Conveyor Equipment Manufacturers Association

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CONVEYOR CHAIN AND SPROCKET SECTION MEETING
7:00 a.m.
Wednesday, September 19, 2018

O'Hare Hilton Hotel
Chicago, Illinois

AGENDA

1. Call to Order and Roll Call

2. Approval of the Minutes of March 12, 2018, Meeting

3. Discussion of Issues

   a. Conveyor Chain Installation, Maintenance & Best Practices-001 – Chordal Action
   b. Sprocket Types and Definitions – Final Draft March 2019
   c. Corrosion Resistant Chains: Coated/Plated vs. Stainless, Plastic chains
   d. Enhancing Maintenance Guide - Chain Selection, Performance, Replacement

4. Chain Section Recruitment

5. Membership Committee Representation

6. Other Business
   a. CEMA Whitepapers
   b. Changes to ANSI standards (Dan Fannin)

7. Next meeting

8. Adjournment

Dean Bogner, Chair

Bob Callahan, Vice Chair/Secretary

MINUTES OF THE CEMA ANNUAL MEETING
CONVEYOR CHAIN AND SPROCKET SECTION MEETING
Naples Grande Beach Resort, Naples, Florida
Monday, March 12, 2018

Attendees:

Glenn Spungen, Peer Chain	Mike Nisenbaum, Timken -Carlisle
Dean Bogner, Webster Industries	Ed Tullar, Groschopp
Bob Callahan, Senqcia Maxco	Arlo Heynen, Groschopp
Dan Fannin, Regal Beloit America	Brian Voshell, Cambridge Engineered Solutions
Andy Felter, Webster Industries	Kevan MacRow, Stephens-Adamson
Jeremy Fogo, Peer Chain	Jordan Bloom, Stephens-Adamson
Phil Hannigan, CEMA	Mark Duncan, Schneider Electric
Kris Ferguson, US Tsubaki	Joe Schwegman, Quality Steel Products

1. Meeting was called to order at 7:30 a.m. Minutes from September 2017 were approved.
2. Conveyor Chain Installation, Maintenance & Best Practices-001, and Technical Report 2018-01 Conveyor Chain Types & Definitions completed and approved.
3. Conveyor Chain and Sprockets Types & Definitions Draft #1 in process.
4. Future Projects for engineering group
    a. Types of corrosion chains
        i. Coated chains vs stainless chains
        ii. Plastic chain - when to use
5. Membership & Recruitment
    a. No new members at this time
6. New Section Chairs
    a. Chair – Dean Bogner, Webster
    b. Vice Chair & Secretary – Bob Callahan, Senqcia Maxco
7. New Business
    a. Changes to ANSI standards will now be reported on as agenda item
        i. B29.400 discussed
        ii. B29.700 discussed
        iii. Dan Fannin, Regal, will report. In absence he will send report to section chair.
8. White paper discussion – Marketing committee would like sections to submit- It will add as future engineering section priority
9. Next Meeting of Section – September 19, 2018 at Hilton Chicago O'Hare Airport, Chicago, IL.
10. Meeting was adjourned at 8:30 a.m.

Respectfully Submitted,

Dean Bogner, Webster, Chair
Bob Callahan, Senqcia Maxco, Vice Chair/Secretary

MINUTES OF THE CEMA ENGINEERING CONFERENCE
CONVEYOR CHAIN & SPROCKET COMMITTEE MEETING
Tuesday, June 26, 2018

1. Call to Order
   Committee Chair Thomas Perdue, Cambridge Engineered Solutions; called the meeting to order at 1:05 pm.

2. Roll Call and Introductions (attached).

3. Committee Purpose and Value.
   - **Purpose:** To provide the most current chain & sprocket information available within the industry and represent all types of conveyor chain, i.e. roller, drive, engineered, drop forged, plastic, wire belt, etc.
   - **Value:** Develop a standardized and effective ability to identify chain & sprocket products and conditions that best fit the needs of member organizations and end user application requirements.

4. Minutes from the June 27, 2017 were reviewed and approved.

5. Old Business
   a) **Sprocket Types and Definition Document, Draft 1 – Status Review.**
      - Need to review sections for continuity and consistency.
      - Tom Perdue, Cambridge Engineered Solutions; will provide Kris Ferguson, US Tsubaki Power Transmission, LLC.; what additional information is required on any other industry-standard sprocket types.
      - Arnesto Rodriguez, Habasit America; will provide information on plastic sprockets to Tom Perdue.
      - Final draft of Sprocket Document to be submitted by March 2019 from Tom Perdue.
      - Volunteers to review technical accuracy, content – Brian Cline, Webster Industries, Inc.; and David Stronczek, Martin Sprocket & Gear, Inc.

6. New Business
   a) **Discuss including Technical Note: Chordal Action as addendum to Conveyor Chain Installation, Maintenance, & Best Practices – 001 document**.
      - Suggestions/comments for technical note – to be submitted by August 24th to Tom Perdue.
      - Other methods for reducing chordal action: compensating sprockets, conveyor shaft positioning, Ray Kisaberth, Webster Industries, Inc.; and Kris Ferguson, US Tsubaki Power Transmission, LLC.

