

ACCC[®] PRODUCT LICENSE AND CORE SUPPLY AGREEMENT

This ACCC[®] Conductor Manufacturing License and Core Supply Agreement (the "Agreement") dated as February 20, 2026 (the "Effective Date"), is between **CTC Global Corporation**, a Delaware corporation, having its principal place of business at **2026 McGaw Avenue, Irvine, CA 92614 USA** ("CTC") which expression shall unless repugnant to the context means its successors and permitted assigns), and **LUMINO INDUSTRIES LIMITED**, Public Limited having its principal place of business at, **ACROPOLIS - 12th FLOOR, 1858/1, RAJDANGA MAIN ROAD, Kolkata, 700107, India**, (the "Manufacturer") which expression shall unless repugnant to the context means its successors and permitted assigns), the aforementioned parties being collectively referred to herein as the "Parties," or individually as a "Party".

RECITALS

CTC is in the business of developing, manufacturing and selling ACCC Core for use in ACCC Conductor for the electric power industry;

Manufacturer has experience developing, manufacturing and selling aluminum and aluminum alloy electric transmission and distribution conductors and related products within the Territory;

The Parties desire Manufacturer to become Qualified to Manufacture ACCC Conductor, and to sell ACCC Conductor to Customers in the Territory and, when authorized by CTC to do so, to Customers outside the Territory;

CTC and Manufacturer desire to pursue opportunities for cooperation in the Territory, including Production of ACCC Conductor by Manufacturer for sale in the Territory through Manufacturer's sales channels;

NOW, THEREFORE, in consideration of the foregoing, the mutual premises and covenants contained herein, and other good and valuable considerations, the receipt and the sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. DEFINITIONS

1.1 "ACCC Accessories" (also "ACCC Hardware") means the installation and maintenance hardware accessories or equipment approved by CTC and used to install, protect, maintain or repair ACCC Conductors, including the mid-span joints (splices) and tension clamps (dead ends) used respectively in joining and anchoring ACCC Conductors developed by CTC.

1.2 "ACCC Conductor" means stranded ACCC Core, including without limitation, all CTC proprietary and public domain conductor configurations and alloys compatible with ACCC Core.

1.3 "ACCC Conductor Installation Guidelines" means the requirements for the installation of ACCC Conductor as promulgated and published from time to time by CTC in the "ACCC Conductor Installation Guidelines".

1.4 "ACCC Conductor Specifications" means the mechanical, electrical and other physical properties of the ACCC Conductor, and the standards governing the ACCC Conductor

and its Production set forth in Exhibit A, which may be changed by CTC at any time at its sole discretion, with prior written notice to Manufacturer.

1.5 “ACCC Core” means composite core produced to conform to the ACCC Core Specifications by CTC or a third party authorized by CTC. ACCC Core includes composite core configurations suitable for use with InfoCore System.

1.6 “ACCC Core Specifications” means the mechanical and other physical properties of the ACCC Core set forth in Exhibit H, which may be changed by CTC at any time at its sole discretion, with prior written notice to Manufacturer.

1.7 “Affiliates” of a Party means entities in which such Party has or acquires an ownership interest of greater than ten percent (10%), or which, directly or indirectly, controls, is controlled by, or is under common control with such Party, including without limitation all subsidiaries and any parent of such Party.

1.8 “Authorized ACCC Representative” (also “Representative”) means an independent representative that has a valid and existing right under a written agreement with CTC to market and represent Licensed Products, but not the right to sell Licensed Products.

1.9 “Authorized Manufacturing Partner(s)” (also “AMP(s)”) are CTC partners that are licensed by CTC to manufacture and distribute ACCC Conductor and associated hardware to the customers in their respective territory.

1.10 “Certified Test Reports” means the summary reports that contain the results of Routine Tests that comply with the applicable requirements set forth in Exhibit E, which may be changed by CTC at any time, at its sole discretion.

1.11 “Composite Conductor” means a conductor incorporating any composite materials as a strength member. This does not include AAC, AAAC, ACSR, AACSR, ACAR, AL59, ACSS, GAP Type, STACIR, TAL, TACSR, Eco Conductor, Copper Conductor, Copper Clad Aluminum Conductor.

1.12 “Confidential Information” means trade secrets, proprietary information and confidential information, including without limitation information, data and materials concerning processes, techniques, procedures, methods, strategies, intellectual property, proprietary rights, know-how, inventions, ideas, research and development, products, product development, samples, models, designs, drawings, specifications, formulations, apparatus, equipment, machines, tools, devices, materials, production quantities, costs, accounting, pricing, sales, market research, marketing, selling techniques, suppliers, sources of supply, customers, prospects, bids, requests for proposals, business practices, business plans, business relationships, financial information and projections, computer programs, software, information that a Party is required to keep in confidence pursuant to legal or contractual requirements, together with copies and derivatives thereof.

1.13 “Core” means any strength member that is incorporated into a Composite Conductor.

1.14 “CTC Intellectual Property” (also “CTC IP”) means all patents, patent applications, patent rights, trademarks, service marks, trade names, copyrights, proprietary information, and all other proprietary rights that relate to ACCC Core, ACCC Conductor, ACCC Accessories, and InfoCore® System that are owned by, licensed to, or otherwise legally in the possession of CTC as set forth in Exhibit J, which may be changed by CTC at any time at its sole discretion, with prior written notice to Manufacturer.

1.15 “Customer” means any purchaser of Licensed Products.

1.16 “Facility” (also “Facilities”) means Manufacturer’s stranding and Production facilities that have been qualified and approved by CTC to manufacture ACCC Conductor.

1.17 “InfoCore System” means the methods and tools approved by CTC for acquiring structural and operational information associated with the production, installation and operation of composite core and composite core conductor.

1.18 “Licensed Mark(s)” means “ACCC” and “InfoCore” marks.

1.19 “Licensed Products” means ACCC Conductor.

1.20 “Manufacturer Improvements” means, collectively Manufacturer suggestions, provision or making of any improvements, input, feedback, comments, fixes, changes, or derivative works and the like to CTC Intellectual Property, ACCC Products or ACCC Core.

1.21 “Manufacturer Intellectual Property” means Manufacturer’s proprietary production and manufacturing processes and techniques, patents, trademarks and copyrights not including any manufacturing, testing, storage, handling or other processes or techniques relating specifically to ACCC Core or ACCC Conductor.

1.22 “Minimum Performance Requirements” means the specific investment and business development milestones and annual sales requirements defined by the Parties and delineated in Exhibit I.

1.23 “Pre-Existing Arrangements” means: (a) the Technology Partnership Agreement between Manufacturer and Third Party, for the manufacture and sale of Carbon Fiber Composite Cable conductors; and (b) any other agreements or arrangements for the manufacture, sale, or distribution of conductors (other than ACCC Conductor) that were in existence as of the Effective Date of this Agreement,

1.24 “Produce”, “Producing” or “Production”, as the case may be, means the stranding of ACCC Core to make ACCC Conductor in accordance with ACCC Conductor Specifications.

1.25 “Purchase Order” means a confirmed purchase order for ACCC Core between CTC and Manufacturer.

1.26 “Qualification”, “Qualify” or “Qualified” as the case may be, means satisfying CTC’s requirements to Produce ACCC Conductor of a particular size and type, and sell or distribute (per Section 5) ACCC Conductor to Customers in the Territory and, when authorized by CTC to do so to Customers outside the Territory.

1.27 “Regulatory Authority” means any governmental, regulatory or other authority having jurisdiction over either Party, this Agreement, any transaction contemplated hereby, Licensed Products or the design, manufacture, Production, sale, installation, use or operation of Licensed Products.

1.28 “Routine Tests” means the tests carried out on each production run of ACCC Core or ACCC Conductor to verify conformity, including without limitation the procedures for the removal and storage of samples of each production run, and the frequency and protocols of the testing, as more fully set forth in Exhibit E, which may be changed by CTC at any time, at its sole discretion.

1.29 “Specifications” means either ACCC Conductor Specifications, or ACCC Core Specifications, or both.

1.30 “Territory” means the countries and/or regions where Manufacturer is authorized to sell Licensed Products. Manufacturer’s Territory is India.

1.31 “Working Records” means the records, as described in Section 7.6, of the Parties’ performance under this Agreement and the manufacturing and testing of ACCC Core or the Production and testing of ACCC Conductor.

2. GRANT OF RIGHTS

2.1 License to Manufacture and Sell Licensed Products. For the duration of, and subject to the terms and conditions of this Agreement, including without limitation Exhibit I, CTC hereby grants to Manufacturer, and Manufacturer hereby accepts from CTC, a non-exclusive, non-transferable, non-sublicensable license to manufacture, promote, advertise, sell and distribute Licensed Products in the Territory. CTC grants to Manufacturer a non-exclusive, non-transferrable, non-sublicensable license to use CTC Intellectual Property only as necessary to accomplish the license rights granted in the previous sentence.

2.2 Territorial Restrictions. Manufacturer shall not manufacture or sell the Products outside the Territory unless so authorized by CTC in writing.

2.3 Compliance with CTC's Directions. All Licensed Products made, marketed, sold, or otherwise distributed by Manufacturer in the Territory shall comply strictly with CTC's directions, including those contained in the CTC Brand Manual, set forth in Exhibit F which may be changed by CTC at any time, at its sole discretion.

2.4 Milestones and Minimum Requirements. Manufacturer must meet the Minimum Performance Requirements to maintain Qualification.

2.5 Licensing Fee. Manufacturer shall within ninety days of signing this Agreement either pay a one-time \$50,000 licensing fee, or place an order for ACCC Core for a value greater than \$1,000,000 USD ready for CTC to ship within the ninety days from signing this Agreement.

2.6 Notice to Public. During the Term of this Agreement, Manufacturer shall have the right to indicate to the public that it is an Authorized Manufacturing Partner.

3. OWNERSHIP AND REGISTRATION

3.1 Acknowledgement of Ownership. Manufacturer acknowledges that (a) CTC is the owner of the Licensed Marks and all goodwill related thereto, and (b) all use of the Licensed Marks under this Agreement and any goodwill accruing from such use shall inure solely to CTC's benefit and ownership. CTC acknowledges that (c) Manufacturer is the owner of Manufacturer's trade names, trademarks, and brand identity, and all goodwill related thereto, and (d) any goodwill accruing to Manufacturer's own brand and reputation from its activities under this Agreement shall remain solely with Manufacturer.

3.2 Reputation of the Mark. Manufacturer agrees that is shall not directly or indirectly (a) take, omit to take, or permit any action which will or may dilute the Licensed Marks or tarnish or bring into disrepute the reputation of or goodwill associated with the Licensed Marks or CTC, or which will or may invalidate or jeopardize any registration of the Licensed Mark; or (b) apply for, or obtain, or assist any third party in applying for or obtaining any registration of the Licensed Marks, or any trademark, service mark, trade name, or other indicia confusingly similar to the Licensed Marks. Manufacturer shall use the Licensed Marks only in conjunction with the Licensed Products, and shall maintain quality standards as set forth in ACCC Conductor Specifications, CTC shall not take any action that materially damages the reputation or goodwill of the Licensed Marks or that would materially and adversely affect the value of the license granted to Manufacturer hereunder.

3.3 Use of the Licensed Marks. Manufacturer shall use the Licensed Marks in conjunction with the Licensed Products as directed by CTC. Upon any termination of this Agreement for any reason, Manufacturer shall cease any and all use of the Licensed Marks.

4. PURCHASE AND SALE OF CORE

4.1 Core Supply Terms. Subject to the terms and conditions of this Agreement, during the Term, Manufacturer shall purchase Core exclusively from CTC, and CTC shall manufacture and sell ACCC Core to Manufacturer in such quantities and at such times as Manufacturer may reasonably request and CTC shall confirm or reject each Purchase Order within twenty one (21) business days of confirmed receipt; failure to respond within such period shall constitute acceptance. Manufacturer should request a quote prior to submission of a Purchase Order. Orders for ACCC Core shall be binding following CTC's acceptance of Manufacturer's purchase order as evidenced by CTC's sales order confirmation document setting forth the terms of such order. The terms and conditions of this Agreement shall be automatically incorporated into the terms of sale. In case of any conflict between the terms and conditions of this Agreement and the written terms of an accepted Purchase Order, the terms of the Agreement shall prevail. Each proposed Purchase Order submitted by Manufacturer to CTC shall specify no less than the following information: the core size, quantity, delivery terms and reasonable delivery date, required cut lengths for each reel, project information (including name and description) if applicable, factory acceptance testing requirements, for which Manufacturer must provide applicable tender documents, and price.

4.2 Acceptance. Following CTC's confirmed receipt of Manufacturer's proposed Purchase Order, CTC shall within twenty one (21) business days either (i) notify Manufacturer of

CTC's terms of acceptance, including without limitation the pricing and delivery date, by sending Manufacturer a sales order confirmation, or (ii) notify Manufacturer that CTC is unable to provide the ACCC Core in accordance with the delivery dates or any other term specified by Manufacturer and proposing alternative delivery dates and terms to satisfy such order to Manufacturer.

4.3 Taxes. Where CTC has a legal obligation to collect any taxes imposed on Manufacturer on the purchase, sale or use of ACCC Core by the Manufacturer, the amount to be collected shall be added to Manufacturer's invoice and shall be paid by Manufacturer. Any such taxes known to CTC shall be advised to Manufacturer on CTC's quotation documents. Notwithstanding anything to the contrary in this Agreement, each Party shall be solely responsible for taxes imposed on it, by any governmental authority under any jurisdiction, due to the performance of its obligations under this Agreement. Post shipping of consignment no subsequent change in tax rates or levies shall be passed on to Manufacturer.

4.4 Delivery. CTC shall deliver ACCC Core to Manufacturer that conforms to the ACCC Core Specifications, and other requirements of this Agreement and the applicable Purchase Orders, is free from defects in workmanship and materials, and is delivered free of encumbrances.

4.5 Handling and Storage. Store and handle ACCC Core in accordance the ACCC Core - Product Handling and Storage guidelines as set forth in Exhibit D, which may be changed by CTC at any time, at its sole discretion.

4.6 No Transfers. Manufacturer shall not resell, transfer or otherwise provide unstranded ACCC Core to any third party for any purpose whatsoever other than as provided under this Agreement without the express prior written permission of CTC.

4.7 No Reverse Engineering. Manufacturer shall not, and shall not permit, procure, assist or enable any third party to, reverse engineer any ACCC Core or ACCC Conductor. Manufacturer shall not sell, transfer or otherwise provide any ACCC Core or ACCC Conductor to any individuals or entities that Manufacturer has definite reason to believe will, or will attempt or seek to reverse engineer any ACCC Core or ACCC Conductor.

4.8 Prices. The prices of ACCC Core shall be reflected in each Purchase Order. The base prices of ACCC Core are quoted separately from this Agreement in US Dollars. Details about warranty, applicable taxes, freight, field service, or other support costs and fees are provided in a letter accompanying the price list.

4.9 Payment. Manufacturer shall pay CTC the amounts then due by payment or Letter of Credit due no later than Seven (7) business days after receipt by Manufacturer of CTC's sales order confirmation documentation. The Parties may mutually agree on different credit terms as particular projects may require.

4.10 Cancellation. Any request to cancel, change, or reschedule an order must be in writing, and is subject to a cancellation, change, or reschedule fee. Such fee shall include but not

be limited to accrued processing costs, storage, return, restocking, and expedited shipping fees. Special or custom orders cancelled after production has begun will be invoiced at full price unless an alternate buyer is available within 60 days of cancellation. Any order for which product has been made available on the scheduled shipment date may be cancelled and cancellation fees assessed if Manufacturer fails to meet delivery requirements within 60 days of scheduled shipment. Unless otherwise agreed by CTC in writing, CTC reserves the right, without prejudice to any other remedies, to cancel Manufacturer's order or contract and to charge Manufacturer cancellation, change, or reschedule fees, if Manufacturer cancels, changes, or reschedules an order or does not give instructions for shipment within ninety (90) days from the date of CTC's acceptance of an order.

4.11 Warranty and Process of Claims. CTC shall offer warranty coverage on ACCC Core purchased by Manufacturer per standard terms and conditions in effect at the time of purchase. Additional warranty coverage can be purchased for an additional cost as quoted. The remedy for all claims under warranty is exclusive and in lieu of all other remedies and conditions. For a warranty claim, Manufacturer shall submit in writing to CTC a detailed explanation of the cause for the claim. CTC shall at Manufacturer's request ship supplemental ACCC Core of lengths suitable for the order (full reels if necessary) as soon as possible after the notification of the claim. CTC shall assess and determine whether defective material or workmanship is the cause of the claim. If determined that the claim is the result of a defect in material or workmanship, CTC shall replace the defective ACCC Core in accordance with the terms and conditions of the Standard Limited Warranty. CTC shall also reimburse Manufacturer for: (a) all shipping and freight costs incurred by Manufacturer in returning defective Core and receiving replacement Core; (b) documented costs of re-testing (factory acceptance and routine testing) if required; and (c) documented storage costs for goods held pending resolution of the claim. Should a defect in material or workmanship not be the reason for the claim, Manufacturer shall reimburse CTC for, and the direct costs incurred in shipping, the supplemental ACCC Core.

5. PRODUCTION QUALIFICATION

5.1 Facility Qualification. Manufacturer's Facility must be Qualified prior to Production. At its sole discretion, CTC may conduct a plant assessment of Manufacturer's Facility for such purposes. Manufacturer will receive a letter evidencing the Qualification for each Facility.

5.2 Conductor Qualification. Manufacturer must Qualify of each size of conductor it wishes to sell. CTC will supply ACCC Core to be used only for Conductor Qualification along with instructions on sample submissions, and once Qualified, Manufacturer will receive a letter evidencing the Qualification for each conductor size Qualified.

5.3 Reasonable Assistance. CTC will reasonably provide guidance and recommendations to Manufacturer in its Production and may advise and comment on Manufacturer's stranding ability, process, or technology and how Manufacturer may enhance the process and the quality of the Licensed Products. CTC may charge for services beyond reasonable recommendations as agreed to in advance with Manufacturer. However, it is expressly understood and agreed that Manufacturer is solely responsible in becoming Qualified to Produce ACCC Conductor, and to define and execute its Production processes.

5.4 Loss of Qualification and Re-qualification. In the event Manufacturer fails to Produce conductor Qualified for production for a continuous period of twenty-four months, or if conductor Produced fails to meet Specifications, CTC may, at its sole discretion, rescind the Qualification and require Manufacturer to re-Qualify the applicable conductor sizes in accordance with Section 5.2 of this Agreement.

6. PRODUCTION OF LICENSED PRODUCTS

6.1 Compliance with CTC Specifications. Manufacturer shall comply with the specifications, standards, and directions relating to the Licensed Products, including their manufacture, promotion, distribution, and sale as set forth in this Agreement (or as notified in writing by CTC from time to time), conforms to the ACCC Conductor Specifications set forth in Exhibit A, and other requirements of this Agreement and applicable Purchase Orders and is free from defects in workmanship and materials and delivered free from encumbrances.

6.2 Production Requirements. Manufacturer must use only ACCC Core supplied by CTC or a third party authorized by CTC in writing, Produce all Licensed Products on approved reel sized as set forth in Exhibit C, and perform Routine Tests as set forth in Exhibit E and keep samples of each production run.

6.3 No Right to Produce and Sell Competing Products. During the Term and for eighteen (18) months following the termination or expiration of this Agreement, Manufacturer and its Affiliates shall not in any way promote, sell, market, stock, strand, or produce, any Composite Conductor other than ACCC Conductor, or assist any third party to promote, sell, market, trade, stock, strand, or produce any Composite Conductor other than ACCC Conductor. The above-mentioned restriction of 18 months shall not apply for India.

6.4 Manufacturer may continue to supply and support competing products under tender processes where Manufacturer has formally bid on or has been awarded a tender; provided that (i) any Pre-Existing Arrangement applicable to such products are fully disclosed and listed to CTC; (ii) the tenders and project on which Manufacturer has contractual obligations, and bids made prior to the Effective Date, are listed on Exhibit K, which shall constitute an exhaustive list of all permitted Pre-Existing Arrangements, and all awards it receives with respect thereto; and (iii) Manufacturer uses commercially reasonable efforts to transition any awarded or active tender opportunities to ACCC Conductor where commercially and technically feasible.

Except as expressly permitted by CTC and solely to the extent required to complete the specific Pre-Existing Arrangements projects listed on Exhibit K, Manufacturer shall terminate, or cause to be terminated, all Pre-Existing Arrangements, including any master, framework, or umbrella agreements, immediately. To the extent CTC permits any such agreement to remain in effect solely because it is required to complete an obligation listed on Exhibit K, such agreement shall remain in effect only for so long as strictly necessary to complete such obligation and shall be terminated immediately upon completion thereof. Manufacturer shall provide CTC with written evidence of such termination. Failure to terminate Pre-Existing Arrangements shall result in material breach of this Agreement.

6.5 Reasonable Assistance. CTC shall provide reasonable technical support and personnel requested by Manufacturer, normally at Manufacturer's expense. Such support shall include making available to Manufacturer appropriate technical information in CTC's possession to support the type registration of Licensed Products by Manufacturer. CTC may charge for services beyond reasonable recommendations as agreed to in advance with Manufacturer. CTC shall provide Manufacturer with all documentation reasonably required by Manufacturer to participate in bids and tenders for projects involving Licensed Products, provided that any request for such documentation is requested within a reasonable time of when it is needed.

7. QUALITY CONTROL

7.1 Acknowledgement and Compliance. Manufacturer acknowledges and is familiar with the high standards, quality, style, and image of CTC and Licensed Products, and Manufacturer at all times shall conduct its business and use the Licensed Mark in a manner consistent with these standards, quality, style, and image. Manufacturer shall comply with the specifications, standards, and directions relating to the Licensed Products, including their design, manufacture, promotion, packaging, distribution, and as notified in writing by CTC from time to time.

7.2 Quality Production System. Manufacturer shall ensure that a proper system of quality and Production control is in place and shall ensure that the Facility and Production process will have and maintain appropriate ISO certification issued by an approved third-party registrar.

7.3 Permits, Licenses, and Authorizations. Manufacturer shall obtain and maintain all permits necessary for the exercise of its rights and performance of its obligations under this Agreement, including any permits required for the import of ACCC Core or any raw materials and other manufacturing parts used in the Production of the Licensed Products.

