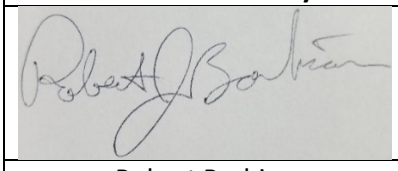
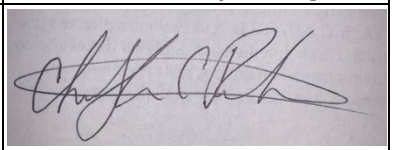
TEST REPORT

Report Reference	71842-20212778Al
Issue Date	2021/06/23

This is to certify that representative crimped samples were investigated to UL 486A-486B 3rd Edition dated 2021/05/05.

[See Page 3 of this report for Test Combinations]

Representative Samples	Compression cable lugs, "DIN" Series Compression joints, "DIN" Series
Compression Connector Manufacturer	Gustav Klauke GmbH
Compression Tool	*Milwaukee Tool*® Battery-operated Cable Crimper Model 2778, with Milwaukee Tool DIN13 Al dies

Test Conducted by:	Results Reviewed by:	Test Laboratory Manager:
		
Robert Barbian	Denise Schwager	Christopher Ritchie
Test Engineer	Sr. Regulatory Engineer	Mgr Engineering Lab
Date: 2021/06/23	Date: 201/06/23	Date: 2021/06/23

Summary

Milwaukee Tool carried out type tests according to UL 486A-486B on compression connectors manufactured by Gustav Klauke GmbH.

Testing was completed in Milwaukee Tool's certified testing laboratory at headquarters in Brookfield, WI.

Test Dates	Test Laboratory	Tests conducted
2021/02/05-2021/04/08, 2021/05/12, 2021/05/14, 2021/05/22; 2021/01/27-2021/03/13, 2021/04/01, 2021/04/02, 2021/04/16, 2021/05/17, 2021/05/22; 2019/09/07-2019/11/22, 2020/06/03-2020/08/11, 2020/06/03, 2020/06/04, 2020/07/01, 2019/12/04, 2019/12/05; 2019/04/17-2019/07/10, 2019/10/01, 2019/10/02, 2019/11/12, 2019/11/27, 2019/12/03	Milwaukee Tool 13135 W. Lisbon Rd. Brookfield, WI 53005	UL 486A-486B Current-cycling and Static-heating Sequence

Procedure

A summary of the sample requirements and testing methods are as follows:

Sample Requirements

- Samples were determined in accordance to UL 486A-486B as appropriate to the test;
- Each sample combination was prepared according to the chart in "Test Combinations";
- Connectors were crimped according to the manufacturers instructions.

Testing

- Current-cycling and Static-heating Sequence testing was completed according to UL 486A-486B.

Test		Condition	Acceptability of Results
Current-cycling		500 On-Off current cycles	Temperatures reached, ≤ 125°C and Stability factor not exceeding ±10
Static-heating Sequence	Heating	Test current applied until stable temperatures reached	Temperatures reached, ≤ 50°C
	Secureness	Mass applied and rotated for 30 minutes	Connection intact
	Heating	Test current applied until stable temperatures reached	Temperatures reached, ≤ 50°C
	Pullout	Direct pull for 1 minute	No slippage, Connection intact

Test Combinations

Test	Milwaukee Tool Crimp Tool designation*	Milwaukee Tool Aluminum Die designation	Klauke Connector designation (Compression cable lug, DIN 46329)	Aluminum Conductor nominal cross-sectional area
Current-cycling	Model 2778	DIN13 AL 16/25	264R10 & 264R12	25 mm^2
		DIN13 AL 70	267R10	70 mm^2
Static-heating Sequence		DIN13 AL 150	270R16	150 mm^2
		DIN13 AL 300	273R16	300 mm^2

