



**THIELE**



## Operating instructions - Mining

*Conveyor chains*

*Chain gauge*

*Plough chains*

**CHANGE**<sup>®</sup>  
for Success



All information given is based on our current knowledge and experience and is supplied without obligations or commitments. This also applies to the patent rights of third parties. Neither do we give any obligatory warranty in the legal sense as to the properties of the products described in this publication. We expressly reserve the right to change our specifications in accordance with technical progress and company developments. This does not release the buyer from his obligation to inspect all incoming products. The quality of all our products is of course guaranteed in accordance with our general terms and conditions of sale.

The information contained in these instructions has been carefully checked for accuracy and completeness. THIELE GmbH & Co. KG accepts no liability for equipment failure or damage resulting from the use of the information contained in this document. The information presented is subject to change. THIELE reserves the right to modify its products without prior notice. All rights relating to copyright shall remain with THIELE GmbH & Co. KG. Any unauthorised use (e.g. duplication) of this document constitutes a criminal offence and offenders will be held liable for damages.





# Contents

<b>THIELE - company profile</b> .....	<b>4-5</b>
<b>Conveyor chains for the mining industry - instructions for use</b> .....	<b>6-14</b>
Introduction .....	6
THIELE chain grades .....	6
Storage and handling prior to commissioning .....	7
Installing the chain assembly .....	7-9
Adapter chains / chain sprockets / chain connectors .....	9
Flights / scraper bars / tensioning the chain assembly.....	10
Starting-up the chain assembly .....	10-11
Conveying of materials and equipment.....	11
Maintenance / inspection .....	12
Interim storage / discard criteria / temporary stoppages .....	13
Simultaneous use of new and used chain lengths .....	13-14
<b>Operating instructions - chain gauge for flat-link and round-link chains - general</b> .....	<b>16-19</b>
Foreword / general information .....	16
Function and description .....	17
Measurement process .....	17
Interpretation .....	18
Maintenance / Spare parts.....	19
<b>Operating instructions - plough chains for the mining industry</b> .....	<b>20-26</b>
Introduction .....	20-21
THIELE plough chain grades .....	21
Storage and handling prior to commissioning .....	22
Installing the plough chain .....	22
Adapter chains / plough chain sprockets / chain connectors.....	22
Tensioning the plough chain.....	23
Starting-up the plough installation / trial run.....	23-24
Maintenance / inspection .....	24-25
Data documentation.....	25
Chain renewal / simultaneous use of new and used chain lengths .....	26
Interim storage / temporary stoppages .....	26
<b>How to find us</b> .....	<b>27</b>





## THIELE – company profile

### The THIELE company

The THIELE Company was founded more than 75 years ago and is now one of the world's leading chain manufacturers. THIELE's product line includes round-link chains, bush conveyor chains, forged conveyor chains and a full range of fittings and accessories.

THIELE's know-how has evolved over many years of designing and producing complete chain systems. Our highly skilled workforce along with modern, state of the art, high-performance production facilities guarantee products of the highest quality.

### Consulting and product development

THIELE specialises in chain systems for lifting and conveying. THIELE engineers provide an on-site consulting service and work alongside the client to analyse the technical requirements before planning and sizing up the moving chain assembly. Customised solutions are then worked out in detail in THIELE's own design department.

### Chain production

All our chains and components are manufactured in-house. Our production facilities include equipment for welding, laser-, plasma- and gas-cutting, solid forming, heat treatment and mechanical processing using the latest CNC lathes and multi-spindle milling machines.

### Quality

High-integrity production methods are used to ensure that all products leaving the THIELE factory are of the finest quality, as confirmed by continuous monitoring in our laboratory and testing house. THIELE was one of the world's first chain making companies to meet the DIN EN ISO 9001 quality management standard.







### Development, CAD design, chain dimensioning

All product development takes place in our own technical department, where the latest 3D CAD programs are used in the design of mining chains, connectors, flight bars and forging dies. Precise volume calculations enable us to reduce material costs during forging.

3D CAD programs are also used to simulate complex chain routings over sprocket wheels and in conveyor installations.



### Production line

THIELE mining products are manufactured at the Iserlohn-Kalthof plant where the facilities include the latest welding and bending machines, forging hammers, CNC machines and heat treatment lines.



### Service

The company operates a mobile chain testing service whereby accredited technicians are able to carry out chain testing in-situ. We can offer a full inspection programme for chain conveyors and also carry out chain wear measurements on request. Specialists are available to oversee chain assembly and commissioning on your conveyor systems.

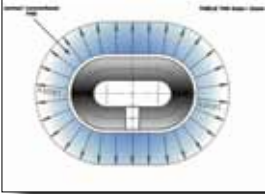
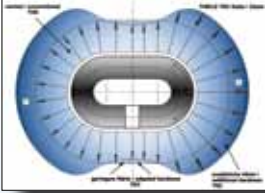
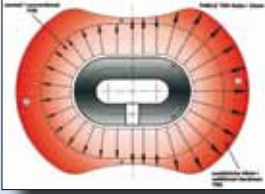
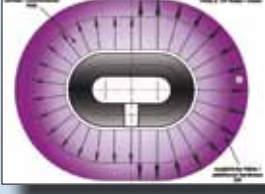
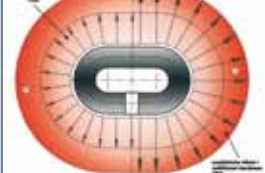
Clients can also have their conveyor chains checked for wear, material fatigue and corrosion in our in-house laboratory – a service that provides reliable information on chain reusability.

 <b>THIELE</b>	<b>Conveyor chains</b> <b>for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 1 of 9	EN-301012

## 1. Conveyor chains: instructions for use – introduction

The conveyor chain is a robust component that is ideal for transmitting the kind of forces generated by chain scraper conveyors operating in the harsh environment of the deep mining industry. These chains are also corrosion resistant and have the capacity to withstand the impacting energy of the conveyed product. Wear and tear and/or corrosion attack can be reduced by selecting the correct chain grade for a particular application. The general rule is “the stronger the chain, the more prone it is to corrosion”.

## 2. THIELE chain grades#

		<b>Crown strength</b>	<b>Leg strength</b>
<ul style="list-style-type: none"> <li> <b>THD chains</b>            The preferred choice for face conveyors         </li> </ul>		345 - 375 HB	345 - 375 HB
<ul style="list-style-type: none"> <li> <b>TSC chains</b>            The preferred choice for plough drives         </li> </ul>		385 - 414 HB	345 - 375 HB
<ul style="list-style-type: none"> <li> <b>TSD chains</b>            The preferred choice for BSL conveyors         </li> </ul>		424 - 453 HB	345 - 375 HB
<ul style="list-style-type: none"> <li> <b>TIP chains</b>            Very high quality chain for tougher applications         </li> </ul>		355 - 383 HB	355 - 383 HB
<ul style="list-style-type: none"> <li> <b>TRQ chains</b>            The preferred choice for rock conveyors with low chain speeds         </li> </ul>		424 - 453 HB	424 - 453 HB

Selecting the correct chain grade for the job will significantly improve chain service life. This can be achieved by following the instructions on the next pages.