7.4 Compliance with Laws. In exercising its rights under this Agreement, Manufacturer shall comply with, and shall ensure that the Licensed Products sold or otherwise supplied by Manufacturer complies with, all applicable laws. Manufacturer shall promptly notify CTC of any inquiries and communications with any governmental, regulatory, or industry authority relating to the Licensed Mark or the Licensed Products. CTC shall comply with all applicable laws in the manufacture and supply of ACCC Core and shall ensure that ACCC Core complies with all applicable laws, standards, and regulations in the Territory.

7.5 Testing. Each Party is responsible for testing the products, the requirements for testing are set forth in Exhibit E.

- a) CTC shall be responsible for carrying out the ACCC Core Routine Tests, the issuance of the relevant Certified Test Reports, the storage of any samples removed for quality control purposes, and upon request from Manufacturer provide a copy of the Certified Test Reports. with each shipment of ACCC Core.
- b) Manufacturer shall be responsible for carrying out the ACCC Conductor Routine Tests, the issuance of the relevant Certified Test Reports, and the storage of any

samples removed for quality control purposes. Each sample shall be labeled with a reference number that will permit its association with a particular reel of ACCC Conductor delivered to the Customer: identification of the date of Production, the ACCC Core and other raw materials used; and cross reference to the sample in the Working Records. Manufacturer shall provide a copy of the Certified Test Reports to CTC. CTC may test ACCC Conductor Produced by Manufacturer at CTC's expense.

- c) Any third-party testing and report, if required for any Bid, then such testing of ACCC Conductor must be approved in writing by CTC, which shall not be unreasonably withheld or delayed.

7.6 Working Records. The Working Records for ACCC Conductor shall identify the reels of ACCC Core used in each reel of ACCC Conductor. The Working Records shall not contain any Confidential Information and shall be kept by each Party and made available to the other Party with reasonable notice, Working Records shared between the Parties shall be treated as Confidential Information of the disclosing Party. The Working Records shall include without limitation:

- a) The identities and quantities of all raw materials and components, the manufacturing or Production processes, the quality of the drawn rod, the annealing conditions, any stoppage, breakage, and other issues and problems encountered;
- b) The length, type, and reel type of the ACCC Core or ACCC Conductor;
- c) The testing, including Routine Tests, other Production tests, and the test reports and validation reports; and
- d) Purchase Orders, Production details, the date of Production, and record of delivery. The Working Records for ACCC Conductor shall identify the reels of ACCC Core used in each reel of ACCC Conductor.

8. CHANGES TO SPECIFICATIONS AND PRODUCTION PROCESS

8.1 Modifications and New Sizes. If either Party desires to modify or add new sizes the ACCC Core Specifications or the ACCC Conductor Specifications, the Parties will discuss and evaluate the benefit of such changes, and if mutually agreed, the responsibility for the costs to make the changes. Both Parties agree to implement any changes that are required to comply with applicable laws, regulations, or requirements of any Regulatory Authority. Upon any modifications to the Specifications, the relevant exhibits to this Agreement shall be revised accordingly without requiring any formal amendment to this Agreement, and the Parties shall promptly implement such modifications within a reasonable transition period for changes requiring modification to production equipment or processes.

8.2 Changes to Core Production Process. If CTC make any change in the manufacturing of ACCC Core that would require retesting or requalification of the ACCC Conductor by any Regulatory Authority that has type registered the ACCC Conductor, CTC shall notify Manufacturer in advance and provide Manufacturer with copies of all tests carried out on

the new ACCC Core. ACCC Conductor using the new ACCC Core will be Produced and tested to ensure compliance with the Specifications at CTC's expense. Manufacturer may continue to use existing inventory of ACCC Core procured prior to such change unless such ACCC Core is disqualified.

8.3 Changes to Conductor Production Process. Manufacturer shall not make any change with respect to ACCC Conductor or the Production process without CTC's advance written approval.

9. SALE OF LICENSED PRODUCTS

9.1 Authorization to Market, Bid, and Sell. Manufacturer will be designated an Authorized Manufacturing Partner and may market, bid on, and sell Licensed Products in the Territory after it has received product training, gained and demonstrated knowledge of the value proposition for each Licensed Product, as provided on by CTC, on a timeline set forth in Exhibit I.

9.2 Authorization Outside the Territory. Manufacturer shall have the right to market, bid, and sell Licensed Products outside the Territory only after granted prior written permission in advance by CTC for a specific project. CTC shall not charge any additional fee solely for granting authorization under this Section.

9.3 Sales and Bid Assistance. CTC will reasonably assist in preparing a tender bid or respond to bid solicitation with sales support and personnel, including Authorized ACCC Representatives which are contracted by CTC to market and represent Licensed Products, as requested by Manufacturer to support and complement Manufacturer's efforts on project. If requested, CTC will also reasonably make available technical information, periodic training, and Application Engineering.

9.4 Tender Requirements. CTC will reasonably assist Manufacturer with testing Licensed Products in support of the requirements of any tender. Notwithstanding the foregoing, meeting tender requirements shall be the sole responsibility of the bidder.

10. MARKETING

10.1 Marketing and Advertising Requirements. Manufacturer shall use its best efforts to promote and expand the demand for Licensed Products throughout the Territory by advertising and publicizing the Licensed Products in accordance with the CTC Brand Manual, which Manufacturer shall at all times adhere to. Manufacturer shall have a dedicated team, trained on and focused on sales and marketing of Licensed Products including agreed on joint marketing efforts related to Licensed Products. Public announcements or press releases in regard to the Licensed Products by Manufacturer must comply with the CTC Brand Manual and should be discussed with CTC prior to release.

10.2 Website Presence. The Parties acknowledge and agree that a Party may use the other Party's logo on its website and other marketing materials to advertise the Parties relationship. Therefore, the Parties hereby grant to the other Party, and the other Party hereby accepts from the other Party a limited, non-exclusive, non-transferable, non-assignable, and non-

sub licensable license to use the other Party's Intellectual Property during the Term of this Agreement for the aforementioned purpose.

10.3 Maintaining Current Product Information. Manufacturer shall maintain current ACCC Product information on all media forms used in promoting its products. Manufacturer shall list ACCC Conductor as a product on its website, and dedicate a webpage to ACCC Conductor including a description and informational facts about the product.

11. INSTALLATION

11.1 Installation Guidelines. CTC shall provide Manufacturer ACCC Conductor Installation Guidelines with the sale of ACCC Core.

11.2 Installation Training. CTC will provide ACCC Installation Training for all ACCC Conductor installations in the Territory consisting of classroom instruction, equipment review, accessories assembly demonstration and initial on-site on-the-job training for up to seven (7) days.

11.3 On-Site Services. CTC sells field and technical support services as described on CTC's website (<https://ctcglobal.com/installation-support>) to Customers to assist with reliable installation of Licensed Products and to generally advance the acceptance and use of ACCC Conductor in its markets. Manufacturer shall use reasonable efforts to promote these services in concert with its promotion and sales of Licensed Products.

11.4 Manufacturer's Responsibilities. Manufacturer will use reasonable efforts to ensure that all personnel and supervision carrying out the installation of Licensed Products have completed the ACCC Conductor Installation Training program for installation in accordance with the Installation Guidelines, only use ACCC Accessories in the installation of the ACCC Conductor. Manufacturer shall further with reasonable efforts ensure its customer is aware that adherence to the ACCC Conductor Installation Guidelines and use of ACCC Accessories are required to maintain the validity of any flow-through warranty of CTC manufactured components. CTC shall not be responsible to Manufacturer for any failure of Products in any installation where the installers do not adhere to the ACCC Conductor Installation Guidelines or for installations where non-ACCC Accessories are used.

11.5 Complaints, Issues, Problems. For Customer complaints, installation or performance issues, or problems or deviations related to Products, Manufacturer shall immediately report and keep CTC informed of issue investigation, and fully participate and assist CTC in performing an investigation.

12. AUDIT AND INSPECTION

12.1 Inspection. At its election, CTC shall have the right to have CTC representatives present in the Facility to audit the conditions that relate to the Production, testing, storing, packaging, and shipping of the Produced ACCC Conductor. All CTC representatives in Manufacturer's Facility will adhere to the confidentiality provisions of this Agreement, including information about Manufacturer's Facility and products other than ACCC Conductor being manufactured by Manufacturer.

13. INTELLECTUAL PROPERTY

13.1 CTC Ownership. Manufacturer acknowledges and agrees that CTC shall retain and own all rights, title, and interests in and to CTC Intellectual Property and all modifications, improvements, and derivative works thereto, which shall be part of CTC's Confidential Information, and except as expressly set forth herein, Manufacturer shall not obtain any right, title, or interest in or to any CTC Intellectual Property by virtue of this Agreement or Manufacturer's performance of this Agreement.

13.2 Manufacturer Ownership. CTC acknowledges and agrees that Manufacturer shall retain and own all rights, title, and interests in and to Manufacturer Intellectual Property and all modifications, improvements, and derivative works thereto, which shall be part of Manufacturer's Confidential Information. Except as expressly set forth herein, CTC shall not obtain any right, title, or interest in or to any Manufacturer Intellectual Property by virtue of this Agreement or CTC's performance of this Agreement. However, to the extent Manufacturer makes any Manufacturer Improvements, Manufacturer hereby assigns all of its rights, title, and interests in or to Manufacturer Improvements to CTC.

14. CONFIDENTIALITY

14.1 Scope of Confidential Information. From time to time the Parties may share Confidential Information with the other Party, whether oral or in writing, marked or not marked as such. Notwithstanding the foregoing, nothing herein shall limit the use or disclosure of Confidential Information which, as evidenced by contemporaneous written documentation:

- a) Is legally in the possession of the receiving Party, without any restrictions on use or disclosure, prior to receipt thereof from the disclosing Party;
- b) Enters into the public domain through no fault of the receiving Party or its employees;
- c) Is disclosed to the receiving Party without any restrictions on use or disclosure by a third party having the right to make such disclosure;
- d) Is independently developed by or for the receiving Party without use of or reference to the disclosing Party's Confidential Information; or
- e) With the exception of confidentiality of each Party's Intellectual Property including but not limited to trade secrets, was acquired while this Agreement was in effect, and five years have elapsed since expiration or termination of this Agreement.

14.2 Protection of Confidential Information. The receiving Party agrees to keep Confidential Information in strict confidence, not to use Confidential Information for any purpose other than performing its obligations in accordance with this Agreement, and not to disclose or make Confidential Information available to any third party. Confidential Information received shall be protected and safeguarded with the same degree of care as for the Receiving Party's own Confidential Information, but in no event with less than care than a commercially

reasonable degree of care. Confidential Information may be disclosed only to those employees or other agents of the receiving Party who: (i) reasonably require access to such information for performing its obligations in accordance with this Agreement; (ii) have been informed of the confidential nature of the Confidential Information; and (iii) agree to be bound by the confidentiality provisions of this Agreement. The receiving Party shall be responsible for any breach of this Section by its employees and representatives, and all Confidential Information in whatever form shall be returned to the disclosing Party upon its request or upon any expiration or termination of this Agreement.

14.3 Legal Requirement to Disclose. If the receiving Party is required by law or legal process to disclose any Confidential Information, the receiving Party shall provide prompt written notice to, and reasonably cooperate with, the disclosing Party so that legal protection for the Confidential Information may be sought. If such legal protection is not obtained, the receiving Party's compliance with the non-disclosure provisions of this Agreement, to the extent required for complying with such law or legal process, shall be waived.

14.4 No Implied Rights. No rights or obligations other than those expressly stated herein shall be implied from this Agreement. Other than as expressly set forth herein, nothing in this Agreement shall be construed to convey to the receiving Party any right, title or interest in or to the disclosing Party's Confidential Information, or any license to use, disclose, sell, distribute, exploit, copy or further develop such Confidential Information in any way.

14.5 Irreparable Harm. Each Party acknowledges that a breach of this Section may cause irreparable harm to the disclosing Party and that money damages may not be an adequate remedy. The disclosing Party shall be entitled to seek injunctive relief and specific performance, in addition to other available remedies, for any breach or threatened breach of this Section without the necessity of proving actual damages or posting a bond or other security.

14.6 Exception to Requirements. Neither Party shall, without the prior written authorization of the other Party, disclose to any third party the terms and conditions of this Agreement, except as may be necessary to establish or assert rights hereunder, or as may be required by law or regulation. The Parties agree that this Agreement may be disclosed to potential investors and their agents, including without limitation underwriters, brokers, counsels and accountants, and may be disclosed in filings with the United States Securities and Exchange Commission.

14.7 Survival of Termination. This Section 14 shall survive any termination or expiration of this Agreement. The Parties' obligations with respect to any Confidential Information shall remain in effect until such time as one of the exceptions set forth in this Section is applicable to such Confidential Information.

15. INDEMNIFICATION

15.1 CTC Responsibilities. CTC will indemnify and hold Manufacturer harmless from and against any and all losses, liabilities, judgments, costs and expenses, including without limitation reasonable attorneys' fees, based on any claim of a third party arising out of:

- a) Infringement of any third party's intellectual property right by use of ACCC Core or ACCC Conductor in accordance with this Agreement; and
- b) Notwithstanding the foregoing, CTC shall have no indemnification obligations with respect to any claim, loss, liability, judgment, cost or expense arising out of or relating to:
 - i. Any intellectual property rights of Manufacturer or Manufacturer's Affiliates;
 - ii. Manufacturer's specifications, processes, or requests;
 - iii. Manufacturer's failure to follow CTC's instructions;
 - iv. Manufacturer's modification to the Specifications, ACCC Core, ACCC Conductor, or CTC Intellectual Property without CTC's express written consent; or
 - v. The negligence, willful misconduct, breach of this Agreement or any Purchase Order, or violation of laws, regulations, or orders of a tribunal or regulatory body by Manufacturer or its Affiliates.

15.2 Manufacturer Responsibilities. Manufacturer will indemnify and hold CTC harmless from and against any and all losses, liabilities, judgments, costs and expenses, including without limitation reasonable attorneys' fees, based on any claim of a third party arising out of:

- a) Failure to comply with all applicable international, national, state, regional and local laws, regulations, rules and orders in its activities and in any of its dealings with respect to the subject matter of this Agreement. Manufacturer agrees that it shall comply with the requirements of the U.S. Foreign Corrupt Practices Act and the Convention on Combating Bribery of Foreign Public Officials in International Business of the Organization for Economic Cooperation and Development and shall refrain from any payments to third parties which would cause Manufacturer to violate such act and/or convention. Any violation of such act and/or convention by Manufacturer shall be deemed a material breach of this Agreement and CTC may immediately terminate this Agreement. Manufacturer shall fully indemnify CTC for any such violation in accordance with this Agreement.
- b) Failure of the ACCC Conductor produced by Manufacturer to meet the ACCC Conductor Specifications and other requirements of this Agreement and the applicable Purchase Orders, except for reasons pertaining to the failure of the ACCC Core due to defects in materials or workmanship;
- c) Infringement on any third party's intellectual property right by use of Manufacturer's manufacturing or Production process or technology; and
- d) Notwithstanding the foregoing, Manufacturer shall have no indemnification obligations with respect to any claim, loss, liability, judgment, cost or expense

arising out of or relating to the negligence, willful misconduct, breach of this Agreement, or violation of laws, regulations, or orders of a tribunal or regulatory body by CTC or its Affiliates.

15.3 **Indemnification Obligations.** The Parties' indemnification obligations set forth herein are expressly conditioned upon the following:

- a) The indemnified Party shall promptly:
 - i. Notify the indemnifying Party of each claim;
 - ii. Give the indemnifying Party the right to control the defense and settlement of the claim, except that any settlement affecting the indemnified Party's rights or interests shall be subject to the prior written approval by the indemnified Party; and
 - iii. Provide the indemnifying Party with information and assistance necessary to defend or settle the claim, including without limitation asserting, or permitting the indemnifying Party to assert, the intellectual property rights of the indemnified Party that may assist in defending or settling the claim.
- b) The indemnified Party shall make reasonable efforts to mitigate its losses and liabilities, and shall have the right to participate in the defense at its own expense.

15.4 **Exclusive Remedy.** This Section sets forth the Parties' exclusive remedies and exclusive liabilities with respect to the matters covered hereby.

16. LIMITATION OF LIABILITIES

16.1 EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, EACH PARTY DISCLAIMS ALL WARRANTIES, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

16.2 Neither Party shall be liable for any indirect, incidental, consequential, special or punitive damages, including without limitation loss of business or profits, whether in an action in contract, tort, strict liability, or otherwise, even if advised of the possibility of those damages.

16.3 Neither Party's aggregate liability pursuant to this Agreement shall exceed the total price paid pursuant to the purchase order giving rise to the liability, even if a term of such Purchase Order fails its essential purpose.

17. TERM AND TERMINATION

17.1 **Term.** Unless terminated earlier as provided herein, the term of this Agreement shall commence on the Effective Date and continue for a period of 6 years (the "Term").

17.2 **Extension.** This Agreement may be extended upon mutual agreement on terms, on or prior to the expiration of the Term, provided the Agreement has not been previously terminated under the terms of this Agreement.

17.3 Termination. Either Party may terminate this Agreement immediately upon written notice to the other Party if:

- a) The other Party fails to cure any material breach of this Agreement within thirty (30) days after receiving a breach notice;
- b) The other party ceases operations, or is liquidated or dissolved;
- c) The other Party is declared insolvent or bankrupt by a court of competent jurisdiction, a voluntary petition of bankruptcy is filed in any court of competent jurisdiction by the other Party, the other Party makes or executes any general assignment for the benefit of creditors, or a receiver is appointed to control all or substantially all of the business or assets of the other Party; or
- d) A Regulatory Authority or court orders that Manufacturer cease Producing ACCC Conductor.

17.4 Effects of Termination. Manufacturer may continue to sell any Licensed Products or ACCC Accessories remaining in its inventory for one year after the termination of this Agreement for any reason other than Manufacturer's breach of this Agreement, provided that such sale shall comply with the terms and conditions of this Agreement. Manufacturer shall provide a list of available unsold Licensed Products, ACCC Core, and ACCC Accessories to CTC within five (5) days of termination of this Agreement for any reason. CTC shall have the right of first refusal for the purchase of such ACCC Conductor and ACCC Accessories at reasonably agreed prices. Manufacturer shall not under any condition have the right to sell ACCC Core to a third party without CTC's written approval. In the event CTC will not authorize the sale of ACCC Core to a third party, CTC will purchase such ACCC Core from Manufacturer for a mutually agreed price, not to exceed that price for which such ACCC Core was sold to Manufacturer. Within one (1) year following termination of this Agreement for any reason other than Manufacturer's breach of this Agreement, or within thirty (30) days following termination due to Manufacturer's breach of this Agreement, Manufacturer shall scrap any unsold ACCC Core, ACCC Conductor and ACCC Accessories and provide proof to CTC.

Notwithstanding the termination of this Agreement (other than a termination for cause), any Purchase Orders issued prior to the effective date of termination for which Manufacturer has an existing contractual obligation to perform on a tender or project shall remain in effect and be fulfilled in accordance with the terms of this Agreement. Termination shall not affect either Party's rights arising from granted warranties or from liability relating to Core ordered.

18. FORCE MAJEURE

18.1 Scope. Neither Party shall be liable to the other for any delay or default in such Party's performance hereunder if such delay or default is caused by conditions beyond such Party's control, including without limitation acts of God, war, terrorism, insurrection, earthquake, strike, fire, flood, and epidemic; provided that:

- a) The force majeure event is not directly or indirectly caused by such Party, and cannot be prevented or removed by such Party by exercising commercially reasonable care;
- b) Such Party promptly notifies the other Party in writing, specifying the force majeure event occurrence and the extent of its inability to perform, takes commercially reasonable steps to limit the effects of such occurrence, and promptly performs its obligations hereunder as soon as possible; and

If a force majeure event continues for thirty (30) days or more, the other Party shall have the right to immediately terminate any affected Purchase Orders.

19. GOVERNING LAW & DISPUTE RESOLUTION

19.1 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of California.

19.2 Amicable Resolution. The Parties shall attempt in good faith to resolve any dispute arising out of or relating to this Agreement through negotiations between senior executives of each Party. If the dispute is not resolved within thirty (30) days of written notice of the dispute, either Party may proceed to arbitration.

19.3 Arbitration. Any dispute, controversy, or claim arising out of or relating to this Agreement, including its breach, termination, or validity, that is not resolved under Section 19.2, shall be finally resolved by arbitration administered by the Singapore International Arbitration Centre ("SIAC") in accordance with the SIAC Arbitration Rules in force at the time of commencement of the arbitration.

- (a) Tribunal. The arbitral tribunal shall consist of three (3) arbitrators. Each Party shall nominate one (1) arbitrator, and the two (2) Party-nominated arbitrators shall jointly nominate the presiding arbitrator within thirty (30) days. Failing agreement, SIAC shall appoint the presiding arbitrator.
- (b) Seat. The seat of arbitration shall be Singapore.
- (c) Language. The arbitration shall be conducted in English.
- (d) Award. The award shall be final and binding on the Parties. Judgment upon the award may be entered in any court having jurisdiction.
- (e) Costs. The arbitral tribunal shall have authority to award costs of arbitration, including reasonable legal fees, to the prevailing Party.
- (f) Continued Performance. Pending final resolution of any dispute, the Parties shall continue to perform their obligations under this Agreement to the extent not affected by the dispute.

20. GENERAL PROVISIONS

20.1 Independent Contractors. The Parties' relationship hereunder is that of independent contractors. This Agreement does not establish any employment, agency, franchise, partnership, joint venture, or other similar relationship between the Parties. Neither Party shall have the right to bind, obligate, or act for or on behalf of the other Party unless expressly agreed to in a written document duly signed by both Parties, and each Party agrees not to solicit, recruit, or hire, without the other Party's express written consent, the other Party's employees from the Effective Date of this Agreement until one (1) year following the termination of this Agreement.

