

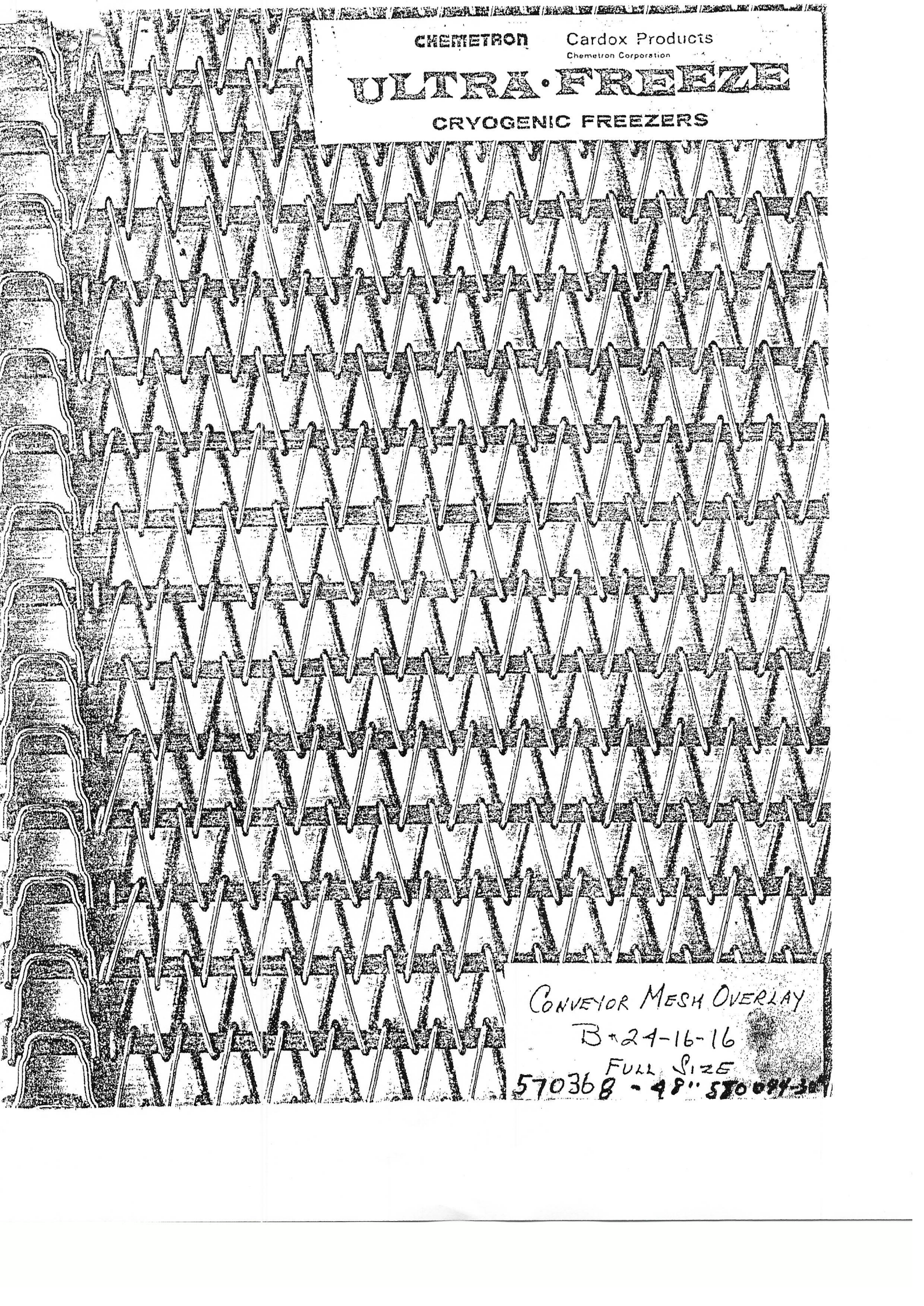
CHEMETRON

Cardox Products

Chemetron Corporation

ULTRA-FREEZE

CRYOGENIC FREEZERS



CONVEYOR MESH OVERLAY

B-24-16-16

FULL SIZE

570368 - 48" 570099-30

