

**SHINGARE**  
INDUSTRIES PVT LTD



# BOILER

## *TUBE EXPANDER*



**MANUFACTURER & EXPORTER OF**

**Tube Cleaners, Tube Expanders, Tube Tools, Pipe Beveling Machines, Plate Bevellers,  
High Pressure Water Jetting Machine & Tapping Machine**

# Our Successful Participation in Trade Fairs and Conventions in INDIA and Overseas.



**SISSA BANGALORE 2015**



**SISSTA, CHENNAI 2016**



**STAI, NEW DELHI 2016**



**SISSTA, TIRUPATI 2017**



**MAHATECH, PUNE 2015**

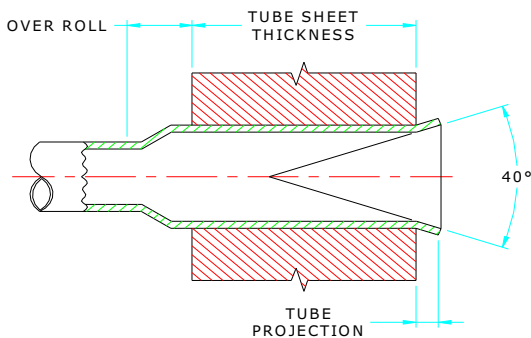
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## 'B114' - 4 PLAIN ROLLERS & 2 FLARE ROLLERS

### FEATURES

- Overlapping rolls prevent ridging of tube.
- Can be converted for parallel expansion use enquire with us.
- Self retained rolls in cage.
- Use: General purpose expander for expanding and flaring boiler tubes, water wall, down comer, economizer, riser, & air heater tubes.



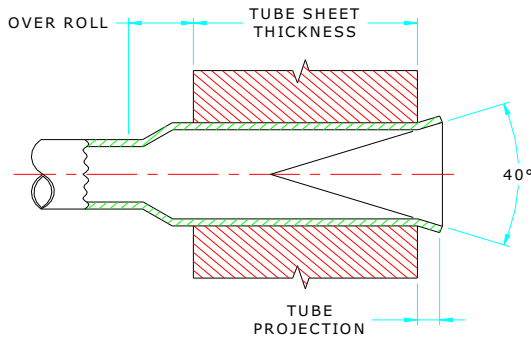
TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOL	TUBE SHEET THICKNESS RANGE				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>								2	3	4	5	6
2	4 & 5	(.238 & .220)	1. 3/4	11 - 13	(.120 - .095)	36.1 (1.444)	43.1 (1.696)	-	B14172	B14174	B14176	B14178
2	6 & 7	(.203 & .180)	1. 3/4	14 - 16	(.480 - .065)	38.3 (1.507)	44.6 (1.755)	-	B14182	B14184	B14186	B14188
2	7 & 8	(.180 & .165)	1.3/4	15 & 16	(.072 & .065)	39.9 (1.570)	46.4 (1.826)	B14191	B14192	B14194	B14196	B14198
2	9 & 10	(.148 & .134)	2. 1/4	13	(.059)	41.5 (1.633)	48.0 (1.889)	B14201	B14202	B14204	B14206	B14208
2	11 - 13	(.120 - .095)	2. 1/4	4 & 5	(.238 & .220)	43.1 (1.696)	49.6 (1.952)	B14211	B14212	B14214	B14216	B14218
2. 1/2	2	(.284)	2. 1/4	6 - 8	(.203 - .165)	45.5 (1.791)	52.6 (2.070)	-	B14222	B14224	B14226	B14228
2. 1/2	3 & 4	(.259 & .238)	2. 1/4	9 - 11	(.148 - .120)	47.1 (1.856)	54.2 (2.133)	-	B14232	B14234	B14236	B14238
2. 1/2	4 - 6	(.238 - .203)	2. 1/4	12 - 15	(.109 - .072)	49.0 (1.929)	57.3 (2.255)	-	B14242	B14244	B14246	B14248
2. 1/2	7 - 10	(.180 - .134)	2. 3/4	2 & 3	(.284 & .259)	51.9 (2.043)	60.5 (2.381)	-	B14252	B14254	B14256	B14258
2. 1/2	11 - 13	(.120 - .095)	2. 3/4	4 & 5	(.238 & .220)	55.1 (2.169)	63.7 (2.507)	B14261	B14262	B14264	B14266	B14268
3	1 - 3	(.300 - .259)	2. 3/4	6 - 10	(.203 - .134)	57.4 (2.259)	66.6 (2.622)	-	B14272	B14274	B14276	B14278
3	4 - 6	(.238 - .203)	2. 3/4	11 - 15	(.120 - .072)	60.6 (2.385)	70.0 (2.755)	-	B14282	B14284	B14286	B14288
3	7 - 11	(.180 - .120)	3. 1/4	1 - 4	(.300 - .238)	63.8 (2.511)	73.9 (2.909)	-	B14292	B14294	B14296	B14298
3	10 - 12	(.134 - .109)	3. 1/4	4 - 7	(.238 - .180)	66.9 (2.635)	77.3 (3.043)	B14301	B14302	B14304	B14306	B14308
3. 1/2	1 - 4	(.300 - .238)	3. 1/4	7 - 11	(.180 - .120)	70.1 (2.759)	80.1 (3.153)	-	B14312	B14314	B14316	B14318
3. 1/2	4 - 7	(.238 - .180)	3. 1/4	10 - 15	(.134 - .072)	73.0 (2.874)	83.4 (3.283)	-	B14322	B14324	B14326	B14328
3. 1/2	7 - 11	(.180 - .120)	3. 3/4	2 & 3	(.284 & .259)	76.2 (2.000)	86.8 (3.417)	-	B14332	B14334	B14336	B14338
3. 1/2	10 - 12	(.134 - .109)	3. 3/4	4 & 5	(.238 & .220)	79.3 (3.122)	89.8 (3.535)	-	B14342	B14344	B14346	B14348
4	1 - 4	(.300 - .238)	3. 3/4	6 - 10	(.203 - .134)	82.5 (3.248)	93.0 (3.661)	-	B14352	B14354	B14356	B14358
4	4 - 7	(.238 - .180)	3. 3/4	11 - 15	(.120 - .072)	85.7 (3.374)	96.0 (3.779)	-	B14362	B14364	B14366	B14368
4	7 - 11	(.180 - .120)	4. 1/4	2 & 3	(.284 & .259)	88.9 (3.500)	98.6 (3.881)	-	B14372	B14374	B14376	B14378
4	8 - 12	(.165 - .109)	4. 1/4	3 & 5	(.259 & .220)	90.5 (3.562)	102.3 (4.027)	-	B14382	B14384	B14386	B14388
4. 1/2	1 - 4	(.300 - .238)	4. 1/4	6 - 9	(.203 - .148)	95.2 (3.748)	104.7 (4.122)	-	B14392	B14394	B14396	B14398
4. 1/2	3 - 8	(.238 - .165)	4. 1/4	10 - 13	(.134 - .095)	98.4 (3.874)	110.3 (4.342)	-	B14402	B14404	B14406	B14408
4. 1/2	6 - 12	(.203 - .109)				101.6 (4.000)	113.5 (4.468)	-	B14412	B14414	B14416	B14418

