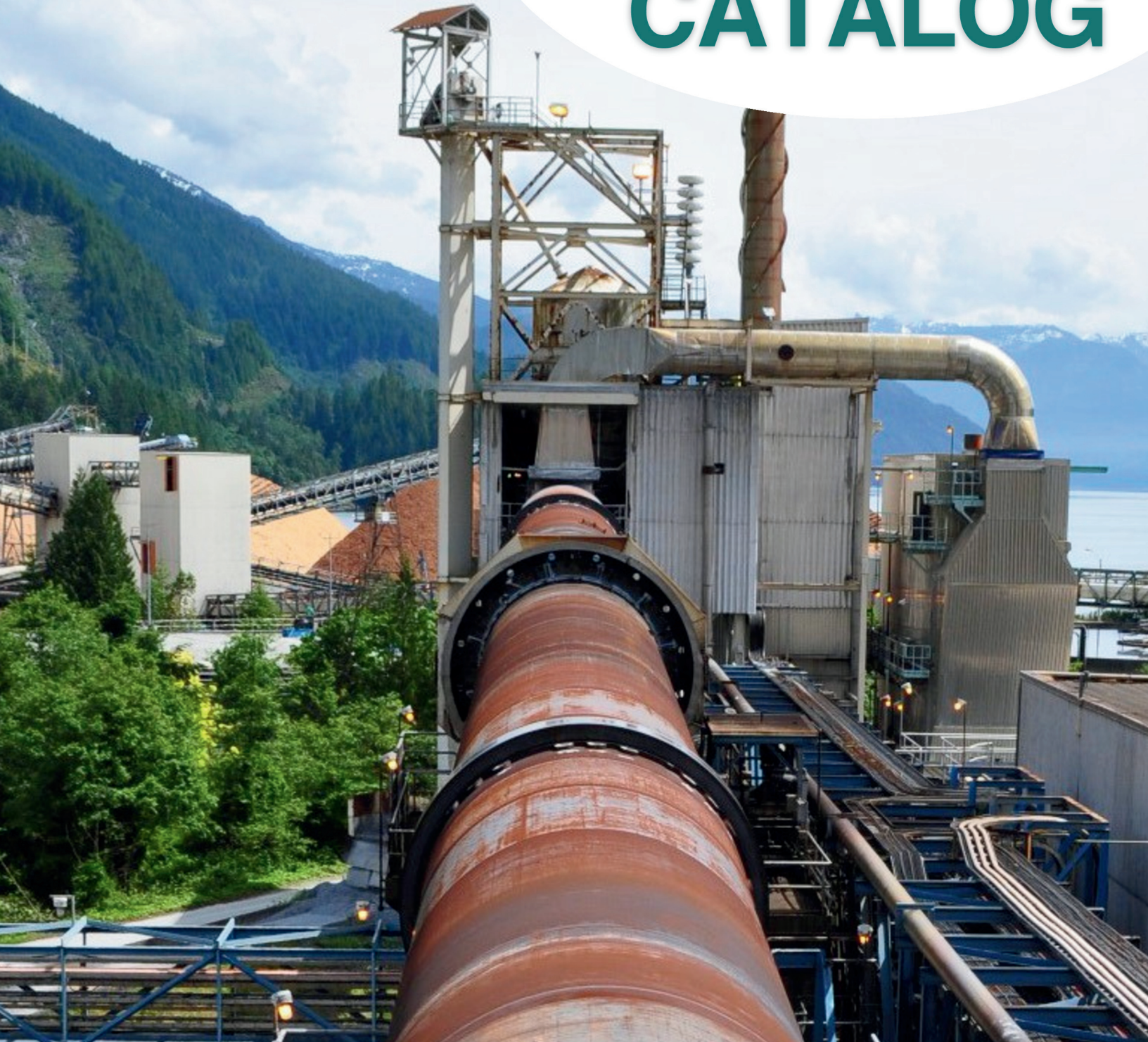


# TECHNICAL PRODUCT SPECIFICATIONS CATALOG



JAMMBCO Industrial Solutions Ltd.  
Rotary kiln efficiency experts  
providing custom solutions  
for over 50 years.