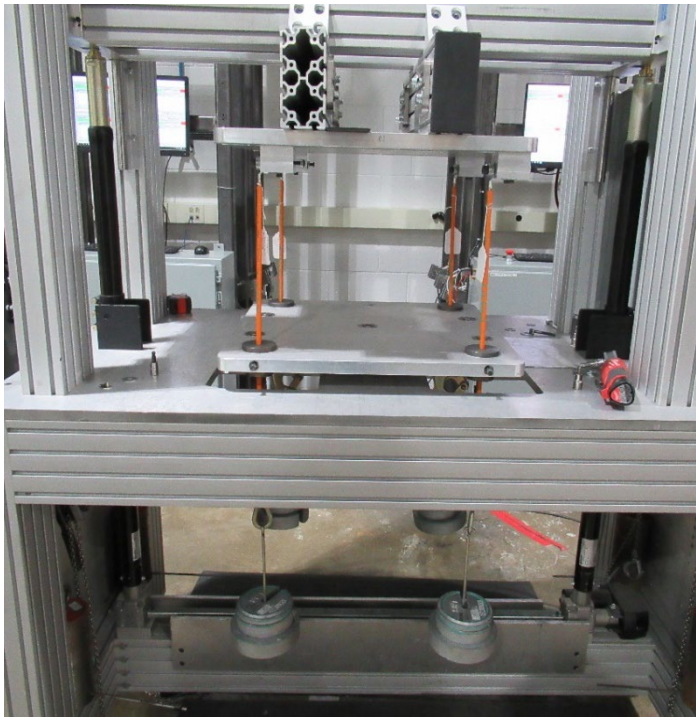
Test	Milwaukee Tool Crimp Tool designation*	Milwaukee Tool Aluminum Die designation	Klauke Connector designation (Compression joint, DIN 46267)	Aluminum Conductor nominal cross-sectional area
Current-cycling	Model 2778	DIN13 AL 16/25	224R	25 mm^2
		DIN13 AL 70	227R	70 mm^2
Static-heating Sequence		DIN13 AL 150	230R	150 mm^2
		DIN13 AL 300	233R	300 mm^2

* Model M18 HCCT109/42 is identical to Model 2778 except the ram is modified to use different styles of crimping and cutting heads, suppression and marking.

Test Setups

Electrical Fixture

Secureness Fixture



Pullout Fixture

Results

Klauke Aluminum Connector designation	Aluminum Conductor, nominal cross-sectional area	Results	
		Current-cycling	Static-heating Sequence
264R10, 264R12 & 224R	25 mm^2	Pass	Pass, No slippage
267R12 & 227R	70 mm^2		
270R16 & 230R	150 mm^2		
273R16 & 233R	300 mm^2		

Testing was completed with acceptable results for the combinations listed. All temperatures remained below specified limits and all connector/conductor joints were intact.

Conclusion

After testing of the compression cable lugs and joints (conductor cross sections 25 mm^2, 70 mm^2, 150 mm^2 and 300 mm^2) we declare that the compression cable lugs and joints comply with the specified connector requirements.

Attachments

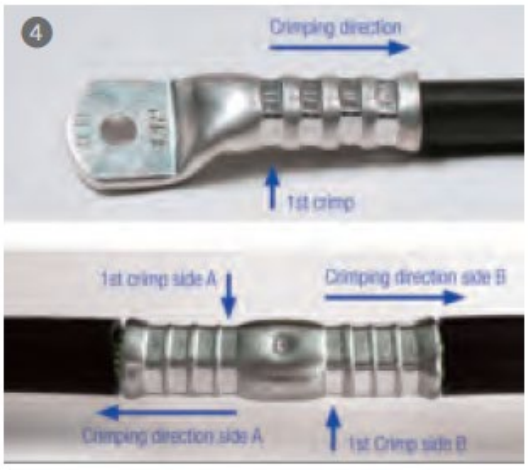
Connector drawing and manufacturers published installation instructions.

- End of Test Report -

Connector photos and manufacturers published installation instructions.

Information from Klauke online Catalogue.

Aluminium compression cable lugs and connectors to DIN



Assembly instructions for cable lugs and connectors

1. Strip conductor in line with insertion depth (+ 10 % because of length change of crimp sleeve).
2. The conductor ends must be cleaned mechanically prior to assembly.
3. Insert conductor fully into cable lug or connector.
4. Observing the crimping direction, crimp the cable lug or connector using the appropriate tools. The crimping direction for cable lug and connector is indicated in the diagram opposite.
5. Remove excess compound emerging from aluminum cable lugs and connectors.