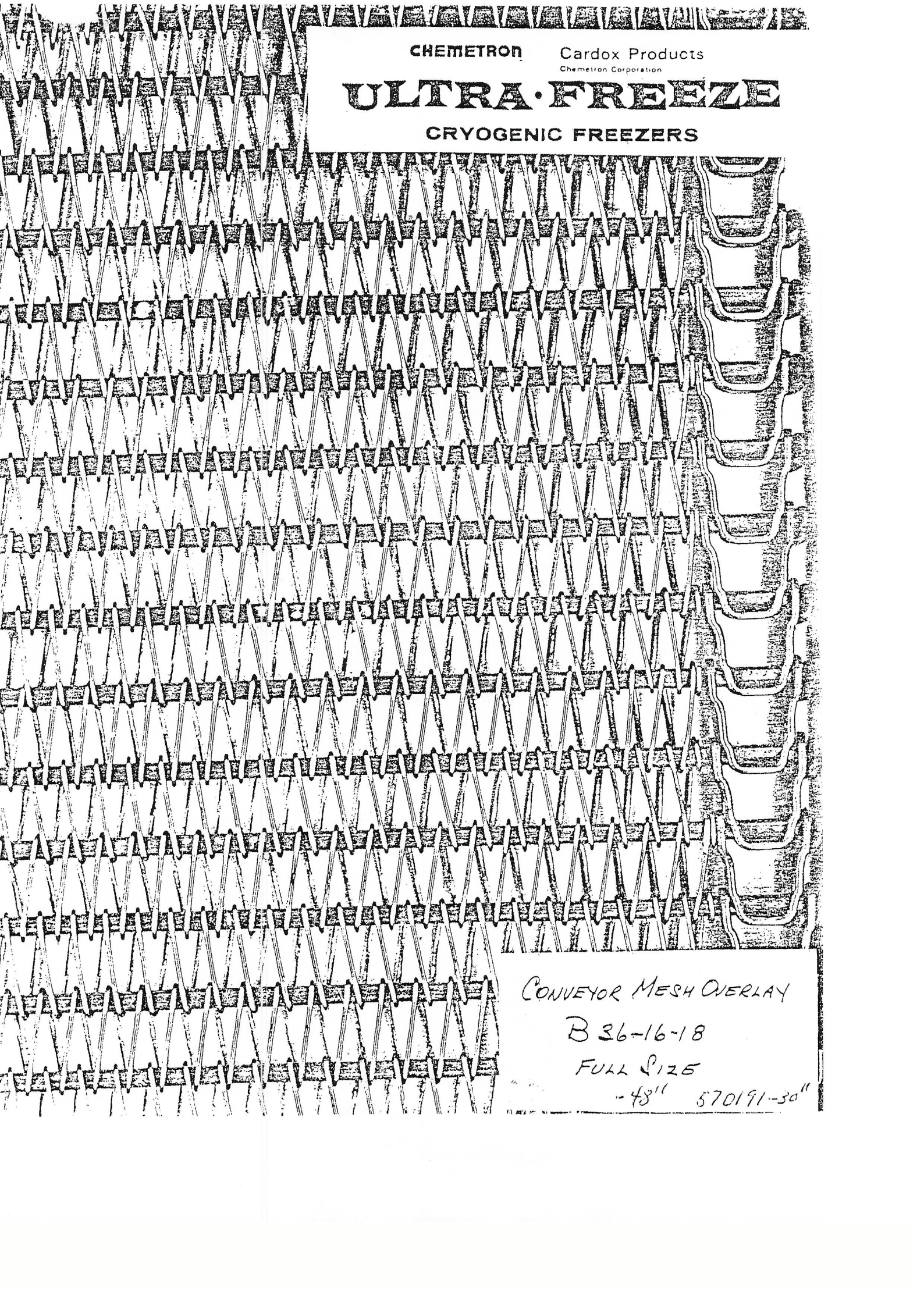
CHEMETRON

Cardox Products

Chemtron Corporation

ULTRA-FREEZE

CRYOGENIC FREEZERS



CONVEYOR MESH OVERLAY

B 36-16-18

FULL SIZE

-48" 570191-30"