Head Office: +1 (705) 730-0840  
Sales & Customer Service: +1 (705) 730-0850  
649 Welham Road, Barrie, ON L4N 0B7

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For over 50 years, JAMMBCO has delivered engineered rotary kiln solutions to customers throughout North America, South America, Europe, Africa, Asia and the Middle East. Our patented technologies, proprietary alloys and extensive field experience help industrial operations improve efficiency, increase production and reduce maintenance costs.

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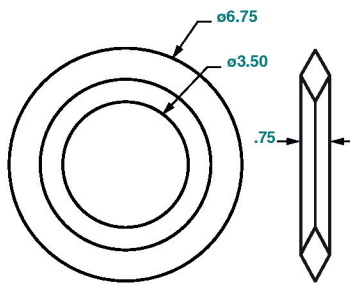
**08** ECONOLINERS

**09** LINER ASSEMBLY



# HEAT-X ROTARY KILN CHAIN

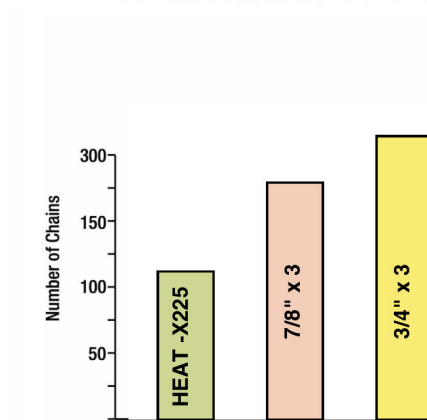
PATENTED TECHNOLOGY



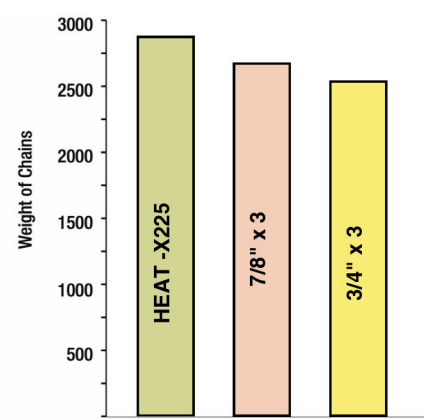
HEAT-X225

|                     | Heat-X225 | 3/4" x 3" | 7/8" x 3" |
|---------------------|-----------|-----------|-----------|
| in <sup>2</sup> /ft | 215.7     | 110.7     | 132.0     |
| lb/ft               | 12.14     | 5.92      | 8.08      |
| Links/ft            | 3.43      | 4         | 4         |

COMPARISON OF 10' CHAINS FOR A 2.5 FT<sup>2</sup>/FT<sup>3</sup> DENSITY IN A  
10' SECTION OF 14' 0" KILN



Heat-X Significantly Reduces  
Number of Chain, Hardware, and  
Installation Costs.



Comparable Weights While Using  
Fewer Chains



# JAMMB HEAT-X ROTARY KILN CHAIN

## PATENTED TECHNOLOGY

| Designation      | Comparison         | Temp Range                       | Application Area and Firing Source               | Resistance to Sulphur | Carburization Resistance | Sigma Phase Res. |
|------------------|--------------------|----------------------------------|--------------------------------------------------|-----------------------|--------------------------|------------------|
| JBC 60           | Carbon Steel       | Up to 932°F (500°C)              | Inlet Areas<br>Gas, Oil, Coal Fired              | Average               | Poor > 500°C             | Good             |
| JBC-1600         | 9F, Ferritic       | 932°F - 1652°F (500°C - 900°C)   | Mid Position Areas<br>Oil and Gas Fired          | Good                  | Good                     | Good             |
| JBCA 18-18 Micro | 304, Austenitic    | 932°F - 1652°F (500°C - 900°C)   | Mid Ranged Areas<br>Gas and Coal Fired           | Below Average         | Good                     | Good             |
| JBCA 20-10 Micro | 309, Austenitic    | 1472°F - 1922°F (800°C - 1050°C) | Mid to Burning Areas<br>Gas and Coal Fired       | Below Average         | Excellent                | Good             |
| JBCA 1650        | 85MA, Aust/Mang    | 932°F - 1652°F (500°C - 900°C)   | Radiation/Burning Areas<br>Oil, Gas, Coal Fired  | Good                  | Good                     | Average          |
| JBCA-1675        | 105MA, Austenitic  | 1675°F (913°C)                   | Radiation/Burning Areas.<br>Oil, Gas, Coal Fired | Good                  | Good                     | Good             |
| JBCA 1750        | 115MA, Aust/Mang   | 1562°F - 1750°F (850°C - 954°C)  | Radiation/Burning Areas<br>Oil, Gas, Coal Fired  | Excellent             | Good                     | < 1382°F (750°C) |
| JBCA-1800CW      | HH + CW, Aust/Mang | 1600°F - 1800°F (871°C - 982°C)  | Radiation/Burning Areas.<br>Oil, Gas, Coal Fired | Good                  | Good                     | < 1100°F (596°C) |

