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TYPE EXAMINATION CERTIFICATE FOR LIFTCOMPONENTS

Issued by Liftinstituut B.V.

Certificate no. : NL19-400-1002-313-01 Revision no.: 1

Description of the product : Suspension rope for lifts

Trademark : 8 x 19 (W) IWRC

Type no. : Diameter 6,5 mm and 6,0 mm

Name and address of the manufacturer : Youngwire [Changwon Plant]
193, Gongdan-ro, Seongsan-Gu
ChangWon City, Gyeongnam, Korea
and
Youngwire [Haman Plant]
731, Hamui-ro, Daesan-Myeon, Haman-Gun
Gyeongnam, 52013, Korea.

Name and address of the certificate holder : HOGER ELEVATOR COMPONENTS
GRAVIT MAKİNE SAN. VE TİC. A.Ş.
Ferhatpaşa Mah. M.Fevzi Çakmak Cd. 33. Sk. No 15
PK. 34888, Ataşehir İstanbul, Türkiye

Certificate based on the following standard : EN 12385-5:2021
EN 81-20:2020 under exclusion of art. 5.5.1.2.a) and art. 5.5.2.1

Test laboratory : None

Date and number of the laboratory report : None

Date of type examination : March 2024

Additional document with this certificate : Report belonging to the type examination certificate
no.: NL19-400-1002-313-01 Rev.1

Additional remarks : This revision replaces certificate NL19-400-1002-313-01 Rev.0 of
21-03-2019

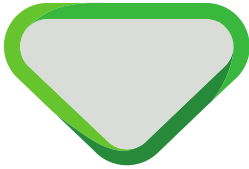
Conclusion : The product meets the requirements / standards referred to in
this certificate considering any additional remarks mentioned
above

Amsterdam

Date : 02-04-2024
Valid until : 02-04-2029

Certification decision by

P.J. Schaareman
Product Manager C&S

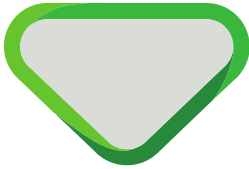


Report type-examination

Report belonging to type-examination certificate number : NL19-400-1002-313-01
Date of issue of original certificate : 21-03-2019
Certificate applies to : Lift Component
Revision number / date : 1 / 02-04-2024
Assessment basis : Standard(s): EN 12385-5:2021 and EN 81-20:2020 under exclusion of art. 5.5.1.2.a) and art. 5.5.2.1
Project number : P240039

1. General specifications

Description of the product : Suspension rope for lifts
Trademark : 8 x 19 (W) IWRC
Type no. : Diameter 6,5 mm and 6,0 mm
Name and address of the manufacturer : Youngwire [Changwon Plant]
193, Gongdan-ro, Seongsan-Gu
ChangWon City, Gyungnam, Korea
and
Youngwire [Haman Plant]
731, Hamui-ro, Daesan-Myeon, Haman-Gun
Gyeongnam, 52013, Korea.
Laboratory : None
Address of examined component : Youngwire
193, Gongdan-ro, Seongsan-Gu
ChangWon City, Gyungnam, Korea
Date of examination : March 2024
Examination performed by : A. van den Burg



2. Description component

The Youngwire 8 x 19 (W) IWRC diameter 6,5 mm and 6,0 mm are high strength suspension ropes intended to be used for lifts, the ropes shall be applied in combination with the specified traction sheaves and diverting pulleys if required.

Application of the rope with the specified small pulleys requires a reduction of the load in the ropes in order to reach sufficient lifetime (increased minimum safety factor).

The calculation of the required safety factor shall be made using the methods and formulas specified in EN 81-50:2020 art. 5.12.

Main data of the 6,5 mm rope:

| | |
|------------------------|------------------------|
| Rope diameter: | 6,5 mm |
| Rope construction: | 8 x 19(W) IWRC |
| Minimum breaking load: | 31,1 kN |
| Wire strength: | 1770 N/mm ² |

Main data of the 6,0 mm rope:

| | |
|------------------------|------------------------|
| Rope diameter: | 6,0 mm |
| Rope construction: | 8 x 19(W) IWRC |
| Minimum breaking load: | 26,5 kN |
| Wire strength: | 1770 N/mm ² |

Main data of traction sheave:

| | |
|----------------------------|------------------------------------|
| Effective pulley diameter: | ≥ 160 mm (centre – centre of rope) |
| Groove shape/condition: | V-groove / Hardened |
| Groove angle: | $\gamma \geq 45^{\circ}$ |

Main data of deflection pulley(s):

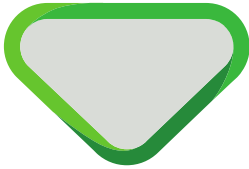
| | |
|----------------------------|------------------------------------|
| Effective pulley diameter: | ≥ 160 mm (centre – centre of rope) |
| Groove shape: | semi-circular |

See annex 1 for a general overview of the product.

3. Examinations and tests

The examination covered a check whether compliance with the Lift Directive 2014/33/EU is met, if possible based on the harmonized product standards EN 81-20:2020 and EN 12385-5.

Issues not covered by or not complying these Standards are directly related to the above mentioned essential requirements based on the risk assessment, where applicable with the aid of harmonized A-and B-standards.