20.2 Notices. All notices under this Agreement shall be in writing and sent by registered or certified mail, postage prepaid and return receipt requested, by nationally recognized express courier service, by personal delivery, by e-mail, or by facsimile with receipt thereof confirmed in writing by the recipient, to the other Party at the address, e-mail or fax number set forth herein, or such other address, e-mail or fax number as either Party may provide by written notice to the other Party in accordance herewith. Notices shall be deemed effective upon receipt if personally delivered, three (3) business days after it is sent by mail or courier, or one (1) business day after it is sent by e-mail or facsimile.

If to CTC:

CTC Global Corporation
2026 McGaw Avenue
Irvine, CA 92614
Attention: CFO
Telephone: (949) 428-8500
Facsimile: (949) 428-8515
E-mail: cfo@ctcglobal.com

If to Manufacturer:

LUMINO INDUSTRIES LIMITED
ACROPOLIS - 12th FLOOR, 1858/1,
RAJDANGA MAIN ROAD
Attention: Amit Bajaj
Telephone: +919674588000
E-mail: abajaj@luminoindustries.com

With copy to:
legal@ctcglobal.com

20.3 Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to the subject matters hereof, superseding any and all previous and contemporaneous oral or written communications, representations, understandings, arrangements and agreements regarding the subject matters hereof between the Parties or any personnel or representatives thereof.

20.4 No Changes. No change to this Agreement shall be effective unless set forth in writing and signed by both Parties.

20.5 No Waiver. Any failure to enforce any right hereunder by either Party on any occasion will not in any way constitute a waiver of such right on any other occasions or of any other right.

20.6 Assignment. Neither this Agreement nor any rights or obligations set forth herein may be assigned nor delegated by Manufacturer without the written consent of CTC.

20.7 Jurisdiction. This Agreement shall be governed, construed, and applied in accordance with the laws of the State of California without regard to its conflict of law

principles. Any disputes arising out of, relating to or in connection with this Agreement shall be subject to the exclusive jurisdiction and venue of United States District Court, Southern District of California.

20.8 Invalid Provisions. Should any provision of this Agreement be held to be illegal, invalid, void or unenforceable, such holding shall not affect the remainder of this Agreement and to the fullest extent permitted by law, any illegal, invalid, void, or unenforceable provision shall be automatically replaced by provisions as similar thereto as possible but which are legal, valid, and enforceable.

20.9 Conflicting Terms. In case of any conflict between this Agreement and the exhibits attached hereto, this Agreement shall prevail.

20.10 Survival. Sections 14, 15, 16, 17, 18, 19, and 21 shall survive any termination or expiration of this Agreement. Termination or expiration of this Agreement for any reason shall not release either Party from any liabilities or obligations set forth in this Agreement which the Parties have expressly agreed shall survive any such termination or expiration, or remain to be performed or by their nature would be intended to be applicable following such termination or expiration.

20.11 Drafter. This Agreement shall not be construed against either Party by virtue of that Party or its representatives having written all or any part of it.

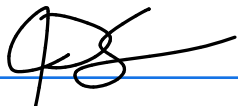
20.12 Headings. The section headings in this Agreement are for convenience only and shall not be construed as part of the terms of this Agreement.

20.13 Signatures. The Agreement may be signed digitally and or delivered via facsimile or electronic mail in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same Agreement. Copies of the signature pages so transmitted may be used for the purpose of enforcing the terms of the Agreement as though they were originals and shall be admissible in any legal or regulatory proceeding concerning the Agreement.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have executed this Agreement by their duly authorized representative as of the date first above written.

CTC Global Corporation

By: 
J D Sitton (Feb 23, 2026 11:51:16 GMT+5.5)

Name: **J D Sitton**

Title: **CEO**

Date: **02/23/2026**

**LUMINO INDUSTRIES
LIMITED**

By: 
Amit Bajaj (Feb 21, 2026 17:22:18 GMT+5.5)

Name: **Amit Bajaj**

Title: **President**

Date: **02/21/2026**

ms

ms (Feb 22, 2026 21:38:34 PST)

EXHIBITS

These exhibits are provided as attachments to this Agreement. Save for Exhibit I, all exhibits may be changed from time to time as required by CTC. Revised exhibits will be provided to Manufacturer upon revision. Prior notice will be given when necessary for production and/or distribution by Manufacturer. Exhibit revision will not require revision or amendment to this Agreement.

Exhibit A – Product Specifications

Exhibit B – Qualification and Type Testing

Exhibit C – Reel Specification Requirements

Exhibit D – Product Handling and Storage

Exhibit E – Routine Tests

Exhibit F – Brand Manual

Exhibit G – Manufacturer Qualification for Aluminum Stranding of ACCC[®] Conductor

Exhibit G1 – Keystone Test

Exhibit H - ACCC[®] Core Specifications

Exhibit I – Minimum Performance Requirements

Exhibit J – Intangible Property

Exhibit K – Pre-Existing Arrangements Projects List

Exhibit A – ACCC® Conductor Specifications

ACCC® CONDUCTOR: US CUSTOMARY SIZES (metric units)																			
ACCC® Conductor	Available as UL5™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 60 Hz.	Capacitive Reactance @ 60Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® UL5™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	180°C	200°C				
Size Designation		(mm²)	(mm)	(mm)	(kg/km)	(kg/km)	(kg/km)	(kN)	(kN)	(ohm/km)	(ohm/km)	(ohm/km)	(amps)	(amps)	(amps)	(mm)	ohms/km	Mohm-km	Size
OCEANSIDE	–	194.2	17.27	5.97	588.0	535.6	52.4	71.1	–	0.1441	0.1475	0.2491	558	938	987	7.04	0.284	0.170	ACSR Ostrich
LINNET	–	218.1	18.29	5.97	653.7	601.3	74.2	98.2	–	0.1277	0.1307	0.2207	602	1,014	1,067	7.44	0.280	0.167	ACSR Linnet
ORIOLE	–	222.3	18.82	7.11	687.2	613.0	74.2	98.2	–	0.1255	0.1283	0.2166	612	1,033	1,087	7.74	0.277	0.166	ACSR Oriole
WACO	–	230.1	19.56	7.75	723.0	634.7	88.3	114.6	–	0.1212	0.1240	0.2108	628	1,060	1,115	8.08	0.274	0.164	ACSR Lynx
LAREDO	–	268.4	20.50	7.11	814.3	740.1	74.2	100.4	–	0.1038	0.1064	0.1805	687	1,162	1,223	8.35	0.271	0.162	ACSR Panther
IRVING	✓	308.8	22.40	8.76	964.8	851.8	113.0	147.5	173.4	0.0903	0.0926	0.1572	753	1,280	1,348	9.24	0.264	0.158	ACSR Hen
HAWK	–	309.7	21.79	7.11	928.0	853.8	74.2	103.0	–	0.0900	0.0923	0.1521	753	1,289	1,358	8.84	0.267	0.159	ACSR Hawk
DOVE	–	361.5	23.55	7.75	1084.8	996.5	88.3	121.7	–	0.0771	0.0792	0.1335	826	1,410	1,486	9.57	0.261	0.155	ACSR Dove
AMARILLO	✓	397.6	25.15	9.53	1229.7	1096.7	133.0	176.0	205.5	0.0703	0.0726	0.1220	879	1,506	1,587	10.33	0.255	0.152	ACSR Drake
GROSBEEK	–	416.2	25.15	8.13	1244.1	1147.0	97.1	135.1	–	0.0672	0.0692	0.1171	898	1,537	1,620	10.21	0.256	0.152	ACSR Grosbeak
LUBBOCK	✓	458.0	26.42	8.76	1374.7	1261.7	113.0	155.6	181.5	0.0608	0.0628	0.1061	956	1,640	1,729	10.73	0.252	0.150	
GALVESTON	✓	512.4	27.69	8.76	1525.0	1412.0	113.0	158.7	184.6	0.0544	0.0564	0.0949	1,022	1,760	1,856	11.22	0.249	0.148	ACSR Condor
DRAKE	✓	519.7	28.14	9.53	1565.6	1432.6	133.0	182.7	212.2	0.0536	0.0554	0.0931	1,036	1,786	1,884	11.46	0.247	0.147	ACSR Drake
CURLIEW	✓	523.4	28.96	10.54	1618.3	1455.3	163.0	217.7	254.5	0.0535	0.0558	0.0931	1,042	1,801	1,901	11.86	0.245	0.145	ACSR Curlew
PLANO	✓	536.8	28.63	8.76	1596.4	1483.4	113.0	160.0	185.9	0.0522	0.0544	0.0912	1,050	1,813	1,913	11.55	0.247	0.146	ACSR Zebra
CORPUS CHRISTI	✓	558.9	29.11	8.76	1656.0	1543.0	113.0	161.3	187.2	0.0501	0.0524	0.0877	1,076	1,859	1,962	11.73	0.246	0.145	AAAC 500
ARLINGTON	✓	583.2	29.90	9.53	1745.9	1612.9	133.0	186.3	215.8	0.0480	0.0502	0.0840	1,106	1,915	2,022	12.10	0.243	0.144	ACSR Deer
CARDINAL	✓	619.1	30.43	8.76	1822.6	1709.6	113.0	164.9	190.8	0.0452	0.0473	0.0787	1,146	1,990	2,101	12.25	0.242	0.143	ACSR Cardinal
FORT WORTH	✓	658.9	31.50	9.53	1952.7	1819.7	133.0	190.7	220.2	0.0425	0.0448	0.0746	1,189	2,067	2,183	12.71	0.240	0.141	AAAC Rubus
EL PASO	✓	684.0	31.80	8.76	2001.2	1888.2	113.0	168.5	194.4	0.0409	0.0434	0.0719	1,212	2,111	2,230	12.77	0.239	0.141	ACSR Moose
BEAUMONT	✓	723.9	32.87	9.53	2137.2	2004.2	133.0	194.3	223.8	0.0387	0.0411	0.0680	1,257	2,194	2,318	13.23	0.237	0.139	ACSR Finch
SAN ANTONIO	✓	747.3	33.40	9.78	2208.2	2068.2	140.0	203.9	235.3	0.0375	0.0387	0.0636	1,302	2,279	2,408	13.44	0.235	0.139	AAAC Sorbus
BITTERN	✓	801.4	34.16	8.76	2330.0	2217.0	113.0	175.1	201.0	0.0352	0.0375	0.0616	1,331	2,332	2,465	13.66	0.234	0.138	ACSR Bittern
DALLAS	✓	909.5	36.88	9.78	2668.0	2528.0	140.0	213.3	244.7	0.0309	0.0339	0.0545	1,434	2,540	2,688	14.78	0.228	0.134	
HOUSTON	✓	976.6	38.25	10.54	2876.9	2713.9	163.0	243.0	279.8	0.0285	0.0317	0.0503	1,502	2,675	2,833	15.36	0.225	0.132	ACSR Lapwing
LAPWING	✓	987.5	38.20	9.78	2883.7	2743.7	140.0	217.3	248.7	0.0285	0.0315	0.0506	1,502	2,665	2,821	15.27	0.226	0.132	ACSR Lapwing
FALCON	✓	1036.2	39.24	10.54	3042.1	2879.1	163.0	246.6	283.4	0.0271	0.0298	0.0480	1,555	2,761	2,923	15.73	0.223	0.131	ACSR Falcon
BLUEBIRD	✓	1388.7	44.75	10.54	4021.1	3858.1	163.0	266.1	302.9	0.0203	0.0240	0.0371	1,808	3,274	3,474	17.83	0.214	0.125	ACSR Bluebird

(1) ACCC® UL5™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the UL5 Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 60 Hz, zero elevation, 60 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 98 W/m² (1033 W/m²) at corresponding surface temperatures.

ACCC® CONDUCTOR: INTERNATIONAL SIZES (metric units)																
ACCC® Conductor	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength		Resistance			Ampacity (2)			Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 300°C	75°C	100°C	200°C	
Size Designation		(mm²)	(mm)	(mm)	(kg/km)	(kg/km)	(kg/km)	(kN)	(kN)	(ohm/km)	(ohm/km)	(ohm/km)	(amps)	(amps)	(amps)	Size
SILVASSA	—	122.7	14.35	5.97	392.3	339.9	52.4	67.3	—	0.2286	0.2335	0.3945	423	705	741	ACSR Coyote
HELSINKI	—	150.6	15.65	5.97	469.4	417.0	52.4	88.9	—	0.1862	0.1902	0.3214	479	802	843	ACSR Coyote
JAIPUR	—	155.7	16.50	7.75	522.3	434.0	86.3	110.5	—	0.1801	0.1839	0.3109	494	826	871	ACSR Coyote
ZADAR	—	177.4	17.10	7.11	564.2	490.0	74.2	95.7	—	0.1576	0.1611	0.2720	533	895	942	ACSR Dove
ROVINJ	—	189.3	17.10	5.97	574.8	522.4	52.4	71.0	—	0.1487	0.1520	0.2566	548	922	970	ACSR Dove
COPENHAGEN	—	219.9	18.29	5.97	659.4	607.0	52.4	72.8	—	0.1272	0.1301	0.2197	603	1,017	1,070	ACSR Linnet
REYKJAVIK	—	223.1	18.82	7.11	691.9	617.7	74.2	98.2	—	0.1256	0.1285	0.2169	612	1,032	1,086	ACSR Oriole
GDANSK	—	248.8	19.20	5.97	741.1	688.7	52.4	74.4	—	0.1126	0.1153	0.1945	649	1,097	1,154	ACSR Oriole
MONTE CARLO	✓	228.5	20.78	10.54	797.8	634.8	163.0	201.2	238.0	0.1230	0.1257	0.2123	634	1,076	1,133	AFL-6 285 (Poland)
GLASGOW	—	236.7	19.53	7.75	743.1	654.8	86.3	115.0	—	0.1184	0.1211	0.2044	636	1,076	1,132	ACSR Lynx
CASABLANCA	—	273.6	20.50	7.11	832.2	758.0	74.2	101.1	—	0.1024	0.1049	0.1768	692	1,174	1,236	ACSR Lynx
OBLO	✓	313.8	22.40	8.76	980.7	867.7	113.0	147.9	173.8	0.0893	0.0915	0.1543	758	1,291	1,360	ACSR Panther
LISBON	—	315.5	21.79	7.11	946.1	871.9	74.2	103.4	—	0.0887	0.0910	0.1532	755	1,285	1,353	ACSR Hen
AMSTERDAM	—	367.4	23.55	7.75	1103.6	1015.3	86.3	122.4	—	0.0762	0.0784	0.1317	831	1,419	1,496	ACSR Hawk
VANCOUVER	✓	383.2	25.00	10.54	1222.0	1059.0	163.0	209.7	245.5	0.0730	0.0750	0.1261	863	1,478	1,558	ACSR Dove
CORDOBA	—	399.4	24.41	7.75	1190.8	1102.5	86.3	124.2	—	0.0700	0.0724	0.1214	873	1,495	1,576	Long Span Crossings
LEIPZIG	✓	406.4	25.14	9.53	1258.1	1125.1	133.0	176.7	206.2	0.0690	0.0710	0.1193	886	1,522	1,605	ACSR Condor
BRUSSELS	—	421.4	25.15	8.13	1263.8	1166.7	97.1	135.7	—	0.0666	0.0687	0.1152	904	1,549	1,633	ACSR Drake
STOCKHOLM 3L	✓	453.7	26.40	8.76	1367.8	1254.8	113.0	155.7	181.6	0.0617	0.0637	0.1068	950	1,633	1,723	ACSR Zebra
STOCKHOLM 2L	✓	463.3	26.40	8.76	1394.6	1281.6	113.0	156.3	182.2	0.0605	0.0625	0.1047	950	1,650	1,740	ACSR Zebra
WARSAW	✓	507.5	27.72	8.76	1519.3	1406.3	113.0	158.8	184.7	0.0553	0.0573	0.0958	1,015	1,751	1,848	ACSR Zebra
DUBLIN	✓	524.5	28.14	9.53	1584.2	1451.2	133.0	183.3	212.8	0.0534	0.0553	0.0925	1,037	1,791	1,889	AAAC 500
KOLKATA	✓	538.9	28.62	9.53	1621.7	1488.7	133.0	184.1	213.6	0.0519	0.0538	0.0896	1,058	1,829	1,930	ACSR Deer
MAHAKAM	✓	544.9	29.00	10.54	1669.0	1506.0	163.0	218.9	255.7	0.0514	0.0534	0.0893	1,063	1,840	1,942	ACSR Cardinal
HAMBURG	✓	546.4	28.62	8.76	1626.8	1513.8	113.0	160.9	186.8	0.0514	0.0534	0.0891	1,061	1,834	1,936	AAAC Rubus
MILAN	✓	567.7	29.10	8.76	1685.6	1572.6	113.0	162.1	188.0	0.0494	0.0514	0.0857	1,086	1,880	1,984	ACSR Rubus
ROME	✓	592.5	29.89	9.53	1774.9	1641.9	133.0	187.1	216.6	0.0474	0.0494	0.0822	1,117	1,936	2,044	AAAC 600
VIENNA	✓	629.2	30.42	8.76	1852.2	1739.2	113.0	165.6	191.5	0.0445	0.0466	0.0773	1,156	2,007	2,120	ACSR Finch
BUDAPEST	✓	668.3	31.50	9.53	1984.5	1851.5	133.0	191.4	220.9	0.0420	0.0440	0.0730	1,200	2,089	2,206	ACSR Cardinal
MUMBAI	✓	685.4	31.77	9.53	2035.6	1902.6	133.0	192.4	221.9	0.0410	0.0431	0.0713	1,217	2,119	2,239	AAAC Rubus
PRAGUE	✓	690.7	31.77	8.76	2030.2	1917.2	113.0	169.1	195.0	0.0407	0.0428	0.0706	1,220	2,126	2,246	ACSR Moose
DHAKA	✓	723.9	32.87	9.53	2137.2	2004.2	133.0	194.5	224.0	0.0387	0.0411	0.0680	1,257	2,194	2,318	ACSR Moose
MUNICH	✓	733.2	32.85	9.53	2170.9	2037.9	133.0	195.0	224.5	0.0384	0.0405	0.0669	1,266	2,212	2,337	ACSR Finch
WARWICK	✓	749.5	33.40	10.54	2241.6	2078.6	163.0	230.5	267.3	0.0375	0.0395	0.0654	1,287	2,248	2,375	AAAC Sorbus
LONDON	✓	759.0	33.40	9.78	2244.9	2104.9	140.0	204.8	236.2	0.0370	0.0391	0.0644	1,295	2,265	2,393	AAAC Sorbus
PARIS	✓	813.7	34.16	8.76	2365.8	2252.8	113.0	176.0	201.9	0.0345	0.0368	0.0603	1,344	2,358	2,493	ACSR Bittern
BORDEAUX	✓	880.9	35.76	10.54	2601.0	2438.0	163.0	237.9	274.7	0.0318	0.0340	0.0557	1,416	2,490	2,633	ACSR Falcon/TW
ANTWERP	✓	944.9	36.85	9.78	2756.5	2616.5	140.0	215.3	245.7	0.0297	0.0321	0.0521	1,471	2,599	2,749	ACSR 617/AAAC 620
BERLIN	✓	1006.5	38.20	10.54	2947.9	2784.9	163.0	244.9	281.7	0.0278	0.0303	0.0488	1,532	2,714	2,873	ACSR Bittern
MADRID	✓	1013.1	38.20	9.78	2944.3	2804.3	140.0	219.1	250.5	0.0275	0.0302	0.0485	1,535	2,722	2,882	ACSR Lapwing
ATHENS	✓	1409.7	44.75	10.54	4064.4	3901.4	163.0	267.6	304.4	0.0199	0.0231	0.0357	1,844	3,336	3,540	ACSR Bluebird

(1) ACCC® ULS™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the ULS® Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 60 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 96 W/m²(1033 W/m²), at corresponding surface temperatures.

ACCC® AZR™ CONDUCTOR: US CUSTOMARY SIZES (metric units)																
ACCC® AZR™ Conductor (3)	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 300°C	75°C	100°C	200°C	
Size Designation		(mm²)	(mm)	(mm)	(kg/km)	(kg/km)	(kg/km)	(kN)	(kN)	(ohm/km)	(ohm/km)	(ohm/km)	(amps)	(amps)	(amps)	Size
AZR™ OCEANSIDE	—	194.2	17.27	5.97	590.7	538.3	52.4	72.4	—	0.1512	0.1547	0.2604	545	918	965	ACSR Oriole
AZR™ LINNET	—	218.1	18.29	5.97	657.1	604.7	52.4	75.5	—	0.1347	0.1379	0.2319	586	990	1,041	ACSR LINNET
AZR™ ORIOLE	—	222.3	18.82	7.11	690.2	616.0	74.2	95.4	—	0.1321	0.1352	0.2275	597	1,008	1,061	ACSR Oriole
AZR™ IRVING	✓	308.8	22.40	8.76	969.0	856.0	113.0	140.8	160.2	0.0951	0.0976	0.1639	735	1,253	1,320	ACSR Hawk
AZR™ HAWK	—	309.7	21.79	7.11	932.7	858.5	74.2	107.4	—	0.0948	0.0974	0.1635	731	1,244	1,310	ACSR Hawk
AZR™ DOVE	—	361.5	23.55	7.75	1089.5	1001.2	86.3	126.6	—	0.0812	0.0836	0.1401	805	1,376	1,451	ACSR Dove
AZR™ GROSBEAK	—	416.2	25.15	8.13	1249.6	1152.5	97.1	142.3	—	0.0705	0.0729	0.1216	878	1,506	1,588	ACSR Grosbeak
AZR™ AMARILLO	✓	397.6	25.15	9.53	1234.1	1101.1	133.0	171.0	193.1	0.0738	0.0761	0.1274	859	1,473	1,553	ACSR AMARILLO
AZR™ LUBBOCK	✓	458.0	26.42	8.76	1381.3	1268.3	113.0	161.8	181.2	0.0641	0.0664	0.1108	932	1,604	1,692	ACSR Drake
AZR™ DRAKE	✓	519.7	28.14	9.53	1573.4	1440.4	133.0	187.9	210.0	0.0565	0.0588	0.0979	1,007	1,741	1,837	ACSR DRAKE
AZR™ CURLEW	✓	523.4	28.96	10.54	1613.9	1450.9	163.0	214.2	241.8	0.0561	0.0583	0.0972	1,019	1,763	1,860	ACSR CURLEW
AZR™ ARLINGTON (2/1)	✓	583.2	29.90	9.53	1749.8	1616.8	133.0	170.1	192.2	0.0492	0.0516	0.0862	1,091	1,890	1,995	ACSR Deer
AZR™ BEAUMONT (2/1)	✓	723.9	32.87	9.53	2141.7	2008.7	133.0	183.5	205.6	0.0396	0.0423	0.0699	1,239	2,163	2,286	ACSR Finch
AZR™ SAN ANTONIO (2/1)	✓	747.3	33.40	9.78	2213.8	2073.8	140.0	191.9	215.4	0.0384	0.0402	0.0659	1,278	2,239	2,366	AAAC Sorbus
AZR™ BITTERN (2/1)	✓	801.4	34.16	8.76	2334.7	2221.7	113.0	173.3	192.7	0.0358	0.0388	0.0634	1,310	2,298	2,430	ACSR BITTERN
AZR™ LAPWING (2/1)	✓	987.5	38.20	9.78	2891.0	2751.0	140.0	214.6	238.1	0.0292	0.0325	0.0523	1,479	2,622	2,776	ACSR LAPWING
AZR™ FALCON (2/1)	✓	1036.2	39.24	10.54	3049.5	2886.5	163.0	237.7	265.3	0.0278	0.0311	0.0499	1,524	2,708	2,867	ACSR FALCON
AZR™ BLUEBIRD (2/1)	✓	1388.7	44.75	10.54	4031.7	3868.7	163.0	272.0	299.6	0.0208	0.0249	0.0384	1,777	3,218	3,415	ACSR BLUEBIRD

(1) ACCC® ULS™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the ULS® Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 60 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 96 W/m²(1033 W/m²), at corresponding surface temperatures.
(3) Numbers after name designate the number of layers of each alloy. First number designates the number of layers with the inner layer, second number designates the number of layers with the higher strength alloy on the outer layers.
(4) Strength at ambient temperature. Based on 98% of the 1350-O minimum tensile strength (8.5 kN/58.8 Mpa) and 90% of the AT3 minimum tensile strength (22.5 kN/155 Mpa) and 75% of the composite core minimum tensile strength.