## HEAT-X KILN CHAIN

JAMMBCO patented HEAT-X CHAIN SYSTEMS have many advantages over conventional round link chain.

- Reduced Dust Generation
- Increased Heat Transfer
- Increased Fuel Efficiency
- 100% more surface area per link
- 50% fewer rings compared to round
- Lower installation cost
- JAMMBCO exclusive Alloys

For your kiln operations, this means:

- Fuel savings
- Reduces hardware costs
- Reduces installation costs
- Improved kiln production
- Reduces dust recycle

As shown in the chart and graph, the “HEAT-X FACTOR” for JAMMB HEAT-X chain is higher than that of old style round chain.

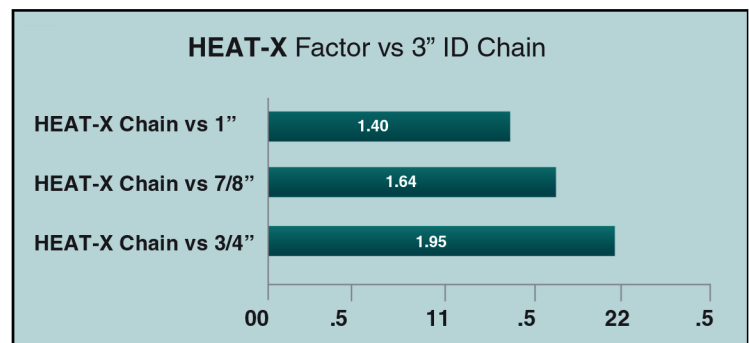
For example:

- 1 ft of HEAT-X Chain = 1.95 ft of 3/4" x 3"
- 1 ft of HEAT-X Chain = 1.64 ft of 7/8" x 3"
- 1 ft of HEAT-X Chain = 1.4 ft of 1" x 3"

In addition, HEAT-X dust generation can be expressed as the inverse of the “HEAT-X Factor” and thereby dramatically reducing your dust recycle.

For example:

- $1/1.95 = 51\%$  less dust, HEAT-X vs. 3/4" x 3"
- $1/1.64 = 61\%$  less dust, HEAT-X vs. 7/8" x 3"
- $1/1.4 = 71\%$  less dust, HEAT-X vs. 1" x 3"



|                     | Weight/ft (lbs/ft) | Surface Area (ft²/ft) |
|---------------------|--------------------|-----------------------|
| <b>HEAT-X Chain</b> | <b>12.07</b>       | <b>1.50</b>           |
| Style Round 3/4"    | 5.86               | 0.77                  |
| Style Round 7/8"    | 8.1                | 0.92                  |
| Style Round 1"      | 10.79              | 1.08                  |

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sales@jammbco.com | jammbco.com



## ROUND KILN CHAIN



### ROUND CHAIN

- Aids Heat Transfer
- Enhances Production
- Readily Available
- Various Materials