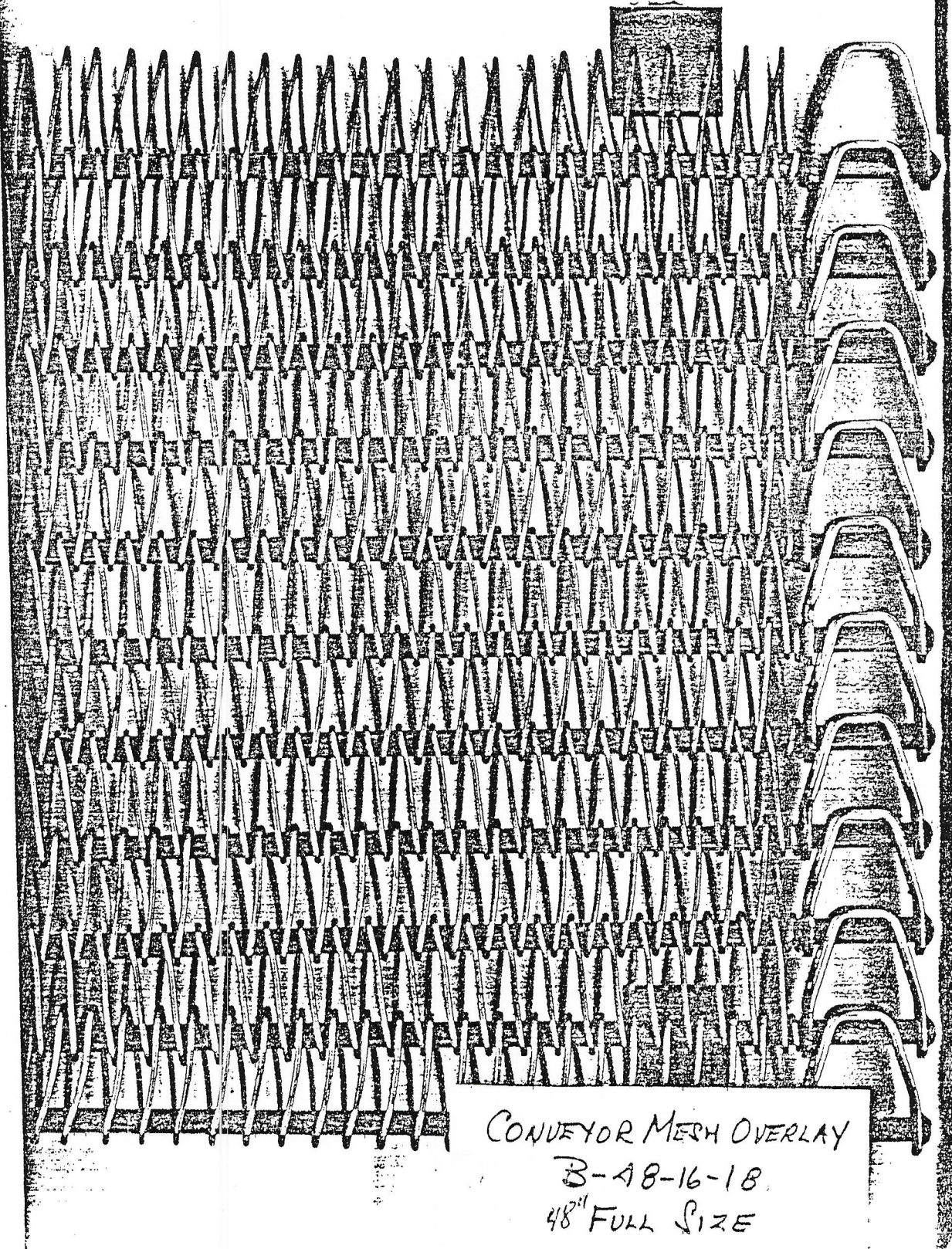
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CRYOGENIC FREEZERS