### **Important for converting hardness measurements into tensile strength: #**

The THIELE-Specification of all THIELE chains is based on hardness measurements with the Brinell Test. These “Brinell-Specs.” have been converted into tensile strength, with the usage of first available tabular (A1) of DIN 50150. Now this DIN is transformed to ISO 18265, and new tabulars are added to the ISO 18265. Now DIN 22252 requires the Tabular B2 for the conversion. The figures of the Brinell Spec. for the THIELE chains all stay the same, but with the new ”B”-Tabular the tensile strength had to be changed in comparison with previous figures in our catalogues.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 2 of 9	EN-301012

### 3. Storage and handling prior to commissioning

THIELE offers the following anti-corrosion protection to suit different underground conditions and surface storage times:

- Tectyl coated - for short storage times and favourable storage conditions
- Corostar Plus - for medium-length storage times and particularly as 'running-in' protection for plough chains
- Hot-dip galvanised - for long storage times and corrosive operating conditions

All chains should be stored dry for maximum corrosion protection when laid-up.

Unloading and transloading must be carried in an appropriate manner so that the identification markings, and especially those used matching the chain strands, are not lost or damaged. The chains must not be dragged across the ground.

Care is to be taken when handling chains at temperatures below -20°C, as at these low temperatures they are particularly vulnerable to knocks – which can cause damage and result in premature chain failure.

It should also be noted that TSC and TSD chains are not recommended for use in wet environments or under aggressive operating conditions because of the susceptibility to corrosion that comes with their high strength rating.

### 4. Installing the chain assembly

The new chain assembly comprises ready-made and matched individual chain strands that are made up of the following individual components:

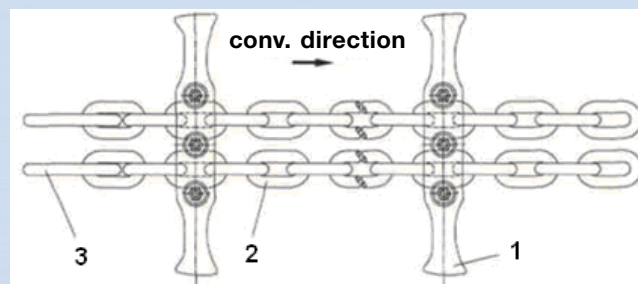
1. Flight bars (scraper bars) with connecting devices
2. Chain sets (matched pairs)
3. Connectors.

The flight bars are attached to the horizontal chain links. Most bars have to be fitted according to the conveying direction. The distance between adjacent flight bars will depend on the operating conditions, but should never be much more than about 1 metre.

The flight-bar nuts must be tightened using an adjustable wrench.

The tightening torques specified by the flight-bar manufacturers must be observed at all times.

The actual torque values should be checked on a random basis using an adjustable torque-wrench. Our service personnel can prepare a proposal tailored to your specific needs and can help with assembly and installation.



# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295



 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 3 of 9	EN-301012

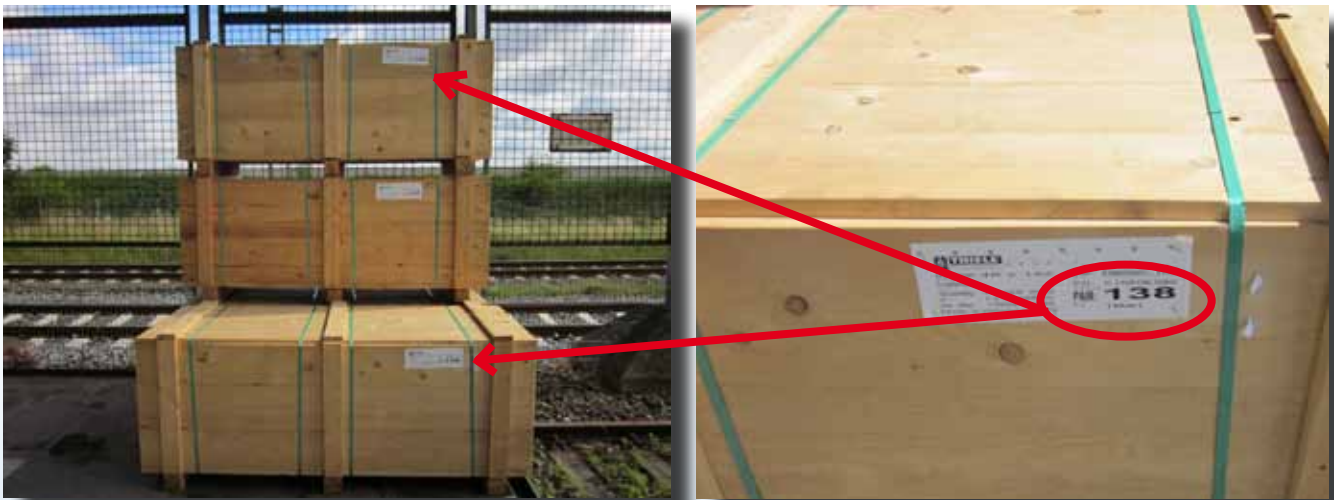


**Attention!**

**Note the matching of the chain sets when loading and unloading and ensure that the connecting devices are complete and are correctly fitted!**

The pairing numbers for identical chain sets can be found as follows:

a) See the wire tags attached to the chains and also the container labels.



Matched chain sets may be packed into different crates for shipping reasons:  
The crates shown contain both sets of chain pair number 138.  
Both crates have labels that clearly designate the pair number.

b) The fifth link from the end of the chain (colour identified side) is stamped with the same number.

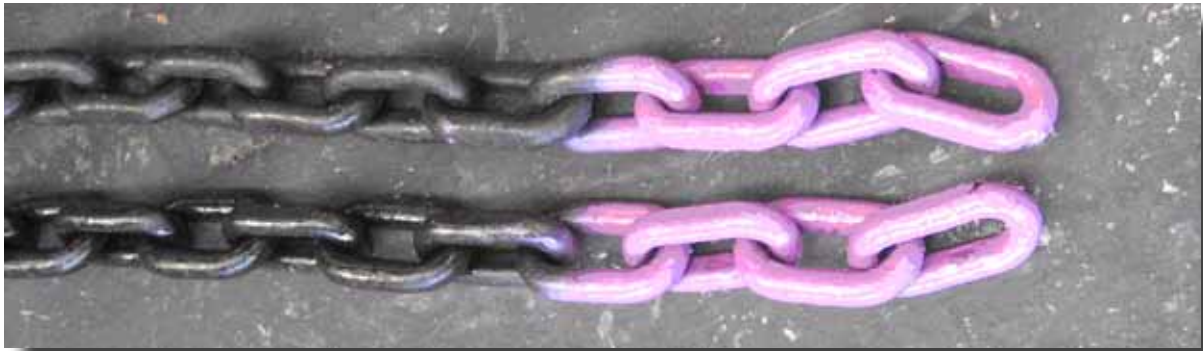


# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295



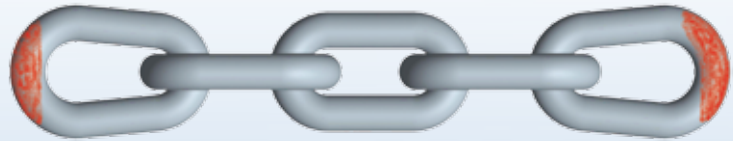
 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 4 of 9	EN-301012

c) The ends of each chain pair are also colour marked in the same way at one end.