# BOILER TUBE EXPANDER



TUBE TOOLS

## 'B114' - 4 PLAIN ROLLERS & 2 FLARE ROLLERS



SPARE ROLLERS SET MODEL NUMBER					SPARE MANDREL MODEL NUMBER										
TUBE SHEET THICKNESS RANGE					MANDREL SIZE inch	DRUM TYPE	HEADER TYPE	SHORT SERIES 5. 1/8 inch					SHORT SERIES 7. 1/8 inch		
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"											
2	3	4	5	6	<<< Tube Sheet Thickness Codes										
-	B34872	B34874	B34878	B34948	3/4	B32269	B32289	B32308	B32309	B32310	B32311	B34876, B34948			
-	B34879	B34881	B34883	B34949	3/4	B32269	B32289	B32309	B32310	B32311	-				
B34878	B34879	B34881	B34883	B34949	3/4	B32270	B32290	B32309	B32310	B32311	B32312	-			
B34885	B34886	B34888	B34890	B34950	3/4	B32270	B32290	B32310	B32311	B32312	B32346				
-	B34893	B34895	B34897	B34951	3/4	B32270	B32290	B32310	B32311	B32312	B32313	B32345			
-	B34893	B34895	B34897	B34951	3/4	B32271	B32291	B32311	B32312	B32313	B32314	-			
-	B34893	B34895	B34897	B34951	3/4	B32272	B32292	B32312	B32313	B21214	B32315	-			
-	B34900	B34902	B34904	B34952	3/4	B32272	B32292	B32312	B32313	B32314	B32315	B32347 B32348 B32349			
B34899	B34900	B34902	B34904	B34952	3/4	B32273	B32293	B32315	B32316	B32317	B33630 B33631				
-	B34907	B34909	B34911	B34953	3/4	B32273	B32293	B32315	B32316	B32317	B32318	B32319	-		
-	B34907	B34909	B34911	B34953	1	B32274	B32294	B32317	B32318	B32319	B32320	B32321	-		
-	B34914	B34916	B34918	B34954	1	B32274	B32294	B32318	B32319	B32320	B32321	B32322	33632 33633 33634 33635		
B34913	B34914	B34916	B34918	B34954	1	B32275	B32295	B32320	B32321	B32322	B33634 B33635				
-	B34921	B34923	B34925	B34955	1	B32274	B32294	B32318	B32319	B32320	B32321	B32322	-		
-	B34921	B34923	B34925	B34955	1	B32275	B32295	B32321	B32322	B32323	B32324	B32325	-		
-	B34921	B34923	B34925	B34955	1	B32276	B32296	B32323	B32324	B32325	B32326	B32327	-		
-	B34921	B34923	B34925	B34955	1	B32277	B32297	B32324	B32325	B32326	B32327	B32328	-		
-	B34928	B34930	B34932	B34956	1	B32276	B32296	B32324	B32325	B32326	B32327	B32328	-		
-	B34928	B34930	B34932	B34956	1	B32277	B32297	B32326	B32327	B32328	B32329	B32330	-		
-	B34928	B34930	B34932	B34956	1	B32278	B32298	B32328	B32329	B32330	B32331	B32332	-		
-	B34935	B34937	B34939	B34957	1	B32277	B32297	B32324	B32325	B32326	B32327	B32327	-		
-	B34935	B34937	B34939	B34957	1	B32278	B32298	B32329	B32330	B32331	B32332	B32333	-		
-	B34935	B34937	B34939	B34957	1	B32279	B32299	B32331	B32332	B32350	B32337	B32338	-		
-	B34942	B34944	B34946	B34958	1	B32278	B32298	B32326	B32327	B32328	B32329	B32330	-		



# BOILER TUBE EXPANDER

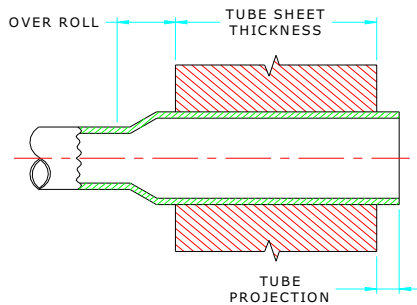


TUBE TOOLS

## PARALLEL TYPE 'BA' - 3 PLAIN ROLLERS

### FEATURES

- Time tested durable design.
- Sturdy construction with rolls self contained in cage.
- Best 'Value for Money' tool in the world when parallel rolling tubes.
- Use - Economical tool used for applications where tubes are to be expanded without flaring.



TUBE SIZE			TUBE SIZE			MIN. I. D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOL		TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch					TUBE SHEET THICKNESS RANGE				
						Mm	Inch	Mm	Inch	1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
7/8	15	(.072)	1	10	(.134)	18.1	(.712)	20.4	(.803)	BA-31/2	BA-31/3	-	-	-
7/8	16	(.065)				18.4	(.724)	20.7	(.814)	BA-32/2	BA-32/3	-	-	-
7/8	17	(.058)	1	11	(.120)	18.8	(.740)	21.1	(.830)	BA-33/2	BA-33/3	-	-	-
7/8	18	(.049)	1	12	(.109)	19.4	(.763)	21.6	(.850)	BA-34/2	BA-34/3	-	-	-
7/8	19 & 20	(.042 & .035)	1. 1/8	8	(.165)	19.7	(.775)	22.3	(.877)	BA-35/2	BA-35/3	-	-	-
1	13	(.095)				20.1	(.791)	22.4	(.881)	BA-36/2	BA-36/3	-	-	-
1	14	(.083)	1. 1/8	9	(.148)	20.6	(.811)	23.1	(.909)	BA-37/2	BA-37/3	BA-37/4	-	-
1	15 & 16	(.072 & .065)	1. 1/8	10	(.134)	21.3	(.838)	23.8	(.937)	BA-38/2	BA-38/3	BA-38/4	-	-
1	17 & 18	(.058 & .048)	1. 1/8	11	(.120)	22.0	(.866)	24.5	(.964)	BA-39/2	BA-39/3	BA-39/4	-	-
1	19 & 20	(.042 & .035)	1. 1/8	12	(.109)	22.4	(.881)	25.0	(.984)	BA-40/2	BA-40/3	BA-40/4	-	-
1. 1/4	8	(.165)	1. 1/8	13	(.095)	23.3	(.917)	25.9	(1.019)	BA-41/2	BA-41/3	BA-41/4	-	-
1. 1/4	9	(.148)	1. 1/8	14	(.083)	23.8	(.937)	26.5	(1.043)	BA-42/2	BA-42/3	BA-42/4	-	-
1. 1/4	10	(.134)	1. 1/8	15 & 16	(.072 & .065)	24.4	(.960)	27.2	(1.070)	BA-43/2	BA-43/3	BA-43/4	-	-
1. 1/4	11	(.120)				25.2	(.992)	28.0	(1.102)	BA-44/2	BA-44/3	BA-44/4	-	-
1. 1/4	12	(.109)				25.7	(1.011)	28.5	(1.122)	BA-45/2	BA-45/3	BA-45/4	-	-
1. 1/4	13	(.095)	1. 3/8	8	(.165)	26.1	(1.027)	28.8	(1.133)	BA-46/2	BA-46/3	BA-46/4	-	-
1. 1/4	14	(.083)				26.4	(1.039)	29.2	(1.149)	BA-47/2	BA-47/3	BA-47/4	-	-
1. 1/4	15	(.072)	1. 3/8	9	(.148)	26.9	(1.059)	29.7	(1.169)	BA-48/2	BA-48/3	BA-48/4	-	-
1. 1/4	16	(.065)	1. 3/8	10	(.134)	27.6	(1.086)	30.4	(1.196)	BA-49/2	BA-49/3	BA-49/4	BA-49/5	BA-49/6
1. 1/2	7	(.180)	1. 3/8	11	(.120)	28.3	(1.114)	31.2	(1.228)	BA-50/2	BA-50/3	BA-50/4	BA-50/5	BA-50/6
1. 1/2	8	(.165)	1. 3/8	12	(.109)	28.8	(1.133)	31.7	(1.248)	BA-51/2	BA-51/3	BA-51/4	BA-51/5	BA-51/6
1. 1/2	9	(.148)	1. 3/8	13 & 14	(.095 & .083)	29.5	(1.161)	33.4	(1.314)	BA-52/2	BA-52/3	BA-52/4	BA-52/5	BA-52/6
1. 1/2	10	(.134)	1. 3/8	15 & 16	(.072 & .065)	30.0	(1.181)	34.1	(1.342)	BA-53/2	BA-53/3	BA-53/4	BA-53/5	BA-53/6
1. 1/2	11 & 12	(.120 & .109)				30.6	(1.204)	34.8	(1.370)	BA-54/2	BA-54/3	BA-54/4	BA-54/5	BA-54/6
1. 1/2	13	(.095)	1. 3/4	5	(.220)	31.4	(1.236)	35.6	(1.401)	BA-55/2	BA-55/3	BA-55/4	BA-55/5	BA-55/6
1. 1/2	14 & 15	(.083 & .072)	1. 3/4	6	(.203)	32.6	(1.283)	36.8	(1.448)	BA-56/2	BA-56/3	BA-56/4	BA-56/5	BA-56/6
			1. 3/4	7	(.180)	33.4	(1.314)	38.1	(1.500)	BA-57/2	BA-57/3	BA-57/4	BA-57/5	BA-57/6
2	3	(.259)	1. 3/4	8	(.165)	34.2	(1.346)	38.7	(1.523)	BA-58/2	BA-58/3	BA-58/4	BA-58/5	BA-58/6
2	4	(.238)	1. 3/4	9 & 10	(.148 & .134)	35.0	(1.377)	40.6	(1.598)	BA-59/2	BA-59/3	BA-59/4	BA-59/5	BA-59/6
			1. 3/4	11 & 12	(.120 & .109)	36.6	(1.440)	42.2	(1.661)	BA-60/2	BA-60/3	BA-60/4	BA-60/5	BA-60/6
2	5 & 6	(.220 & .203)	1. 3/4	13 & 14	(.095 & .083)	38.2	(1.503)	43.8	(1.712)	BA-61/2	BA-61/3	BA-61/4	BA-61/5	BA-61/6
2	7 & 8	(.180 & .165)	1. 3/4	15 & 16	(.072 & .065)	39.8	(1.566)	45.4	(1.787)	BA-62/2	BA-62/3	BA-62/4	BA-62/5	BA-62/6
2	9 & 10	(.148 & .134)	2. 1/4	3	(.259)	41.4	(1.629)	47.0	(1.850)	BA-63/2	BA-63/3	BA-63/4	BA-63/5	BA-63/6
2	11 - 13	(.120 - .095)	2. 1/4	4	(.238)	42.9	(1.688)	49.5	(1.948)	BA-64/2	BA-64/3	BA-64/4	BA-64/5	BA-64/6
2	14 - 16	(.083 - .065)	2. 1/4	6 & 7	(.203 & .180)	44.5	(1.751)	51.1	(2.011)	BA-65/2	BA-65/3	BA-65/4	BA-65/5	BA-65/6
2	17 & 18	(.058 & .049)	2. 1/4	8 & 9	(.165 & .148)	46.1	(1.814)	52.7	(2.074)	BA-66/2	BA-66/3	BA-66/4	BA-66/5	BA-66/6

