

General Description

A typical Hot Mix Asphalt (HMA) plant uses approximately 200ft of flexible metal hoses "jumpers" as part of a heated oil re-circulating system. Currently, none of these flexible hoses are insulated. The following Case Study demonstrates the heat loss in the "jumpers" and the energy savings realized by installing *Cool-Skin™* sleeve.

Heat Loss Calculation Parameters

HMA Operation Season:	Continuous 24 hour, 7 day operation between May 1 – December 1 (5040 hours of operation)
"Jumper" Description:	Stainless Steel Metal Flexible Hose – Primarily horizontal
Bare Surface Emittance:	0.3 for Stainless Steel
"Jumper" Size:	1 ½" OD
Process Temperature:	325 °F
Avg. Ambient Temperature:	57 °F (~ avg. temp. between May. 1 – Dec. 1)
Avg. Wind Speed:	5.0 mph (conservative for non-costal regions)
Outer Jacket Material:	Neoprene coated nylon substrate <i>Cool-Skin™</i> cover
Outer Surface Emittance:	0.9
Insulation Layer:	<i>Cool-Skin™</i> , ¼" wall thickness

A Case for *Cool-Skin™*

"Jumper" Condition	Surface Temperature (°F)	Heat Loss (BTU/ft/5040hrs)	Efficiency (%)
Bare	324.4	2880000*	0
Insulated with <i>Cool-Skin™</i> (1/4" thick)	120.8	893600	68.90
Heat losses recovered with <i>Cool-Skin™</i>		1986400 BTU/ft/per season	
Heating capacity of natural gas		1026000 Mcf	
Cost of natural gas		\$14.00 Mcf (current market conditions)	
Heat costs recovered with <i>Cool-Skin™</i>		\$27.10/ft per season**	
Cost of <i>Cool-Skin™</i> to fit 1 ½" OD		\$15.50/ft	
Cool-Skin™ pays for itself in 120 days!			

* Bear Heat Loss Costs approximately \$40.00/linear ft of 1 ½" OD "Jumper" per season.