ACCC® AZR™ CONDUCTOR: INTERNATIONAL SIZES (metric units)																
ACCC® Conductor (3)	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C	
Size Designation		(mm²)	(mm)	(mm)	(kg/km)	(kg/km)	(kg/km)	(kN)	(kN)	(ohm/km)	(ohm/km)	(ohm/km)	(amps)	(amps)	(amps)	Size
AZR™ SILVASSA	–	122.7	14.35	5.97	392.4	340.0	52.4	62.2	–	0.2400	0.2450	0.4130	413	689	724	
AZR™ HELSINKI	–	150.6	15.65	5.97	470.1	417.7	52.4	66.2	–	0.1958	0.1999	0.3369	467	783	823	
AZR™ ROVINJ	–	187.8	17.09	5.97	572.3	519.9	52.4	71.5	–	0.1566	0.1601	0.2696	535	899	946	
AZR™ JAIPUR	–	155.7	16.51	7.75	523.2	434.9	86.3	98.1	–	0.1906	0.1946	0.3279	481	807	848	ACSR COYOTE
AZR™ ZADAR	–	177.4	17.09	7.11	565.2	491.0	74.2	89.2	–	0.1658	0.1694	0.2854	520	874	919	
AZR™ COPENHAGEN	–	219.9	18.29	5.97	660.5	608.1	52.4	76.0	–	0.1337	0.1367	0.2301	589	993	1,045	ACSR LINNET
AZR™ REYKJAVIK	–	223.1	18.82	7.11	692.9	618.7	74.2	95.4	–	0.1322	0.1351	0.2275	597	1,008	1,061	ACSR ORIOLE
AZR™ MONTE CARLO	✓	228.5	20.78	10.54	799.2	636.2	163.0	173.2	200.8	0.1295	0.1323	0.2228	619	1,050	1,106	LONG SPAN CROSSINGS
AZR™ GLASGOW	–	236.7	19.53	7.75	744.2	655.9	86.3	109.2	–	0.1245	0.1273	0.2142	621	1,051	1,106	ACSR LYNX
AZR™ CASABLANCA	–	273.6	20.50	7.11	833.8	759.6	74.2	102.6	–	0.1079	0.1104	0.1858	675	1,145	1,206	ACSR PANTHER
AZR™ OSLO	✓	313.8	22.40	8.76	982.4	869.4	113.0	141.3	160.7	0.0939	0.0962	0.1617	740	1,261	1,329	ACSR HEN
AZR™ LISBON	–	315.5	21.79	7.11	947.6	873.4	74.2	108.3	–	0.0933	0.0956	0.1607	737	1,254	1,321	ACSR HAWK
AZR™ AMSTERDAM	–	367.4	23.55	7.75	1105.3	1017.0	86.3	127.5	–	0.0801	0.0823	0.1381	811	1,386	1,461	ACSR DOVE
AZR™ LEIPZIG	✓	406.4	25.15	9.53	1260.2	1127.2	133.0	171.9	194.0	0.0725	0.0745	0.1251	867	1,497	1,567	ACSR GROSEBEAK
AZR™ BRUSSELS	–	421.4	25.15	8.13	1265.9	1168.8	97.1	142.7	–	0.0700	0.0721	0.1207	882	1,513	1,595	ACSR GROSEBEAK
AZR™ CALGARY	✓	416.6	25.70	9.53	1295.5	1162.5	133.0	173.7	195.8	0.0703	0.0725	0.1214	885	1,519	1,602	ACSR DRAKE
AZR™ STOCKHOLM 2L	✓	463.3	26.39	8.76	1396.6	1283.6	113.0	162.2	181.6	0.0636	0.0656	0.1098	937	1,611	1,699	
AZR™ WARSAW (2/1)	✓	507.5	27.71	8.76	1521.9	1408.9	113.0	144.9	164.3	0.0565	0.0586	0.0987	1,003	1,726	1,820	ACSR CONDOR
AZR™ DUBLIN	✓	524.5	28.14	9.53	1596.2	1453.2	133.0	188.4	210.5	0.0562	0.0581	0.0971	1,013	1,748	1,844	ACSR DRAKE
AZR™ TORONTO (1/1)	✓	503.8	28.14	10.54	1559.4	1396.4	163.0	196.0	222.6	0.0573	0.0595	0.0998	1,000	1,724	1,819	ACSR DRAKE
AZR™ MILAN (2/1)	✓	567.7	29.11	8.76	1689.0	1576.0	113.0	150.6	170.0	0.0505	0.0526	0.0883	1,073	1,853	1,955	AAAC 500
AZR™ BUDAPEST (2/1)	✓	668.3	31.50	9.53	1988.3	1855.3	133.0	177.7	199.8	0.0429	0.0450	0.0752	1,185	2,058	2,173	AAAC Rubus
AZR™ MUNICH (2/1)	✓	733.2	32.84	9.53	2174.4	2041.4	133.0	183.9	206.0	0.0393	0.0414	0.0690	1,260	2,178	2,300	ACSR Finch
AZR™ WARWICK (2/1)	✓	749.5	33.40	10.54	2245.8	2082.8	163.0	211.0	238.6	0.0383	0.0404	0.0673	1,271	2,217	2,342	AAAC Sortus
AZR™ PARIS (2/1)	✓	813.7	34.16	8.76	2378.5	2265.5	113.0	173.8	193.2	0.0354	0.0377	0.0623	1,326	2,320	2,451	ACSR Bittem
AZR™ ANTWERP (2/1)	✓	944.9	36.86	9.78	2760.7	2620.7	140.0	209.7	233.2	0.0303	0.0327	0.0537	1,454	2,560	2,708	ACSR 617/AAAC 620
AZR™ BERLIN (2/1)	✓	1006.5	38.20	10.54	2951.8	2788.8	163.0	234.2	261.8	0.0285	0.0309	0.0505	1,512	2,670	2,825	ACSR LAPWING
AZR™ ATHENS (3/1)	✓	1409.7	44.75	10.54	4068.8	3905.8	163.0	261.7	289.3	0.0203	0.0234	0.0369	1,826	3,285	3,483	ACSR BLUEBIRD

- (1) ACCC® ULS™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the ULS Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 50 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 90 WdR/(1033 Whr²), at corresponding surface temperatures.
(3) Numbers after name designate the number of layers of each alloy. First number designates the number of layers with the lower tensile strength alloy starting with the inner layer, second number designates the number of layers with the higher strength alloy on the outer layers.
(4) Strength at ambient temperature. Based on 90% of the 1350-O minimum tensile strength (8.5 ksi/58.6 Mpa) and 90% of the AT3 minimum tensile strength (22.5 ksi/155 Mpa) and 75% of the composite core minimum tensile strength.

ACCC® CONDUCTOR FOR DISTRIBUTION (metric units)																
ACCC® Conductor (3)	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C	
Size Designation		(mm²)	(mm)	(mm)	(kg/km)	(kg/km)	(kg/km)	(kN)	(kN)	(ohm/km)	(ohm/km)	(ohm/km)	(amps)	(amps)	(amps)	Size
AZR™ BRIGHTON-Z	–	57.6	10.06	4.83	192.2	158.0	34.2	37.6	–	0.5073	0.5175	0.8726	259	427	448	ACSR 1/0 - ACSR RABBIT
CAMBRIDGE	–	131.0	14.15	4.83	394.3	360.1	34.2	47.1	–	0.2125	0.2170	0.3668	437	728	765	ACSR DOG
AZR™ CAMBRIDGE	–	131.0	14.15	4.83	394.3	360.1	34.2	47.8	–	0.2231	0.2278	0.3839	427	712	748	ACSR DOG
ODESSA	–	128.0	14.35	4.83	387.6	353.4	34.2	46.6	–	0.2187	0.2234	0.3779	432	720	757	ACSR 4/0 - PENGUIN
AZR™ ODESSA	–	128.0	14.35	4.83	386.5	352.3	34.2	47.4	–	0.2279	0.2326	0.3920	424	707	743	ACSR 4/0 - PENGUIN
CORONADO	–	179.5	16.31	4.83	530.6	496.4	34.2	49.7	–	0.1560	0.1594	0.2693	529	887	933	ACSR 228.8 kcmil PARTROCK
AZR™ CORONADO	–	179.5	16.31	4.83	530.6	496.4	34.2	54.5	–	0.1638	0.1674	0.2819	516	867	912	ACSR 228.8 kcmil PARTROCK
OCEANSIDE	–	194.2	17.27	5.97	588.0	535.6	52.4	71.1	–	0.1441	0.1475	0.2491	558	938	987	ACSR 336 kcmil MERLIN
AZR OCEANSIDE	–	194.2	17.27	5.97	590.7	538.3	52.4	72.4	–	0.1512	0.1547	0.2604	545	918	965	ACSR 336 kcmil MERLIN

- (1) ACCC® ULS™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the ULS Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 90 WdR/(1033 Whr²), at corresponding surface temperatures.
(3) The -Z designates the conductor is single layer, Z-shaped wires.
(4) For AZR™ Conductors, strength at ambient temperature based on 90% of the AT3 minimum tensile strength (22.5 ksi/155 Mpa) and 75% of the composite core minimum tensile strength.

US Units

ACCC* CONDUCTOR: US CUSTOMARY SIZES (US units)																			
ACCC* Conductor	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 60 Hz.	Capacitive Reactance @ 60Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC* Core	w/ACCC* ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C				
Size Designation		(kcmil)	(in.)	(in.)	(lb/ft)	(lb/ft)	(lb/ft)	(kibf)	(kibf)	(ohm/mile)	(ohm/mile)	(ohm/mile)	(amps)	(amps)	(amps)	(ft)	ohms/mile	Mohm-mile	Size
OCEANSIDE	–	363.2	0.680	0.235	395.2	360.0	35.2	16.0	–	0.2319	0.2374	0.4009	558	938	987	0.0231	0.4572	0.1057	ACSR Ostrich
LINNET	–	430.5	0.720	0.235	439.3	404.1	35.2	16.3	–	0.2055	0.2103	0.3552	602	1,014	1,067	0.0244	0.4506	0.1040	ACSR Linnet
ORIOLE	–	438.6	0.741	0.280	462.0	412.0	50.0	22.1	–	0.2019	0.2065	0.3486	612	1,033	1,087	0.0254	0.4457	0.1032	ACSR Oriole
WACO	–	454.0	0.770	0.305	485.9	426.6	59.3	25.8	–	0.1951	0.1996	0.3393	628	1,060	1,115	0.0265	0.4405	0.1020	ACSR Lynx
LAREDO	–	529.8	0.807	0.280	547.4	497.4	50.0	22.6	–	0.1671	0.1712	0.2905	687	1,162	1,223	0.0274	0.4365	0.1006	ACSR Panther
IRVING	✓	609.5	0.882	0.345	648.3	572.5	75.8	33.2	39.0	0.1454	0.1491	0.2530	753	1,280	1,348	0.0303	0.4243	0.0980	ACSR Hen
HAWK	–	611.3	0.858	0.280	623.8	573.8	50.0	23.2	–	0.1448	0.1485	0.2448	753	1,289	1,358	0.0290	0.4296	0.0988	ACSR Hawk
DOVE	–	713.5	0.927	0.305	729.0	669.7	59.3	27.4	–	0.1240	0.1274	0.2149	826	1,410	1,486	0.0314	0.4200	0.0965	ACSR Dove
AMARILLO	–	784.7	0.990	0.375	826.3	737.1	89.2	39.6	46.2	0.1132	0.1168	0.1963	879	1,506	1,587	0.0339	0.4107	0.0946	ACSR Drake
GROSBEEK	–	821.4	0.990	0.320	836.1	770.9	65.2	30.4	–	0.1081	0.1114	0.1884	898	1,537	1,620	0.0335	0.4121	0.0946	ACSR Grosbeak
LUBBOCK	✓	903.9	1.040	0.345	923.8	848.0	75.8	35.0	40.8	0.0979	0.1011	0.1707	956	1,640	1,729	0.0352	0.4061	0.0931	
GALVESTON	✓	1011.3	1.090	0.345	1024.8	949.0	75.8	35.7	41.5	0.0875	0.0907	0.1527	1,022	1,760	1,856	0.0368	0.4007	0.0917	ACSR Condor
DRAKE	✓	1025.6	1.108	0.375	1052.0	962.8	89.2	41.1	47.7	0.0863	0.0892	0.1498	1,036	1,786	1,884	0.0376	0.3981	0.0912	ACSR Drake
CURLEW	✓	1033.0	1.140	0.415	1088.1	978.1	110.0	48.9	57.2	0.0862	0.0898	0.1498	1,042	1,801	1,901	0.0389	0.3940	0.0904	ACSR Curlew
PLANO	✓	1059.5	1.127	0.345	1072.8	997.0	75.8	36.0	41.8	0.0840	0.0876	0.1468	1,050	1,813	1,913	0.0379	0.3971	0.0907	ACSR Zebra
CORPUS CHRISTI	✓	1103.0	1.146	0.345	1112.8	1037.0	75.8	36.3	42.1	0.0806	0.0843	0.1411	1,076	1,859	1,962	0.0385	0.3952	0.0902	AAAC 500
ARLINGTON	✓	1151.0	1.177	0.375	1173.2	1084.0	89.2	41.9	48.5	0.0773	0.0809	0.1352	1,106	1,915	2,022	0.0397	0.3915	0.0894	ACSR Deer
CARDINAL	✓	1221.8	1.198	0.345	1224.8	1149.0	75.8	37.1	42.9	0.0728	0.0762	0.1266	1,146	1,990	2,101	0.0402	0.3900	0.0889	ACSR Cardinal
FORT WORTH	✓	1300.4	1.240	0.375	1312.2	1223.0	89.2	42.9	49.5	0.0684	0.0721	0.1200	1,189	2,067	2,183	0.0417	0.3855	0.0879	AAAC Rubus
EL PASO	✓	1349.9	1.252	0.345	1344.8	1269.0	75.8	37.9	43.7	0.0659	0.0698	0.1157	1,212	2,111	2,230	0.0419	0.3850	0.0876	ACSR Moose
BEAUMONT	✓	1428.6	1.294	0.375	1436.2	1347.0	89.2	43.7	50.3	0.0623	0.0661	0.1094	1,257	2,194	2,318	0.0434	0.3807	0.0866	ACSR Finch
SAN ANTONIO	✓	1474.9	1.315	0.385	1484.1	1390.0	94.1	45.8	52.9	0.0603	0.0623	0.1024	1,302	2,279	2,408	0.0441	0.3787	0.0861	AAAC Sorbus
BITTERN	✓	1581.6	1.345	0.345	1585.8	1490.0	75.8	39.4	45.2	0.0566	0.0603	0.0992	1,331	2,332	2,465	0.0448	0.3768	0.0855	ACSR Bittern
DALLAS	✓	1794.9	1.452	0.385	1793.1	1699.0	94.1	47.9	55.0	0.0497	0.0546	0.0877	1,434	2,540	2,688	0.0485	0.3672	0.0832	
HOUSTON	✓	1927.4	1.506	0.415	1934.0	1824.0	110.0	54.6	62.9	0.0459	0.0510	0.0809	1,502	2,675	2,833	0.0504	0.3625	0.0821	ACSR Lapwing
LAPWING	✓	1948.9	1.504	0.385	1938.1	1844.0	94.1	48.8	55.9	0.0458	0.0507	0.0815	1,502	2,665	2,821	0.0501	0.3633	0.0822	ACSR Lapwing
FALCON	✓	2045.1	1.545	0.415	2045.0	1935.0	110.0	55.4	63.7	0.0436	0.0479	0.0773	1,555	2,761	2,923	0.0516	0.3597	0.0814	ACSR Falcon
BLUEBIRD	✓	2740.6	1.762	0.415	2703.0	2593.0	110.0	59.8	68.1	0.0326	0.0387	0.0597	1,808	3,274	3,474	0.0585	0.3445	0.0775	ACSR Bluebird

(1) ACCC* ULS™ Core has a slightly lower weight than ACCC* Core, and thus the total weight of the ULS Conductor will be a less. See individual data sheets for nominal weight.

(2) Ampacity values based on IEEE 738-2006: 60 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 96 W/m² (103 W/m²), at corresponding surface temperatures.