7/8" - 4.1/2" Tube O. D.

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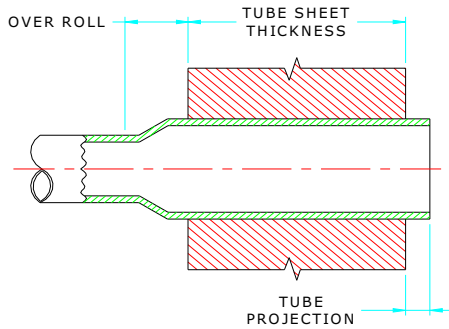
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# BOILER TUBE EXPANDER



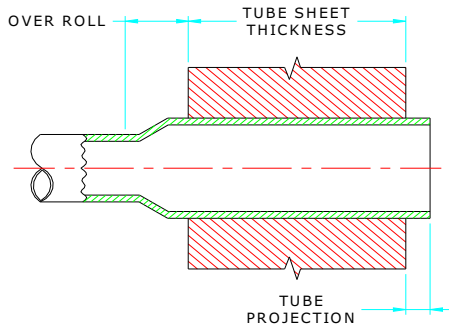
TUBE TOOLS

## PARALLEL TYPE 'BA' - 3 PLAIN ROLLERS



SPARE ROLLERS SET MODEL NUMBER TUBE SHEET THICKNESS RANGE					SPARE MANDREL MODEL NUMBER			
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"	MANDREL SIZE inch	DRUM TYPE	HEADER TYPE	SHORT SERIES
2	3	4	5	6	<<< Tube Sheet Thickness Codes			
15-2-RS 15-2-RS 16-2-RS	15-3-RS 15-3-RS 16-3-RS	- - -	- - -	- - -	3/8 3/8 3/8	BDM-11 BDM-12 BDM-12	- - -	- - -
20-2-RS 17-2-RS 18-2-RS	20-3-RS 17-3-RS 18-3-RS	- - -	- - -	- - -	3/8 3/8 3/8	BDM-12 BDM-13 BDM-12	- - -	- - -
18-2-RS 19-2-RS 21-2-RS	18-3-RS 19-3-RS 21-3-RS	18-4-RS 19-4-RS 21-4-RS	- - -	- - -	3/8 3/8 3/8	BDM-13 BDM-13 BDM-13	BHM-13 BHM-13 BHM-13	BSM-13 BSM-13 BSM-13
21-2-RS 22-2-RS 23-2-RS	21-3-RS 22-3-RS 23-3-RS	21-4-RS 22-4-RS 23-4-RS	- - -	- - -	3/8 3/8 1/2	BDM-14 BDM-14 BDM-15	BHM-14 BHM-14 BHM-15	BSM-14 BSM-14 BSM-15
24-2-RS 26-2-RS 27-2-RS	24-3-RS 26-3-RS 27-3-RS	24-4-RS 26-4-RS 27-4-RS	- - -	- - -	1/2 1/2 1/2	BDM-15 BDM-16 BDM-16	BHM-15 BHM-16 BHM-16	BSM-15 BSM-16 BSM-16
31-2-RS 28-2-RS 29-2-RS	31-3-RS 28-3-RS 29-3-RS	31-4-RS 28-4-RS 29-4-RS	- - -	- - -	1/2 1/2 1/2	BDM-16 BDM-17 BDM-17	BHM-16 BHM-17 BHM-17	BSM-16 BSM-17 BSM-17
30-2-RS 30-2-RS 32-2-RS	30-3-RS 30-3-RS 32-3-RS	30-4-RS 30-4-RS 32-4-RS	30-5-RS 30-5-RS 32-5-RS	30-6-RS 30-6-RS 32-6-RS	1/2 1/2 1/2	BDM-17 BDM-18 BDM-18	BHM-17 BHM-18 BHM-18	BSM-17 BSM-18 BSM-18
28-2-RS 29-2-RS 30-2-RS	28-3-RS 29-3-RS 30-3-RS	28-4-RS 29-4-RS 30-4-RS	28-5-RS 29-5-RS 30-5-RS	28-6-RS 29-6-RS 30-6-RS	1/2 1/2 1/2	BDM-20 BDM-20 BDM-20	BHM-20 BHM-20 BHM-20	BSM-20 BSM-20 BSM-20
33-2-RS 32-2-RS 36-2-RS	33-3-RS 32-3-RS 36-3-RS	33-4-RS 32-4-RS 36-4-RS	33-5-RS 32-5-RS 36-5-RS	33-6-RS 32-6-RS 36-6-RS	1/2 1/2 1/2	BDM-20 BDM-21 BDM-21	BHM-20 BHM-21 BHM-21	BSM-20 BSM-21 BSM-21
37-2-RS 33-2-RS 37-2-RS	37-3-RS 33-3-RS 37-3-RS	37-4-RS 33-4-RS 37-4-RS	37-5-RS 33-5-RS 37-5-RS	37-6-RS 33-6-RS 37-6-RS	1/2 3/4 3/4	BDM-21 BDM-22 BDM-22	BHM-21 BHM-22 BHM-22	BSM-21 BSM-22 BSM-22
38-2-RS 39-2-RS 40-2-RS	38-3-RS 39-3-RS 40-3-RS	38-4-RS 39-4-RS 40-4-RS	38-5-RS 39-5-RS 40-5-RS	38-6-RS 39-6-RS 40-6-RS	3/4 3/4 3/4	BDM-22 BDM-22 BDM-22	BHM-22 BHM-22 BHM-22	BSM-22 BSM-22 BSM-22
40-2-RS 41-2-RS 42-2-RS	40-3-RS 41-3-RS 42-3-RS	40-4-RS 41-4-RS 42-4-RS	40-5-RS 41-5-RS 42-5-RS	40-6-RS 41-6-RS 42-6-RS	3/4 3/4 3/4	BDM-23 BDM-23 BDM-23	BHM-23 BHM-23 BHM-23	BSM-23 BSM-23 BSM-23