CONVEYOR MESH OVERLAY

B-18-16-18

48" FULL SIZE

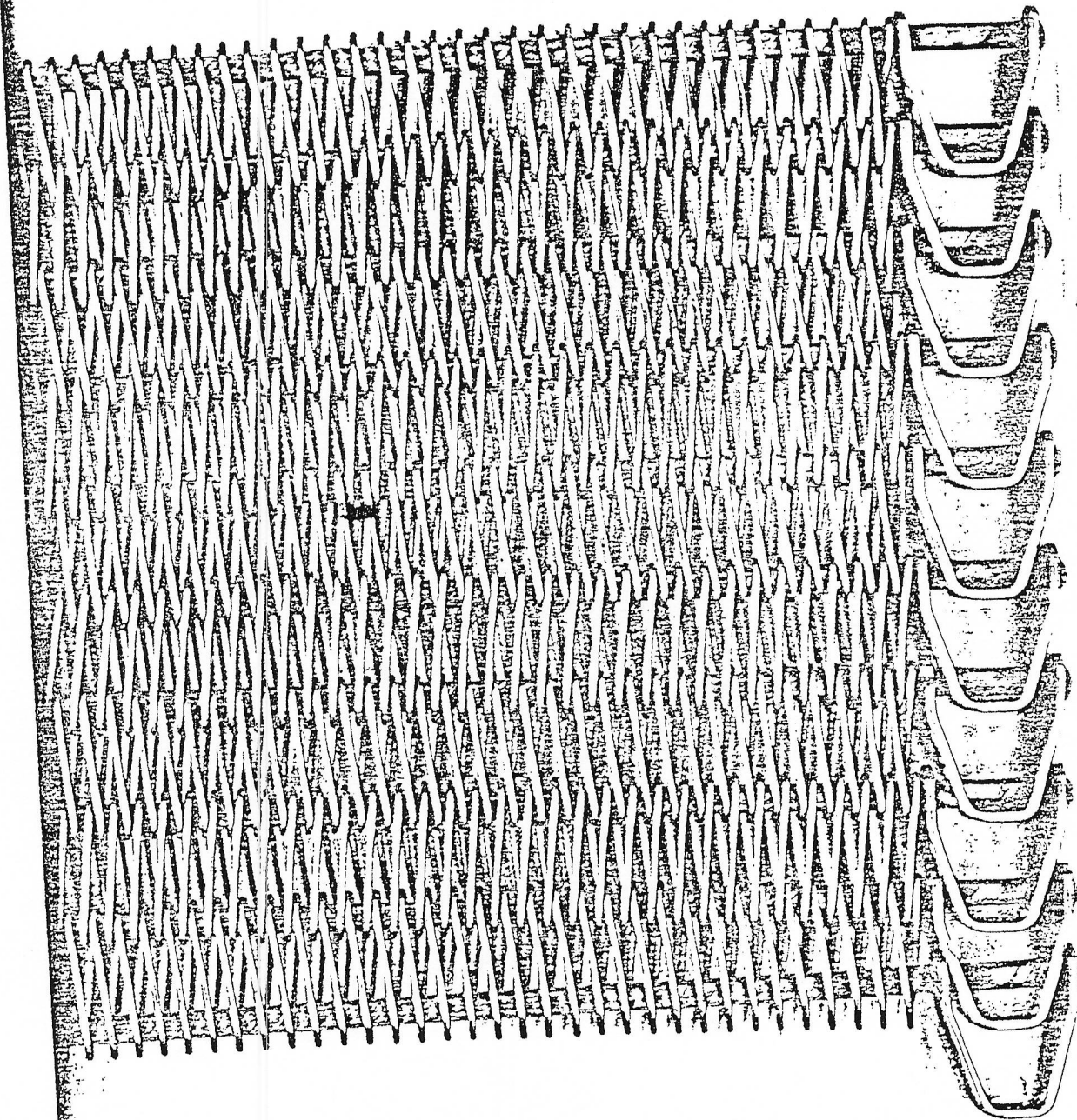
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CONVEYOR MESH OVERLAY