#### Wrought Type Chain:

- Carbon Steel
- Abrasion Resistant
- Ferritic Stainless
- Austenitic Stainless

#### Cast Type Chain:

- Abrasion Resistant
- Ferritic Stainless
- Austenitic Stainless
- Ductile Iron

#### Popular Sizes:

- 3/4" Cross Section x 3" I.D.
- 7/8" Cross Section x 3" I.D.
- 1" Cross Section x 3" I.D.
- Other Sizes on Demand

| Diameter |        | Pitch |        | Weight/Ring |      | Weight   |                | Surface area per unit length |                     |
|----------|--------|-------|--------|-------------|------|----------|----------------|------------------------------|---------------------|
| mm       | inch   | mm    | inch   | kg          | lbs  | kg per m | lbs per 100 ft | cm <sup>2</sup> /m           | ft <sup>2</sup> /ft |
| 16       | 5/8    | 70    | 2 3/4  | 0.43        | 0.95 | 6.14     | 413            | 1940                         | 0.637               |
| 18       | 5/8    | 100   | 4      | 0.74        | 1.63 | 7.40     | 497            | 2096                         | 0.688               |
| 19       | 3/4    | 65    | 2 5/16 | 0.65        | 1.43 | 10.00    | 672            | 2423                         | 0.795               |
| 19       | 3/4    | 70    | 2 3/4  | 0.63        | 1.39 | 9.00     | 605            | 2384                         | 0.782               |
| 19       | 3/4    | 76    | 3      | 0.67        | 1.48 | 8.82     | 592            | 2344                         | 0.769               |
| 20       | 3/4    | 65    | 2 5/16 | 0.67        | 1.48 | 10.31    | 693            | 2581                         | 0.847               |
| 20       | 3/4    | 70    | 2 3/4  | 0.70        | 1.54 | 10.00    | 672            | 2538                         | 0.833               |
| 20       | 3/4    | 76    | 3      | 0.75        | 1.65 | 9.90     | 665            | 2493                         | 0.818               |
| 20       | 3/4    | 78    | 3 5/16 | 0.77        | 1.70 | 9.87     | 663            | 2480                         | 0.814               |
| 20       | 3/4    | 80    | 3 1/8  | 0.78        | 1.72 | 9.75     | 655            | 2467                         | 0.810               |
| 20       | 3/4    | 100   | 4      | 0.93        | 2.05 | 9.30     | 625            | 2369                         | 0.777               |
| 22       | 7/8    | 76    | 3      | 0.93        | 2.05 | 12.24    | 822            | 2802                         | 0.919               |
| 22       | 7/8    | 80    | 3 1/8  | 0.97        | 2.14 | 12.13    | 815            | 2768                         | 0.908               |
| 22       | 7/8    | 100   | 4      | 1.14        | 2.51 | 11.40    | 766            | 2649                         | 0.869               |
| 23       | 7/8    | 76    | 3      | 1.02        | 2.25 | 13.42    | 902            | 2957                         | 0.970               |
| 23       | 7/8    | 80    | 3 1/8  | 1.07        | 2.36 | 13.38    | 899            | 2923                         | 0.959               |
| 23       | 7/8    | 100   | 4      | 1.14        | 2.51 | 11.40    | 765            | 2792                         | 0.916               |
| 25       | 1      | 76    | 3      | 1.23        | 2.71 | 16.18    | 1088           | 3279                         | 1.076               |
| 25       | 1      | 80    | 3 1/8  | 1.29        | 2.85 | 16.12    | 1083           | 3238                         | 1.062               |
| 25       | 1      | 89    | 3 1/2  | 1.40        | 3.09 | 15.73    | 1057           | 3160                         | 1.037               |
| 25       | 1      | 100   | 4      | 1.52        | 3.35 | 15.20    | 1021           | 3084                         | 1.012               |
| 28       | 1 1/8  | 100   | 4      | 1.95        | 4.30 | 19.50    | 1310           | 3537                         | 1.161               |
| 30       | 1 3/16 | 100   | 4      | 2.28        | 5.03 | 22.80    | 1532           | 3849                         | 1.263               |
| 32       | 1 1/4  | 100   | 4      | 2.65        | 5.84 | 26.50    | 1781           | 4169                         | 1.368               |



# LINK HANGER ASSEMBLY

PATENTED TECHNOLOGY



## JAMMB LINK HANGER

- No Chain Hangups
- Heavy Duty
- Easily Installed
- Alloy Flexibility
- Exclusive JAMMB Lock