The chain pairs must be installed as shown (coloured ends go together).

In the case of outboard chain assemblies the outer chain links of the link ends are made slightly wider at their outer crowns (about 1 mm) and are colour marked for easier fitting to the flight bars. (This wider shape is accentuated in the drawing below)



## 5. Adapter chains

Adapter chains are used to adjust the chain assembly to the conveyor length, for example to shorten the chain when excessive chain slack has formed.

## 6. Chain sprockets

New chain sprockets must always be fitted when new chains are being installed.

## 7. Chain connectors

The individual chain strands are linked together by chain connectors.

When fitting the connectors always ensure that new roll pins are used (this also applies to connectors that are opened up in situ or are being re-used).

Under no circumstances should the roll pins be re-used.

Follow the connector operating instructions at all times.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 5 of 9	EN-301012

## 8. Flights / scraper bars

When connecting the flight bars to the chain take special care to prevent any possibility of crevice corrosion affecting the chain links lying within the flights.

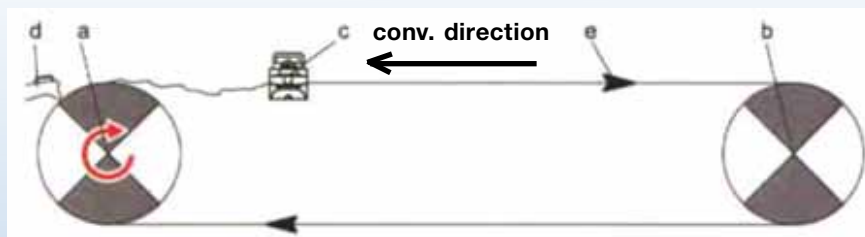
THIELE knows from many years` experience that crevice corrosion can be effectively prevented by ensuring a loose fit of the chain (air gap between flight bar and chain).

The relative movement that this allows between the flight bar and the chain prevents the formation of corrosion pitting and has other positive effects on the running characteristics of the chain as the flight bars and sprocket come under increasing wear and tear.

If the requirement is to have a tight chain fit (force fit# ; the chain is clamped within the flight bar) it is essential to use a hot-dip galvanised chain. Bolts must be torqued to the flightbar-specific requirements, and every 5th assembly should be double-checked prior to the setup of the conveyor.#

## 9. Tensioning the chain assembly

The amount of chain pretension must match the operating conditions. Note that an inadequate pretension force will result in a slack chain and this in turn will increase the risk of kinking. On the other hand, an excessive pretension force will cause increasing wear and may lead to frictional oscillation in the system. Our service personnel will be happy to draw up a proposal based on your operating parameters.



a) main drive    b) tail-end drive    c) chain securing device    d) pawl    e) conveyor direction during chain tensioning



**Note that the conveyor manufacturer's instructions on chain tensioning are to be strictly observed at all times.**

**Further information can be obtained on request from our service personnel.**

## 10. Starting up the chain assembly



**No-one is permitted to remain in the hazard zone when the conveyor is being started up. When the system is being started up for the first time hazards not generally associated with normal operation can arise as a result of incorrect assembly, for example. Always keep a safe distance from the conveyor.**

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295



 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 6 of 9	EN-301012

The following actions must be taken prior to conveyor start-up:

- Align the conveyor.
- Remove all tools, auxiliary appliances, etc. from the conveyor.
- Ensure that the maximum drive force that is applied when starting-up against a blocked conveyor does not exceed the test force, or twice the test force in the case of twin chain assemblies.



**Note that solid conveyor blockages with almost no delay time will essentially cause the chains to be overstressed to the point of failure; this constitutes improper use of the product and will render the warranty invalid.**

After having examined the conveyor and eliminated any faults proceed to check the interplay between the individual components that make up the installation.

To do this, carry out a test run with an unladen conveyor (short conveyors are to be run for at least one hour, longer conveyors of 200 m and more for at least four hours).

Apply a bio-degradable lubricant (e.g. PLANTOLUBE L 32 GN from Fuchs) to the tail-end drive so as to improve the running-in behaviour of the components. After the test run check the chain pretension. Now carry out a test run of about six hours with the conveyor in a laden state. During this test perform the following actions:



- **Gradually increase the load on the conveyor.**
- **Check the manner in which the chain rolls off the sprockets.**
- **Check continuously for any chain slack forming.**
- **Monitor power consumption at the electric motors.**

After the test run examine the unladen conveyor as described in Section 12 'Maintenance/inspection', paragraph 1. The Flight bar bolts must be 100% retorqued to the flightbar-specific requirements.# If no defects are found during this inspection the conveyor can be cleared for service.

## 11. Conveying of materials and equipment

Using a chain scraper conveyor to transport materials and equipment is generally prohibited as such payloads cannot be safely positioned on the chain or chain assembly.

Exceptions to this rule require special authorisation from THIELE GmbH & Co. KG.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

## 12. Maintenance / inspection

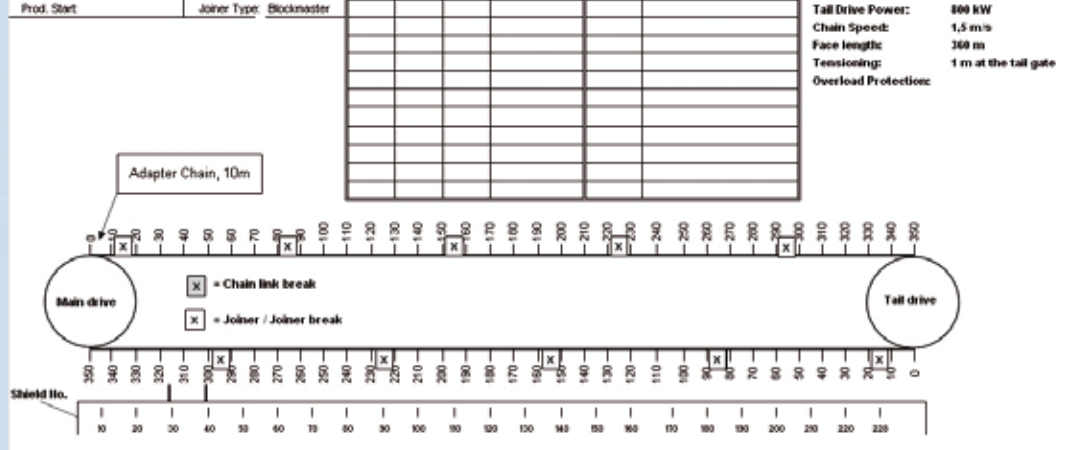
THIELE chains must be checked for damage at regular intervals (once a day). Any permanently stretched or damaged sections of chain must be renewed in pairs and any defective or missing flight bars should be replaced. Tighten any loose flight-bar nuts. Check the chain sprockets for damage and ensure that they are a tight fit. Also check that the chain stripper is operating correctly.