B72-16-18

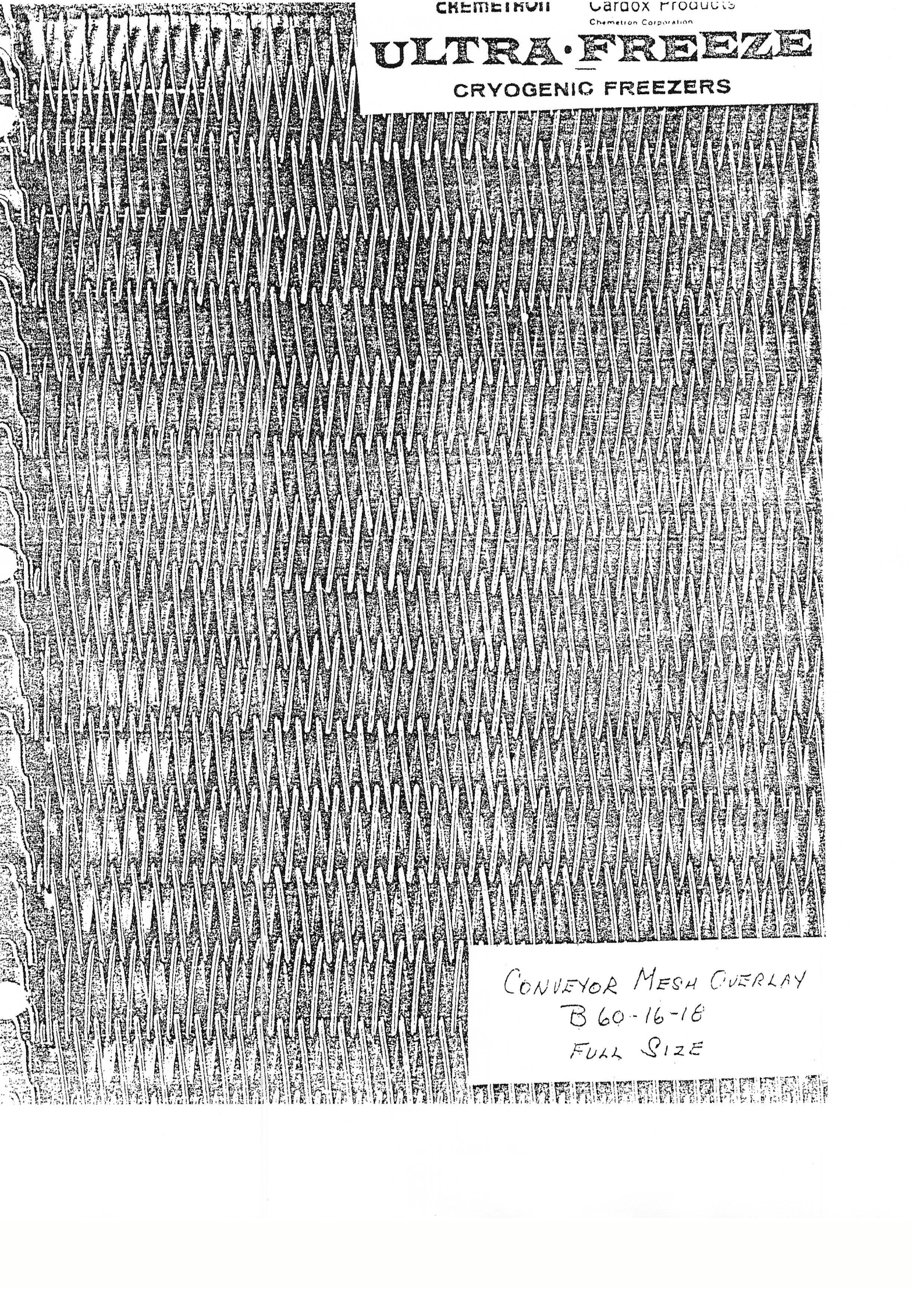
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CONVEYOR MESH OVERLAY
B 60-16-18
FULL SIZE

EQUILIBRATION

When a product is put through any freezer the outside surface is cooled first so that there is a temperature differential from the center to the outside surface of the product. Over a period of time the colder outer mass will absorb heat from the inner mass of the product. The product will equalize (equilibrate) its temperature throughout its mass. The time required for this equilibration depends on several factors - the thickness of the item, its heat transfer characteristics and the difference in temperature between the product and the environment in which it is equilibrating.

Since a cryogenic freezer is operated at a very low temperature the outside of the product mass is brought to a low temperature in a very short time. The more time the product is left in the cold freezer the colder the outer mass will become and the deeper the penetration of the crust freeze.

If just enough refrigeration is put into the outer mass of the product so that when the product is quickly packaged and put in a cold storage room the excess refrigeration in the outer mass will, in a short time, absorb the residual heat from the center and the entire mass will equilibrate to the desired end temperature of 0° or -10° or whatever.