ACCC® CONDUCTOR: INTERNATIONAL SIZES (US Units)																			
ACCC® Conductor	Available as UL5™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 50 Hz.	Capacitive Reactance @ 50Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ACCC® UL5™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C				
Size Designation		(kcmil)	(in.)	(in.)	(lb/ft)	(lb/ft)	(lb/ft)	(kibf)	(kibf)	(ohm/mile)	(ohm/mile)	(ohm/mile)	(amps)	(amps)	(amps)	(ft)	ohms/mile	Mohm-mile	Size
SILVASSA	–	242.2	0.565	0.235	264	228.4	35.2	15.2	–	0.3679	0.3759	0.6349	423	705	741	0.0196	0.3976	0.1334	
HELSINKI	–	297.2	0.616	0.235	315	280.3	35.2	15.5	–	0.2997	0.3061	0.5172	479	802	843	0.0211	0.3902	0.1304	
JAIPUR	–	307.3	0.650	0.305	351	291.7	59.3	24.9	–	0.2898	0.2959	0.5003	494	828	871	0.0228	0.3823	0.1285	ACSR Coyote
ZADAR	–	350.1	0.673	0.280	379	329.3	50.0	21.5	–	0.2536	0.2593	0.4378	533	895	942	0.0233	0.3801	0.1272	
ROVINJ	–	373.6	0.673	0.235	386	351.1	35.2	16.0	–	0.2393	0.2446	0.4130	548	922	970	0.0229	0.3819	0.1272	
COPENHAGEN	–	434.0	0.720	0.235	443	408.0	35.2	16.4	–	0.2047	0.2094	0.3535	603	1,017	1,070	0.0244	0.3755	0.1248	ACSR Linnet
REYKJAVIK	–	440.3	0.741	0.280	465	415.2	50.0	22.1	–	0.2021	0.2067	0.3490	612	1,032	1,086	0.0254	0.3714	0.1238	ACSR Oriole
GDANSK	–	491.0	0.756	0.235	498	462.9	35.2	16.8	–	0.1812	0.1856	0.3130	649	1,097	1,154	0.0255	0.3710	0.1231	AFL-6 285 (Poland)
MONTE CARLO	✓	451.0	0.818	0.415	537	426.6	110.0	45.2	53.5	0.1979	0.2023	0.3417	634	1,076	1,133	0.0291	0.3577	0.1203	Long Span Crossings
GLASGOW	–	467.1	0.769	0.305	499	440.1	59.3	25.9	–	0.1905	0.1949	0.3269	636	1,076	1,132	0.0265	0.3671	0.1225	ACSR Lynx
CASABLANCA	–	540.0	0.807	0.280	559	509.4	50.0	22.8	–	0.1648	0.1688	0.2846	692	1,174	1,236	0.0274	0.3637	0.1208	ACSR Panther
OSLO	✓	619.3	0.882	0.345	659	583.2	75.8	33.3	39.1	0.1437	0.1473	0.2483	758	1,291	1,360	0.0303	0.3536	0.1176	ACSR Hen
LISBON	–	622.7	0.858	0.280	636	586.0	50.0	23.3	–	0.1427	0.1464	0.2466	755	1,285	1,353	0.0290	0.3580	0.1186	ACSR Hawk
AMSTERDAM	–	725.1	0.927	0.305	742	682.4	59.3	27.6	–	0.1226	0.1261	0.2120	831	1,419	1,496	0.0314	0.3500	0.1158	ACSR Dove
VANCOUVER	✓	756.3	0.984	0.415	822	711.7	110.0	47.1	55.4	0.1175	0.1207	0.2029	863	1,478	1,558	0.0341	0.3416	0.1137	Long Span Crossings
CORDOBA	–	788.2	0.961	0.305	800	741.0	59.3	28.0	–	0.1127	0.1165	0.1954	873	1,495	1,576	0.0324	0.3468	0.1145	
LEIPZIG	✓	802.1	0.990	0.375	845	756.2	89.2	39.7	46.3	0.1110	0.1143	0.1920	888	1,522	1,605	0.0339	0.3422	0.1135	ACSR Grosbeak
BRUSSELS	–	831.7	0.990	0.320	849	784.1	65.2	30.5	–	0.1072	0.1105	0.1854	904	1,549	1,633	0.0335	0.3434	0.1135	ACSR Grosbeak
STOCKHOLM 3L	✓	895.4	1.039	0.345	919	843.3	75.8	35.0	40.8	0.0993	0.1025	0.1719	950	1,633	1,723	0.0352	0.3384	0.1117	
STOCKHOLM 2L	✓	914.3	1.039	0.345	937	861.3	75.8	35.2	41.0	0.0974	0.1006	0.1685	960	1,650	1,740	0.0352	0.3384	0.1117	
WARSAW	✓	1001.6	1.091	0.345	1021	945.2	75.8	35.7	41.5	0.0890	0.0922	0.1542	1,015	1,751	1,848	0.0368	0.3339	0.1100	ACSR Condor
DUBLIN	✓	1035.1	1.108	0.375	1065	975.3	89.2	41.2	47.8	0.0859	0.0891	0.1489	1,037	1,791	1,889	0.0376	0.3317	0.1095	ACSR Drake
KOLKATA	✓	1063.5	1.127	0.375	1090	1000.5	89.2	41.4	48.0	0.0835	0.0866	0.1442	1,058	1,829	1,930	0.0382	0.3301	0.1089	ACSR Zebra
MAHAKAM	✓	1075.4	1.142	0.415	1122	1012.2	110.0	49.2	57.5	0.0827	0.0863	0.1437	1,063	1,840	1,942	0.0390	0.3280	0.1084	Long Span Crossings
HAMBURG	✓	1078.4	1.127	0.345	1093	1017.4	75.8	36.2	42.0	0.0827	0.0860	0.1434	1,061	1,834	1,936	0.0379	0.3309	0.1089	ACSR Zebra
MILAN	✓	1120.4	1.146	0.345	1133	1056.9	75.8	36.5	42.3	0.0795	0.0828	0.1379	1,086	1,880	1,984	0.0385	0.3294	0.1083	AAAC 500
ROME	✓	1169.3	1.177	0.375	1193	1103.5	89.2	42.1	48.7	0.0763	0.0795	0.1323	1,117	1,936	2,044	0.0397	0.3262	0.1073	ACSR Deer
VIENNA	✓	1241.8	1.198	0.345	1245	1168.9	75.8	37.3	43.1	0.0716	0.0750	0.1244	1,156	2,007	2,120	0.0402	0.3250	0.1067	ACSR Cardinal
BUDAPEST	✓	1318.9	1.240	0.375	1334	1244.4	89.2	43.1	49.7	0.0676	0.0709	0.1175	1,200	2,089	2,206	0.0417	0.3213	0.1055	AAAC Rubus
MUMBAI	✓	1352.7	1.251	0.375	1368	1278.7	89.2	43.3	49.9	0.0660	0.0693	0.1147	1,217	2,119	2,239	0.0421	0.3203	0.1052	ACSR Moose
PRAGUE	✓	1363.1	1.251	0.345	1364	1288.5	75.8	38.0	43.8	0.0655	0.0690	0.1140	1,220	2,126	2,246	0.0418	0.3210	0.1052	ACSR Moose
DHAKA	✓	1428.6	1.294	0.375	1436	1347.0	89.2	43.2	50.3	0.0623	0.0661	0.1094	1,257	2,194	2,318	0.0434	0.3172	0.1039	ACSR Finch
MUNICH	✓	1447.0	1.293	0.375	1459	1369.6	89.2	43.9	50.5	0.0618	0.0652	0.1076	1,266	2,212	2,337	0.0434	0.3172	0.1040	ACSR Finch
WARWICK	✓	1479.2	1.315	0.415	1507	1397.0	110.0	51.8	60.1	0.0604	0.0636	0.1053	1,287	2,248	2,375	0.0444	0.3149	0.1034	AAAC Sorbus
LONDON	✓	1497.9	1.315	0.385	1509	1414.7	94.1	46.0	53.1	0.0595	0.0630	0.1037	1,295	2,265	2,393	0.0441	0.3156	0.1034	AAAC Sorbus
PARIS	✓	1605.9	1.345	0.345	1590	1514.1	75.8	39.6	45.4	0.0555	0.0593	0.0970	1,344	2,358	2,493	0.0448	0.3140	0.1026	ACSR Bittern
BORDEAUX	✓	1738.5	1.408	0.415	1749	1638.5	110.0	53.4	61.7	0.0512	0.0547	0.0896	1,416	2,490	2,633	0.0473	0.3085	0.1009	ACSR Falcon/TW
ANTWERP	✓	1864.8	1.451	0.385	1853	1758.5	94.1	48.4	55.5	0.0478	0.0517	0.0838	1,471	2,599	2,749	0.0484	0.3062	0.0999	ACSR 617/AAAC 620
BERLIN	✓	1986.4	1.504	0.415	1982	1871.7	110.0	55.0	63.3	0.0447	0.0487	0.0786	1,532	2,714	2,873	0.0503	0.3023	0.0986	ACSR Lapwing
MADRID	✓	1999.4	1.504	0.385	1979	1884.7	94.1	49.2	56.3	0.0444	0.0485	0.0781	1,535	2,722	2,862	0.0501	0.3027	0.0986	ACSR Lapwing
ATHENS	✓	2782.1	1.762	0.415	2732	2622.1	110.0	60.1	68.4	0.0320	0.0371	0.0575	1,844	3,336	3,540	0.0585	0.2870	0.0930	ACSR Bluebird

(1) ACCC® UL5™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the UL5 Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2006: 50 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 98 W/m² (1033 W/m²) at corresponding surface temperatures.

ACCC® AZR™ CONDUCTOR: US CUSTOMARY SIZES (US Units)																			
ACCC® AZR™ Conductor (3)	Available as UL5™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 60 Hz.	Capacitive Reactance @ 60Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC®	w/ UL5™® Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C				
Size Designation		(kcmil)	(in.)	(in.)	(lb/ft)	(lb/ft)	(lb/ft)	(kbf)	(kbf)	(ohm/mile)	(ohm/mile)	(ohm/mile)	(amps)	(amps)	(amps)	(ft)	ohm/mile	Mohm-mile	Size
AZR™ OCEANSIDE	–	383.2	0.680	0.235	397	361.8	35	16.3	–	0.2434	0.2490	0.4191	545	918	965	0.0231	0.4572	0.1057	ACSR Ostrich
AZR™ LINNET	–	430.5	0.720	0.235	442	406.4	35	17.0	–	0.2167	0.2219	0.3732	586	990	1,041	0.0244	0.4506	0.1040	ACSR LINNET
AZR™ ORIOLE	–	438.6	0.741	0.280	464	414.0	50	21.5	–	0.2126	0.2176	0.3661	597	1,008	1,061	0.0254	0.4457	0.1032	ACSR ORIOLE
AZR™ IRVING	✓	609.5	0.882	0.345	651	575.3	76	31.7	36.0	0.1530	0.1570	0.2637	735	1,253	1,320	0.0303	0.4243	0.0980	ACSR HAWK
AZR™ HAWK	–	611.3	0.858	0.280	627	577.0	50	24.2	–	0.1526	0.1568	0.2632	731	1,244	1,310	0.0290	0.4296	0.0988	
AZR™ DOVE	–	713.5	0.927	0.305	732	672.9	59	28.5	–	0.1306	0.1346	0.2254	805	1,376	1,451	0.0314	0.4200	0.0965	ACSR DOVE
AZR™ GROSBEAK	–	821.4	0.990	0.320	840	774.6	65	32.0	–	0.1134	0.1173	0.1960	878	1,506	1,588	0.0335	0.4121	0.0946	ACSR GROSBEAK
AZR™ AMARILLO	✓	784.7	0.990	0.375	829	740.0	89	38.5	43.4	0.1187	0.1224	0.2050	859	1,473	1,553	0.0339	0.4107	0.0946	ACSR AMARILLO
AZR™ LUBBOCK	✓	903.9	1.040	0.345	928	852.4	76	36.4	40.7	0.1031	0.1069	0.1783	932	1,604	1,692	0.0352	0.4061	0.0931	ACSR DRAKE
AZR™ DRAKE	✓	1025.6	1.108	0.375	1057	968.1	89	42.3	47.2	0.0909	0.0946	0.1575	1,007	1,741	1,837	0.0376	0.3981	0.0912	
AZR™ CURLEW	✓	1033.0	1.140	0.415	1085	975.1	110	48.1	54.4	0.0903	0.0939	0.1564	1,019	1,763	1,860	0.0389	0.3940	0.0904	ACSR CURLEW
AZR™ ARLINGTON (2/1)	✓	1151.0	1.177	0.375	1176	1066.6	89	38.3	43.2	0.0792	0.0831	0.1388	1,091	1,890	1,995	0.0397	0.3915	0.0894	ACSR Deer
AZR™ BEAUMONT (2/1)	✓	1428.6	1.294	0.375	1439	1350.0	89	41.3	46.2	0.0638	0.0681	0.1125	1,239	2,163	2,286	0.0434	0.3807	0.0866	ACSR Finch
AZR™ SAN ANTONIO (2/1)	✓	1474.9	1.315	0.385	1488	1393.8	94	43.1	48.4	0.0618	0.0647	0.1061	1,278	2,239	2,366	0.0441	0.3787	0.0861	AAAC Sorbus
AZR™ BITTERN (2/1)	✓	1581.6	1.345	0.345	1569	1493.2	76	39.0	43.3	0.0576	0.0624	0.1021	1,310	2,298	2,430	0.0448	0.3768	0.0855	ACSR BITTERN
AZR™ LAPWING (2/1)	✓	1948.9	1.504	0.385	1943	1848.9	94	48.2	53.5	0.0470	0.0523	0.0842	1,479	2,622	2,776	0.0501	0.3633	0.0822	ACSR LAPWING
AZR™ FALCON (2/1)	✓	2045.1	1.545	0.415	2050	1940.0	110	53.4	59.7	0.0447	0.0500	0.0803	1,524	2,708	2,867	0.0516	0.3597	0.0814	ACSR FALCON
AZR™ BLUEBIRD (2/1)	✓	2740.6	1.762	0.415	2710	2600.1	110	61.1	67.4	0.0334	0.0400	0.0618	1,777	3,218	3,415	0.0585	0.3445	0.0775	ACSR BLUEBIRD

(1) ACCC® UL5™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the UL5 Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 50 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 96 W/m² (1033 W/ft²) at corresponding surface temperatures.
(3) Numbers after name designate the number of layers of each alloy. First number designates the number of layers with the lower tensile strength alloy starting with the inner layer, second number designates the number of layers with the higher strength alloy on the outer layers.
(4) Strength at ambient temperature. Based on 96% of the 1350-M minimum tensile strength (8.5 ksi/58.6 MPa) and 90% of the AT3 minimum tensile strength (22.5 ksi/155 MPa) and 75% of the composite core minimum tensile strength.

ACCC® AZR™ CONDUCTOR: INTERNATIONAL SIZES (US Units)																			
ACCC® Conductor (3)	Available as UL5™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 50 Hz.	Capacitive Reactance @ 50Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ ACCC® UL5™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C				
Size Designation		(kcmil)	(in.)	(in.)	(lb/ft)	(lb/ft)	(lb/ft)	(kbf)	(kbf)	(ohm/mile)	(ohm/mile)	(ohm/mile)	(amps)	(amps)	(amps)	(ft)	ohm/mile	Mohm-mile	Size
AZR™ SILVASSA	–	242.2	0.565	0.235	264	228.5	35	14.0	–	0.3863	0.3943	0.6646	413	689	724	0.0196	0.3976	0.1334	
AZR™ HELSINKI	–	297.2	0.616	0.235	316	280.7	35	14.9	–	0.3151	0.3217	0.5422	467	783	823	0.0211	0.3902	0.1304	
AZR™ ROVINJ	–	370.6	0.673	0.235	385	349.4	35	16.1	–	0.2521	0.2576	0.4339	535	899	946	0.0229	0.3819	0.1272	
AZR™ JAIPUR	–	307.3	0.650	0.305	352	292.3	59	22.1	–	0.3067	0.3131	0.5277	481	807	848	0.0229	0.3819	0.1285	ACSR COYOTE
AZR™ ZADAR	–	350.1	0.673	0.280	380	330.0	50	20.1	–	0.2669	0.2726	0.4593	520	874	919	0.0233	0.3801	0.1272	
AZR™ COPENHAGEN	–	434.0	0.720	0.235	444	408.7	35	17.1	–	0.2151	0.2200	0.3703	589	993	1,045	0.0244	0.3755	0.1248	ACSR LINNET
AZR™ REYKJAVIK	–	440.3	0.741	0.280	466	415.8	50	21.5	–	0.2127	0.2175	0.3661	597	1,008	1,061	0.0254	0.3714	0.1238	ACSR ORIOLE
AZR™ MONTE CARLO	✓	451.0	0.818	0.415	538	427.6	110	38.9	45.2	0.2084	0.2129	0.3586	619	1,050	1,106	0.0291	0.3577	0.1203	LONG SPAN CROSSINGS
AZR™ GLASGOW	–	467.1	0.769	0.305	500	440.8	59	24.6	–	0.2003	0.2048	0.3448	621	1,051	1,106	0.0265	0.3671	0.1225	ACSR LYNX
AZR™ CASABLANCA	–	540.0	0.807	0.280	561	510.5	50	23.1	–	0.1736	0.1777	0.2990	675	1,145	1,206	0.0274	0.3637	0.1208	ACSR PANTHER
AZR™ OSLO	✓	619.3	0.882	0.345	660	584.3	76	31.8	36.1	0.1511	0.1548	0.2603	740	1,261	1,329	0.0303	0.3536	0.1176	ACSR HEN
AZR™ LISBON	–	622.7	0.858	0.280	637	587.0	50	24.4	–	0.1501	0.1539	0.2587	737	1,254	1,321	0.0290	0.3580	0.1186	ACSR HAWK
AZR™ AMSTERDAM	–	725.1	0.927	0.305	743	683.5	59	28.7	–	0.1289	0.1324	0.2223	811	1,386	1,461	0.0314	0.3500	0.1158	ACSR DOVE
AZR™ LEIPZIG	✓	802.1	0.990	0.375	847	757.6	89	38.7	43.6	0.1167	0.1199	0.2013	867	1,487	1,567	0.0339	0.3422	0.1135	ACSR GROSBEEK
AZR™ BRUSSELS	–	831.7	0.990	0.320	851	785.5	65	32.1	–	0.1126	0.1160	0.1943	882	1,513	1,595	0.0335	0.3434	0.1135	ACSR GROSBEEK
AZR™ CALGARY	✓	826.1	1.012	0.375	871	781.3	89	39.1	44.0	0.1131	0.1167	0.1954	885	1,519	1,602	0.0346	0.3402	0.1127	ACSR DRAKE
AZR™ STOCKHOLM 2L	✓	914.3	1.039	0.345	939	862.7	76	36.5	40.8	0.1023	0.1055	0.1767	937	1,611	1,699	0.0352	0.3384	0.1118	
AZR™ WARSAW (2/1)	✓	1001.6	1.091	0.345	1023	946.9	76	32.6	36.9	0.0910	0.0943	0.1588	1,003	1,726	1,820	0.0368	0.3339	0.1100	ACSR CONDOR
AZR™ DUBLIN	✓	1035.1	1.108	0.375	1066	976.7	89	42.4	47.3	0.0904	0.0935	0.1563	1,013	1,748	1,844	0.0376	0.3317	0.1095	ACSR DRAKE
AZR™ TORONTO (1/1)	✓	994.2	1.108	0.415	1049	938.5	110	43.8	50.1	0.0922	0.0957	0.1606	1,000	1,724	1,819	0.0379	0.3309	0.1095	ACSR DRAKE
AZR™ MILAN (2/1)	✓	1120.4	1.146	0.345	1135	1059.2	76	33.9	38.2	0.0813	0.0846	0.1421	1,073	1,853	1,955	0.0385	0.3294	0.1083	AAAC 500
AZR™ BUDAPEST (2/1)	✓	1318.9	1.240	0.375	1336	1246.9	89	40.0	44.9	0.0691	0.0724	0.1211	1,185	2,058	2,173	0.0417	0.3213	0.1055	AAAC Rubus
AZR™ MUNICH (2/1)	✓	1447.0	1.293	0.375	1461	1372.0	89	41.4	46.3	0.0632	0.0666	0.1110	1,250	2,178	2,300	0.0434	0.3172	0.1040	ACSR Finch
AZR™ WARWICK (2/1)	✓	1479.2	1.315	0.415	1510	1399.8	110	47.4	53.7	0.0617	0.0650	0.1083	1,271	2,217	2,342	0.0444	0.3149	0.1034	AAAC Sorbus
AZR™ PARIS (2/1)	✓	1605.9	1.345	0.345	1598	1522.6	76	39.1	43.4	0.0569	0.0606	0.1003	1,326	2,320	2,451	0.0448	0.3140	0.1026	ACSR Bittern
AZR™ ANTWERP (2/1)	✓	1864.8	1.451	0.385	1855	1761.3	94	47.1	52.4	0.0488	0.0527	0.0864	1,454	2,560	2,708	0.0484	0.3062	0.0999	ACSR 617/AAAC 620
AZR™ BERLIN (2/1)	✓	1986.4	1.504	0.415	1984	1874.3	110	52.6	58.9	0.0458	0.0497	0.0813	1,512	2,670	2,825	0.0503	0.3023	0.0986	ACSR LAPWING
AZR™ ATHENS (3/1)	✓	2782.1	1.762	0.415	2735	2625.0	110	58.8	65.1	0.0326	0.0376	0.0594	1,826	3,285	3,483	0.0585	0.2870	0.0930	ACSR BLUEBIRD

(1) ACCC® UL5™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the UL5 Conductor will be a less. See individual data sheets for nominal weight.
(2) Ampacity values based on IEEE 738-2008: 50 Hz, zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 96 W/m² (1033 W/ft²) at corresponding surface temperatures.
(3) Numbers after name designate the number of layers of each alloy. First number designates the number of layers with the lower tensile strength alloy starting with the inner layer, second number designates the number of layers with the higher strength alloy on the outer layers.
(4) Strength at ambient temperature. Based on 96% of the 1350-M minimum tensile strength (8.5 ksi/58.6 MPa) and 90% of the AT3 minimum tensile strength (22.5 ksi/155 MPa) and 75% of the composite core minimum tensile strength.

ACCC® CONDUCTOR for DISTRIBUTION (US Units)																			
ACCC® Conductor (3)	Available as ULS™	Size	Diameter	ACCC Core Diameter	Approximate Weight (1)			Cond. Rated Strength (4)		Resistance			Ampacity (2)			Geometric Mean Radius	Inductive Reactance @ 60 Hz.	Capacitive Reactance @ 60 Hz.	Commonly Replaces
					Total	Aluminum	Core	w/ ACCC® Core	w/ACCC® ULS™ Core	DC @ 20°C	AC @ 25°C	AC @ 200°C	75°C	100°C	200°C				
Size Designation		(kcmil)	(in.)	(in.)	(lb/ft)	(lb/ft)	(lb/ft)	(kbf)	(kbf)	(ohm/mile)	(ohm/mile)	(ohm/mile)	(amps)	(amps)	(amps)	(ft)	ohms/mile	Mohm-mile	Size
AZR™ BRIGHTON-Z	—	113.6	0.396	0.190	129.2	106	23	8.5	—	0.8164	0.8328	1.4043	259	427	448	0.0140	0.5180	0.1217	ACSR 1/0 - ACSR RABBIT
CAMBRIDGE	—	258.5	0.557	0.190	265.0	242	23	10.6	—	0.3420	0.3492	0.5903	437	728	765	0.0189	0.4816	0.1116	ACSR DOG
AZR™ CAMBRIDGE	—	258.5	0.557	0.190	265.0	242	23	10.8	—	0.3591	0.3666	0.6178	427	712	748	0.0189	0.4816	0.1116	ACSR DOG
ODESSA	—	252.6	0.565	0.190	260.5	238	23	10.5	—	0.3520	0.3595	0.6082	432	720	757	0.0192	0.4796	0.1112	ACSR 4/0 - PENGUIN
AZR™ ODESSA	—	252.6	0.565	0.190	259.8	237	23	10.7	—	0.3667	0.3744	0.6309	424	707	743	0.0192	0.4796	0.1112	ACSR 4/0 - PENGUIN
CORONADO	—	354.2	0.642	0.190	356.6	334	23	11.2	—	0.2510	0.2566	0.4334	529	887	933	0.0216	0.4654	0.1074	ACSR 228.8 kcmil PARTRIDGE
AZR™ CORONADO	—	354.2	0.642	0.190	356.6	334	23	12.3	—	0.2636	0.2694	0.4537	516	867	912	0.0216	0.4654	0.1074	ACSR 228.8 kcmil PARTRIDGE
OCEANSIDE	—	383.2	0.680	0.235	395.2	360	35	16.0	—	0.2319	0.2374	0.4009	558	938	987	0.0231	0.4572	0.1057	ACSR 336 kcmil MERLIN
AZR OCEANSIDE	—	383.2	0.680	0.235	397.0	362	35	16.3	—	0.2434	0.2490	0.4191	545	918	965	0.0231	0.4572	0.1057	ACSR 336 kcmil MERLIN

(1) ACCC® ULS™ Core has a slightly lower weight than ACCC® Core, and thus the total weight of the ULS Conductor will be a less. See individual data sheets for nominal weight.

(2) Ampacity values based on IEEE 738-2006: zero elevation, 90 sun altitude, 25°C ambient temperature, 0.5 Solar Absorptivity, 0.5 Emissivity, 2 ft/sec (0.61 m/sec) wind and 95 WdR(1033 W/m²), at corresponding surface temperatures.

(3) The -Z designates the conductor is single layer, Z-shaped wires.

(4) For AZR™ Conductors, strength at ambient temperature based on 90% of the AT3 minimum tensile strength (22.5 ksi/155 Mpa) and 75% of the composite core minimum tensile strength.

The nominal weight may vary by plus or minus two percent (+/-2%) in accordance with ASTM B857-02 and EN50540.

The maximum number of layers is 4 for the purposes of the Specification.