## PARALLEL TYPE 'BA' - 3 PLAIN ROLLERS



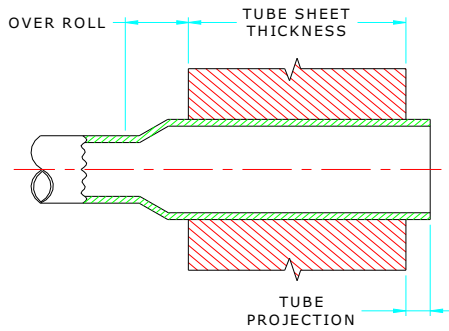
TUBE SIZE			TUBE SIZE			MIN. I. D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOL	TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			TUBE SHEET THICKNESS RANGE				
						1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"		
Tube Sheet Thickness Codes >>>								2	3	4	5	6
2. 1/2	3	(.259)	2. 1/4	10 & 11	(.134 & .120)	47.7 (1.877)	54.3 (2.137)	BA-67/2	BA-67/3	BA-67/4	BA-67/5	BA-67/6
2. 1/2	4 & 5	(.238 & .220)	2. 1/4	12 & 13	(.109 & .095)	49.3 (1.940)	55.9 (2.200)	BA-68/2	BA-68/3	BA-68/4	BA-68/5	BA-68/6
2. 1/2	6 & 7	(.203 & .180)	2. 1/4	14 - 16	(.083 - .065)	50.8 (2.000)	57.8 (2.275)	BA-69/2	BA-69/3	BA-69/4	BA-69/5	BA-69/6
2. 1/2	8 & 9	(.165 & .148)	2. 3/4	3	(.259)	52.4 (2.062)	59.4 (2.338)	BA-70/2	BA-70/3	BA-70/4	BA-70/5	BA-70/6
2. 1/2	10 & 11	(.134 & .120)	2. 3/4	4	(.238)	54.0 (2.125)	61.0 (2.401)	BA-71/2	BA-71/3	BA-71/4	BA-71/5	BA-71/6
2. 1/2	12 - 14	(.109 - .083)	2. 3/4	5 & 6	(.220 & .203)	55.6 (2.188)	64.0 (2.519)	BA-72/2	BA-72/3	BA-72/4	BA-72/5	BA-72/6
2. 1/2	15 & 16	(.072 & .065)	2. 3/4	7 & 8	(.180 & .165)	57.2 (2.251)	65.6 (2.582)	BA-73/2	BA-73/3	BA-73/4	BA-73/5	BA-73/6
3	3	(.259)	2. 3/4	9 & 10	(.148 & .134)	58.6 (2.307)	67.0 (2.637)	BA-74/2	BA-74/3	BA-74/4	BA-74/5	BA-74/6
3	4	(.238)	2. 3/4	11 - 13	(.120 - .095)	60.4 (2.377)	68.8 (2.708)	BA-75/2	BA-75/3	BA-75/4	BA-75/5	BA-75/6
3	5 & 6	(.220 & .203)	2. 3/4	14 - 16	(.083 - .065)	62.2 (2.448)	70.4 (2.771)	BA-76/2	BA-76/3	BA-76/4	BA-76/5	BA-76/6
3	7 & 8	(.180 & .165)	3. 1/4	3	(.259)	63.6 (2.503)	72.0 (2.834)	BA-77/2	BA-77/3	BA-77/4	BA-77/5	BA-77/6
3	9 & 10	(.148 & .134)	3. 1/4	3	(.259)	65.0 (2.559)	73.4 (2.889)	BA-78/2	BA-78/3	BA-78/4	BA-78/5	BA-78/6
3	11 - 13	(.120 - .095)	3. 1/4	4	(.238)	66.6 (2.622)	75.0 (2.952)	BA-79/2	BA-79/3	BA-79/4	BA-79/5	BA-79/6
3	14 - 16	(.083 - .065)	3. 1/4	5 & 6	(.220 & .203)	68.3 (2.688)	76.9 (3.027)	BA-80/2	BA-80/3	BA-80/4	BA-80/5	BA-80/6
3. 1/2	2	(.284)	3. 1/4	7 & 8	(.180 & .165)	69.9 (2.751)	78.5 (3.090)	BA-81/2	BA-81/3	BA-81/4	BA-81/5	BA-81/6
3. 1/2	3	(.259)	3. 1/4	9 & 10	(.148 & .134)	71.5 (2.814)	80.1 (3.153)	BA-82/2	BA-82/3	BA-82/4	BA-82/5	BA-82/6
3. 1/2	4	(.238)	3. 1/4	11 - 13	(.120 - .095)	73.1 (2.877)	81.7 (3.216)	BA-83/2	BA-83/3	BA-83/4	BA-83/5	BA-83/6
3. 1/2	5 & 6	(.220 & .203)	3. 1/4	14 - 16	(.083 - .065)	74.6 (2.937)	84.2 (3.314)	BA-84/2	BA-84/3	BA-84/4	BA-84/5	BA-84/6
3. 1/2	7 & 8	(.180 & .165)	3. 3/4	2	(.084)	76.2 (3.000)	85.5 (3.366)	BA-85/2	BA-85/3	BA-85/4	BA-85/5	BA-85/6
3. 1/2	9 - 11	(.148 - .120)	3. 3/4	3	(.259)	77.8 (3.062)	87.4 (3.440)	BA-86/2	BA-86/3	BA-86/4	BA-86/5	BA-86/6
3. 1/2	12 - 16	(.109 - .065)	3. 3/4	4	(.238)	79.4 (3.125)	89.0 (3.503)	BA-87/2	BA-87/3	BA-87/4	BA-87/5	BA-87/6
4	2	(.284)	3. 3/4	5 & 6	(.220 & .203)	81.0 (3.188)	90.6 (3.566)	BA-88/2	BA-88/3	BA-88/4	BA-88/5	BA-88/6
4	3	(.259)	3. 3/4	7 & 8	(.180 & .165)	82.6 (3.251)	92.2 (3.629)	BA-89/2	BA-89/3	BA-89/4	BA-89/5	BA-89/6
4	4	(.238)	3. 3/4	9 & 10	(.148 & .134)	84.2 (3.314)	93.8 (3.692)	BA-90/2	BA-90/3	BA-90/4	BA-90/5	BA-90/6
4	4	(.238)	3. 3/4	11 - 13	(.120 - .095)	85.8 (3.377)	96.2 (3.787)	BA-91/2	BA-91/3	BA-91/4	BA-91/5	BA-91/6
4	5 & 6	(.220 & .203)	3. 3/4	14 - 16	(.083 - .065)	87.4 (3.440)	97.8 (3.850)	BA-92/2	BA-92/3	BA-92/4	BA-92/5	BA-92/6
4	7 & 8	(.180 & .165)	4. 1/4	2		89.0 (3.503)	99.4 (3.913)	BA-93/2	BA-93/3	BA-93/4	BA-93/5	BA-93/6
4	9 - 11	(.148 - .120)	4. 1/4	3	(.284)	90.4 (3.559)	100.8 (3.968)	BA-94/2	BA-94/3	BA-94/4	BA-94/5	BA-94/6
4	12 - 16	(.109 - .065)	4. 1/4	4	(.238)	92.0 (3.622)	102.4 (4.031)	BA-95/2	BA-95/3	BA-95/4	BA-95/5	BA-95/6
4	4	(.238)	4. 1/4	5 & 6	(.220 & .203)	93.4 (3.677)	103.8 (4.086)	BA-96/2	BA-96/3	BA-96/4	BA-96/5	BA-96/6
4. 1/2	2	(.284)	4. 1/4	7 & 8	(.180 & .165)	95.0 (3.740)	105.4 (4.149)	BA-97/2	BA-97/3	BA-97/4	BA-97/5	BA-97/6
4. 1/2	3	(.259)	4. 1/4	9 - 11	(.148 - .120)	96.6 (3.803)	107.0 (4.212)	BA-98/2	BA-98/3	BA-98/4	BA-98/5	BA-98/6
4. 1/2	4 & 5	(.238 & .220)	4. 1/4	11 - 13	(.120 - .095)	98.2 (3.866)	108.6 (4.275)	BA-99/2	BA-99/3	BA-99/4	BA-99/5	BA-99/6
4. 1/2	6 & 7	(.203 & .180)				101.2 (3.984)	110.0 (4.330)	BA-100/2	BA-100/3	BA-100/4	BA-100/5	BA-100/6
4. 1/2	8 & 9	(.165 & .148)				102.8 (4.047)	111.6 (4.393)	BA-101/2	BA-101/3	BA-101/4	BA-101/5	BA-101/6
4. 1/2	10 - 12	(.134 - .109)				104.4 (4.110)	113.2 (4.456)	BA-102/2	BA-102/3	BA-102/4	BA-102/5	BA-102/6