**CAP EASILY  
SLIDES BASE  
ONTO BASE**

**JAMMBCO Patented LINK HANGER ASSEMBLY (2 PART)** comes with our unique base and cap that replaces a traditional hanger and shackle assembly. The advantages of the JAMMBCO Link Hanger Assembly are:

- Free rotation of the chain prevents chain hang-ups
- The cap can be replaced and/or re-used
- Easy removal during a turnaround
- Heavy duty design increases life
- Easily installed with our exclusive locking system
- Material for base can be matched to the shell to avoid any welding issues
- Used with any refractory thickness
- Can be used on a bare kiln shell
- Provided in numerous alloys depending on service temperature
- Minimal heat loss through the shell
- JAMMBCO on-site installation supervision is available



# SHACKLES

## PATENTED TECHNOLOGY



Experience has shown that the kiln chain area the actual temperatures are approx. 100-150°C (212-302°F) lower than in the kiln centre, therefore, a lower heat resisting grade for shackles and hangers is recommended and more cost effective.

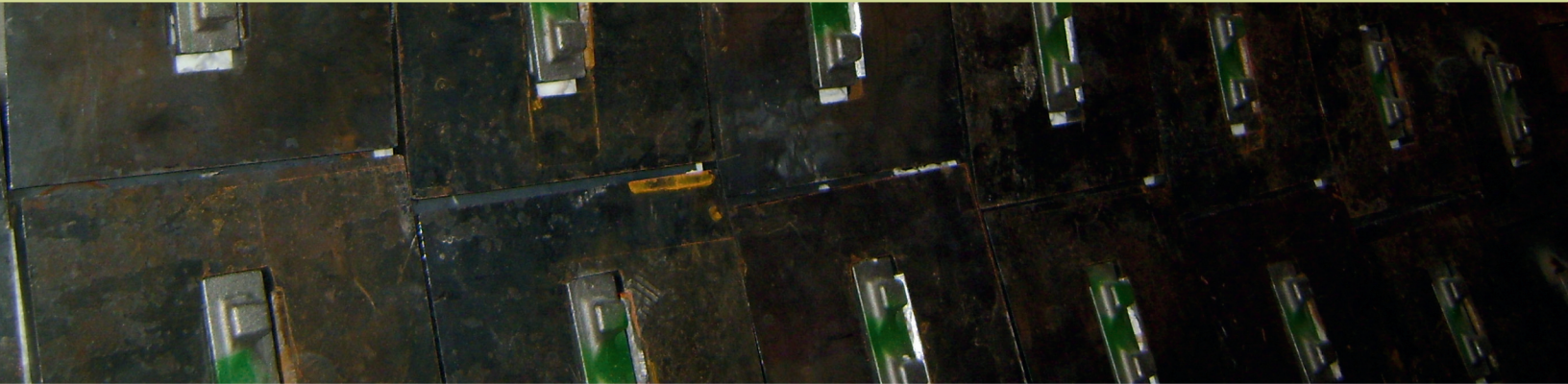
- Engineered for secure and reliable chain attachment in demanding kiln environments.
- Available in heat-resistant alloy grades selected to suit specific operating conditions.
- Designed for durability, ease of installation and dependable service life.