In addition to the above specific requirements, the following general manufacturing specifications must be followed:

Stranding:

In the Production process, the ACCC® Core shall pass through the machinery in a near straight line. No undue crushing force should be applied to the ACCC® Core.

All aluminum applied during the stranding process must be in trapezoidal form.

Blasting to achieve non-specular finish shall be with Acrylic media.

Recommend; From; Grit direct.com, US Polymedia, Polyplus, Size 12-16, any variation from acrylic media, needs to be approved by CTC.

Design and Form:

The Producer must comply with the applicable elements of ASTM Designation B 857 – 02 “Standard Specification for ‘Shaped Wire Compact Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Supported’”, or reasonably acceptable equivalent or better recognized international standard if approved by CTC in advance.

Annealing Treatment:

Production must allow for the aluminum in final ACCC Product to have been fully annealed to comply with the applicable elements of ASTM Designation B 609/B 609M – 12 “Standard Specification for ‘Aluminum Round Wire, Annealed and Intermediate Tempers, for Electrical Purposes’” and EN 50540, or any reasonably acceptable equivalent or better recognized international standard if approved by CTC in advance. In addition, the conductivity of the

aluminum must be equal to or better than 61.8% IACS ($0.0279 \Omega \text{ mm}^2/\text{m}$ at 20° C) before and after stranding.

In calculating the ‘fill factor’, the cross-sectional area shall be considered as a percentage of the total possible annular area between the outer diameter of the ACCC® Core and the COD. The cross section shall be calculated as the sum of the cross section of each aluminum strand composing the conductor, measured at right angles to the strand. For the remainder, ACCC® Conductor Producer shall comply with the applicable elements of ASTM Designation B 263 – 99 “Standard Specification for ‘Determination of Cross-Sectional Area of Stranded Conductors’”, or any reasonably acceptable equivalent or better recognized international standard if approved by CTC in advance.

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Exhibit B – Qualification and Type Testing

1. Tests to be conducted by Manufacturer in the qualification process:
 - a. The weight of the ACCC[®] Conductor final;
 - b. The electrical resistance and conductivity of the aluminum strands in the finished ACCC Conductor;
 - c. The weight, electrical resistance and conductivity of an annealed aluminum strand taken prior to any stranding (wire drawn and annealed);
 - d. The diameter of each layer of the finished ACCC Conductor;
 - e. The measurement of the lay length of each layer of the finished ACCC Conductor;
 - f. Verification that Customer specified if ACCC Conductor surface is to be specular or non-specular;
 - g. Verification of the ability to produce the minimum claimed length of one reel of the specified ACCC Conductor;
 - h. Verification that no excessive lubricants exist on the finished ACCC Conductor; excessive lubricant is dripping from the finished reel or evidence of oil on the outermost packaging.
 - i. General inspection of the strands to ensure conformance, uniformity, surface quality, and damage-free condition;
 - j. Confirmation that the ACCC Conductor reels on-the-dock do not retain moisture; and
 - k. Other tests used to identify new ACCC Conductor design if deemed necessary by CTC.
2. Tests to be conducted by CTC in the qualification process:
 - a. Overall workmanship;
 - b. Analysis of possible ACCC Core damage resulting from stranding, blast media or packing; and
 - c. Verification that the ACCC Conductor meets Specifications.
3. Required tests on new ACCC Conductor designs, tests shall be the international standards and solely dictated/supplied to Manufacturer by CTC:
 - a. Stress strain;
 - b. Electrical testing; per ASTM B193, and the resistance measurements made on a 3 meter sample, and
 - c. Ultimate strength on a 15 meter sample.
4. Other tests on new ACCC Conductor designs:
 - a. Sustained load at high temperature;
 - b. Sustained load at room temperature;
 - c. Cyclical high temperature loading;
 - d. Creep (type test of ACCC Core)
 - e. High temperature – sag / tension / current (ampacity); and
 - f. Short circuit.

5. Exhibit C – ACCC® Conductor Reel Specification Requirements

CTC GLOBAL

ACCC® Conductor Reel Specifications Requirements

FOR STANDARD CONDUCTORS (by core size)				
Diameter (mm)	Spool (mm)		Reel (inches)	
Core	Minimum Hub Dia.	Reference Boss Diameter	Minimum Drum Dia.	Reference Arbor Diameter
4.83	700	80	28	3.25
5.97	860	80	34	3.25
7.11	1020	125	40	3.25
7.75	1120	125	44	3.25
8.13	1170	125	46	3.25
8.76	1270	125	50	5.25
9.53	1370	125	54	5.25
9.78	1400	125	55	5.25
10.54	1515	125	60	5.25

FOR ULS CONDUCTORS (by core size)				
Diameter (mm)	Spool (mm)		Reel (inches)	
Core	Minimum Hub Dia.	Reference Boss Diameter	Minimum Drum Dia.	Reference Arbor Diameter
8.76	1515	130	60	5.25
9.53	1650	130	65	5.25
9.78	1680	130	66	5.25
10.54	1810**	130	72**	5.25

** 1780 mm (70 inches) allowable for 3 months storage or less

Not all sizes are listed please reach out to CTC Global Engineering for any questions or to confirm sizing.

Steel Reels are recommended, meeting DIN 46395 or NEMA WC 26, except for drum diameters above

Wooden Reels shall not be used for outdoor storage longer than 3 months

Wooden Reels should meet DIN 46395 or NEMA WC 26 Class 3, except for drum diameters above

Spacers may be used provided the following criteria are met:

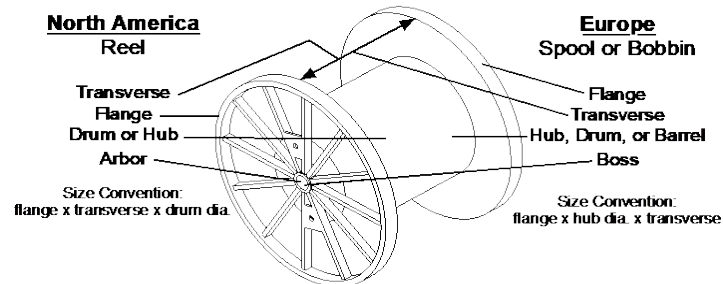
Spacer must maintain a uniform roundness and be free of bumps or angles

It is not required for the spacer to be affixed or attached to the reel hub provided the conductor is attached to the reel as normal

Material must be of suitable strength to withstand the load of the conductor without being crushed or deforming

Load bearing capability must be sustained across the entire winding surface from flange to flange

Material shall be weather resistant such that it can be stored outside in rain, snow or ice conditions without degradation



Note: Every layer of conductor spooled must be filled completely "no gaps" and tight against spool sides.

Reference WI-750-023 ACCC Product Specification

1. All packaging must be self-draining and not retain moisture. No stretch-wrap or other sealing treatments may be used.
2. Water is not to be retained by any of the packaging materials.
3. Reels shall be in accordance with NEMA WC26 or approved alternative.

4. REEL TAG MARKING

- ACCC® CONDUCTOR PRODUCED BY _____ UNDER LICENSE FROM CTC GLOBAL CORPORATION or Produced under license from CTC Global Corporation Manufacturer's name
- Manufacturer's location
- Date of manufacture
- Reel identification number that correlates to manufacturing traceability
- Customer purchase order number
- Length of conductor
- Weight of empty reel (tare)
- Type and size of conductor

Exhibit D – Product Handling and Storage



F-824-006-E ACCC Safety Data Sheet

SDS NO. 061306001

Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standards,
29 CFR 1910, 1200, Standard must be consulted for specific requirements.

IDENTITY (As Used on Label and List) ACCC Cable Core		Note: Blank spaces are not permitted. If any item is not applicable, or no Information is available, the space must be marked as indicated that.	
Section I			
Manufacture's Name CTC Global Corporation		Emergency Telephone Number Infotrac 800-535-5053	
Address (Number, Street, City, State, and Zip Code) 2026 McGaw Ave Irvine, CA 92714		Telephone Number for Information 949-428-8500	
		Date Prepared 08/18/14	
		Signature of Preparer (optional)	
Section II – Hazardous Ingredients/Identity Information			
Hazardous Components (Specific Chemical; Common name(s))			
None			
OSHA PEL	ACGIH TLV	Other Limits Recommended	% (Optional)
N/E	N/E	N/E	N/E
None Established—N/E			
Section III – Physical/Chemical Characteristics			
Boiling Point N/A	Specific Gravity (H ₂ O = 1) 2.03 g/cc		
Vapor Pressure (mm Hg.) N/A	Melting Point N/A		
Vapor Density (AR = 1) N/A	Evaporation Rate (Butyl Acetate = 1) N/A		
Solubility in Water <0.1%			
Appearance and Odor Tan/Brown solid rod			
Section IV – Fire and Exposition Hazard Area			
Flash Point (Method Used) > 300 deg C / 570 deg F Estimated		Flammable Limits Not Established	LEL NE
Extinguishing Media Water, Foam, CO2, Dry Chem.		UEL NE	
Special Fire Fighting Procedures Use self contained breathing apparatus			
Unusual Fire and Explosion Hazards Combustion product may be toxic. Note: Cable on reel under high tension. Fire may burn through cable releasing tension violently.			
Section V – Reactivity Data			
Stability	Unstable	Conditions to Avoid None	
	Stable X		
Incompatibility (Materials to Avoid) None known			

Hazardous Decomposition or Byproducts Combustion may form toxic materials such as carbon dioxide, carbon monoxide and airborne particulates.			
Hazardous Polymerization	May Occur		Conditions to Avoid Extreme heat > 260 deg. C / 500 deg. F
	Will Not Occur	X	
Section VI – Health Hazard Data			
Route(s) of Entry: Inhalation? X Skin? X Ingestion? N/A			
Health Hazards (<i>Acute and Chronic</i>) Dust particles associated with cutting, grinding or burning may cause irritation of the skin, eyes, and respiratory tract.			
Carcinogenicity: NO NTP? NO IARC Monographs? NO OSHA Regulated? NO			
Signs and Symptoms of Exposure With exposure to machined dust – itchy skin, possible rash, itchy eyes and/or respiratory irritation.			
Medical Conditions with exposure to machined dust Skin, eye, and respiratory ailments			
Emergency and First Aid Procedures Skin contact: Wash with soap and water. Eye contact: Irrigate to remove particles. Inhalation: Move to fresh air, treat irritation symptomatically contact a physician.			
Section VII – Precautions for Safe Handling and Use			
Steps to Be Taken in Case Material is Released or Spilled Dust should be collected in a manner not likely to create airborne particles. Vacuuming with a HEPA filtered vacuum is the preferred method; but if that can not be done carefully sweep up the particles.			
Use NIOSH or equivalent international standard approved respirator mask.			
Waste Disposal Method ACCC Core and residue from machining are not listed as hazardous waste, nor do they exhibit any of the hazardous characteristics contained in federal hazardous regulations (40 CFR 261). Waste ACCC Core should be disposed of in an approved landfill in accordance with existing national and any local regulations.			
Precautions to be Taken in Handling and Storing Cable Core is stable for storage. Care should be taken when unwinding due to potential energy contained in wound product.			
Section VIII – Control Measures			
Respiratory Protection (<i>Specify Type</i>) NIOSH approved respirator for dust from cutting or grinding.			
Ventilation N/R	Local Exhaust Adequate ventilation should be provided whenever dust is generated.	Special N/A	
	Mechanical (<i>General</i>) N/A	Other N/A	
Protective Gloves Leather or latex when cutting or grinding		Eye Protection Safety glasses	
Other Protective Clothing or Equipment Hard hats, long sleeves and pants must be worn when releasing or securing core material.			
Work/Hygienic Practices Wash exposed skin with soap and water immediately after exposure to dust from cutting.			

1.0 PURPOSE

- 1.1 The purpose of this document is to provide experienced technicians, cable wrapping personnel and shipping personnel, recommendations and requirements necessary to safely handle, unwind and re-spool the CTC ACCC® core material. This document is intended to provide a guide and recommendations to handling this ACCC™™ core material, which is wrapped around a reel for shipping.

2.0 SCOPE

- 2.1 These guidelines apply to equipment and techniques required to handle, unwrap or re-spool onto shipping reels and payout of ACCC® core material.

3.0 TRAINING

- 3.1 CTC strongly recommends that all plant technicians, shipping personnel and plant management be aware of the risks associated with handling ACCC® core material to all personnel and any damage that may occur to the ACCC® core material during handling could also result in premature power transmission line failure.

4.0 ASSOCIATED DOCUMENTS

- 4.1 Handling & Warning labels posted on all shipping reels originating from CTC.

5.0 DEFINITIONS

- 5.1 ACCC® is defined as Aluminum Conductor Composite Core with trapezoidal wire in all the aluminum layers and where the core is made from ACCC® core material.
- 5.2 Core is defined as composite material (various diameters and lengths) that functions as the center strength element for ACCC® conductor.

6.0 RESPONSIBILITY

- 6.1 It is the responsibility of the facility and trained personnel handling ACCC® core material, to ensure safe reeling, unreeling and re-spooling practices by following the instructions provided in this guideline, as well as customary safe plant or field practices.
- 6.2 ACCC® core material is highly loaded, it will spring out and cause serious bodily harm possible resulting in hospitalization or death if these instructions are not followed.

See Example in Photo 3

7.0 TOOLS, GAGES, FIXTURES

- 7.1 All equipment shall be maintained in accordance with applicable safety standards.
- 7.2 Use only equipment sized to handle the specific type and sized reels fitted with an appropriate braking system to restrain the core reel rotation.

8.0 SAFETY REQUIREMENTS

- 8.1 All safety requirements associated with the operation of approved equipment shall be followed.
- 8.2 Eye protection should be worn at all times when handling core material.
- 8.3 Protective head gear with attached face shield strongly recommended.



Recommended Eye and Head Protection Gear

- 8.4 Leather or protective gloves should be worn when handling core material. Gloves should be provided with an enhanced gripping surface and be close fitting to enable

the user to obtain a good grip on the core.

- 8.5 It is recommended the ACCC® core material be re-secured to the wooden reel any time it is left unattended. See Photo 2

9.0 Securing ACCC® Core to the Wooden Reel

- 9.1 In the event the core material must be re-spooled back onto the shipping reel for some reason, the process outlined below shall be followed and the core secured to the side of the wooden reel as shown on Photos 1 and 2.

Note: The core handlers shall always maintain tension and control of the core during the re-attaching or re-spooling process using a minimum of three (3) operators.

9.2 Core re-spooling and attaching instructions

- Operator 1 (lead Operator) always maintains control of the loose end of the core at all times by manually grasping the core.
- Operator 2 shall securely grasp and maintain control of the core between the wooden reel and the "One Way Rollers, see figure 1.
- After inspection of the payout brake being on and that Operator 2 has complete control of the core shall give the command to cut once all operators and equipment is ready.
- On command from the lead operator (Operator 1), Operator 3 cuts the core between the wooden reel and "one way rollers while Operator 2 maintains control of the loose end of the cut end of the core between the "One Way Rollers" and the wooden reel.

Note: see Photo 3 if control of the core is lost during this process

- The lead operator (Operator 1), slowly releases the brake on with enough pressure released to allow the shipping reel to turn manually.
- Operator 3 moves to the wooden reel and prepares to turn the wooden reel in reverse on command

Note: Operator 1 keeps the brake control within reach for braking as required.

- On command from the lead operator, Operator 3 slowly rotates the wooden shipping reel in the reverse of the pay-out rotation to orderly re-spool the core onto the wooden shipping reel. Operator 1 maintains control of the loose end of the core at all times

- Once the core is re-spoiled enough to leave approximately one half (1/2) meter free from the wooden reel (see Photo 1) and the orderly spooled core, Operator 1 applies the break to hold the wooden reel in place.
- Operator 2 maintains control of the loose end of the core as shown in Photo 2 and operator 3 secures the core to the shipping reel shown on Photos 1 or 2.

Note: Operator 2 maintains control of the loose end of the core until at least two of the minimum of three clamps are fully installed and secured.

- Re-Inspect the re-spoiled portion of the core for any damage
- If any damage is discovered this must be immediately reported to the CTC Global Project or Quality Assurance office.

10.0 DISPOSING OF UNWANTED CORE

- 9.3 On completion of the unreeling of a section of the ACCC® core material, if there is surplus ACCC® core material left on the shipping reel, it is important that the end of the ACCC® core is carefully secured back to the side of the reel following the instructions in Section 9 para 9.2 with the original rubber lined clamps and original screws to prevent the ACCC® core end from whipping loose. (See Photo 2). It is recommended that the quantity of the core removed from the shipping reel and what is left over be recorded onto the reel for future reference.
- 9.4 Follow all safety requirements in section 8 of this document and any additional safety procedures in order to make the operation of disposing unwanted core safe for all operators, in addition all operators must completely read this document.
- 9.5 The equipment shown in the picture below must be used during this operation arranged in the sequence shown, secured to the ground, and in good working order. The equipment is the following: Reel brake, one-way roller system and core extractor. See Figure 1

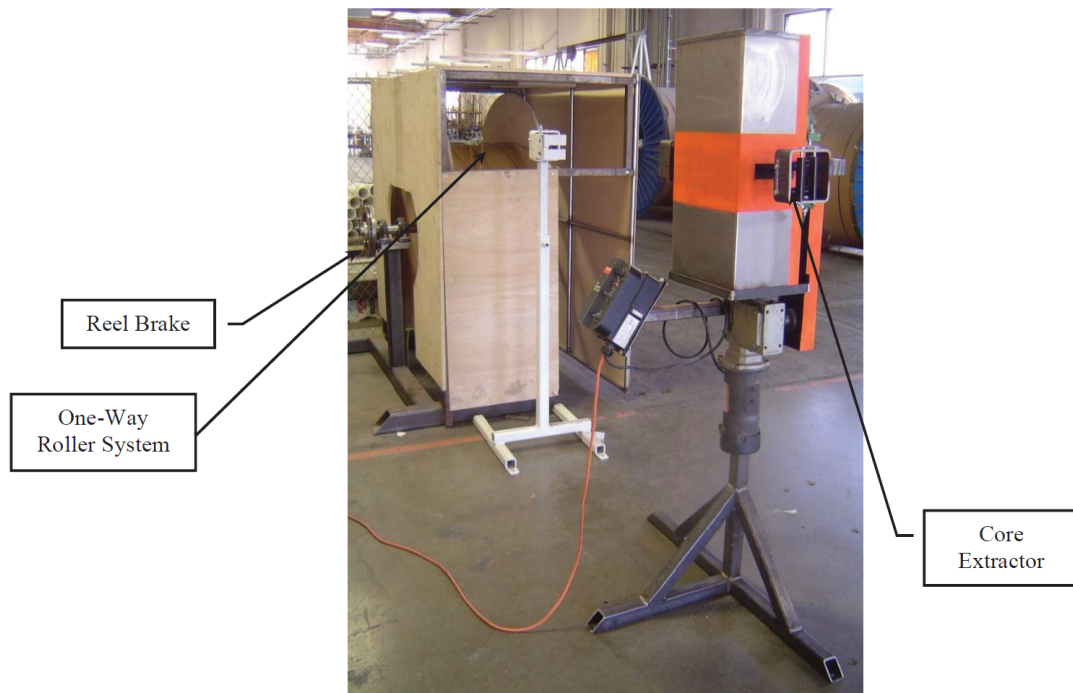


Figure 1

- 9.6 The operation of disposing of unwanted core must be performed by a minimum of two (2) operators who are well experienced handling CTC's core and as detailed in Section 9.
- 9.7 The reel brake must be capable to continuously hold tension on the core as the core extractor pulls the core off the reel. The one-way roller system must be capable of holding the core from going back towards the reel in case of a failure in the core extractor, or anywhere in the system.
- 9.8 Using a forklift or pallet jack load a reel of non-conforming core on the reel brake, ensure that the safety panel is replaced on the reel brake after loading the reel of non-conforming core. Using the equipment previously mentioned, with all safety equipment used by operators and all safety devices installed on equipment.
- 9.9 With all safety equipment used by operators, all safety devices installed on equipment and following the Procedure to Release Secured Core End from Shipping Reel

mentioned on this document, feed the end of the core through the one-way roller system then through the core extractor. Do the previous making sure the braking system on the reel brake is always engaged and adjusted to allow only the movement needed to feed the core for the initial setup.

- 9.10 After the core has been fed through the one-way roller system and the core extractor one operator will adjust the braking system on the reel brake and continuously check it for proper braking power to keep necessary tension on the core, payout of the core should proceed in a measured manner avoiding any sudden drop in brake pressure or abrupt stops. The same operator will control the feed speed on the core extractor.
- 9.11 The second operator will be at the discharge end of the core extractor cutting pieces of core 25' to 50' in length using wire cutters or a set of bolt cutters (shown on the picture below).



- 9.12 After cutting the non-conforming core, place it in a receptacle or an area designated for scrap/excess core.
- 9.13 Never leave the scrap/excess core setup on the equipment unattended, always secure core to the reel flange using the proper clamps. (see photo 2)

10.0 SHIPPING

- 10.1 ACCC[®] core material is shipped on sturdy, carefully designed reels that safe-guard the ACCC[™] core from damage in transit and storage. The ACCC[®] core material is carefully inspected during all stages of fabrication; packaging is inspected prior to shipment, and only properly packaged material is delivered to the carrier. All ACCC[®] core material shipping reels will be constructed of high grade plywood, with a 24" (60cm) diameter interior wax treated cardboard drum or larger and have a 3" (76mm) arbor holes in the reel sides which are 48" (121cm) or larger. Finished reels shall be encompassed in a pressboard protective sheet (see Photo 1) and banded in place with plastic shrink wrap applied outside the entire ACCC[™] core area. The completed reel

is then banded to a shipping skid.

- 10.2 Reels should remain secured to the shipping skid until ready for un-reeling.
- 10.3 Cranes or other equipment of adequate capacity should be used to avoid damage and to prevent possible safety hazards.
- 10.4 It is important that reels of ACCC® core material are not lifted by placing the forks of the forklift directly under the drum area of the reel which would allow the forks to come in direct contact with the ACCC® core material or its protective wrapping (see Photo 1).
- 10.5 Lift reel by approaching from the side and placing forks under **BOTH** flanges **completely** or using a forklift mounted bar of appropriate diameter and length thru the arbor hole.
- 10.6 Any metallic object contact against the ACCC® core material can cause damage resulting in possible ACCC® core failure in the finished conductor, **no damaged ACCC® core material should be allowed into the stranding process.**
- 10.7 At no time should the reel be laid on its side for transportation, storage or handling.