# BOILER TUBE EXPANDER



TUBE TOOLS

## PARALLEL TYPE 'BA' - 3 PLAIN ROLLERS



SPARE ROLLERS SET MODEL NUMBER					SPARE MANDREL MODEL NUMBER			
TUBE SHEET THICKNESS RANGE					MANDREL SIZE inch	DRUM TYPE	HEADER TYPE	SHORT SERIES
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"				
2	3	4	5	6	<<< Tube Sheet Thickness Codes			
43-2-RS 44-2-RS 43-2-RS	43-3-RS 44-3-RS 43-3-RS	43-4-RS 44-4-RS 43-4-RS	43-5-RS 44-5-RS 43-5-RS	43-6-RS 44-6-RS 43-6-RS	3/4 3/4 3/4	BDM-23 BDM-23 BDM-24	BHM-23 BHM-23 BHM-24	BSM-23 BSM-23 BSM-24
44-2-RS 45-2-RS 47-2-RS	44-3-RS 45-3-RS 47-3-RS	44-4-RS 45-4-RS 47-4-RS	44-5-RS 45-5-RS 47-5-RS	44-6-RS 45-6-RS 47-6-RS	3/4 3/4 3/4	BDM-24 BDM-24 BDM-24	BHM-24 BHM-24 BHM-24	BSM-24 BSM-24 BSM-24
46-2-RS 47-2-RS 48-2-RS	46-3-RS 47-3-RS 48-3-RS	46-4-RS 47-4-RS 48-4-RS	46-5-RS 47-5-RS 48-5-RS	46-6-RS 47-6-RS 48-6-RS	1 1 1	BDM-25 BDM-25 BDM-25	BHM-25 BHM-25 BHM-25	BSM-25 BSM-25 BSM-25
49-2-RS 50-2-RS 51-2-RS	49-3-RS 50-3-RS 51-3-RS	49-4-RS 50-4-RS 51-4-RS	49-5-RS 50-5-RS 51-5-RS	49-6-RS 50-6-RS 51-6-RS	1 1 1	BDM-25 BDM-25 BDM-25	BHM-25 BHM-25 BHM-25	BSM-25 BSM-25 BSM-25
52-2-RS 51-2-RS 52-2-RS	52-3-RS 51-3-RS 52-3-RS	52-4-RS 51-4-RS 52-4-RS	52-5-RS 51-5-RS 52-5-RS	52-6-RS 51-6-RS 52-6-RS	1 1 1	BDM-25 BDM-26 BDM-26	BHM-25 BHM-26 BHM-26	BSM-25 BSM-26 BSM-26
53-2-RS 54-2-RS 54-2-RS	53-3-RS 54-3-RS 54-3-RS	53-4-RS 54-4-RS 54-4-RS	53-5-RS 54-5-RS 54-5-RS	53-6-RS 54-6-RS 54-6-RS	1 1 1	BDM-26 BDM-26 BDM-27	BHM-26 BHM-26 BHM-27	BSM-26 BSM-26 BSM-27
55-2-RS 56-2-RS 57-2-RS	55-3-RS 56-3-RS 57-3-RS	55-4-RS 56-4-RS 57-4-RS	55-5-RS 56-5-RS 57-5-RS	55-6-RS 56-6-RS 57-6-RS	1 1 1	BDM-27 BDM-27 BDM-27	BHM-27 BHM-27 BHM-27	BSM-27 BSM-27 BSM-27
58-2-RS 59-2-RS 60-2-RS	58-3-RS 59-3-RS 60-3-RS	58-4-RS 59-4-RS 60-4-RS	58-5-RS 59-5-RS 60-5-RS	58-6-RS 59-6-RS 60-6-RS	1 1 1	BDM-27 BDM-27 BDM-27	BHM-27 BHM-27 BHM-27	BSM-27 BSM-27 BSM-27
59-2-RS 60-2-RS 61-2-RS	59-3-RS 60-3-RS 61-3-RS	59-4-RS 60-4-RS 61-4-RS	59-5-RS 60-5-RS 61-5-RS	59-6-RS 60-6-RS 61-6-RS	1 1 1	BDM-28 BDM-28 BDM-28	BHM-28 BHM-28 BHM-28	BSM-28 BSM-28 BSM-28
62-2-RS 63-2-RS 62-2-RS	62-3-RS 63-3-RS 62-3-RS	62-4-RS 63-4-RS 62-4-RS	62-5-RS 63-5-RS 62-5-RS	62-6-RS 63-6-RS 62-6-RS	1 1 1	BDM-28 BDM-28 BDM-29	BHM-28 BHM-28 BHM-29	BSM-28 BSM-28 BSM-29
63-2-RS 64-2-RS 63-2-RS	63-3-RS 64-3-RS 63-3-RS	63-4-RS 64-4-RS 63-4-RS	63-5-RS 64-5-RS 63-5-RS	63-6-RS 64-6-RS 63-6-RS	1 1 1	BDM-29 BDM-29 BDM-30	BHM-29 BHM-29 BHM-30	BSM-29 BSM-29 BSM-30
64-2-RS 65-2-RS 66-2-RS	64-3-RS 65-3-RS 66-3-RS	64-4-RS 65-4-RS 66-4-RS	64-5-RS 65-5-RS 66-5-RS	64-6-RS 65-6-RS 66-6-RS	1 1 1	BDM-30 BDM-30 BDM-30	BHM-30 BHM-30 BHM-30	BSM-30 BSM-30 BSM-30

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# BOILER TUBE EXPANDER

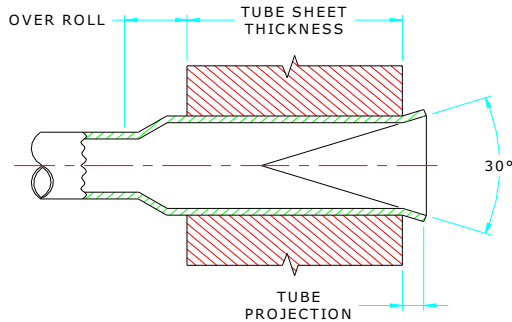


TUBE TOOLS

## FLARE TYPE 'BAF3' - 3 PLAIN & FLARE ROLLERS

### FEATURES

- Time tested durable design.
- Sturdy construction with rolls self contained in cage.
- Best 'Value for Money' tool in the world when parallel rolling tubes.
- Use - Economical tool used for applications where tubes are to be expanded without flaring.