** Heat cost recovered with *Cool-Skin™* = Heat loss recovered / heat capacity x cost of natural gas

For more info visit us at www.worbo.com

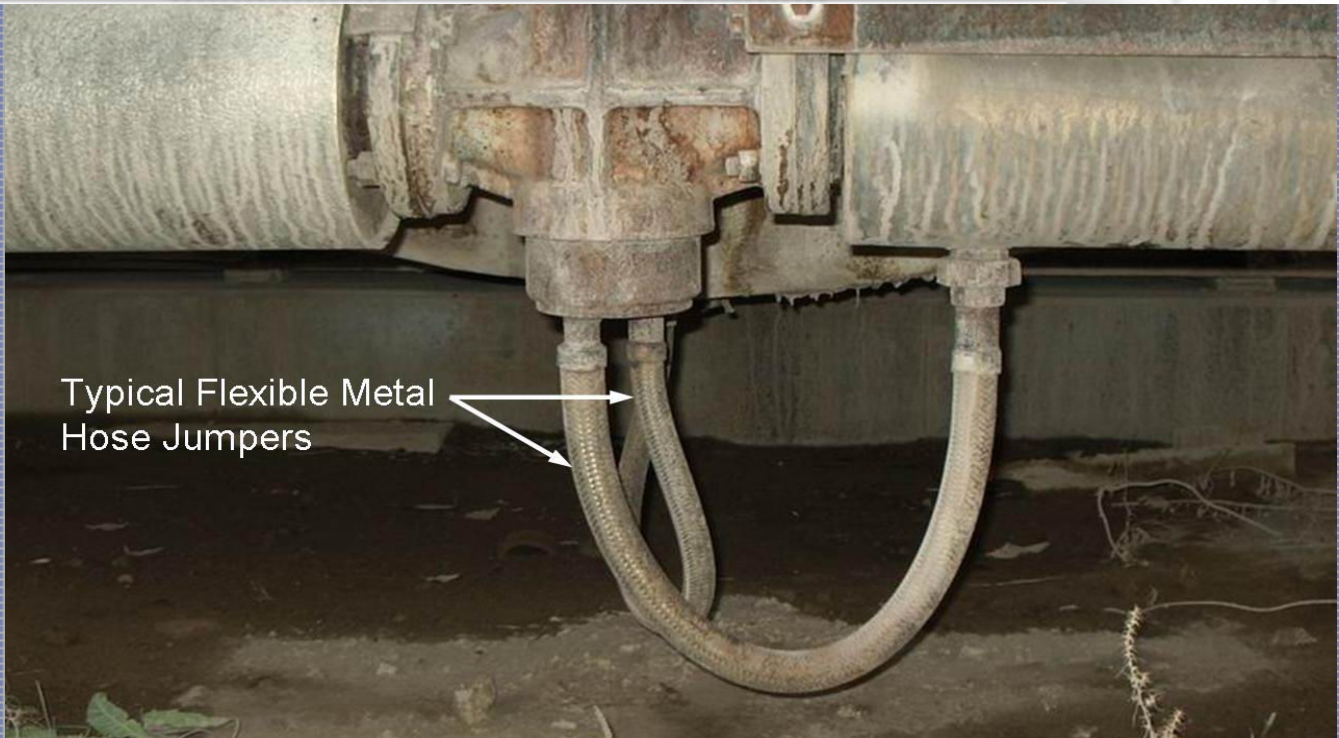


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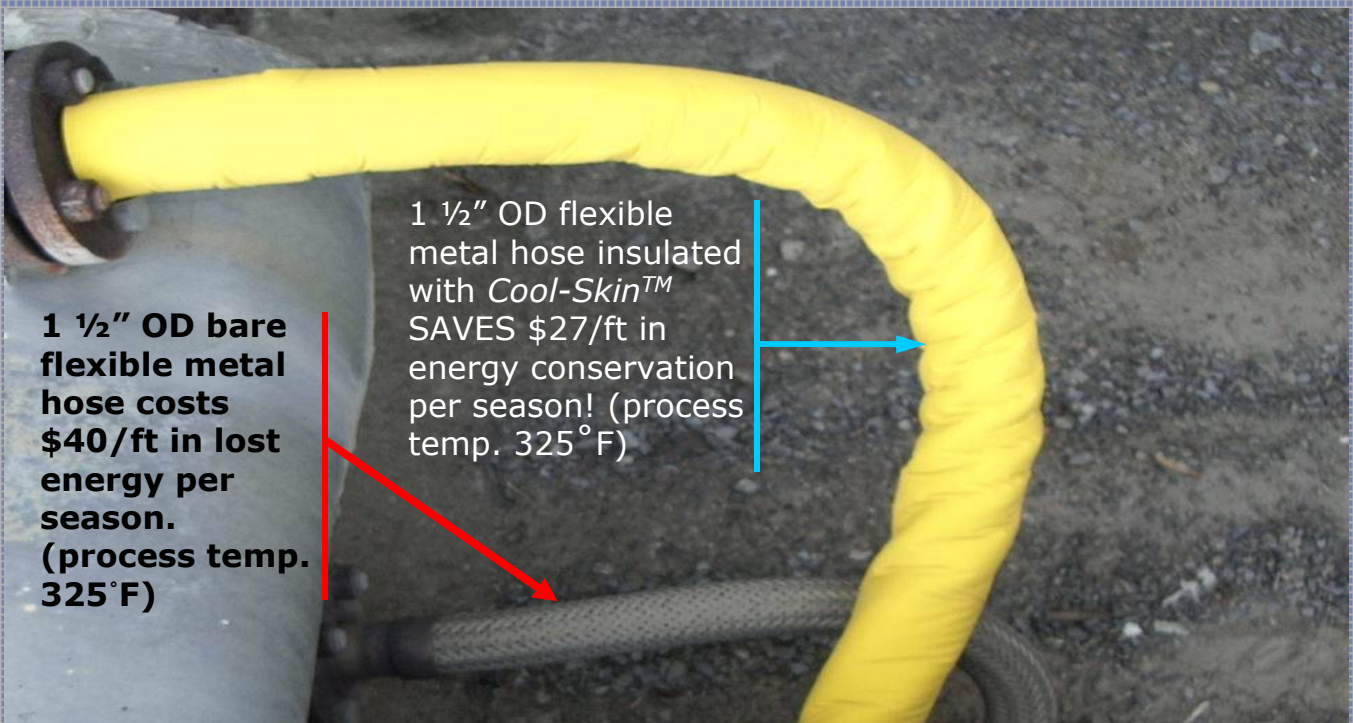
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Typical Cool-Skin™ "Jumper" Installation

July 2006



Typical Flexible Metal
Hose Jumpers



**1 1/2" OD bare
flexible metal
hose costs
\$40/ft in lost
energy per
season.
(process temp.
325°F)**

1 1/2" OD flexible
metal hose insulated
with *Cool-Skin™*
SAVES \$27/ft in
energy conservation
per season! (process
temp. 325°F)

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