| Diameter |        |    |        |     |        |    |         |      |         |      |        |      |        |    | weight  | drawing          |
|----------|--------|----|--------|-----|--------|----|---------|------|---------|------|--------|------|--------|----|---------|------------------|
| D        | D1     | a  | b      | c   | d      | e  | f       |      |         |      |        |      |        |    | kg      |                  |
| mm       | inch   | mm | inch   | mm  | inch   | mm | inch    | mm   | inch    | mm   | inch   | mm   | inch   | mm | inch    |                  |
| 19       | ¾      | 19 | ¾      | 95  | 3 ¾    | 50 | 2       | 34   | 1 11/32 | 22   | 7/8    | 14   | 9/16   | 45 | 1 ¾     | 0.75 1216/1782   |
| 22       | 7/8    | 22 | 7/8    | 100 | 4      | 55 | 2 5/32  | 36.5 | 1 7/16  | 26   | 1      | 16   | 5/8    | 52 | 2 1/16  | 1.05 9471120     |
| 27       | 1 1/10 | 22 | 7/8    | 95  | 3 ¾    | 50 | 2       | 27   |         | 26   |        | 20   | ¾      | 48 |         | 1.30 977556      |
| 24       | 15/16  | 20 | ¾      | 93  | 3 5/32 | 48 | 1 57/64 | 27   | 1 1/16  | 26   | 1 1/64 | 20   | ¾      | 48 | 1 57/64 | 1.20 975676      |
| 24       | 15/16  | 20 | ¾      | 95  | 3 5/64 | 46 | 1 19/16 | 27   | 1 1/16  | 26   | 1 1/64 | 20   | ¾      | 48 | 1 57/64 | 1.20 3087116     |
| 25       | 1      | 25 | 1      | 102 | 4      | 58 | 2 5/16  | 38   | 1 1/2   | 29   | 1 5/32 | 18   | 23/32  | 59 | 2 15/16 | 1.50 950         |
| 25       | 1      | 25 | 1      | 102 | 4      | 58 | 2 5/16  | 38   | 1 1/2   | 26   | 1 5/32 | 18   | 23/32  | 59 | 2 15/16 | 1.50 950-M 24    |
| 25       | 1      | 25 | 1      | 102 | 4      | 58 | 2 5/16  | 38   | 1 1/2   | 24   | 1 5/32 | 18   | 23/32  | 59 | 2 15/16 | 1.50 950-M 22    |
| 25       | 1      | 25 | 1      | 102 | 4      | 58 | 2 5/16  | 43   | 1 1/2   | 26   | 1 5/32 | 18   | 23/32  | 59 | 2 15/16 | 1.50 950-43-M 24 |
| 25       | 1      | 20 | ¾      | 100 | 4      | 60 | 3       | 26   | 1       | 26   | 1      | 20   | ¾      | 50 | 2       | 1.30 3123        |
| 25       | 1      | 25 | 1      | 122 |        | 58 | 2 5/16  | 45   | 1 25/32 | 27.5 | 1 5/64 | 22.5 | 7/8    | 57 | 2 1/4   | 1.70 M5          |
| 25       | 1      | 25 | 1      | 122 |        | 58 | 2 5/16  | 45   | 1 25/32 | 26   |        | 22.5 | 7/8    | 57 | 2 1/4   | 1.70 M 5-Pi 25   |
| 25       | 1      | 33 | 1 3/64 | 92  |        | 58 | 2 5/16  | 41   | 1 39/64 | 27   |        | 23   | 7/8    | 56 | 2 13/64 | 2.00 B 25        |
| 28       | 1 1/8  | 28 | 1 1/8  | 130 | 3 ¾    | 70 | 2 ¾     | 34   | 1 3/4   | 31   | 1 1/32 | 27   | 1 1/16 | 68 | 2 49/64 | 2.00 B 28        |



# METAL ECONOLINER

PATENTED TECHNOLOGY



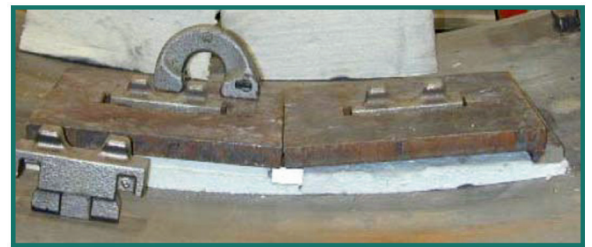
## ECONOLINER SYSTEMS

JAMMBCO Patented ECONOLINER SYSTEMS have many advantages over conventional castable linings when used in the chain area of the kiln:

- Significant increase in Kiln working internal diameter
- Reduced Dust Generation due to pressure drop
- Increases Production
- Increased lining life
- Easily Installed plus no bake out required
- Lower installation cost due to reduced hardware
- Provided in numerous alloys depending on temperature including JBCA-1750 Austenitic Stainless-Steel
- Minimal heat loss through the shell
- Protects the shell and eliminates chain wear on the refractory
- JAMMBCO on-site installation supervision is available



