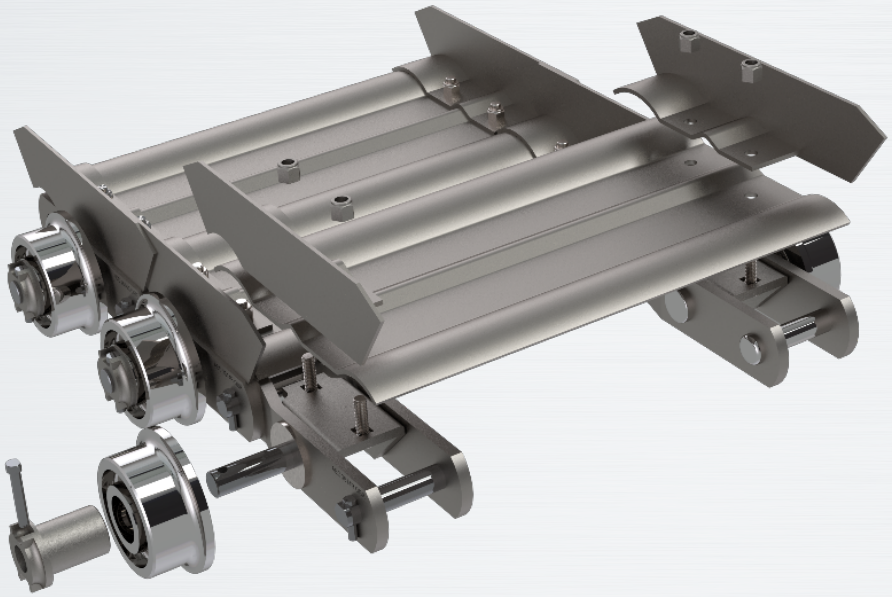
# Technical Paper

**Atlantic Bearing Services**

# Improving your Chain's performance

*Engineering Coatings on selective components. AEC OBR Chain 4051M14-OBR6-STD*



## Atlantic Engineering Chain coating facts:

Our Engineering Coatings will not peel, chip, blister or crack.

The coefficient of friction between surfaces of engineering coated steel and untreated steel is much lower than for both mating surfaces of untreated steel.

AEC
ATLANTIC ENGINEERING CHAIN

*Main Carrier Chain with Slats*
*Chain 4051M14-OBR6-STD*

## Friction reduction and other advantages

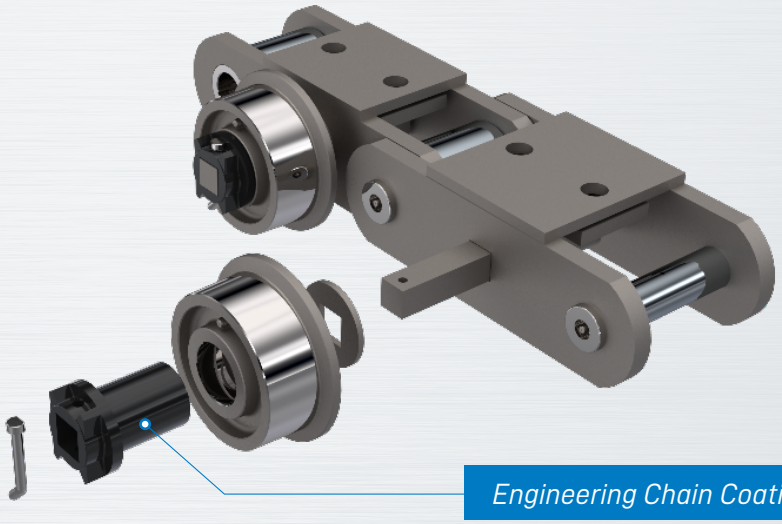
**Coated Surfaces Coefficient of 0.27 Vs. untreated dry steel coefficient of 0.39**

*Galling reduction - Corrosion Protection - Dimensional Stability*

## Engineering coating over roller pins

Well proved engineering coatings are now available for our Chains. Coated components like pins and bushings dramatically reduce friction coefficient, decrease power consumption and improve the chain life. Reduction of galling in dried lubrication condition is a plus.