TUBE SIZE			TUBE SIZE			MIN. I. D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOL	TUBE EXPANDER MODEL NUMBER						
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			TUBE SHEET THICKNESS RANGE						
						Mm	Inch	Mm	Inch	1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
7/8	15	(.072)	1	10	(.134)	18.1	(.712)	20.4	(.803)	BAF3-31/2	BAF3-31/3	-	-	-
7/8	16	(.065)				18.4	(.724)	20.7	(.814)	BAF3-32/2	BAF3-32/3			
7/8	17	(.058)	1	11	(.120)	18.8	(.740)	21.1	(.830)	BAF3-33/2	BAF3-33/3	-	-	-
7/8	18	(.049)	1	12	(.109)	19.4	(.763)	21.6	(.850)	BAF3-34/2	BAF3-34/3	-	-	-
7/8	19 & 20	(.042 & .035)	1. 1/8	8	(.165)	19.7	(.775)	22.3	(.877)	BAF3-35/2	BAF3-35/3	-	-	-
1	13	(.095)				20.1	(.791)	22.4	(.881)	BAF3-36/2	BAF3-36/3	-	-	-
1	14	(.083)	1. 1/8	9	(.148)	20.6	(.811)	23.1	(.909)	BAF3-37/2	BAF3-37/3	BAF3-37/4	-	-
1	15 & 16	(.072 & .065)	1. 1/8	10	(.134)	21.3	(.838)	23.8	(.937)	BAF3-38/2	BAF3-38/3	BAF3-38/4	-	-
1	17 & 18	(.058 & .048)	1. 1/8	11	(.120)	22.0	(.866)	24.5	(.964)	BAF3-39/2	BAF3-39/3	BAF3-39/4	-	-
1	19 & 20	(.042 & .035)	1. 1/8	12	(.109)	22.4	(.881)	25.0	(.984)	BAF3-40/2	BAF3-40/3	BAF3-40/4	-	-
1. 1/4	8	(.165)	1. 1/8	13	(.095)	23.3	(.917)	25.9	(1.019)	BAF3-41/2	BAF3-41/3	BAF3-41/4	-	-
1. 1/4	9	(.148)	1. 1/8	14	(.083)	23.8	(.937)	26.5	(1.043)	BAF3-42/2	BAF3-42/3	BAF3-42/4	-	-
1. 1/4	10	(.134)	1. 1/8	15 & 16	(.072 & .065)	24.4	(.960)	27.2	(1.070)	BAF3-43/2	BAF3-43/3	BAF3-43/4	-	-
1. 1/4	11	(.120)				25.2	(.992)	28.0	(1.102)	BAF3-44/2	BAF3-44/3	BAF3-44/4	-	-
1. 1/4	12	(.109)				25.7	(1.011)	28.5	(1.122)	BAF3-45/2	BAF3-45/3	BAF3-45/4	-	-
1. 1/4	13	(.095)	1. 3/8	8	(.165)	26.1	(1.027)	28.8	(1.133)	BAF3-46/2	BAF3-46/3	BAF3-46/4	-	-
1. 1/4	14	(.083)				26.4	(1.039)	29.2	(1.149)	BAF3-47/2	BAF3-47/3	BAF3-47/4	-	-
1. 1/4	15	(.072)	1. 3/8	9	(.148)	26.9	(1.059)	29.7	(1.169)	BAF3-48/2	BAF3-48/3	BAF3-48/4	-	-
1. 1/4	16	(.065)	1. 3/8	10	(.134)	27.6	(1.086)	30.4	(1.196)	BAF3-49/2	BAF3-49/3	BAF3-49/4	BAF3-49/5	BAF3-49/6
1. 1/2	7	(.180)	1. 3/8	11	(.120)	28.3	(1.114)	31.2	(1.228)	BAF3-50/2	BAF3-50/3	BAF3-50/4	BAF3-50/5	BAF3-50/6
1. 1/2	8	(.165)	1. 3/8	12	(.109)	28.8	(1.133)	31.7	(1.248)	BAF3-51/2	BAF3-51/3	BAF3-51/4	BAF3-51/5	BAF3-51/6
1. 1/2	9	(.148)	1. 3/8	13 & 14	(.095 & .083)	29.5	(1.161)	33.4	(1.314)	BAF3-52/2	BAF3-52/3	BAF3-52/4	BAF3-52/5	BAF3-52/6
1. 1/2	10	(.134)	1. 3/8	15 & 16	(.072 & .065)	30.0	(1.181)	34.1	(1.342)	BAF3-53/2	BAF3-53/3	BAF3-53/4	BAF3-53/5	BAF3-53/6
1. 1/2	11 & 12	(.120 & .109)				30.6	(1.204)	34.8	(1.370)	BAF3-54/2	BAF3-54/3	BAF3-54/4	BAF3-54/5	BAF3-54/6
1. 1/2	13	(.095)	1. 3/4	5	(.220)	31.4	(1.236)	35.6	(1.401)	BAF3-55/2	BAF3-55/3	BAF3-55/4	BAF3-55/5	BAF3-55/6
1. 1/2	14 & 15	(.083 & .072)	1. 3/4	6	(.203)	32.6	(1.283)	36.8	(1.448)	BAF3-56/2	BAF3-56/3	BAF3-56/4	BAF3-56/5	BAF3-56/6
			1. 3/4	7	(.180)	33.4	(1.314)	38.1	(1.500)	BAF3-57/2	BAF3-57/3	BAF3-57/4	BAF3-57/5	BAF3-57/6
2	3	(.259)	1. 3/4	8	(.165)	34.2	(1.346)	38.7	(1.523)	BAF3-58/2	BAF3-58/3	BAF3-58/4	BAF3-58/5	BAF3-58/6
2	4	(.238)	1. 3/4	9 & 10	(.148 & .134)	35.0	(1.377)	40.6	(1.598)	BAF3-59/2	BAF3-59/3	BAF3-59/4	BAF3-59/5	BAF3-59/6
			1. 3/4	11 & 12	(.120 & .109)	36.6	(1.440)	42.2	(1.661)	BAF3-60/2	BAF3-60/3	BAF3-60/4	BAF3-60/5	BAF3-60/6
2	5 & 6	(.220 & .203)	1. 3/4	13 & 14	(.095 & .083)	38.2	(1.503)	43.8	(1.712)	BAF3-61/2	BAF3-61/3	BAF3-61/4	BAF3-61/5	BAF3-61/6
2	7 & 8	(.180 & .165)	1. 3/4	15 & 16	(.072 & .065)	39.8	(1.566)	45.4	(1.787)	BAF3-62/2	BAF3-62/3	BAF3-62/4	BAF3-62/5	BAF3-62/6
2	9 & 10	(.148 & .134)	2. 1/4	3	(.259)	41.4	(1.629)	47.0	(1.850)	BAF3-63/2	BAF3-63/3	BAF3-63/4	BAF3-63/5	BAF3-63/6
2	11 - 13	(.120 - .095)	2. 1/4	4	(.238)	42.9	(1.688)	49.5	(1.948)	BAF3-64/2	BAF3-64/3	BAF3-64/4	BAF3-64/5	BAF3-64/6
2	14 - 16	(.083 - .065)	2. 1/4	6 & 7	(.203 & .180)	44.5	(1.751)	51.1	(2.011)	BAF3-65/2	BAF3-65/3	BAF3-65/4	BAF3-65/5	BAF3-65/6
2	17 & 18	(.058 & .049)	2. 1/4	8 & 9	(.165 & .148)	46.1	(1.814)	52.7	(2.074)	BAF3-66/2	BAF3-66/3	BAF3-66/4	BAF3-66/5	BAF3-66/6

7/8" - 4.1/2" Tube O. D.

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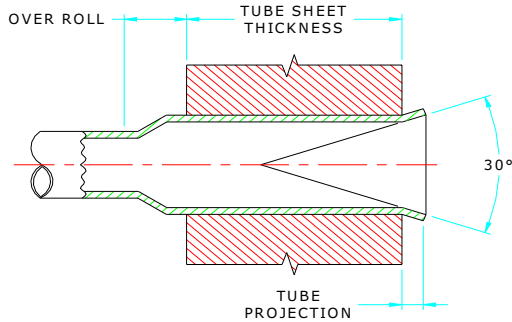
SHINGARE