**LINER PLATE AND BASE SHOWING  
FIBRE INSULATION**

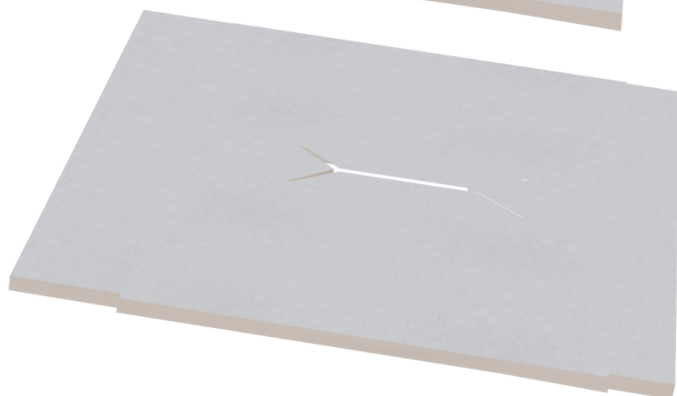
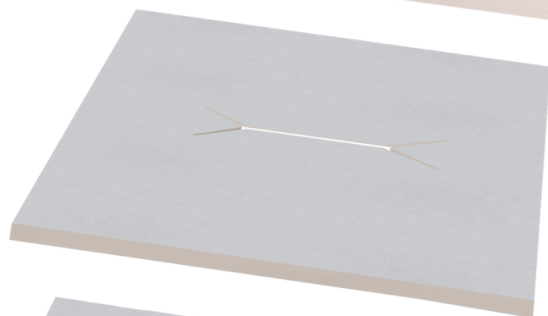
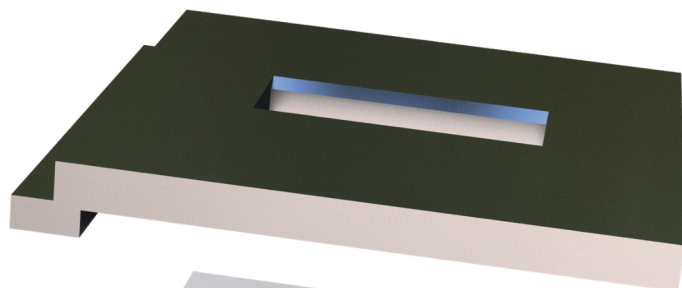
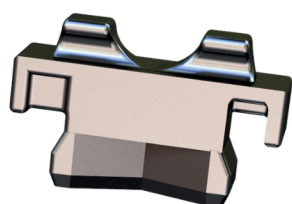
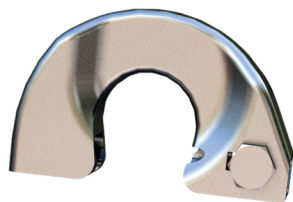


**LINER SYSTEM SHOWING THE CAP  
AND BASE DETAIL**

**Case History:** On a 12' ID kiln our customer was able to increase the internal diameter by 12.5%.



## LINER ASSEMBLY



### JAMMB LINK HANGER CAP

Install with the solid end in the direction of kiln rotation. Install the bolts with the nuts in the down kiln direction and tack weld the nuts to the bolts.

### JAMMB 4" HANGER BASE

The 4" hanger base #HGRC700-14 is welded all around with 12" of 3/8" fillet using E-7018 electrodes or equivalent for the -A and SS309 electrodes or equivalent for the -B or -M materials.

### JAMMB METAL ECONOLINER

They are installed with the spacer bar facing in the direction of kiln rotation. Weld to the -A hangers along both sides with 8" of 5/16" fillet using E-7018 electrodes or equivalent, and to the -B & -M hangers or -M liners with 8" of 5/16" fillet using SS309 electrodes or equivalent.

### TOP INSULATION PAD

The top insulation pad is shorter than the bottom pad and the cut for the hanger is centred. This pad fits between the liner spacer bars when installed.