This equilibration is a very important factor in cryogenic freezing. A processor will often specify that the product is "to come out of the freezer with a 0°F core temperature." Usually in order to satisfy his requirements (equilibrate to 0°F) the product must have enough refrigeration when it comes out of the freezer to quickly equilibrate to 0°F in the storage room after a short exposure to ambient conditions during handling and packaging before putting in cold storage.

If a relatively thick product is left in the freezer until the center is reduced to 0°F, the outer mass could be -30° or -40°F. This would be wasteful of N₂ since the product when equilibrated would then be overfrozen.

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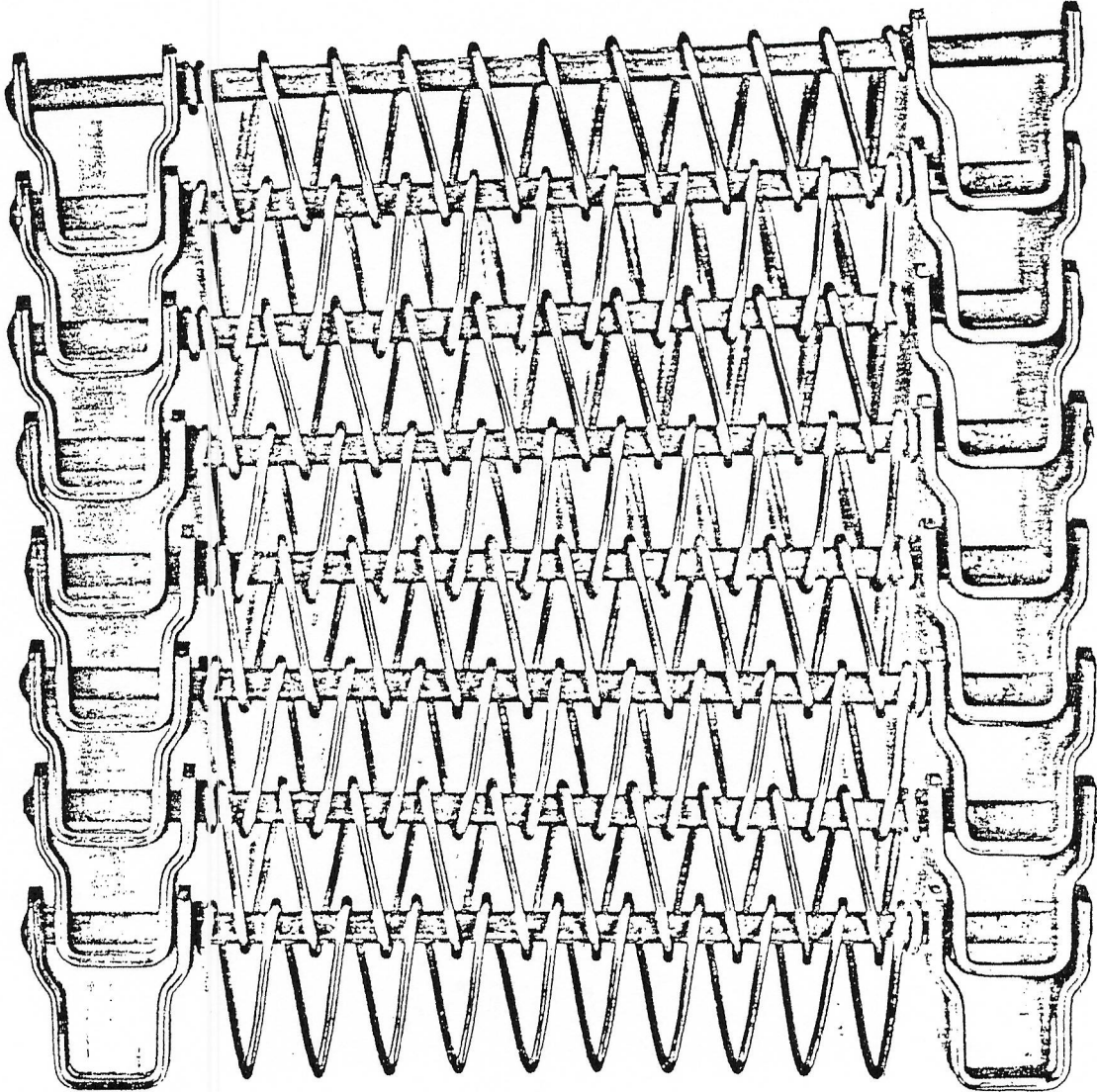
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ULTRA-FREEZE