The chain should be examined at least quarterly for signs of elongation. This must be done in a cold state using a suitable measuring gauge.



Sections of chain (7 links, no adapter chains) may also be sent to THIELE for testing. These samples must have completed the same number of operating hours as the rest of the chain. It is recommended that suitable test pieces be examined by the manufacturer as a safeguard against possible corrosion damage.

A data sheet similar to that shown below should also be kept for the purpose of documenting all relevant chain data.

Chain Management:			Panel:			Date:			
Coal field:	x	Type:	DMK	Chain length:		Joiners:		Last measurement taken on:	
Panel:	y	Chain:	42x14G	Date:	Shorted # Links:	extended # Links:	Remarks:	Number:	Remarks:
Seam:	z	Manufact.	THEIE						
Prod. Start:		Joiner Type:	Blockmaster						
						Total Drive Power: 2400 kW Main Drive Power: 1600 kW Tail Drive Power: 800 kW Chain Speed: 1.5 m/s Face length: 360 m Tensioning: 1 m at the tail gate Overload Protection:			
									
Chain monitoring tabular									
Date	Chain elongation (in %)	Coal production (in t)	Service time (in d)	Chain break:			Remarks and specifics		
				Strand, Face or Oct. Side:	Joiner or link:	Location (Shield #):			



### 13. Interim storage

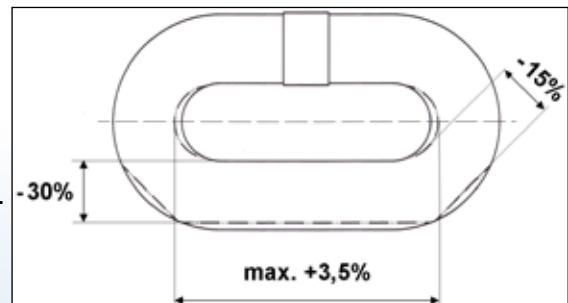
When chains are being put into interim storage, such as when the panel is mined and/or when another deployment is planned (e.g. a longwall move)#, the chain assembly must be cleaned immediately after removal from the face installation (e.g. by sandblasting) and then preserved.

We recommend dipping in Tectyl or the application of a thick coating of oil (do not use old oil for this purpose)#. Interim storage should not be carried out underground.#

### 14. Discard criteria

- At a chain elongation of more than 3.5 % (from new\*)
- When friction wear at the legs exceeds 30% (in relation to the smallest diameter)
- When the crowns have developed 'flats' of more than 15% (in relation to the smallest diameter)

\* In such cases the chain may continue to be used with special sprockets – subject to the manufacturer's approval.



### 15. Temporary stoppages

If the coal panel or face is temporarily stopped for a period of several days the chain assembly should be set in motion for 30 minutes at least once a day in order to prevent corrosion build-up. If necessary, protect the chain and connectors from corrosion by starting up the assembly briefly and applying a coating of oil.

In the event of longer stoppages of days or weeks duration, as may occur after an underground fire, it is absolutely essential to fit a new chain. If this is not done there is a very high probability of chain failure occurring.

### 16. Simultaneous use of new and used chain lengths #

Used chains may occasionally have to be run alongside new chain strands, for example when a new face is being started up.

**THIELE generally advises against mixing used sections of chain with new chains.**

When the situation arises where new and used chains must be run concurrently, it is absolutely essential that the segments of the chains that are passing simultaneously over the main and auxiliary drives, respectively, are either both used sections of chain or both new sections (as on the following picture).

 <b>THIELE</b>	<b>Conveyor chains for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B07693
Name	Norpoth	Change Index	B
		Page 9 of 9	EN-301012



Anyway the individual and used chain sections (matched pairs) must be installed into the overall assembly as it was before in the previous panel (resp. assembly).

Provided the symmetrical assembly the use of new and used chains should not present any problems.

For shorter face lengths it is important to ensure that the chains pairs are shortened in a corresponding way keeping the matching length upright.

---

The information contained in these instructions has been carefully checked for accuracy and completeness.

THIELE GmbH & Co. KG accepts no liability for equipment failure or damage resulting from the use of the information contained in this document. The information presented is subject to change.

THIELE reserves the right to modify its products without prior notice.

All rights relating to copyright shall remain with THIELE GmbH & Co. KG.

Any unauthorised use (e.g. duplication) of this document constitutes a criminal offence and offenders will be held liable for damages.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07693-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295





**[www.thiele.de](http://www.thiele.de)**

**your link to the world of chains**

 <b>THIELE</b>	<b>Chain Gauge</b> <b>Flat- and Round Link Chains</b> <b>general</b>	<b>Operating Instructions</b>	
		Art. No.	B07765
Name	Norpoth	Change Index	C
		Page 1 of 4	EN-301012

# Operating instructions – chain gauge

## 1. Foreword

These operating instructions should be read and followed before using the chain measuring gauge. They provide important information on the safe use and maintenance of the gauge.

The chain measuring gauge is an inspection tool and must only be used for taking length measurements of round-link conveyor chains, e.g. on face conveyors (AFC) and BSL conveyors, which may include other types of flat-link, Dualink and special chain designs in the 18 to 60 mm nominal diameter range.

## 2. General

**Manufacturer:** THIELE GmbH & Co. KG  
**Werkstraße 3**  
**58640 Iserlohn**

Before using the gauge check that the kit contains the following parts:

- 1 x plastic case or leather pouch
- 1 x gauge tool 'sliding arm with scale'
- 1 x gauge tool 'fixed arm'
- X x adaptor pieces with chain identification (variable number)
- 1 x allen key size 2
- 1 x allen key size 3
- 1 x wrench size 6



### **Check the tool for signs of damage prior to use!**

Damaged parts must be replaced before using the measuring gauge.

The gauge should always be carried in the plastic case or leather pouch provided.

Note: do not use the strap to hang the leather pouch from fixed or moving parts.

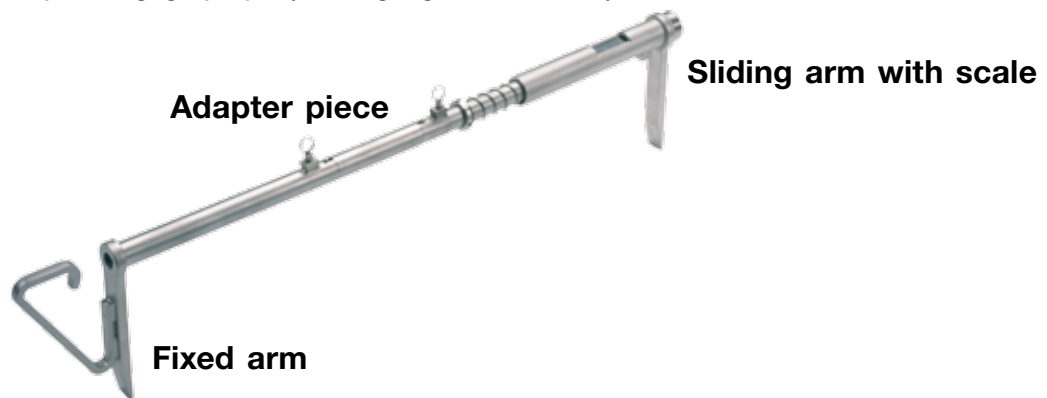
# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07765-B
! Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295



 <b>THIELE</b>	<b>Chain Gauge</b> <b>Flat- and Round Link Chains</b> <b>general</b>	<b>Operating Instructions</b>	
		Art. No.	B07765
Name	Norpoth	Change Index	C
		Page 2 of 4	EN-301012

### 3. Function and description

The gauge should be assembled before use. Select the appropriate adapter piece for the nominal chain size. The pitch of the chain being measured is engraved on to the adapter. Fit the 'sliding arm with scale' to one end of the adapter piece and the 'fixed arm' to the other. Ensure that the spring-loaded pins engage properly. The gauge is now ready for use.



