BAKING BANDS

Many woven wire belts used for baking have been referred to as Baking Bands – typically Balanced Weave or Compound Balanced Weave belts are used. A Compound Balanced Weave belt consists of two to five balanced weave or unilateral weave belts interconnected and compressed into each other forming one dense weave belt. Each individual belt is composed of right and left hand helicals joined by a connector rod in the case of balanced weave belts (CB3 OR CB5) or all one-hand helicals joined by a connector in unilateral weave belts (CB2 OR CB4). Ashworth has set the standard in the industry with the CB5 Baking Band®.

DEFINING CHARACTERISTICS

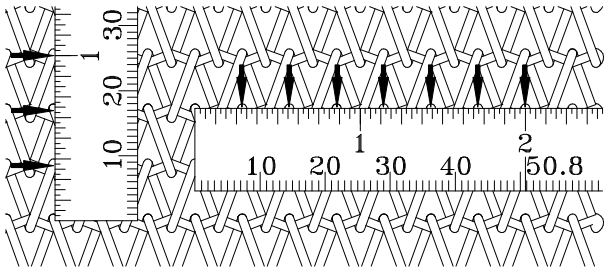
Turn Capability: Straight run only.
Width Limits: Minimum width = 3 lateral pitches + 4 spiral wire diameters, Maximum width = 144" [3658 mm].
Maximum width for CB5-27-84-1416F, MCB5-27-84-1516F, and other compound balanced weave belts = 120" [3048mm]
Conveying Surface: Overall belt width – (1/2 of one lateral pitch + 3 spiral wire diameters).
Method of Drive: Friction driven with a flat-faced drum.
Pitch: Varies with standard meshes.
Belt Strength: Varies with standard meshes.
Mesh Designation: A Balanced Weave or Compound Balanced Weave Mesh is designated by the letters "B" or "CB" and followed by a number that indicates a number of meshes that are interconnected. This is followed by a number that indicates the number of complete turns or loops an individual spiral makes in one foot [304.8 mm] of width.

Mesh choice is nearly unlimited. Choice depends on the baking requirements of the product. Selection should consider product support, heat exposure, and the belt strength required for the oven design. Typical nomenclature for Woven mesh designations:
Examples: see chart on next page.

A	CB = Compound Balanced Weave mesh B = Balanced Weave mesh U = Unilateral
XX	number of loops in 12 inches of belt width
YY	number of connectors in 12 inches of belt length
ZZ	Third count is the wire gauge. If the third count is four numbers (two pairs of numbers), the first is the gauge of the connector wire and the second is the gauge of the spiral wire.

The following letters may also be used:

M	Metric
F	Flattened wire
PGLW	Precision Ground Light Weight



AXX-YY-ZZ

Technical Bulletins available for more information see "034 Balanced Weave Belt" and "028 TruSeat™ Lehr Belts"

Typical Balanced Weave meshes used for baking:

Mesh Designation	Approximate Opening Size		Thickness		Weight	
	inch	mm	inch	mm	lbs/ft^2	kg/m^2
CB5-27-84-1416F	.050	1.3	.215	5.46	4.20	20.5
MCB5-27-84-1516F	.050	1.3	.205	5.21	3.35	16.4
B48-38-15	.18 x .24	4.6 x 6.1	.280	7.11	2.80	13.70
B48-48-16	.18 x .19	4.7 x 4.8	.250	5.72	2.30	10.70
B60-36-14 PGLW	.12 x .25	3.0 x 6.4	.250	6.35	3.54	17.30
B60-36-16 PGLW	.14 x .27	3.6 x 6.9	.250	6.35	2.12	10.30
B72-72-18	.12 x .12	2.9 x 2.9	.205	5.21	2.05	10.00
B84-20-1416	.08 x .52	2.0 x 13.2	.275	6.99	2.80	13.70
B102-24-1418	.07 x .42	1.8 x 10.7	.245	6.22	2.20	10.70
U66-48-1718 PGLW	.13 x .20	3.3 x 5.1	.225	5.72	1.69	8.20

Special Options

Material: Baking Bands are typically manufactured from annealed high carbon steel round wire in standard gauge sizes. Stainless steel and other steel alloys can be used if the particular application requires.
Flattened Wire (F): If a more flat conveying surface is required the spirals can be made from a flattened wire.
Precision Ground Light Weight (PGLW): Flattened surface of an open mesh band by precision grinding the surface after manufacture. The feature is currently limited to carbon steel bands 54" [1370 mm] or less in width.