# BOILER TUBE EXPANDER



TUBE TOOLS

## FLARE TYPE 'BAF3' - 3 PLAIN & 3 FLARE ROLLERS



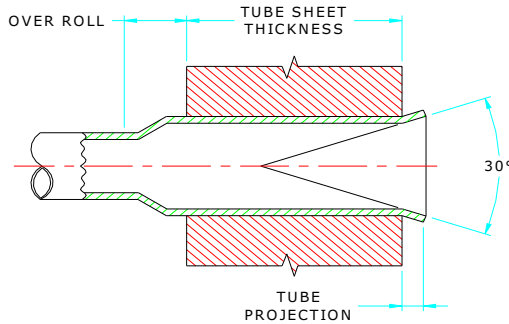
SPARE ROLLERS SET MODEL NUMBER					SPARE MANDREL MODEL NUMBER			
TUBE SHEET THICKNESS RANGE					MANDREL SIZE inch	DRUM TYPE	HEADER TYPE	SHORT SERIES
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"				
2	3	4	5	6	<<< Tube Sheet Thickness Codes			
15-2-F3S 15-2-F3S 16-2-F3S	15-3-F3S 15-3-F3S 16-3-F3S	- - -	- - -	- - -	3/8 3/8 3/8	BDM-11 BDM-12 BDM-12	- - -	- - -
20-2-F3S 17-2-F3S 18-2-F3S	20-3-F3S 17-3-F3S 18-3-F3S	- - -	- - -	- - -	3/8 3/8 3/8	BDM-12 BDM-13 BDM-12	- - -	- - -
18-2-F3S 19-2-F3S 21-2-F3S	18-3-F3S 19-3-F3S 21-3-F3S	18-4-F3S 19-4-F3S 21-4-F3S	- - -	- - -	3/8 3/8 3/8	BDM-13 BDM-13 BDM-13	BHM-13 BHM-13 BHM-13	BSM-13 BSM-13 BSM-13
21-2-F3S 22-2-F3S 23-2-F3S	21-3-F3S 22-3-F3S 23-3-F3S	21-4-F3S 22-4-F3S 23-4-F3S	- - -	- - -	3/8 3/8 1/2	BDM-14 BDM-14 BDM-15	BHM-14 BHM-14 BHM-15	BSM-14 BSM-14 BSM-15
24-2-F3S 26-2-F3S 27-2-F3S	24-3-F3S 26-3-F3S 27-3-F3S	24-4-F3S 26-4-F3S 27-4-F3S	- - -	- - -	1/2 1/2 1/2	BDM-15 BDM-16 BDM-16	BHM-15 BHM-16 BHM-16	BSM-15 BSM-16 BSM-16
31-2-F3S 28-2-F3S 29-2-F3S	31-3-F3S 28-3-F3S 29-3-F3S	31-4-F3S 28-4-F3S 29-4-F3S	- - -	- - -	1/2 1/2 1/2	BDM-16 BDM-17 BDM-17	BHM-16 BHM-17 BHM-17	BSM-16 BSM-17 BSM-17
30-2-F3S 30-2-F3S 34-2-F3S	30-3-F3S 30-3-F3S 34-3-F3S	30-4-F3S 30-4-F3S 34-4-F3S	30-5-F3S 30-5-F3S 34-5-F3S	30-6-F3S 30-6-F3S 34-6-F3S	1/2 1/2 1/2	BDM-17 BDM-18 BDM-18	BHM-17 BHM-18 BHM-18	BSM-17 BSM-18 BSM-18
28-2-F3S 29-2-F3S 30-2-F3S	28-3-F3S 29-3-F3S 30-3-F3S	28-4-F3S 29-4-F3S 30-4-F3S	28-5-F3S 29-5-F3S 30-5-F3S	28-6-F3S 29-6-F3S 30-6-F3S	1/2 1/2 1/2	BDM-20 BDM-20 BDM-20	BHM-20 BHM-20 BHM-20	BSM-20 BSM-20 BSM-20
33-2-F3S 32-2-F3S 36-2-F3S	33-3-F3S 32-3-F3S 36-3-F3S	33-4-F3S 32-4-F3S 36-4-F3S	33-5-F3S 32-5-F3S 36-5-F3S	33-6-F3S 32-6-F3S 36-6-F3S	1/2 1/2 1/2	BDM-20 BDM-21 BDM-21	BHM-20 BHM-21 BHM-21	BSM-20 BSM-21 BSM-21
37-2-F3S 33-2-F3S 37-2-F3S	37-3-F3S 33-3-F3S 37-3-F3S	37-4-F3S 33-4-F3S 37-4-F3S	37-5-F3S 33-5-F3S 37-5-F3S	37-6-F3S 33-6-F3S 37-6-F3S	1/2 3/4 3/4	BDM-21 BDM-22 BDM-22	BHM-21 BHM-22 BHM-22	BSM-21 BSM-22 BSM-22
38-2-F3S 39-2-F3S 40-2-F3S	38-3-F3S 39-3-F3S 40-3-F3S	38-4-F3S 39-4-F3S 40-4-F3S	38-5-F3S 39-5-F3S 40-5-F3S	38-6-F3S 39-6-F3S 40-6-F3S	3/4 3/4 3/4	BDM-22 BDM-22 BDM-22	BHM-22 BHM-22 BHM-22	BSM-22 BSM-22 BSM-22
40-2-F3S 41-2-F3S 42-2-F3S	40-3-F3S 41-3-F3S 42-3-F3S	40-4-F3S 41-4-F3S 42-4-F3S	40-5-F3S 41-5-F3S 42-5-F3S	40-6-F3S 41-6-F3S 42-6-F3S	3/4 3/4 3/4	BDM-23 BDM-23 BDM-23	BHM-23 BHM-23 BHM-23	BSM-23 BSM-23 BSM-23