### 4. Measurement procedure

The chain should be tensioned and in a straight line. First push the fixed arm of the gauge against the outer crown of the selected link and then bring the sliding arm into contact with a matching crown further along the same run of chain.

The measurement process can be used equally on both horizontal and vertical (recommended. see Figure) # chain links. The gauge must be kept parallel to the line of chain:



The measurement is then read off on the millimetre scale while the arms of the gauge are kept in contact with the respective links.

The reading taken from the scale represents the amount of chain stretch from new.

**Example: 2 = 20 mm**



As stretch is not always a uniform process measurements should be taken at different points along the chain.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07765-B
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

 <b>THIELE</b>	<b>Chain Gauge</b> <b>Flat- and Round Link Chains</b> <b>general</b>	<b>Operating Instructions</b>	
		Art. No.	B07765
Name	Norpoth	Change Index	C
		Page 3 of 4	EN-301012

## 5. Interpretation

The following table can be used to convert the scale reading into a % wear factor.

Example: a reading of 20 mm taken along four links of a 42 x 146 mm chain represents a wear factor of 3.42%.

Chain type:	round-link chains and flat-link chains DIN 22252 / DIN 22255							
Pitch:	64	86	92	108	126	137	146	152 + 144/160
Number of links:	10	8	8	6	6	4 #	4	4
Scale reading	chain elongation							
1 mm	0,16%	0,15%	0,14%	0,15%	0,13%	0,18% #	0,17%	0,16%
2 mm	0,31%	0,29%	0,27%	0,31%	0,26%	0,36% #	0,34%	0,33%
3 mm	0,47%	0,44%	0,41%	0,46%	0,40%	0,55% #	0,51%	0,49%
4 mm	0,63%	0,58%	0,54%	0,62%	0,53%	0,73% #	0,68%	0,66%
5 mm	0,78%	0,73%	0,68%	0,77%	0,66%	0,91% #	0,86%	0,82%
6 mm	0,94%	0,87%	0,82%	0,93%	0,79%	1,09% #	1,03%	0,99%
7 mm	1,09%	1,02%	0,95%	1,08%	0,93%	1,28% #	1,20%	1,15%
8 mm	1,25%	1,16%	1,09%	1,23%	1,06%	1,46% #	1,37%	1,32%
9 mm	1,41%	1,31%	1,22%	1,39%	1,19%	1,64% #	1,54%	1,48%
10 mm	1,56%	1,45%	1,36%	1,54%	1,32%	1,82% #	1,71%	1,64%
11 mm	1,72%	1,60%	1,49%	1,70%	1,46%	2,01% #	1,88%	1,81%
12 mm	1,88%	1,74%	1,63%	1,85%	1,59%	2,19% #	2,05%	1,97%
13 mm	2,03%	1,89%	1,77%	2,01%	1,72%	2,37% #	2,23%	2,14%
14 mm	2,19%	2,03%	1,90%	2,16%	1,85%	2,55% #	2,40%	2,30%
15 mm	2,34%	2,18%	2,04%	2,31%	1,98%	2,74% #	2,57%	2,47%
16 mm	2,50%	2,33%	2,17%	2,47%	2,12%	2,92% #	2,74%	2,63%
17 mm	2,66%	2,47%	2,31%	2,62%	2,25%	3,10% #	2,91%	2,80%
18 mm	2,81%	2,62%	2,45%	2,78%	2,38%	3,28% #	3,08%	2,96%
19 mm	2,97%	2,76%	2,58%	2,93%	2,51%	3,47% #	3,25%	3,13%
20 mm	3,13%	2,91%	2,72%	3,09%	2,65%	3,65% #	3,42%	3,29%
21 mm	3,28%	3,05%	2,85%	3,24%	2,78%	3,83% #	3,60%	3,45%
22 mm	3,44%	3,20%	2,99%	3,40%	2,91%	4,01% #	3,77%	3,62%
23 mm	3,59%	3,34%	3,13%	3,55%	3,04%	4,20% #	3,94%	3,78%
24 mm	3,75%	3,49%	3,26%	3,70%	3,17%	4,38% #	4,11%	3,95%
25 mm	3,91%	3,63%	3,40%	3,86%	3,31%	4,56% #	4,28%	4,11%
26 mm	4,06%	3,78%	3,53%	4,01%	3,44%	4,74% #	4,45%	4,28%
27 mm	4,22%	3,92%	3,67%	4,17%	3,57%	4,93% #	4,62%	4,44%
28 mm	4,38%	4,07%	3,80%	4,32%	3,70%	5,11% #	4,79%	4,61%
29 mm	4,53%	4,22%	3,94%	4,48%	3,84%	5,29% #	4,97%	4,77%
30 mm	4,69%	4,36%	4,08%	4,63%	3,97%	5,47% #	5,14%	4,93%
31 mm	4,84%	4,51%	4,21%	4,78%	4,10%	5,66% #	5,31%	5,10%
32 mm	5,00%	4,65%	4,35%	4,94%	4,23%	5,84% #	5,48%	5,26%
33 mm	5,16%	4,80%	4,48%	5,09%	4,37%	6,02% #	5,65%	5,43%
34 mm	5,31%	4,94%	4,62%	5,25%	4,50%	6,20% #	5,82%	5,59%
35 mm	5,47%	5,09%	4,76%	5,40%	4,63%	6,39% #	5,99%	5,76%

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B07765-B
18   Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

## 6. Maintenance

After use the gauge should be cleaned and wiped with an oil-soaked rag to protect against corrosion.

The sleeves containing the spring pins should be adjusted using a 6 mm spanner so that the adapter pieces can be deployed with a small amount of play. Apply Loctite 243 to the sleeves to prevent them from coming loose.



A grub screw is used to prevent the sliding arm with scale from rotating. This grub screw must not be fully tightened!