11.0 Storage

- 11.1 If the ACCC® core material is to be stored for an extended period of time before use, the reel containing the ACCC® core material should be kept off of the ground and protected from any possible weather damage. At no time should the reel be laid on its side for transportation, storage or handling.
- 11.2 Identification tags and other markings should be retained on all packages until such time as the ACCC® core material is to be used.
- 11.3 For future identification purposes, it is good practice to retain and track the reel tag information corresponding to the section of ACCC® core material in which the finished ACCC® conductor is fabricated. Key reel tag information includes, but not limited to the manufacturing date of the ACCC® core material, component number, lot number and the length of ACCC® core material on the reel.
- 11.4 The reels come from the factory with a pressboard type reel wrap, held down with bands over the outermost layer of ACCC® core. It is recommended that the cover be left on the reels and they remain affixed to the shipping skid if they are going to be stored for an extended period of time. **See photo 1.**

12.0 Procedure to Release Secured Core End From Shipping Reel and/or Re-Spool

Core Back on to Shipping Reel

- 12.1 The ACCC® core material reel should be loaded onto a pay-out device (with braking/tension mechanism) prior to the removal of lagging or protective wrapping. When the ACCC® core material shipping reel is loaded onto the pay-out device, ACCC® core should be situated such that the material is pulled off the top side of the reel towards the take up reel. After the removal of the covering, all reels must be examined for any shipping damage that may have occurred; at no time should damaged material be allowed into the wrapping process.
- 12.2 A reel brake mechanism on the payout reel must be utilized at all times to avoid spring action or uncoiling (see Photo 3). Adequate back-tension must be applied at all times during the pulling operation to prevent the conductor from unraveling or becoming tangled.
- 12.3 Minimum of two technicians (1&2 respectively) are required to release the shipping clips.
- 12.4 Technician (1) holds material with both gloved hands while standing off to one side of the reel. Note: brake is set to prevent rotation of ACCC™ core material reel. See photo 2.
- 12.5 Technician (2) releases the material (saves the rubber lined clips and bolts) while technician (1) continues to hold the live end of the ACCC™ core material. Note: Material requires no great force to hold or stop it from coming loose, however it must be restrained by an "attentive" technician.
- 12.6 Once the material is released technician (1) can pull the material away from the reel while technician (2) adjusts the brake pressure to pay out the material use appropriate brake pressure so the remaining material on the reel stays orderly and arranged.
- 12.7 Payout or re-spooling of the material should proceed in a measured and controlled manner avoiding any sudden drop in brake pressure or abrupt stops of the reel. During the payout or re-spooling process the bend radius in the ACCC® should never exceed the limits identified on Table 1
- 12.8 If the material becomes tangled for any reason stop and carefully reorganize the wind pattern, the material can break if forced into an abrupt angle releasing a lot of energy if the reel is unwound quickly while tangled. See Photo 3.
- 12.9 On completion of the unreeling of a section of the ACCC® core material, if there is surplus ACCC® core material left on the shipping reel, it is important that the end of the ACCC® core is carefully secured back to the side of the reel with the original rubber lined clips and original bolts to prevent the ACCC® core end from whipping loose. (See Photo 2). It is recommended that the quantity of the core removed from the shipping reel be recorded onto the re34el for future reference.

- 12.10 ACCC® conductor is delivered pre-inspected however; the top layer should be inspected for any damage caused by shipping. If damage is found after shipping wrapping is removed, this damage should be reported to the assigned Project Manager and/or Quality Manager at CTC Global.
- 12.11 Always use Nylon, Teflon, Neoprene or Urethane lined dollies, sheaves, rollers, blocks, etc. that touch the ACCC® core material to avoid damage to the ACCC® core material during processing.



Photo 1



Photo 2



Photo 3

Table 1 – Core bend limitations by size & type

Core Size	Minimum Allowable Core Handling Bend Radius	
	Inches	(cm)
Penguin	20.125	(51.12)
5.97mm	20.125	(51.12)
7.11mm	24.00	(60.96)
7mm China	24.00	(60.96)
7.75mm	24.00	(60.96)
8.13mm	30.25	(76.84)
8.76mm	30.25	(76.84)
9.53mm	30.25	(76.84)
9.78mm	30.25	(76.84)
10.03mm	36.00	(91.44)
10.54mm	36.00	(91.44)
ULS type to be added		

Exhibit E – Routine Tests

1. ACCC® Core Routine Factory Tests listed in this Section 1 of Exhibit E, unless otherwise agreed in writing between the Parties, shall be carried out by CTC, and where required, a Certified Test Report will be supplied by CTC to Manufacturer.

- 1.1. On the full reel of the ACCC® Core:
 - a) Roller bend test; and
 - b) Measurement of the diameter of ACCC® Core.

The test reports shall record whether the ACCC® Core passed or failed the test in 1.1(a) above and the maximum and minimum diameters of ACCC® Core measured in 1.1(b) above.

- 1.2. On sections of ACCC® Core cut from the front end and the back end of each reel of ACCC® Core:
 - a) Measurement of the tensile strength; and
 - b) Glass transition temperature (Tg) test

The test reports shall record the values measured in 1.2(a) and 1.2(b) above, and whether the material exceeded the minimum Tg temperature and passed or failed the test in 1.2(b) above.

2. ACCC® Conductor Routine Tests listed in this Section 2 of Exhibit E, unless otherwise agreed in writing between the Parties shall be carried out by Manufacturer, and where required, a Certified Test Report will be supplied by Manufacturer to CTC.

- 2.1. Elongation of individual strands;
- 2.2. Total weight of ACCC® Conductor on the reel (do not include the reel weight);
- 2.3. Diameter of each layer of the ACCC® Conductor;
- 2.4. Lay length of each layer of the ACCC® Conductor;
- 2.5. Appearance of the conductor (stranding, scuffing, impurities, excess lubricants, etc.);
- 2.6. Total Length; and
- 2.7. Emissivity (if required by the Customer).

The test reports shall record, as applicable, the values measured, pass or fail, and other results of the tests, in a format mutually agreed by the Parties.

EXHIBIT F – Brand Manual

ACCC® Registered Trademark Usage

ACCC® is a registered trademark of CTC Global Corporation in the US and throughout much of the world. Partners licensed to use the ACCC Trademark may do so provided such use complies with the CTC Global Trademark Policy for Licensees, Customers, and others available at: <https://www.ctcglobal.com/accc-trademark-policy/> including the following usage basics:

- ACCC is an adjective that describes the noun which follows. Do not use it as a noun or by itself.
- ACCC is NOT an acronym. DO NOT write Aluminum Conductor Composite Core (ACCC) or vice versa.
- On anything that can stand alone, use the ® in superscript following the ACCC the first 2 times it appears. i.e. ACCC® Core, ACCC® Conductor, then ACCC Accessories, ACCC Trademark etc.
- ALWAYS CAPITALIZE ACCC and the noun that follows. i.e. ACCC® Conductor.
- Whenever the **ACCC® Name or Logo** appears, the following footnote must also appear: "ACCC® is a registered trademark of CTC Global Corporation in the U.S. and/or other countries."
- Whenever used in connection with licensed products offered for sale, the following footnote must also appear: "ACCC® Conductors are manufactured under license from CTC Global Corporation, in accordance with its technical requirements and specifications."

This can be copied and pasted on the bottom of the product page:

ACCC® is a registered trademark of CTC Global Corporation in the United States and other Countries. ACCC® Conductors are manufactured under license from CTC Global Corporation, in accordance with its technical requirements and specifications.

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ACCC® Conductor Content to use

ACCC® Conductor utilizes a hybrid carbon and glass fiber core embedded in a high-performance thermoset epoxy matrix. The carbon fiber core is ~50% stronger and 70% lighter than steel. The lighter weight structural core allows the incorporation of 28% more conductive aluminum without a weight or diameter penalty (using compact trapezoidal shaped strands). The carbon fiber core also exhibits a coefficient of thermal expansion about one-tenth that of steel, which serves to mitigate thermal sag. To date, over 100,000 km of the ACCC Conductor have been installed at over 800 projects in 50+ countries.

In addition to mitigating thermal sag, ACCC Conductor also offers:

- Twice the capacity of conventional AAAC & ACSR Conductors
- Reduced line losses which reduces fuel consumption and associated emissions while also freeing up generation capacity otherwise wasted
- Longer spans between fewer and/or shorter structures (for new installations) due to high strength and lower sag
- Greater reliability and safety from improved clearances with under-build and vegetation
- Outstanding corrosion resistance
- Greater resistance to cyclic load fatigue due to improved damping characteristics
- Ability to upgrade existing corridors without the need for modification or replacement of existing structures

The characteristics of ACCC Conductor make it ideal for reconductoring; new lines; generation tie lines; long span applications; rebuild projects; EHV, UHV & DC lines; mountainous terrain; and highly corrosive environments. Please contact us for more information.

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Website Example

ACCC® Conductor consists of a hybrid carbon and glass fiber core which is wrapped with trapezoidal shaped aluminum strands. The high strength structural core carries most of the conductor's mechanical load, while the fully annealed aluminum strands carry all of the conductor's electrical current. ACCC Conductor's composite core is much lighter and stronger than conventional or high-strength steel core.

APPLICATION

ACCC® Conductor

Ideal for Reconductoring

- Increase capacity while improving line clearance and losses.
- Reduce strain on structures, increasing life.

Reduced Line Losses in New Lines

- Under equal load conditions reduces line losses by 30%-40% compared to conductors of the same diameter and weight.
- 100% more capacity building towards future demands.

BENEFITS

- With 28% more annealed aluminum in a trapezoidal configuration, the ACCC Conductor of the same diameter as ACSR, can double the current (ampacity) rating; Higher operating efficiency reduces line losses and associated emissions by more than 35%, resulting in more power delivered and lower power generation costs.
- ACCC Conductors use a patented carbon/glass/thermoset resin core that provides high strength and reduces high temperature sag.
- Can re-conductor existing pathway without structural modification and reduce capital expenses on new lines.
- Uses conventional installation methods, tools and mostly conventional hardware. Requires no special tools and limited special training.
- Resists environmental degradation-will not rust, corrode or cause electrolysis with aluminum conductors and components.

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Pictures that can be used



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CTC Global Logo and Color

Logo for General use:



C13 M10 Y0 K64
R81 G84 B93
Hex #51545D
PANTONE 7547 U

Logo for dark backgrounds:



C0 M53 Y84 K4
R244 G115 B39
Hex #F47327
PANTONE 16-1356 TCX

Other colors used for website and printed materials:



C100 M44 Y0 K35
R0 G93 B166
Hex #005DA6
PANTONE 2935



C42 M0 Y92 K35
R97 G166 B14
Hex #61A60E
PANTONE 369 C

Exhibit G – Producer Qualification for Aluminum Stranding of ACCC® Conductor

1.0 PURPOSE

This document describes CTC Global Corporation's ("CTC") process for Qualifying an Authorized ACCC® Producer, ("Stranding Partner" or "Strander") and associated ACCC® Conductor ("Conductor").

2.0 SCOPE

The scope includes initial and subsequent Qualification of ACCC® Conductor, equipment, tooling, stranding methods, test lab and quality reporting requirements in accordance with the latest revision of ISO 9001, ASTM B609, ASTM B857, CTC Work Instruction WI-750-024 and Stranding Partner's ACCC® Conductor Product Specification Sheet.

3.0 RESPONSIBILITY

CTC Product Engineering and CTC Quality are responsible for maintaining this document.

4.0 RECORDS

- 4.1 All Stranding Partner's Qualification records shall be kept for a minimum of 10 years (or longer as required by warranty) and shall be submitted to CTC upon request. Certified test data shall be archived and traceable to each sample of Qualified ACCC® Conductor.
- 4.2 CTC Quality shall review, identify and archive all submitted Qualification samples with referenced sample number, date of receipt and product specification.

5.0 ASSOCIATED DOCUMENTS

- 5.1 WI-750-091 CTC-Keystone Test Procedure
- 5.2 CTC-Stranding Partner Production and Distribution Agreement
- 5.3 WI-750-023 ACCC® Product Specification
- 5.4 WI-750-024 Characterization of Annealed Aluminum Strands from ACCC®

Conductor

- 5.5 ASTM B857 Standard Specifications for Shaped Wire
- 5.6 ASTM B173 Standard Test Method for Resistivity of Electrical Conductor Materials
- 5.7 ASTM B263 Test Methods for Determination of Cross Sectional Area of Stranded Conductors
- 5.8 ASTM B609 Standard Specification for Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical Purposes.

6.0 TOOLS, GAUGES, FIXTURES

All measuring and cutting equipment shall be maintained and calibrated in accordance with applicable standards.

7.0 SAFETY REQUIREMENTS

- 7.1 All safety requirements associated with the operation of necessary equipment shall be followed.

8.0 Quality Assurance Reporting

- 8.1 All quality assurance reporting electronic or paper to include for Customer or CTC Global:
 - 8.1.1 Reel ID number listed, and ACCC® Core reel listed
 - 8.1.2 Total length of Conductor produced on each reel report
 - 8.1.3 Actual weight of Conductor (minus reel weight)
 - 8.1.4 All quality assurance measurements in the same type units throughout the report, metric or imperial (no mixing), in a clear readable format, if multiple reels, an overall summary would be included on first page.

9.0 SAMPLE SUBMISSIONS

9.1 Sample Qualification

- 9.1.1 Strander shall Produce 200 meters of ACCC® Conductor as a

Qualifying reel.

9.1.2 Strander shall submit three (3) >1 -meter samples sectioned from the Qualifying reel of ACCC® Conductor to CTC Quality who shall verify Conductor in accordance with Section 9.0. and Strander's internal quality assurance reporting, see section 8.0 above.

9.1.3 Unless otherwise stated, Strander shall submit, if requested one (1) 15-meter sample (from the same reel as the >3-meter samples) to an accredited test facility of CTC's choosing who shall verify the Conductor in accordance with Section 10.0.

9.1.4 CTC Quality at their discretion may audit and approve Strander's in-house test lab. Strander shall perform all required testing and submit results in accordance with Sections 9.0 and 10.0 below.

9.2 Shipment Instructions

Note: Unless otherwise specified, wood packaging materials must be ISPM 15-compliant. Plastic pipe preferred.

>3-Meter Sample

9.2.1.1 After sectioning the >3-meter samples, wrap the sections with foam or bubble wrap-equivalent material.

9.2.1.2 Place protected sections in shipping container.

9.2.1.3 Label shipping container with the following information:

- a) **Strander Reel No.** Strander's ACCC® Conductor reel no. from whence the sample originated.
- b) **Core Reel No.** CTC's ACCC® Core reel number used in the Production of the sample Conductor.
- c) **Size and Length.** Strander's ACCC® Conductor size, Conductor name and cut length of sample.
- d) **Shipping Label.** A shipping label shall detail ship from and ship to contact information. Mark "ATTENTION TO: CTC Test Lab."
- e) **Declaration of Goods Label.** "This SAMPLE Material is not

for Commercial Sale.”

- 9.2.1.4 Ship packaged sample ensuring **receipt by CTC within 3 business days** after completion of Qualification run.

9.2.2 **15-Meter Sample**

- 9.2.2.1 Wrap sample with foam or bubble wrap-equivalent material.
- 9.2.2.2 Loop sample using a minimum bend radius equivalent to standard payout reel drum size; bind loop to prevent unraveling.
- 9.2.2.3 Label loop in accordance with 9.2.1.3 above, package and **ship to CTC or designated test lab for receipt within 3 business days** after completion of qualification run.

10.0 **SAMPLE TESTING (ASTM B857 Sections 5, 7, 8 & 12)**

10.1 **Requirements for Wire – ASTM B857(5)**

- 10.1.1 Before and after stranding, each individual aluminum wire shall be capable of meeting the elongation requirements >20% as specified in WI-750-024.
- 10.1.2 Completed Conductor shall be tested in accordance with WI-750-024. This test shall be conducted on sample strands from each layer of the initial Production sample.

10.2 **Lay – ASTM B857(7)**

- 10.2.1 The direction of lay of the outside layer of aluminum wire shall be right-hand lay unless otherwise specified by Customer.
- 10.2.2 The direction of lay of the aluminum wires shall be reversed in successive layers.
- 10.2.3 Lay/ratios shall be in accordance with the ranges specified in the ASTM specifications.
- 10.2.4 Lay/ratios (lay length divided by measured diameter of each layer) as described in ASTM B857 are as follows:

- Outer aluminum layer 10-13, (11 preferred) section 7.1
- Inner or middle (if 3) layers 10-16, (13 preferred) section 7.2

- Inner (if 3-4) layers 10-17 section 7.3

10.3 **Construction** – ASTM B857(8)

10.3.1 The nominal aluminum cross-sectional area, number of strands, weight per measured length, and outside diameter shall be verified against the submitted Product Specification Sheet.

10.4 **Workmanship** – ASTM B857(12)

10.4.1 Conductor outside layer shall be checked for tightness of wind (no gaps - smooth transition from one strand to the next) and chamfer of the outside strand edges (no raised sharp corners).

10.4.2 Outer surface shall be inspected for non-specular finish as required by PO.

10.4.3 Sample shall be checked for excessive tool marking on outside layer (indicating poor manufacturing practices). Inner and outer layers shall be checked for evidence of burnt oil, excessive blast media and dirt.

10.4.4 The inner ACCC® Core shall be checked for external markings of any kind.

10.4.5 The inner ACCC® Core shall be checked for any evidence of twisting during the stranding process (indicating bobbin back-tension was set incorrectly).

10.4.6 No rework, no rewinding, no re-cycling of ACCC® core at a stranding partner, without explicit written CTC Global permission and guidance.

10.5 **Nesting / Keystone** – WI-750-091 CTC-Keystone Test Procedure

10.5.1 **Scope**

This test ensures ACCC® can be installed without slippage of the core, stranded layers aluminum layers need to nest together but still allow external pressure (grip) to exert force on the core. Test procedure is

10.5.2 **Purpose**

Because the core is smooth, the strander needs to insure the ACCC®

can be gripped with conventional overhead installation equipment and brought to sagging tension without slippage of the strands over the core. Strands outside of design tolerance may bind on each other, preventing full contact between the core and inner strand layers. This can result in slippage of the core during tensioning.

10.5.3 **Test Results**

a) Pass. If the core is bound and does not (Audible Click) rotate under .53 N-m (4.7 in-lb) of torque within the conductor strands, the stranding is considered within tolerance.

b) Fail. If core is able to twist (No Click) at .53 N-m (4.7 in-lb) of torque, then the strands are out of tolerance and the conductor should be analyzed to determine which layer(s) is limiting the compaction force of the hose clamp (the keystone condition).

10.6 **Oil – CTC Global specialty test.** Note: Oil must be evaporative solvent or water based

10.6.1 Scope

This test ensures ACCC® Conductor can easily be installed. External pressure (grip) needs to exert force on the ACCC® Core, but excessive lubricant in the ACCC® Core/aluminum interface can prohibit or reduce the external grip force.

10.6.2 Purpose

The ACCC® Core is smooth. Strander needs to insure the ACCC® Conductor can easily be gripped with conventional overhead installation equipment. The purpose of this test is to detect the presence of excessive lubricant between the ACCC® Core/aluminum layer interfaces or excessive lubricant throughout ACCC® Conductor construction.

10.6.3 Instructions

10.6.3.1 Take sample length (minimum one meter) of ACCC® Conductor. Pull the ACCC® Core out the end of the sample or unwind the aluminum layers until reaching the ACCC® Core.

10.6.3.2 The removed ACCC® Core from the sample shall be dry and free of lubricant. Wipe the sample with a clean paper or fine weave cloth towel.

10.6.3.3 The sample towel must be dry. No oil should be felt in or on the towel surface.

11.0 15-METER SAMPLE TESTING (ASTM B857 Sections 11 & 14)

11.1 Area and Electrical Resistance (Aluminum Wire Conductivity) – ASTM B857(11)

11.1.1 The maximum resistivity of the aluminum wires shall not exceed the ACCC® Conductor Specifications as submitted by Strander.

11.1.2 Area of each strand layer shall be verified for conformance with the Product Specification Sheet.

11.2 Mechanical and Electrical Tests – ASTM B857(14)

11.2.1 Testing shall be carried out for engineering conductor characterization purposes at the expense of Strander or end user.

11.2.2 The 15-meter sample may be used for this purpose after resistivity testing.

12.0 STRANDER QUALIFICATION LETTER

12.1 CTC Product Engineering shall perform a Qualification of Strander's first time Production run of ACCC® Conductor. Both CTC Product Engineering and CTC Quality shall authorize and issue a Strander Qualification Letter for this Initial Qualification.

12.2 For each subsequent ACCC® Conductor Qualification, CTC Quality or CTC Engineering shall authorize and issue a Strander Qualification Letter provided Strander has not moved or changed the Qualified manufacturing equipment or method since the Initial Qualification.

12.3 A Strander Qualification Letter shall be issued for each ACCC® Conductor size.

12.4 The Strander Qualification Letter is applicable to ACCC® Conductor and

- ACCC® ULS Conductor of the same size, name and kcmil.
- 12.5 Stranding Qualifications apply to the specific Facility of the Strander and do not extend to other sites.
 - 12.6 Qualification is not transferable and cannot be extended to Stranding Partner's designated tolling houses.
 - 12.7 Any Qualification Letter is revocable at any time at the sole discretion of CTC Quality.

Exhibit G1 – Keystone Test

1.0 PURPOSE

This document describes CTC Global Corporation's ("CTC") process for Testing a ACCC® Conductor, for a keystone layer within a trapezoidal or Z wire conductor.

2.0 SCOPE

This test ensures ACCC® can be installed without slippage of the core, stranded layers aluminum layers need to nest together but still allow external pressure (grip) to exert force on the core.

3.0 PURPOSE

The Keystone test procedure is designed to identify keystone conductor. Because the core is smooth, the stranding partner needs to insure the ACCC® can be gripped with conventional overhead installation equipment and brought to sagging tension without slippage of the strands over the core. Strands outside of design tolerance may bind on each other, preventing full contact between the core and inner strand layers. This can result in slippage of the core during tensioning.