- Darkening of sprocket images and text – Roger Bruere, 4B Components Ltd.; sent to Kimberly, CEMA.

b) **New document request: Corrosion Resistant Chains: Coated/Plated vs. Stainless, Plastic chains – when to use. Other – to be specified.**
   - Table of Corrosion & Wear Resistance by Materials/Applications – Ray Kisaberth, Webster Industries, Inc.; and Kris Ferguson, US Tsubaki Power Transmission, LLC; for steel chains, Arnesto Rodriguez, Habasit America; for plastic chains – Draft due November 30, 2018 to Tom Perdue. Tom will send reminders as needed for this information.

c) **CEMA White Papers – Volunteers needed**.
   - Matthew Whyte, Timken Drives, LLC; will propose a topic.

d) **Discuss enhancing Unit Handling Section (Maintenance guide on chain selection and performance, Definition and detail on how and when to replace chain).**
   - To be discussed further after everyone has a chance to review current Document.
   - CEMA will send Dan Fannin's Survey to all attendees of this meeting as none of them received it.
   - CEMA will send Material List to Tom Perdue and Roger Bruere for review of materials for Chain/Sprockets, they were not aware that a list was being developed.

7. The next scheduled meeting will be on June 25, 2019 at La Playa Hotel, Naples, FL

8. Meeting was adjourned at 2:24 pm

Respectfully submitted,
Thomas Perdue, Chair
Roger Bruere, Vice Chair

Technical Note: Chordal Action

Chain drives experience a vibration known as chordal action or polygonal effect which occurs as the effective radius of action in the chain and sprocket system changes during each revolution. Chordal action can cause increased wear on the chain and sprocket. The effect can be minimized by using a sprocket with more teeth and virtually eliminated with a sufficiently large sprocket.

As the sprocket rotates, the engagement position of the chain is restricted by the pitch points of the links. These pitch points create a polygon, with the number of vertices equal to the number of sprocket teeth. The resulting polygon defines the maximum and minimum effective radii illustrated in Figure 1. The radii can be calculated using Equations 1 and 2. During rotation, the instantaneous speed of the chain changes, however, the percent variation will always be constant for a sprocket with a number of teeth *N*. Figure 2 illustrates the percentage speed variation versus the number of teeth.

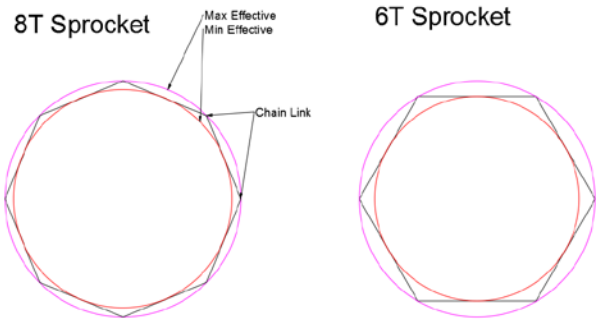

Figure 1: Defining Effective Radii

$$r_{maximum} = Sprocket\ Pitch\ Radius$$

$$r_{minimum} = Sprocket\ Pitch\ Radius * cos\frac{180}{N_{teeth}}$$

Equations 1&2: Minimum and maximum effective radii

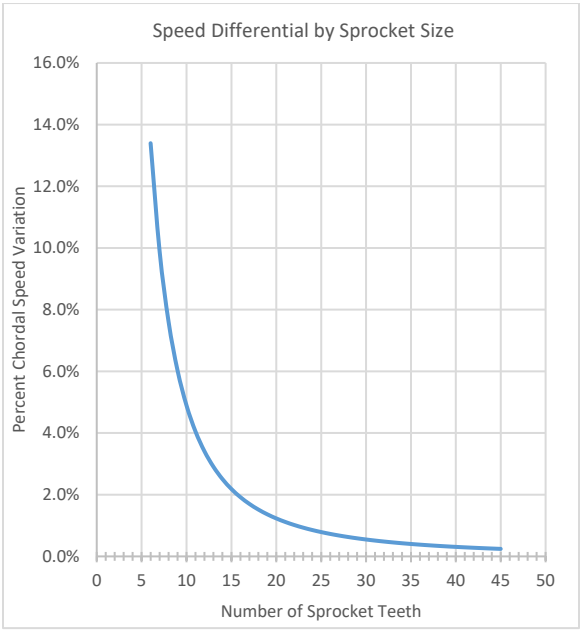

Figure 2: Percentage speed gap for common sprockets

Chordal action can be minimized by reducing the speed of the chain or by using a sprocket with more teeth. As the percentage chordal speed variation is solely dependent on the number of teeth, the percentage can be found using Equation 2.

$$\Delta = 1 - \cos\frac{180°}{N_{teeth}}$$

Equation 2: Speed Differential