## 7. Spare parts

### Designation

### Art.-No.

<b>Shatterproof and waterproof plastic case</b>	<b>Z08606</b>
<b>Leather pouch</b>	<b>Z08881</b>
<b>Sliding arm with scale</b>	<b>Z08879</b>
<b>Fixed arm</b>	<b>Z08880</b>
<b>Adapter piece for chain pitch P = 64 mm</b>	<b>Z08868</b>
<b>Adapter piece for chain pitch P = 86 mm</b>	<b>Z08869</b>
<b>Adapter piece for chain pitch P = 92 mm</b>	<b>Z08870</b>
<b>Adapter piece for chain pitch P = 108 mm</b>	<b>Z08871</b>
<b>Adapter piece for chain pitch P = 126 mm</b>	<b>Z08872</b>
<b>Adapter piece for chain pitch P = 137 mm</b>	<b>Z08873</b>
<b>Adapter piece for chain pitch P = 146 mm</b>	<b>Z08874</b>
<b>Adapter piece for chain pitch P = 152 mm and P = 144/160 mm</b>	<b>Z08875</b>
<b>2 mm allen key</b>	<b>Z09041</b>
<b>3 mm allen key</b>	<b>Z08915</b>
<b>6 mm spanner</b>	<b>Z08916</b>

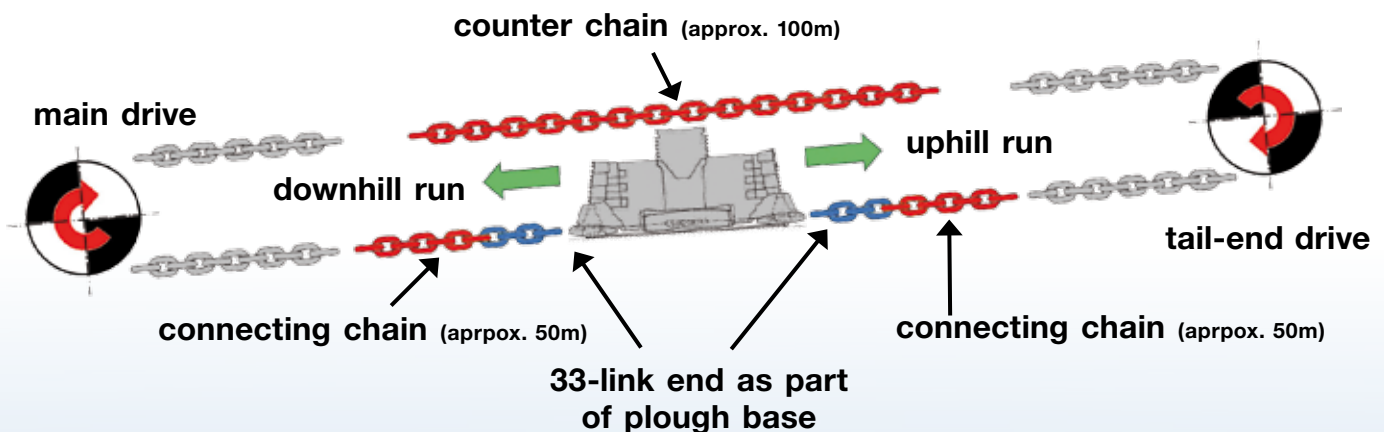


 <b>THIELE</b>	<h1>Plough Chains</h1> <p>for the mining industry</p>	<b>Operating Instructions</b>	
		Art. No.	B08126
Name	Bittner	Change Index	B
		Page 1 of 7	EN-301012

## 1. Plough chains: instructions for use – introduction

The plough chain provides the driving force for the coal plough as it runs along the chain scraper conveyor on stripping winning coal faces. The chain travels inside tubular guides that run either on the face side (Gleithobel system) or on the goaf side (Reisshaken system). The plough chain is a high-tensile strength round-link steel chain.

The following diagram shows the basic structure of the “Gleithobel” plough system:



A special length of chain is attached directly to each side of the plough base. This special chain consists of long-pitch links, swivel links, clearing wedge and a section of chain (blue) containing 33 links. The diameter of the links in the special section of chain is larger than that of the standard chain. For example, special 42 x 146 mm links are used on a 38 x 137 mm plough chain. Three links after the swivel link the dimension changes to match the original plough chain (e.g. 38 x 137 mm) over 33 links. A plough chain connector is used to attach this section of chain to the 50 m-long connection chain (red).

If the plough is allowed to travel to the end-stop, this chain arrangement means that the first joint in the direction of travel is still in the top strand of the plough chain and so, for support, is still under load from the second pulling drive unit.

The corresponding section of chain in the top strand that is opposite to the plough base is also referred to as the ‘counter chain’ or ‘reversing chain’.

The instructions and information given here should be followed in order to get the best performance from THIELE plough chains.

Two different types of operation are essentially possible with a coal plough installation:

- with reversing run

In order to begin the next strip on reaching the end of the face the plough is first run back a few metres and then returns to the face end once the shield supports in the face-end zone have been advanced. The plough then completes another run to the other end of the face.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B08126-A
!Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

 <b>THIELE</b>	<b>Plough Chains</b> <b>for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B08126
Name	Bittner	Change Index	B
		Page 2 of 7	EN-301012

The advantage of this system is that the depth of cut, and hence the force acting on the chain, does not have to be increased. The disadvantage is that the plough has to be reversed and this can mean that some sections of the chain have to pass twice as often over the sprockets, which results in greater wear on the links. The areas most affected are the connection chains and parts of the counter-chain (shown in red).

- without reversing run

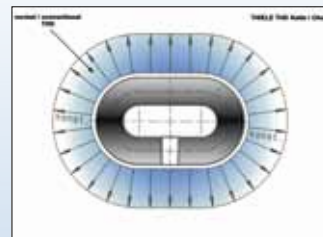
The depth of cut at the face-end zone is doubled by setting the shield supports for double the unit of advance. This of course increases the force acting on the entire plough chain. The advantage is a better utilisation factor for the face installation as there is no need for a reversing run. However, this system requires a corresponding adjustment to the depth of cut.

In order to achieve a smooth transition, the area in which the depth of cut is being increased at the face end should essentially correspond to the width of at least 15 shield supports.

## 2. THIELE plough chain grades

- **THD chains - uniformly hardened**

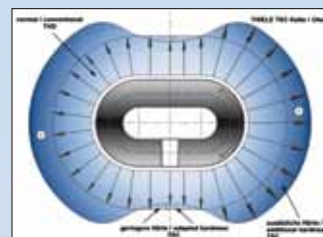
(max. strength 375 HB)



For short face lengths where there is a higher risk of stoppages and blockages and a higher rock ratio.

- **TSC chains - crown hardened #**

(max. strength at crown # approx. 414 HB)



For longer faces with less risk of stoppages and blockages.

The correct choice of chain will significantly improve the operating life of the assembly. The crowns of the plough chain are more highly tempered in order to minimise the interlink wear.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B08126-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

 <b>THIELE</b>	<b>Plough Chains</b> <b>for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B08126
Name	Bittner	Change Index	B
		Page 3 of 7	EN-301012

### 3. Storage and handling prior to commissioning

THIELE offers Corostar Plus treatment on new chains in order to reduce the interlink friction and minimise the interlink wear during 'running-in'.

