm
Welding current (=)	80 – 110 A	100 – 140 A	130 – 180 A	See root run or stringer pass. Note: The quench and temper layer must only be applied to the weld metal. Contact with the base metal must be avoided.
Electrode polarity	(= +)	(= +)	(= +)	
Voltage	-	-	-	
Shield gas ISO 14175; M21	-	-	-	
Kind of pass	Stringer pass	Stringer pass	Stringer pass	

[1)] Re-drying according to manufacturer's instructions

6. CONDITIONS OF USE

6.1 Normal use

The lateral line-shaped markings (see 4.1) make it easier to estimate the inclination angles of connected sling or lashing equipment strands.

Using 4-leg slings may cause higher risk because only 2 opposite legs carrying the load. Check the working load limit of lifting points and slings carefully and chose if necessary bigger sizes.

6.2 Environmental influence

Lifting points must not be used in environments where acids, aggressive or corrosive chemicals or their fumes are present.

6.3 Influence of temperature

The permissible working load limit of the lifting points reduces at elevated temperatures. The reduced working load limits shown in the following table shall only apply for short-term use at the temperatures indicated.

If the lifting points have been exposed to temperatures exceeding the maximum values specified, they must no longer be used.

Temperature range	Remaining WLL
-40 °C ≤ t ≤ 200 °C	100 %
200 °C < t ≤ 300 °C	90 %
300 °C < t ≤ 400 °C	75 %

7. INSPECTIONS, MAINTENANCE, DISPOSAL

7.1 General

Inspections and maintenance must be arranged for by the owner!

Inspection deadlines shall be determined by the owner!

Inspections must be carried out and documented by competent persons regularly but at least once a year, or more frequently if the lifting points are in heavy-duty service. After three years at the latest they must additionally be examined for cracks. A load test shall never be considered a substitute for this examination.

The results of the inspection shall be entered into a register (DGUV I 209-062 or DGUV I 209-063) to be prepared at first use. The register will show characteristic data as well as identity details.

Immediately stop using lifting points that show the following defects:

- missing or illegible identification/marking,
- deformation, elongation or fractures,
- cuts, notches, cracks, incipient cracks, pinching,
- heating beyond permissible limits,
- severe corrosion,
- wear exceeding 10 %, for example in the ring diameter area,
- weld failures.

7.2 Inspection service

THIELE offers inspection, maintenance and repair services by trained and competent personnel.

7.3 Maintenance

Maintenance and repair work must only be performed by competent persons.

Minor notches or cracks may be eliminated by careful grinding observing the maximum cross section reduction requirement of 10 % and avoid making more severe cuts or scores.

All maintenance and repair activities are to be documented.

7.4 Disposal

All components and accessories of steel taken out of service are to be scrapped in line with local regulations and provisions.

8. STORAGE

Lifting points are to be stored in dry locations at temperatures ranging between +5 °C and +40 °C.

9. THIELE OPERATING AND MOUNTING INSTRUCTIONS

Current operating and installation instructions are available as a PDF download on the homepage.

10. IMPRINT

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11. DECLARATION OF CONFORMITY

EC DECLARATION OF CONFORMITY

acc. to Machinery Directive 2006/42/EC, Annex II A for a machine

THIELE GmbH & Co. KG herewith declares as manufacturer that

LIFTING POINTS THI-EYE, TWN 1490

are placed on the market in the form of a complete machine by THIELE together with the relevant test certificate and are in compliance with the applicable provisions of the EU Machinery Directive 2006/42/EC.

The following harmonized standards have been observed:

- EN ISO 12100
- EN 1677-1

The following document of the German Social Accident Insurance (Deutsche Gesetzliche Unfallversicherung, DGUV) was applied:

- GS-HM 36 Principles for the testing and certification of lifting points and attachment hooks

This declaration/statement is not meant to warrant any product properties. Safety notes and instructions pertinent to the products must be observed.

Responsible for the documentation
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(QA and EP)
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Iserlohn, 13th November 2024
Dr. Michael Hartmann
(General manager)