4.0 RESPONSIBILITY

CTC Product Engineering and CTC Quality are responsible for maintaining this document.

5.0 RECORDS

All Stranding Partner's Keystone records shall be included into each reel's quality documentation. Documentation to be retained for a minimum of 10 years (or longer as required by warranty) and shall be submitted to CTC upon request. Certified test data shall be archived and traceable to each sample of Qualified ACCC® Conductor.

6.0 ASSOCIATED DOCUMENTS

- 6.1 WI-750-025 Strander and ACCC Conductor Qualification
- 6.2 CTC-Stranding Partner Production and Distribution Agreement
- 6.3 WI-750-023 ACCC Product Specification

7.0 TOOLS, GAGES, FIXTURES

All measuring and cutting equipment shall be maintained and calibrated in accordance with applicable standards.

8.0 SAFETY REQUIREMENTS

All safety requirements associated with the operation of necessary equipment shall be followed.

9.0 Quality Assurance Reporting

9.1 All quality assurance reporting of Keystone results, electronic or paper to include for Customer or CTC Global:

9.1.1 Reel ID number listed, and ACCC® Core reel listed

9.1.2 Total length of Conductor produced on each reel report

9.1.3 Actual weight of Conductor (minus reel weight)

9.1.4 All quality assurance measurements in the same type units throughout the report, metric or imperial (no mixing), in a clear readable format, if multiple reels, an overall summary would be included on first page.

10.0 SAMPLE Test Procedure

10.1 Instructions

10.1.1 Step 1. Cut a test sample with an overall length of **0.6-1.0 m (23.6-39.4 in)**.

10.1.2 Step 2. Push the core out of the conductor a distance of **120 mm (4.7 in)**.

10.1.3 Step 3. On the end of the sample where the core has been pushed out, secure a 13 mm (.5 in) wide hose clamp at a distance of **140 mm (5.5 in)** from the end of the strands and tighten to 4.5 N-m (40 in-lb) factory setting.

10.1.4 Step 4. Mount a 1/2 inch (13 mm), 3-jaw chuck with torque screwdriver adaptor onto the end of the 120 mm (4.7 in) exposed core section.

10.1.5 Step 5. Torque screwdriver is factory set to **.53 N-m (4.7 in-lb)**, attach to the chuck now located on core end. Note: this torque is representative of a typical human hand's ability to twist a 4 -12mm round rod.

10.1.6 Step 6. Mark the sample aluminum and core with a single black line to indicate no rotation between core and aluminum.

10.1.7 Step 7. Twist the torque screwdriver with one hand while restraining the conductor with the other hand

10.2. Test result criteria

- a) **Pass.** If the core is bound and does not rotate (**Audible Click**) under .53 N-m (4.7 in-lb) of torque within the conductor strands, the stranding is considered within tolerance.
- b) **Fail.** If core is able to twist (**NO Click**) at .53 N-m (4.7 in-lb) of torque, then the strands are out of tolerance and the conductor should be analyzed to determine which layer(s) is limiting the compaction force of the hose clamp (the keystone condition).

Figures from 10.

Tools needed:



- a) Torque measuring device: torque screwdriver, set @ 4.5 Nm (40 in-lb).
- b) Torque measuring device factory set @ .53nm (4.7 in/lb) for torque to core application
- c) Nut driver adaptor for hose clamp to torque measuring device.
- d) 13mm (1/2 in) 3 jaw chuck with torque device adaptor, typically hex insert
- e) Hose clamps 13mm (1/2 in) band width
- f) Black felt pen (not shown)



Step 1

Cut sample .6 meter (23.6 in) in length with a fine blade saw: minimum 7 teeth per mm (18 TPI).

Step 2

Push core 120mm (4.7 in) out of conductor.



Step 3

Hose clamp location 140 mm (5.5 in) from end of strands.

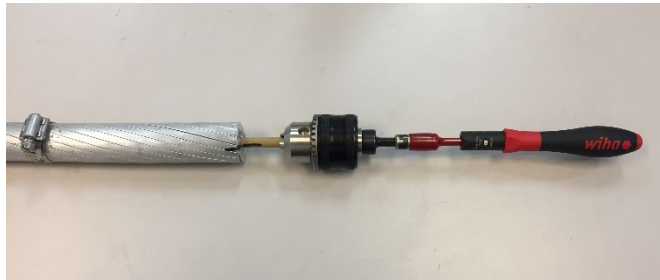


Step 3 continued.

Install one 13mm (1/2 in) wide hose clamp at 140mm (5.5 in) from end of conductor with exposed core.

Use only one hose clamp on the conductor.

Torque hose clamp to 4.5 N-m (40 in-lb).



Step 4

a) Mount 3 jaw chuck with torque adaptor to core, firmly.

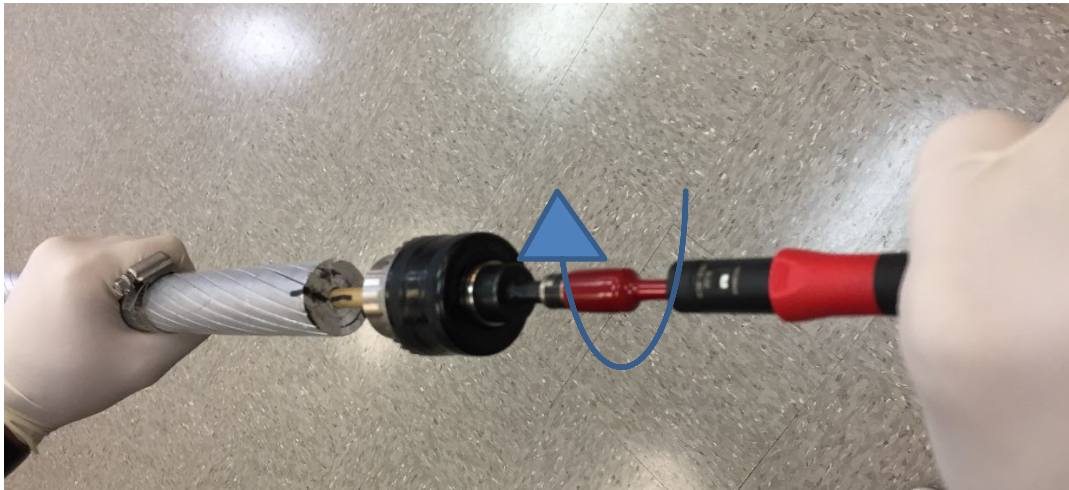
b) Torque screwdriver factory set to .53 N-m (4.7 in-lb).

c) Attach screwdriver to chuck using hex fitting



Step 5

Before testing, mark clearly core and strand alignment with felt tipped marker.



Step 6

- a) Grasp the conductor with left hand.
- b) Grasp torque screwdriver with right hand.
- c) Rotate clockwise (right hand away from the body) at factory setting .53 N-m (4.7 in-lb)
- d) Listen for the click of the torque screwdriver and watch for rotation.



a) Pass: No rotation, audible click click



b) Fail: rotation, before audible click

Results

If the conductor passes the test (Audible Click), the strand dimensions and lay ratio are acceptable to avoid keystone, lay ratio and weight need to be verified in additional testing.

Step 8. If the conductor fails (No Click), analyze which layer is the issue by removing strand layers and testing to determine which layer is keystoneed.

In that layer, the individual strands are too wide or the lay ratio is too steep causing the strands to lock and not allow the pressure of the hose clamp (simulating grip pressure in the field) to be transferred to the core or aluminum layers beneath.

Figure 9



Analyze which layer causes keystone, if core still turns with one clamp on inner layer, then inner layer is causing the issue.

Exhibit H – ACCC® Core Specification

ACCC® Composite Core Specifications									
ASTM B987 High Strength Grade									
METRIC									
CTC Part Number	200-003	200-004	200-005	200-006	200-007	200-008	200-009	200-010	200-011
Metric Core Name Designation (mm)	5.97	7.11	7.75	8.13	9.53	8.76	9.78	10.03	10.54
Nominal Diameter of Composite Core (mm)	5.97	7.11	7.75	8.13	9.53	8.76	9.78	10.03	10.54
Diameter Tolerance (mm)	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
Nominal Cross-sectional Area of Core (mm ²)***	28.0	39.7	47.2	51.9	71.3	60.3	75.1	79.01	87.25
Rated Strength (ASTM B987 - High Strength Grade) (MPa)	2137	2137	2137	2137	2137	2137	2137	2137	2137
Nominal Rated Tensile Load at Failure (kN)***	59.6	85.0	101.0	110.8	151.7	129.0	160.1	169.5	185.9
Core Nominal Density (g/cc)	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
Core Nominal Mass (kg/km)***	52.4	74.2	88.3	97.1	133	113	140	148	163
Final Modulus of Elasticity (GPa)	112.3	112.3	112.3	112.3	112.3	112.3	112.3	112.3	112.3
Coefficient of Thermal Expansion (x10 ⁻⁶ /°C)	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61
Specific Heat Capacity of Core (J/m ³ °C)	42.6	60.3	71.8	78.9	108.4	91.7	114.1	120.1	132.7
Electrical Conductivity of the Core (% IACS)	∞	∞	∞	∞	∞	∞	∞	∞	∞
Recommended Maximum Operating Temperature of Core (°C)*	180	180	180	180	180	180	180	180	180
Emergency Operating Temperature of Core (°C)**	200	200	200	200	200	200	200	200	200
Document Number	F-730-203	F-730-204	F-730-205	F-730-206	F-730-207	F-730-208	F-730-209	F-730-210	F-730-211
IMPERIAL									
CTC Part Number	200-003	200-004	200-005	200-006	200-007	200-008	200-009	200-010	200-011
Imperial Core Name Designation (mils)	235	280	305	320	375	345	385	395	415
Nominal Diameter of Composite Core (in.)	0.235	0.280	0.305	0.320	0.375	0.345	0.385	0.395	0.415
Diameter Tolerance (in.)	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002
Nominal Cross-sectional Area of Core (in ²)***	0.0434	0.0616	0.0731	0.0804	0.110	0.0935	0.116	0.123	0.135
Rated Strength (ASTM B987 - High Strength Grade) (ksi)	310	310	310	310	310	310	310	310	310
Nominal Rated Tensile Load at Failure (klbf)***	13.4	19.1	22.7	24.9	34.1	29.0	36.0	38.1	41.8
Core Nominal Density (lb/in ³)	0.0676	0.0676	0.0676	0.0676	0.0676	0.0676	0.0676	0.0676	0.0676
Core Nominal Mass (lb/kft)***	35.2	50.0	59.3	65.2	89.2	75.8	94.1	99.8	110
Final Modulus of Elasticity (Msi)	16.29	16.29	16.29	16.29	16.29	16.29	16.29	16.29	16.29
Coefficient of Thermal Expansion (x10 ⁻⁶ /°F)	0.894	0.894	0.894	0.894	0.894	0.894	0.894	0.894	0.894
Specific Heat Capacity of Core (J/ft ³ °F)	7.2	10.2	12.2	13.4	18.4	15.5	19.3	20.3	22.5
Electrical Conductivity of the Core (% IACS)	∞	∞	∞	∞	∞	∞	∞	∞	∞
Recommended Maximum Operating Temperature of Core (°F)*	356	356	356	356	356	356	356	356	356
Emergency Operating Temperature of Core (°F)**	392	392	392	392	392	392	392	392	392
Document Number	F-730-203	F-730-204	F-730-205	F-730-206	F-730-207	F-730-208	F-730-209	F-730-210	F-730-211

*The recommended maximum operating temperature of the composite core in ACCC® conductors is up to 180°C (356°F).

**The maximum recommended emergency temperature rating of the composite core in ACCC® is 200°C (392°F), which CTC defines as 10,000 hours over the conductor lifetime.

***Based on three significant figures unless otherwise indicated. ASTM E29, NIST Special Publications 811 and 1038 rounding applied.

All values are determined at room temperature unless otherwise indicated.

ACCC[®] ULS Composite Core Specifications

ASTM B987 Extra High Strength Grade

METRIC					
CTC Part Number	210-007	210-008	210-009	210-010	210-011
Metric Core Name Designation (mm)	9.53	8.76	9.78	10.03	10.54
Nominal Diameter of Composite Core (mm)	9.53	8.76	9.78	10.03	10.54
Diameter Tolerance (mm)	±0.05	±0.05	±0.05	±0.05	±0.05
Nominal Cross-sectional Area of Core (mm ²)***	71.3	60.3	75.1	79.01	87.25
Rated Strength (ASTM B987 - Extra High Strength Grade) (MPa)	2586	2586	2586	2586	2586
Nominal Rated Tensile Load at Failure (kN)***	183.3	156.1	193.5	205.1	225.1
Core Nominal Density (g/cc)	1.80	1.80	1.80	1.80	1.80
Core Nominal Mass (kg/km)***	128	108	135	142	157
Final Modulus of Elasticity (GPa)	146	146	146	146	146
Coefficient of Thermal Expansion (x10 ⁻⁶ /°C)	0.751	0.751	0.751	0.751	0.751
Specific Heat Capacity of Core (J/m ³ °C)	104.3	87.8	109.9	115.6	127.7
Electrical Conductivity of the Core (% IACS)	∞	∞	∞	∞	∞
Recommended Maximum Operating Temperature of Core (°C)*	180	180	180	180	180
Emergency Operating Temperature of Core (°C)**	200	200	200	200	200
Document Number	F-730-217	F-730-218	F-730-219	F-730-220	F-730-221
IMPERIAL					
CTC Part Number	210-007	210-008	210-009	210-010	210-011
Imperial Core Name Designation (mils)	375	345	385	395	415
Nominal Diameter of Composite Core (in.)	0.375	0.345	0.385	0.395	0.415
Diameter Tolerance (in.)	±0.002	±0.002	±0.002	±0.002	±0.002
Nominal Cross-sectional Area of Core (in ²)***	0.110	0.0935	0.116	0.123	0.135
Rated Strength (ASTM B987 - Extra High Strength Grade) (ksi)	375	375	375	375	375
Nominal Rated Tensile Load at Failure (klbf)***	41.2	35.1	43.5	46.1	50.6
Core Nominal Density (lb/in ³)	0.065	0.065	0.065	0.065	0.065
Core Nominal Mass (lb/kft)***	85.8	72.9	90.5	95.9	105
Final Modulus of Elasticity (Msi)	21.17	21.17	21.17	21.17	21.17
Coefficient of Thermal Expansion (x10 ⁻⁶ /°F)	0.417	0.417	0.417	0.417	0.417
Specific Heat Capacity of Core (J/ft ³ °F)	17.7	14.9	18.6	19.6	21.6
Electrical Conductivity of the Core (% IACS)	∞	∞	∞	∞	∞
Recommended Maximum Operating Temperature of Core (°F)*	356	356	356	356	356
Emergency Operating Temperature of Core (°F)**	392	392	392	392	392
Document Number	F-730-217	F-730-218	F-730-219	F-730-220	F-730-221

*The recommended maximum operating temperature of the composite core in ACCC[®] conductors is up to 180°C (356°F).

**The maximum recommended emergency temperature rating of the composite core in ACCC[®] is 200°C (392°F), which CTC defines as 10,000 hours over the conductor lifetime.

***Based on three significant figures unless otherwise indicated. ASTM E29, NIST Special Publications 811 and 1038 rounding applied.

**Exhibit I - Minimum Performance Requirements for Production and Distribution
Milestones**

Activity	Completion
Facility investment and upgrading for Production of ACCC [®] Conductor Activities	6 months
Qualification to Produce ACCC [®] Conductor	6 months
Progress Review Meetings	Monthly

Minimum Requirements for Production and Sales of InfoCore Certified ACCC Conductor

For sales of ACCC Conductor with the InfoCore System, Manufacturer must meet all requirements, terms and conditions set forth below, in addition to any requirements, terms and conditions set forth in the Agreement. Failure to maintain compliance may result in withdrawal of authorization to manufacture and sell ACCC Conductor with the InfoCore System.

1. Authorization to Manufacture and Sell

Manufacturer shall be authorized to Manufacture and Sell InfoCore Certified ACCC Conductor, as evidenced by a qualification letter indicating Manufacturer has met the following requirements:

- Sponsor or Sell a Project using InfoCore Certified ACCC Conductor
- Coordinate with CTC personnel in business development and marketing ensuring clear visibility on all Projects (timeline, start date, installation)
- Updating work instructions for InfoCore Conductor manufacturing
- Updating Quality Assurance documentation for InfoCore Certified ACCC Conductor Manufacturing.
- Promote the InfoCore Technology on its website, tradeshow and sales materials in accordance with CTC guidelines.
- Maintain a current InfoCore Confirmation Kit lease agreement to run concurrently and in concert with the Agreement.
- At all times maintain no less than two personnel that have been certified by CTC to perform InfoCore Confirmation testing.

Exhibit J – Intangible Property

Licensed Patents

Patent Number	Title	Jurisdiction	Filing Date	Grant Date	Status	Notes
202017020570; 202418041791	Systems, methods, and tools for the interrogation of fiber-reinforced composite strength members	India India			Pending Pending	

Licensed Trademarks

Trademark Name	Registration Number	Jurisdiction	Class of Goods/Services	Status	Notes
ACCC	1601117	India	9	Granted	
InfoCore	4942081	India	9	Granted	

Exhibit K – Pre-Existing Arrangements Projects List

Expected from Private Customer

Sl. No.	Customer Name	Discom	Conductor Name	QTY (km)	Validity
1	Teems India Towerlines Pvt. Ltd.	TNEB	HTLS CFCC 582/60 CONDUCTOR	180	12-04-2026
2	Export	Export	HTLS CFCC Hawk Conductor	40	10-04-2026
3	Export	Export	HTLS CFCC ULS HAMBURG CONDUCTOR	403	17-04-2026
4	Export	Export	HTLS CFCC ULS MAHAKAM CONDUCTOR	63	17-04-2026
5	Tarun Enterprises	WBSEDCL	HTLS CFCC CASABLANCA CONDUCTOR	65.2	27-04-2026
6	Capchem Electricals Ltd.	MSETCL	HTLS CFCC DRAKE CONDUCTOR	20	25-04-2026
7	Power Engineering & Infraproject Pvt Ltd	MSETCL	HTLS CFCC DRAKE CONDUCTOR	246	16-04-2026
8	Winsol Engineers	Private-Domestic	HTLS CFCC DRAKE CONDUCTOR	101	29-04-2026
9	Inventive Software Solutions (P) Ltd.	RRVFNL	HTLS CFCC DRAKE CONDUCTOR	36	22-04-2026
10	TNT Projects, Arunachal Pradesh	Department of Power	HTLS CFCC CASABLANCA CONDUCTOR	70	25-04-2026
11	Jai Balaji	WBSEDCL	ACFR 281sq mm	13	20-04-2026
				1237.2	

BID STATUS TRACKER - 2025-26

Sl. No.	Discom	Tender Title	Location	Quantity (KM)	Bid Validity Period	Status
1	PGCIL	Reconductoring Package OH01 associated with Eastern Region	West Bengal, India	887.70	Valid upto 07.03.2026	We are LI. RA postponed. Awaiting PGCIL response
2	PGCIL	Reconductoring Package OH02 associated with Eastern Region	West Bengal, India	754.00	Valid upto 07.03.2026	We are LI. RA postponed. Awaiting PGCIL response
3	PGCIL	Reconductoring Package OH03 associated with Eastern Region	West Bengal, India	929.10	Valid upto 07.03.2026	We are LI. Awaiting PGCIL response
4	PGCIL	Re-conductoring Package OH01 associated with Transmission	Kishtwar-J&K, India	751.00	Valid upto 28.02.2026	Submitted under evaluation
5	DVC	Survey, Design, Supply, Erection, Testing & Commissioning of	Jharkhand, India	1222.84	Valid upto 25.04.2026	Submitted under evaluation
6	OPTCL	Engineering, Supply, Erection, Testing & Commissioning of	Odisha, India	113.36	Valid upto 28.06.2026	Submitted under evaluation
				4658.00		

CFCC ORDER IN HAND

Sl. No.	Customer/Vendor Name	Vendor Ref. No.	Ref. Date	Voltage (KV)	Item/Service Description	Qty. (KM)
1	M/s. Kundan Hydro Pvt. Ltd.	RLNW2425/130843	29-10-2024	66	ACFR 146/17-FA-TT Conductor	27.405
2	M/s. KASHMIRILAL CONSTRUCTIONS (P) LTD.	92(H)/RDSS-Hld/UPCL/PO/1006-KH/24	28-03-2025	33	HTLS CFCC 153/28 Conductor	83.015
3	M/s. VVIP	RRPO/00007/25-26	15-05-2025	33	HTLS CFCC Casablanca Conductor	15.450
4	M/s. Mega Electricals	ME/PO/AEGCL/Umrangsu LIL/25-26/148	13-08-2025	132	HTLS CFCC Casablanca Conductor	15.00
5	M/s. Badri Rai & Co	BRCO/AEGCL/25-26/005	30-12-2025	132	HTLS CFCC Casablanca Conductor	73.00
6	M/s. AEGCL	AEGCL/MD/TECH-1162/2025/77	01-01-2026	220	HTLS CFCC Drake Conductor	24.00
7	M/s. PGCIL	GEMC-511687794711685	01-01-2026	765	HTLS CFCC 165/71 Conductor	27.00
8	M/s. Tata Power Company Ltd.	5500013164	07.01.2026	220	HTLS CFCC Casablanca Conductor	240.00
9	M/s. TECHNO Electric	GTP Approval Received		220	HTLS CFCC Drake	6
10	M/s. ABI Energy Solution Pvt. Ltd	Order Expected		33	HTLS CFCC 153/28 Conductor	17.67
11	M/s. ABI Energy Solution Pvt. Ltd	Order Expected		33	HTLS CFCC Casablanca Conductor	11.12
TOTAL CFCC Conductor ORDER IN HAND (KM) :-						539.660

LUMINO INDUSTRIES LIMITED - Licensing and Supply Agreement (AMP) - 02/20/2026 (77816)

Final Audit Report

2026-02-23

Created:	2026-02-20
By:	CTC Global Legal (legal@ctcglobal.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA87Xxq0-VyB1SSJsbLf7JrCKRrHWcY0Cw

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