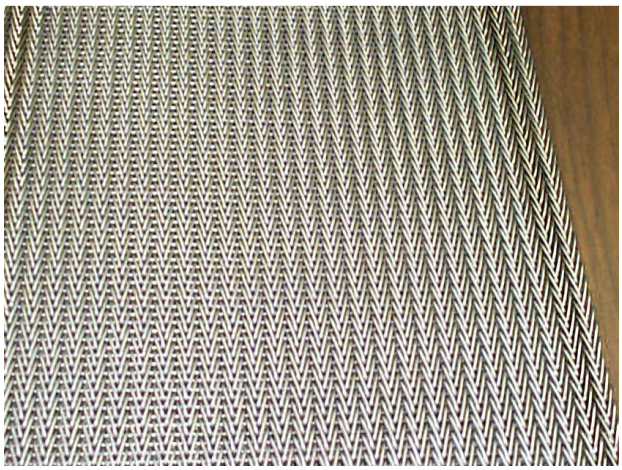
Band Performance

Key factors for successful band operation:

- Select a band suitable for the product and baking environment.

Consider:

- ❖ material suitable for baking environment
- ❖ baking surface compatible with product
- ❖ opening size with consideration of product size, air flow, and band temperature
- ❖ markings on the product
- ❖ band strength required for oven design



CB5 36-120-80

ENGINEERING CALCULATIONS & DATA

BELT TENSION

$T = [WLf_r + wLf_r] \times C$

			Metric Units:
where	T	= Belt Tension in lbs/ft belt width	*[kg/m belt width]*
	W	= Total Weight = Belt Weight + Product Weight in lbs/sq.ft	*[kg/sq.m]*
	L	= Conveyor Length in feet	*[meters]*
	w	= Belt Weight in lbs/sq.ft	*[kg/sq.m]*
	f_r	= Coefficient of Friction Between Belt and Supporting Bed	*dimensionless*
	C	= Force Conversion Factor	
		Imperial: 1.0	
		Metric: 9.8	

Typical f_r values:

Type of Belt Support	f_r
Stainless Steel	0.40
Free Turning Rollers	0.10
Mild Steel:	
with temperatures up to 1000ºF [538ºC]	0.35
with 1001 to 1200ºF [538 to 649ºC]	0.37
with 1201 to 1400ºF [649 to 760ºC]	0.40
with 1401 to 1600ºF [760 to 871ºC]	0.44

TORQUE REQUIREMENT

T = Torque in units of inch-lb.
= Belt Tension [lb.] x 1/2 (Drum or Pulley Diameter [in.])

DRUM/PULLEY DIAMETERS

Drums or pulleys where the belt is wrapping 180º or more have a minimum diameter.
Minimum drum diameter for balanced (B) or unilateral (U) meshes = 180/SC; "SC" is the second count of the mesh. For compound balanced weave (CB) meshes minimum drum diameter = (180 x CB#) / SC where CB# = number following CB in belt designation, i.e., CB5 27-84-1416F – CB number would be "5". If a drum is used with a diameter less than the

minimum, the belt will hinge on the spirals and bend them. Bending the spirals essentially elongates the pitch. This elongation typically is not uniform across the belt's width and may cause tracking problems along with mesh distortion.

CONTROL SYSTEMS

Ashworth designs and manufactures devices used to guide the belts' path at terminal locations. Model 2 controls function statically. Suitable in temperatures up to 1200ºF [650ºC] with nickel brazed bearings. See Ashworth bulletin "control systems" for detailed information.

Ashworth recommends the use of Ashworth Model #1 or Model #2 'Control Systems' to prevent the belt from contacting framework and keep the belt centered on the terminal drums. Other manufacturers' systems have been used successfully, but they must be monitored to prevent belt damage due to excessive side loading on the belt. Ashworth recommends that belt guides be located a distance 2-3 times the belt width from the terminal rollers. Ashworth will not warrant belts against edge damage caused by systems of other manufacturers; and can not make recommendations on their installation, use and maintenance.

Refer to: Ashworth's Technical Bulletin on "#046 Baking Band Assembly Instructions, #048 Control Systems for Friction Driven Belts" for proper conveyor alignment and belt installation.

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