CorostarPlus is also very effective as a medium-term corrosion protection treatment. #

Chains should be stored dry for maximum corrosion protection when laid-up.

Unloading and transloading must be carried out in an appropriate manner so that the identification markings are not lost or damaged. The chains must not be dragged across the ground.

Care is to be taken when handling chains at temperatures below -20° C, as at these low temperatures they are particularly vulnerable to knocks – which can cause damage and result in premature chain failure.

### 4. Installing the plough chain

When assembling the pan line a draw rope must be run through the upper plough chain guideway to help with the subsequent installation of the plough chain.

### 5. Adapter chains

Adapter chains are used to adjust the plough chain assembly to the conveyor length, for example to shorten the chain when excessive chain slack has formed.

### 6. Plough chain sprockets

Inspect the chain on a daily basis to ensure that it is running properly over the sprockets.

### 7. Chain connectors

The individual chain strands are linked together by chain connectors.

When fitting the connectors always ensure that new roll pins are used (this also applies to connectors that are opened up in situ or are being re-used).

Under no circumstances should the roll pins be re-used.

Follow the connector operating instructions at all times.

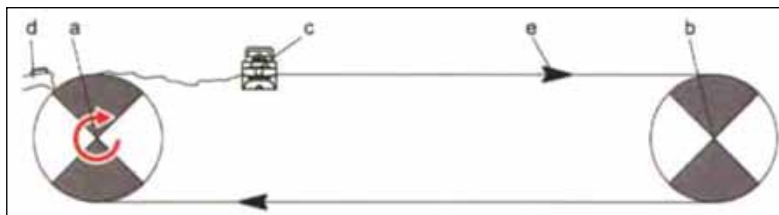
# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B08126-A
!Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295



## 8. Tensioning the plough chain

Use the anchor jaw and pawl when the plough chain is to be joined up and tensioned by means of a suitable chain tensioning device.

Note that an inadequate pretension force will result in a slack chain and this in turn will increase the risk of kinking. On the other hand, an excessive pretension force will cause increasing wear and may lead to frictional oscillation in the system. Our service personnel will be happy to draw up a proposal based on your operating parameters.



- a) main drive      b) tail-end drive      c) anchor jaw at main drive      d) pawl  
e) plough direction during chain tensioning



**Note that the conveyor manufacturer's instructions on chain tensioning are to be strictly observed at all times.**

Further information can be obtained on request from our service personnel.

Ongoing operation will cause the chain to heat up and stretch, with the result that individual chain links may have to be removed for re-tensioning to be carried out.

**Pay special attention to the fact that the chain will cool down again during operational stoppages (e.g. following a machine breakdown or during longer periods of inactivity such as at weekends and holiday times#) and that this will cause the chain assembly to contract again. As this process will lead to an increase in the chain pretension force, appropriate countermeasures must be taken to prevent this and so avoid chain failure due to chain overload, especially when the installation is being started up.**

In some cases it may be necessary to re-insert individual chain links. It is recommended that a hydraulic tensioning device be installed to alleviate this problem.

## 9. Starting up the chain assembly



**No-one is permitted to remain in the hazard zone when the plough is being started up. When the system is being started-up for the first time hazards not generally associated with normal operation can arise as a result of incorrect assembly, for example. Always keep a safe distance from the plough installation.**

 <b>THIELE</b>		<h1>Plough Chains</h1> <h2>for the mining industry</h2>		<b>Operating Instructions</b>	
				Art. No.	B08126
Name	Bittner	Page 5 of 7	EN-301012		

Before commissioning it is essential to carry out the following actions:

- align the plough installation
- remove all tools, auxiliary appliances etc. from the conveyor or plough track
- ensure that the maximum drive force that is applied when starting up against a blocked plough body does not exceed the test force.

## 10. Test run

To prevent dry running between the plough chain and the sprocket the chain should be sprayed with lubricating oil. We would generally recommend that a chain lubrication device is used for this purpose.



**Observe environmental regulations at all times.**  
**Only use bio-degradable vegetable oil of water hazard class O, as the installation operates on the 'lost lubrication' principle.**

After installation the plough must undergo a test run without any pressure from the pusher rams. Check that the swivel links are functioning on both sides of the plough body.

If the plough chain is running smoothly through the chain guideways and is passing without twisting over the sprockets at the main and tail-end drives the pusher rams can be activated in order to apply pressure against the plough body.

After another check of plough chain pretension active ploughing can commence – initially using a reduced depth of cut.

During the test run monitor the following points:

- steady and consistent current consumption at the motors
- roll-off behaviour of the chain at the sprockets
- chain slack development
- heating-up and smooth running of the gearbox; response characteristics of the overload coupling

## 11. Maintenance / inspection

THIELE plough chains must be checked for damage at regular intervals (once a day). Any permanently stretched or damaged sections of chain must be renewed.

Examine the chain sprockets for damage and also check that the chain stripper is operating correctly.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B08126-A
!Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

Art. No.	B08126
Change Index	B
Page 6 of 7	EN-301012

Name	Bittner
------	---------

THIELE plough chains should be measured for chain stretch at least once a month using a suitable gauge. This operation must be carried out with the chain in a cold state.



Suitable sections of chain (7 links, no adapter chains) may also be sent to THIELE for testing. These samples must have completed the same number of operating hours as the rest of the main chain.

It is recommended that suitable samples of chain be examined by the manufacturer as a safeguard to maximise the operating lifetime of the chain.

## 12. Documentation

A data sheet similar to that shown below should also be kept for the purpose of documenting all relevant chain data.

Plow Chain Mapping		Panel:	Seam:	Date: __-__-__																																																																																					
Coal Field: Panel: Seam: Start Operator:	Plow Type: Chain: Joiner Type:	<table border="1" style="width:100%; font-size: small;"> <thead> <tr> <th colspan="3">Joiner Replacement</th> <th colspan="2">Plow Chain Out</th> <th colspan="2">Main Drive Ret. Drive</th> </tr> <tr> <th>Date</th><th>Run time</th><th>Qty.</th> <th>Date</th><th>Links</th> <th>Date</th><th>Shield</th> <th>Shield</th><th>Shield</th> </tr> </thead> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>		Joiner Replacement			Plow Chain Out		Main Drive Ret. Drive		Date	Run time	Qty.	Date	Links	Date	Shield	Shield	Shield																																																																<table border="1" style="width:100%; font-size: x-small;"> <tr><th colspan="2">Latest measurement taken:</th></tr> <tr><td>Smallest diameter:</td><td>/</td></tr> <tr><td>Biggest elongation:</td><td>/</td></tr> </table> <p><b>Installed Drive Power: kW</b> <b>Face length: m</b> <b>Tensioning:</b> <b>Overload Protection:</b></p> <p><b>Joiner change every ..... Minutes!</b> <b>Every ..... Min. Info to LW-Manager</b></p> <p>Chain in service since: .....</p>	Latest measurement taken:		Smallest diameter:	/	Biggest elongation:	/
Joiner Replacement			Plow Chain Out		Main Drive Ret. Drive																																																																																				
Date	Run time	Qty.	Date	Links	Date	Shield	Shield	Shield																																																																																	
Latest measurement taken:																																																																																									
Smallest diameter:	/																																																																																								
Biggest elongation:	/																																																																																								
<p>Installation date Plow Chain _____ from Thiele.</p> <div style="text-align: center;"> </div> <p style="text-align: center;">Average Service life Chain _____ Min. <span style="margin-left: 200px;">Total Hr. _____</span></p>																																																																																									
<div style="display: flex; justify-content: space-between;"> <div style="text-align: right;">             Return drive (0-110)           </div> <div style="flex-grow: 1; text-align: center;"> <table border="1" style="width:100%; font-size: x-small;"> <tr><td>Actual run time joiners</td><td>Min.</td></tr> <tr><td>Actual run time Chain</td><td>Min.</td></tr> </table> </div> <div style="text-align: left;">             Main Drive (0-350)           </div> </div> <p style="text-align: center;">Schild Nr. 2</p>					Actual run time joiners	Min.	Actual run time Chain	Min.																																																																																	
Actual run time joiners	Min.																																																																																								
Actual run time Chain	Min.																																																																																								
Nr.	Date	Downtime (Min.)	Break type Joiner Link	Plow Pos. Shield No.	Repair time from ____ to ____	Remarks:																																																																																			
1																																																																																									
2																																																																																									
3																																																																																									
4																																																																																									
5																																																																																									