### BOTTOM INSULATION PAD

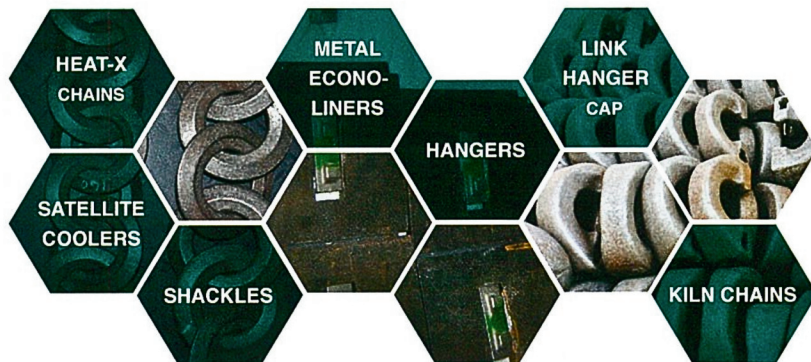
The bottom insulation pad is installed with the longer end facing in the direction of kiln rotation. It completely covers the shell and the liner spacer bar sits on it.



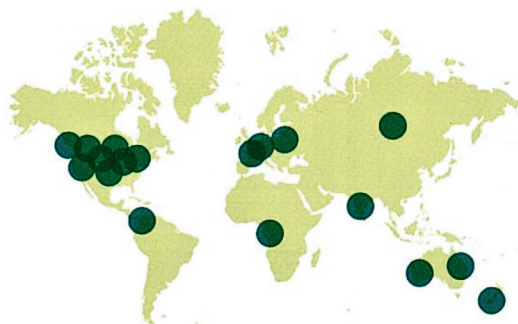
## SAVINGS POTENTIALS OF A JAMMBCO SYSTEM

| PLANT | AVG. FUEL SAVINGS/YR<br>MMBTU/t | PRODUCTION INCREASE %/DAY | MAINTENANCE SAVINGS 10YRS |
|-------|---------------------------------|---------------------------|---------------------------|
| 1     | 1.2                             | 15%                       | \$1,000,000               |
| 2     | 0.99                            | 10%                       | \$1,000,000               |
| 3     | 0.85                            | 16%                       | \$850,000                 |
| 4     | 0.84                            | 12%                       | \$900,000                 |
| 5     | 0.8                             | 12%                       | \$925,000                 |
| 6     | 0.77                            | 8%                        | \$750,000                 |
| 7     | 0.77                            | 12%                       | \$740,000                 |
| 8     | 0.75                            | 9%                        | \$900,000                 |
| 9     | 0.73                            | 17%                       | \$800,000                 |
| 10    | 0.71                            | 15%                       | \$825,000                 |

## JAMMBCO'S SUITE OF PATENTED PRODUCTS



## INSTALLED IN OVER 200 PLANTS WORLDWIDE



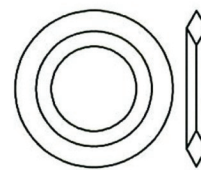
UNITED STATES  
GABON  
AUSTRALIA  
CANADA (HQ)  
COLUMBIA  
FRANCE  
GERMANY  
INDIA  
NEW ZEALAND



We are dedicated to efficiently optimizing the heat recovery from rotary kilns by utilizing our high quality wear performance products.

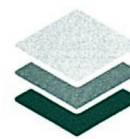
Jammbraco's name has become synonymous with professionalism, quality products, and expertise internationally over the past five decades.

REALIZE YEARLY SAVINGS OF  
**1MBTU** PER TON



HEAT-X CHAINS  
REDUCE DUSTING  
**10-20%**

ECONOLINER SYSTEMS  
CAN LAST UP TO **20** yrs



**5-15% INCREASE**  
IN PRODUCTION



AVG. FUEL SAVINGS/YR  
**OF \$700,000**



up to **117 lb CO2**  
**REDUCTION**  
per ton (natural gas)





# **ROTARY KILN EFFICIENCY**

**Increase Fuel Efficiency**

**Increase Production**

**Reduce Dust**

**Low Maintenance**

**Reliable & Safe**

**Rotary kiln efficiency experts  
providing custom solutions  
for over 50 years.**

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