The examination included:

- Examination of the technical file (See annex 2):
- Examination of the representative sample in order to establish conformity with the technical file.
- Inspections and tests to check compliance with the requirements.
A verification of the validity of the methods and formulas of art. 5.12 of EN 81-50:2020 for the application limits of this certificate and this rope type (traction pulleys ≥ 160 mm, diverting pulleys ≥ 160 mm and a minimum required safety factor ≤ 47 for 6,5 mm rope and and a minimum required safety factor ≤ 38 for 6,0 mm rope).

4. Results

After the examination, the product and the technical file were found in accordance with the requirements. The functional tests passed without remarks.

The load tests and bending fatigue tests passed without remarks and did not lead to loss of stability.

Bending fatigue tests simulating the defined traction sheave under maximum allowed tension have shown enough resistance to wear and no loss of strength.

Accepted deviations from the requirements of EN 81-20:2020 are:

- The nominal Diameter of the rope is 6,5 mm or 6,0 mm.
- The allowed ratio between the pitch diameter of the pulleys and the diameter of the rope is 24,61 for the 6,5 mm rope and 26,7 for the 6,0 mm rope where EN 81-20 demands a minimum ratio of 40.

5. Conditions

Additional to or in deviation of the applicable demands in the considered requirements / standards (see certificate and/or page 1 of this report), the following conditions shall be taken into account:

- The rope and pulleys shall be according to the descriptions of Chapter 2.
- For application in lifts, the minimum required safety factor shall be determined using the methods and formulas described in EN 81-50:2020 art. 5.12.
- The outcome of the calculation of the minimum safety factor shall be a factor of 47 at maximum for the 6,5 mm rope and 38 at maximum for the 6,0 mm rope; higher required safety factors are not allowed (the actual safety factor in the lift of application may be higher).
- All the following other relevant rope and pulley related requirements of EN 81-20:2020 shall be fulfilled:
 - The rope terminations shall resist 80% of the minimum breaking load.



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- The minimum number of suspension ropes is 2.
- The load shall be equally distributed between the ropes.
- The ropes shall be replaced when one of the following conditions is reached:
 - A diameter reduction of 6% is measured.
 - The elongation of the rope is $\geq 1\%$.
 - More than 15 broken wires in one rope lay.
 - More than 8 broken wires in one rope lay predominating in one or two strands.
 - 4 broken wires are found concentrated in one strand.
 - 1 valley break per rope lay.

6. Conclusions

Based upon the results of the type-examination Liftinstituut B.V. issues a type-examination certificate.

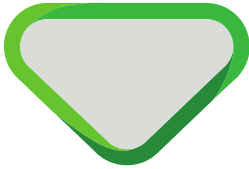
The type-examination certificate is only valid for products which are in conformity with the same specifications as the type certified product. The type-examination certificate is issued based on the requirements that are valid at the date of issue. In case of changes of the product specifications, changes in the requirements or changes in the state of the art, the certificate holder shall request Liftinstituut B.V. to reconsider the validity of the type-examination certificate.

Prepared by:

A. van den Burg
Product Specialist Certification

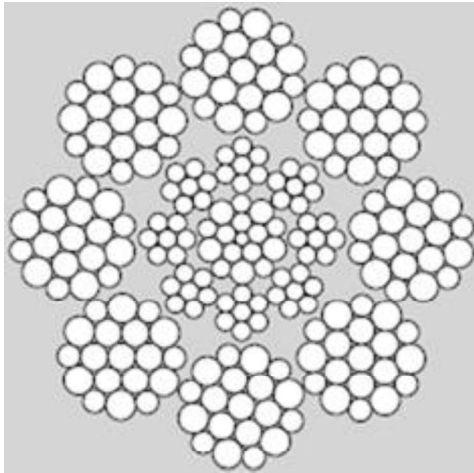
Certification decision by:

P.J. Schaareman
Product Manager C&S



Annexes

Annex 1 : lay-out drawing showing the construction of the 6,5 / 6,0 mm rope.



Annex 2. Documents of the Technical File which were subject of the examination

| Title | Document number | Date |
|------------------------------|----------------------------|------------|
| Manufacturing Specifications | D 6,50 8x19(W)+8x7+1x16(W) | 2016/04/19 |
| Manufacturing Specifications | D 6,00 8x19(W)+8x7+1x16(W) | 2016/08/12 |
| Elevator wire rope | Catalog No: 2016.01 | 2016-01 |

Annex 3. Reviewed deviations from the standards

| EN 81-20 par. | Requirement | Accepted design |
|---------------|------------------------------|---------------------------------------------|
| 5.5.1.2 a) | Diameter of rope ≥ 8 mm | See chapter 2. |
| 5.5.2.1 | $D/d \geq 40$ | $D/d \geq 24,61$, see chapters 2, 3 and 4. |

Annex 4. Revision of the certificate and its report

| Rev.: | Date | Summary of revision |
|-------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - | 21-03-2019 | Original |
| 1 | 02-04-2024 | Recertification after 5 years Name of manufacturer Young Heung Iron & Steel Co., Ltd changed to Youngwire [Changwon Plant] and Dae Heung Industrial Co., Ltd changed to Youngwire [Haman Plant] |

--- End of report ---