 <b>THIELE</b>	<b>Plough Chains</b> <b>for the mining industry</b>	<b>Operating Instructions</b>	
		Art. No.	B08126
Name	Bittner	Change Index	B
		Page 7 of 7	EN-301012

## 13. Chain renewal

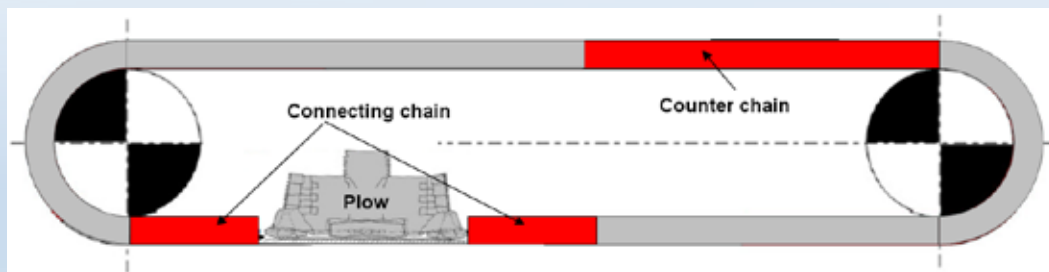
The operating life of a plough chain will be determined by the stress levels applied by the power delivery of the drives and by the geological conditions on the face being ploughed. If a large amount of rock wall is being cut along with the coal seam the operating life of the assembly will be shorter than when ploughing in soft coal. The connecting chains at the plough body and the corresponding counter-chains will be particularly stressed as they have to pass over the sprocket twice as frequently as the rest of the plough chain when the drives are being moved over (reversing). This will reduce their service life accordingly.

General experience has shown that the connecting chains and counter-chains achieve half as long an operating life as the other sections of chain, which easily deliver runtimes of 60,000 minutes. However, because of the many different ways in which the actual on-face conditions affect the wear behaviour of the chain assembly, this figure must only be seen as a rough guide and should not be considered as a product characteristic of the chain. The residual load cycles provide a more useful indication of how much operating life remains in the chain.

## 14. Simultaneous use of new and used chain lengths<sup>#</sup>

The connecting chains and the counter chain are typically more stressed and more worn than the rest of the plow chain – and typically they have to be replaced sooner than the rest of the chain.

When the situation arises where new and used plow chains must be run concurrently, it is absolutely essential that the segments of the chains that are passing simultaneously over the main and auxiliary drives, respectively, are either both used sections of chain or both new sections (as on the following picture). Provided the symmetrical assembly – symmetrical to the plow - the use of new and used chains should not present any problems.



## 15. Interim storage<sup>#</sup>

When chains are being put into interim storage, e.g. when the face is mined and/or when another deployment is planned, the chain assembly must be cleaned immediately after removal from the face installation (by sandblasting) and then preserved.

We recommend dipping in Tectyl or Corostar Plus, or alternatively the application of a thick coating of oil (do not use old oil for this purpose). Interim storage should not be carried out underground.

## 16. Temporary stoppages

If the coal panel or face is temporarily stopped for a period of several days the chain assembly should be set in motion for 30 minutes at least once a day in order to prevent corrosion build-up. If necessary, protect the chain and connectors from corrosion by starting up the assembly briefly and applying a coating of oil.

In the event of longer stoppages of days or weeks duration, as may occur after an underground fire, it is absolutely essential to fit a new chain. If this is not done there is a very high probability of chain failure occurring.

# Denotes change from previous version	<b>Conveyor systems sales dept</b>	Replacement for B08126-A
Subject to change! www.thiele.de	Duplication, in whole or in part, only by permission of THIELE GmbH & Co. KG. 58640 Iserlohn info@thiele.de	Fax: +49 (0) 2371 / 947 295

# How to find us



## Driving directions to THIELE:

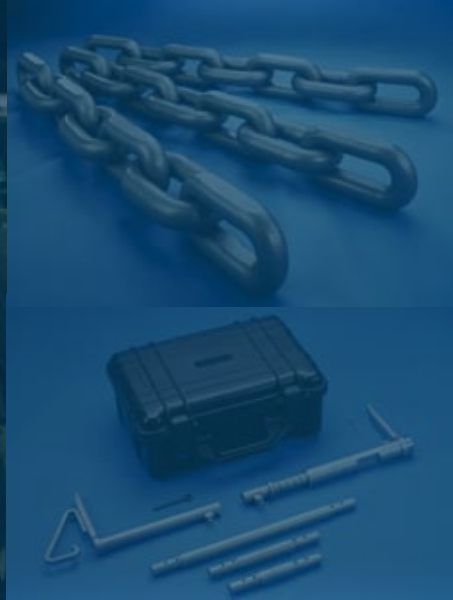
Werkstr. 3  
58640 Iserlohn-Kalthof

From A 45: Leave motorway at the Hagen intersection and take the A 46 to Iserlohn. Leave the motorway at the Iserlohn-Seilersee exit and take the B233 (Baarstrasse) direction Unna. In Kalthof turn left at the traffic lights into Leckingser Strasse and then turn right immediately after the railway underpass.

From A 44: Leave the motorway at the Unna-Ost exit and take the B233 (A 443) direction Iserlohn. In Kalthof turn right at the traffic lights into Leckingser Strasse and then turn right immediately after the railway underpass.



**THIELE**<sup>®</sup>



## THIELE GmbH & Co. KG

Werkstr. 3  
58640 Iserlohn - Kalthof  
Germany

Phone +49 23 71 9 47 - 0  
Fax +49 23 71 9 47 - 295  
Internet [www.thiele.de](http://www.thiele.de)  
e-mail [mining@thiele.de](mailto:mining@thiele.de)

## THIELE APP



**NEW**

**CHANGE**<sup>®</sup>  
for Success