CRYOGENIC FREEZERS



CONVEYOR MESH OVERLAY

B 30-16-16

FULL SIZE

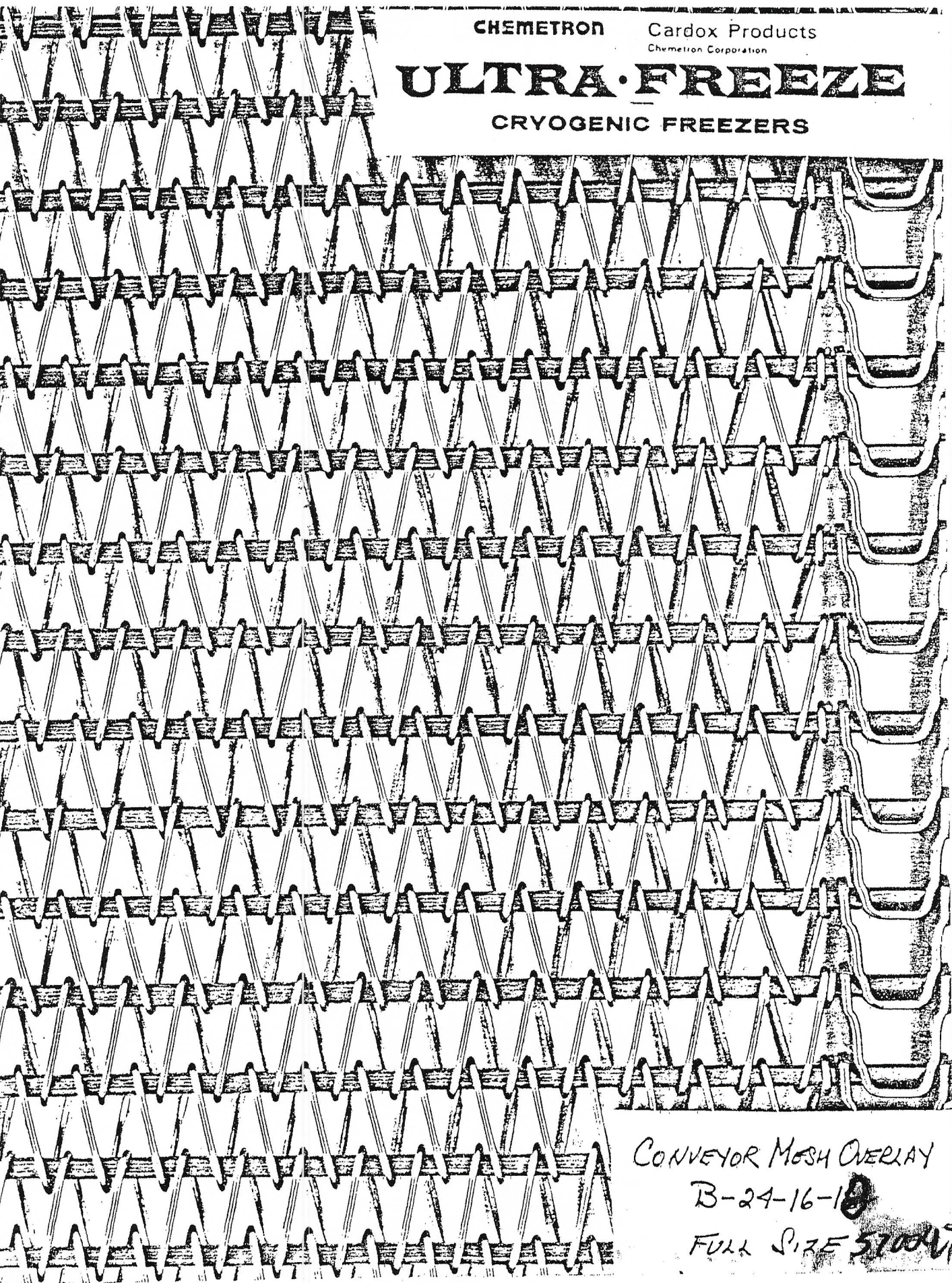
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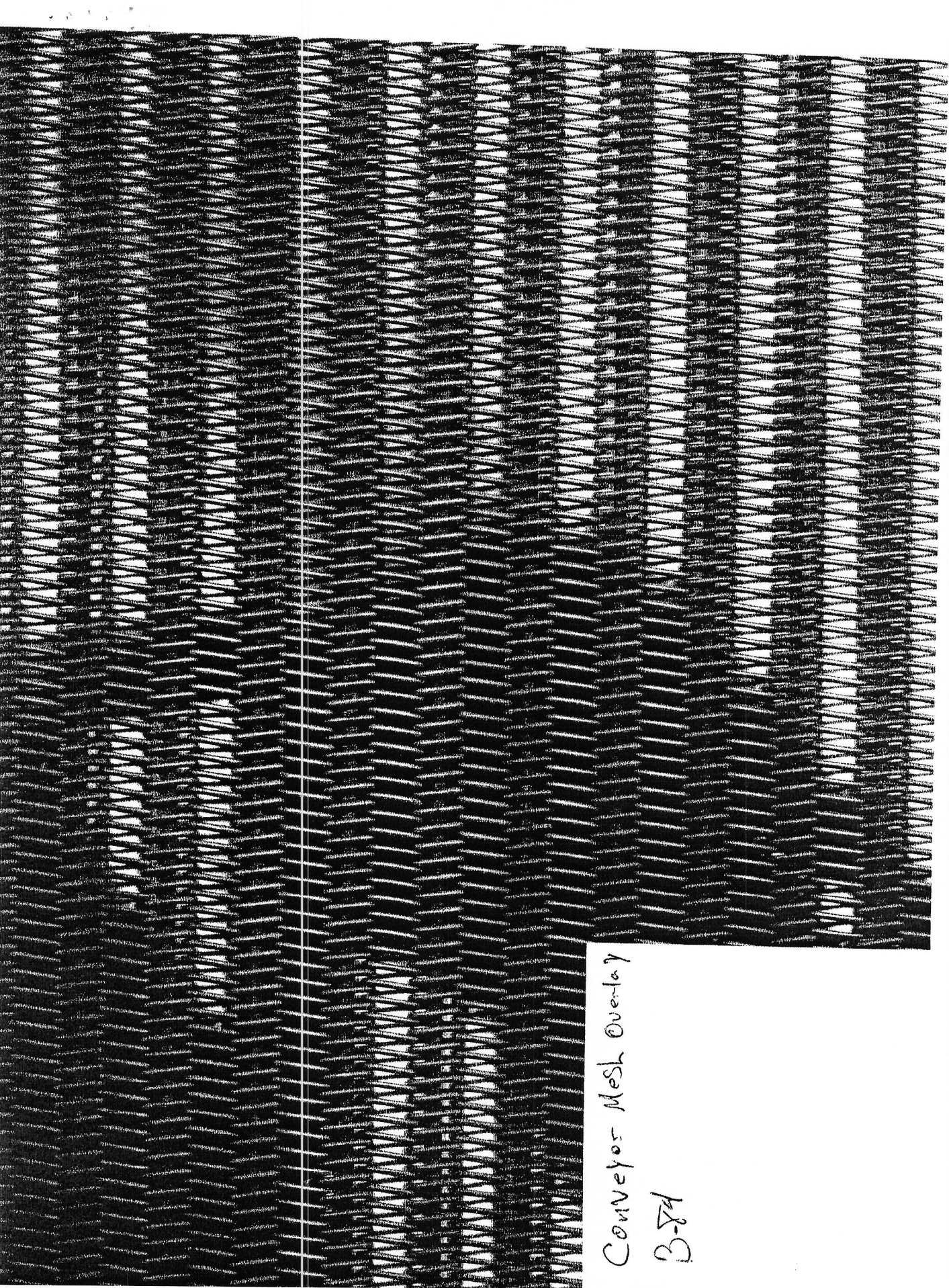
CRYOGENIC FREEZERS



CONVEYOR MESH OVERLAY

B-24-16-10

FULL SIZE 5700V



Conveyor Mesh Overlay

B-74

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ULTRA-FREEZE

CRYOGENIC FREEZERS

CONVEYOR MESH OVERLAY

B18-16-16

FULL SIZE

570372-30" 570351-48"