*Coated Roller Pin for*
*Chain 4051M14-OBR6-STD*

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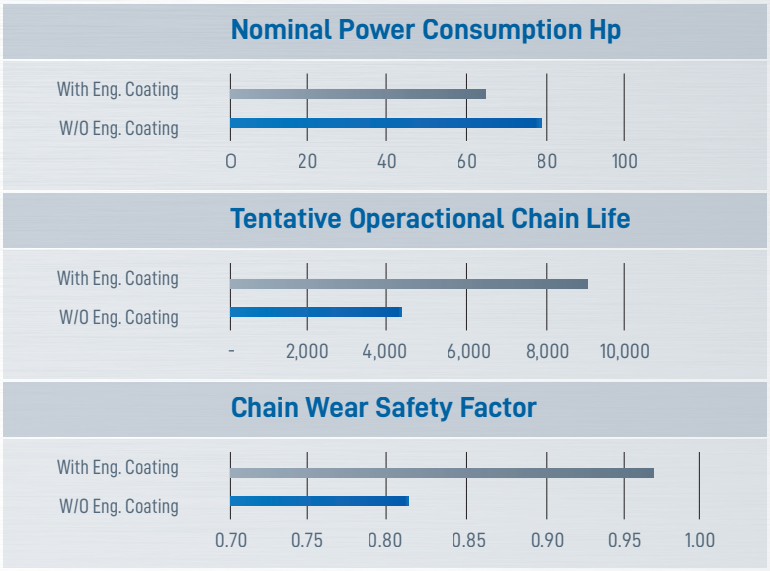
## Engineering coating use in chain components

**Engineering coating over key chain components will:**

Increase in Double the tentative operational Chain Life.*
Reduces more than 17% the Power Consumption.*
Increases more than 16% the Wear Safety Factor.*

** Values could change for other OBR's Chains/ Application Conditions But it gives a clear idea of the improvements that are achieved with this coating. Our engineering department is available to make the specific calculation for your conveyor*




## Detailed Comparison for Chain 4051M14-OBR-6 *With & Without Engineering Coating*

| MAGNITUDE & SYMBOL | UNIT | 4051M14 OBR 6 W/O Eng. Coating | 4051M14 OBR 6 With Eng. Coating | % |
|---|---|---|---|---|
| Mass flow of shredded cane, $C_m$ | t/day | 18,000 | 18,000 | |
| Speed of flow, v | ft/min | 43.21 | 43.21 | |
| Center distance of sprockets, a | ft | 131 | 131 | |
| Mass density | Lb/ft3 | 21.84 | 21.84 | |
| Chain pitch, p | in | 12 | 12 | |
| Number of teeth of driver sprocket, $z_1$ | 1 | 12 | 12 | |
| Load mass Service Factor | 1 | 1.3 | 1.3 | |
| Pitch diameter of driver sprocket, $D_1$ | in | 46.37 | 46.37 | |
| Pitch diameter of take-up sprockets (rollers), $D_2$ | in | 46.37 | 46.37 | |
| Width of carrier through, B | in | 84 | 84 | |
| Height of load trough or height of flights., F | in | 84 | 84 | |
| Filling factor of carrier, $\varphi_A$ | 1 | 0.6 | 0.6 | |
| Number of carrier chain strands, N | 1 | 2 | 2 | |
| Number of carrier flights, NF | 1 | 274 | 274 | |
| Number of links per chain strand, X | 1 | 274 | 274 | |
| Length of each chain strand, $\Lambda$ | ft | 274 | 274 | |
| Maximum chain strand tension, $T_{max}$ | lbf | 41,124 | 34,353 | -16.46% |
| Power propose at Drive motor | hp | 125 | 125 | |
| Nominal power consumption | hp | 78.47 | 64.71 | -17.53% |
| Tension force at take-up sprockets (rollers), $F_T$ | N | 9,046.53 | 4,860.59 | -46.27% |
| Chain Medium Ultimate Tensile Strength, Breakage, $Q_{med}$ | lbf | 400,000 | 400,000 | |
| Multi-strand factor for conveyor chains,KN | 1 | 1.75 | 1.75 | |
| Maximum allowable speed of chain, $v_{max}$ | ft/min | 101.21 | 101.21 | |
| Minimum chain safety factor to breakage, $S_{Fmin}$ | 1 | 7 | 7 | |
| Chain safety factor to breakage, $S_F$ | 1 | 13.10 | 15.68 | 16.45% |
| Tentative operational life of chain, $L_O$ (1 d = 24 h) | h | 4,225 | 8,788 | 51.91% |
| Safety factor for wear of chain. | 1 | 0.81 | 0.97 | 16.49% |
| Drive sprocket rotational frequency. | l/min | 3.56 | 3.56 | |
| Nominal rotational frequency of electric motor. | l/min | 1,180 | 1,180 | |
| Speed ratio of speed reducer or transmission | 1 | 331.73 | 331.73 | |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