# BOILER TUBE EXPANDER



TUBE TOOLS

## FLARE TYPE 'BAF3' - 3 PLAIN & 3 FLARE ROLLERS



TUBE SIZE			TUBE SIZE			MIN. I. D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOL		TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch	Mm	Inch	Mm	Inch	TUBE SHEET THICKNESS RANGE				
										1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
2. 1/2	3	(.259)	2. 1/4	10 & 11	(.134 & .120)	47.7	(1.877)	54.3	(2.137)	BAF3-67/2	BAF3-67/3	BAF3-67/4	BAF3-67/5	BAF3-67/6
2. 1/2	4 & 5	(.238 & .220)	2. 1/4	12 & 13	(.109 & .095)	49.3	(1.940)	55.9	(2.200)	BAF3-68/2	BAF3-68/3	BAF3-68/4	BAF3-68/5	BAF3-68/6
2. 1/2	6 & 7	(.203 & .180)	2. 1/4	14 - 16	(.083 - .065)	50.8	(2.000)	57.8	(2.275)	BAF3-69/2	BAF3-69/3	BAF3-69/4	BAF3-69/5	BAF3-69/6
2. 1/2	8 & 9	(.165 & .148)	2. 3/4	3	(.259)	52.4	(2.062)	59.4	(2.338)	BAF3-70/2	BAF3-70/3	BAF3-70/4	BAF3-70/5	BAF3-70/6
2. 1/2	10 & 11	(.134 & .120)	2. 3/4	4	(.238)	54.0	(2.125)	61.0	(2.401)	BAF3-71/2	BAF3-71/3	BAF3-71/4	BAF3-71/5	BAF3-71/6
2. 1/2	12 - 14	(.109 - .083)	2. 3/4	5 & 6	(.220 & .203)	55.6	(2.188)	64.0	(2.519)	BAF3-72/2	BAF3-72/3	BAF3-72/4	BAF3-72/5	BAF3-72/6
2. 1/2	15 & 16	(.072 & .065)	2. 3/4	7 & 8	(.180 & .165)	57.2	(2.251)	65.6	(2.582)	BAF3-73/2	BAF3-73/3	BAF3-73/4	BAF3-73/5	BAF3-73/6
3	3	(.259)	2. 3/4	9 & 10	(.148 & .134)	58.6	(2.307)	67.0	(2.637)	BAF3-74/2	BAF3-74/3	BAF3-74/4	BAF3-74/5	BAF3-74/6
3	4	(.238)	2. 3/4	11 - 13	(.120 - .095)	60.4	(2.377)	68.8	(2.708)	BAF3-75/2	BAF3-75/3	BAF3-75/4	BAF3-75/5	BAF3-75/6
3	5 & 6	(.220 & .203)	2. 3/4	14 - 16	(.083 - .065)	62.2	(2.448)	70.4	(2.771)	BAF3-76/2	BAF3-76/3	BAF3-76/4	BAF3-76/5	BAF3-76/6
3	7 & 8	(.180 & .165)	3. 1/4	3	(.259)	63.6	(2.503)	72.0	(2.834)	BAF3-77/2	BAF3-77/3	BAF3-77/4	BAF3-77/5	BAF3-77/6
3	9 & 10	(.148 & .134)	3. 1/4	3	(.259)	65.0	(2.559)	73.4	(2.889)	BAF3-78/2	BAF3-78/3	BAF3-78/4	BAF3-78/5	BAF3-78/6
3	11 - 13	(.120 - .095)	3. 1/4	4	(.238)	66.6	(2.622)	75.0	(2.952)	BAF3-79/2	BAF3-79/3	BAF3-79/4	BAF3-79/5	BAF3-79/6
3	14 - 16	(.083 - .065)	3. 1/4	5 & 6	(.220 & .203)	68.3	(2.688)	76.9	(3.027)	BAF3-80/2	BAF3-80/3	BAF3-80/4	BAF3-80/5	BAF3-80/6
3. 1/2	2	(.284)	3. 1/4	7 & 8	(.180 & .165)	69.9	(2.751)	78.5	(3.090)	BAF3-81/2	BAF3-81/3	BAF3-81/4	BAF3-81/5	BAF3-81/6
3. 1/2	3	(.259)	3. 1/4	9 & 10	(.148 & .134)	71.5	(2.814)	80.1	(3.153)	BAF3-82/2	BAF3-82/3	BAF3-82/4	BAF3-82/5	BAF3-82/6
3. 1/2	4	(.238)	3. 1/4	11 - 13	(.120 - .095)	73.1	(2.877)	81.7	(3.216)	BAF3-83/2	BAF3-83/3	BAF3-83/4	BAF3-83/5	BAF3-83/6
3. 1/2	5 & 6	(.220 & .203)	3. 1/4	14 - 16	(.083 - .065)	74.6	(2.937)	84.2	(3.314)	BAF3-84/2	BAF3-84/3	BAF3-84/4	BAF3-84/5	BAF3-84/6
3. 1/2	7 & 8	(.180 & .165)	3. 3/4	2	(.084)	76.2	(3.000)	85.5	(3.366)	BAF3-85/2	BAF3-85/3	BAF3-85/4	BAF3-85/5	BAF3-85/6
3. 1/2	9 - 11	(.148 - .120)	3. 3/4	3	(.259)	77.8	(3.062)	87.4	(3.440)	BAF3-86/2	BAF3-86/3	BAF3-86/4	BAF3-86/5	BAF3-86/6
3. 1/2	12 - 16	(.109 - .065)	3. 3/4	4	(.238)	79.4	(3.125)	89.0	(3.503)	BAF3-87/2	BAF3-87/3	BAF3-87/4	BAF3-87/5	BAF3-87/6
4	2	(.284)	3. 3/4	5 & 6	(.220 & .203)	81.0	(3.188)	90.6	(3.566)	BAF3-88/2	BAF3-88/3	BAF3-88/4	BAF3-88/5	BAF3-88/6
4	3	(.259)	3. 3/4	7 & 8	(.180 & .165)	82.6	(3.251)	92.2	(3.629)	BAF3-89/2	BAF3-89/3	BAF3-89/4	BAF3-89/5	BAF3-89/6
4	4	(.238)	3. 3/4	9 & 10	(.148 & .134)	84.2	(3.314)	93.8	(3.692)	BAF3-90/2	BAF3-90/3	BAF3-90/4	BAF3-90/5	BAF3-90/6
4	4	(.238)	3. 3/4	11 - 13	(.120 - .095)	85.8	(3.377)	96.2	(3.787)	BAF3-91/2	BAF3-91/3	BAF3-91/4	BAF3-91/5	BAF3-91/6
4	5 & 6	(.220 & .203)	3. 3/4	14 - 16	(.083 - .065)	87.4	(3.440)	97.8	(3.850)	BAF3-92/2	BAF3-92/3	BAF3-92/4	BAF3-92/5	BAF3-92/6
4	7 & 8	(.180 & .165)	4. 1/4	2		89.0	(3.503)	99.4	(3.913)	BAF3-93/2	BAF3-93/3	BAF3-93/4	BAF3-93/5	BAF3-93/6
4	9 - 11	(.148 - .120)	4. 1/4	3	(.284)	90.4	(3.559)	100.8	(3.968)	BAF3-94/2	BAF3-94/3	BAF3-94/4	BAF3-94/5	BAF3-94/6
4	12 - 16	(.109 - .065)	4. 1/4	4	(.238)	92.0	(3.622)	102.4	(4.031)	BAF3-95/2	BAF3-95/3	BAF3-95/4	BAF3-95/5	BAF3-95/6
			4. 1/4	5 & 6	(.220 & .203)	93.4	(3.677)	103.8	(4.086)	BAF3-96/2	BAF3-96/3	BAF3-96/4	BAF3-96/5	BAF3-96/6
4. 1/2	2	(.284)	4. 1/4	7 & 8	(.180 & .165)	95.0	(3.740)	105.4	(4.149)	BAF3-97/2	BAF3-97/3	BAF3-97/4	BAF3-97/5	BAF3-97/6
4. 1/2	3	(.259)	4. 1/4	9 - 11	(.148 - .120)	96.6	(3.803)	107.0	(4.212)	BAF3-98/2	BAF3-98/3	BAF3-98/4	BAF3-98/5	BAF3-98/6
4. 1/2	4 & 5	(.238 & .220)	4. 1/4	11 - 13	(.120 - .095)	98.2	(3.866)	108.6	(4.275)	BAF3-99/2	BAF3-99/3	BAF3-99/4	BAF3-99/5	BAF3-99/6
4. 1/2	6 & 7	(.203 & .180)				101.2	(3.984)	110.0	(4.330)	BAF3-100/2	BAF3-100/3	BAF3-100/4	BAF3-100/5	BAF3-100/6
4. 1/2	8 & 9	(.165 & .148)				102.8	(4.047)	111.6	(4.393)	BAF3-101/2	BAF3-101/3	BAF3-101/4	BAF3-101/5	BAF3-101/6
4. 1/2	10 - 12	(.134 - .109)				104.4	(4.110)	113.2	(4.456)	BAF3-102/2	BAF3-102/3	BAF3-102/4	BAF3-102/5	BAF3-102/6

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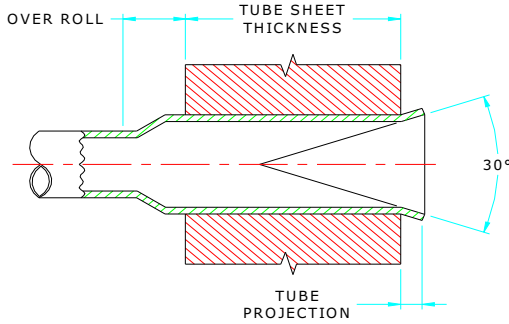
SHINGARE

# BOILER TUBE EXPANDER



TUBE TOOLS

## FLARE TYPE 'BAF3' - 3 PLAIN & 3 FLARE ROLLERS



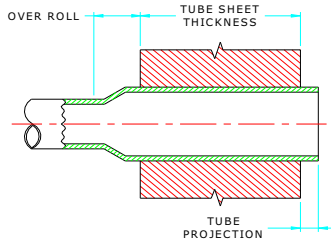
SPARE ROLLERS SET MODEL NUMBER TUBE SHEET THICKNESS RANGE					SPARE MANDREL MODEL NUMBER			
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"	MANDREL SIZE inch	DRUM TYPE	HEADER TYPE	SHORT SERIES
2	3	4	5	6	<<< Tube Sheet Thickness Codes			
43-2-F3S 44-2-F3S 43-2-F3S	43-3-F3S 44-3-F3S 43-3-F3S	43-4-F3S 44-4-F3S 43-4-F3S	43-5-F3S 44-5-F3S 43-5-F3S	43-6-F3S 44-6-F3S 43-6-F3S	3/4 3/4 3/4	BDM-23 BDM-23 BDM-24	BHM-23 BHM-23 BHM-24	BSM-23 BSM-23 BSM-24
44-2-F3S 45-2-F3S 47-2-F3S	44-3-F3S 45-3-F3S 47-3-F3S	44-4-F3S 45-4-F3S 47-4-F3S	44-5-F3S 45-5-F3S 47-5-F3S	44-6-F3S 45-6-F3S 47-6-F3S	3/4 3/4 3/4	BDM-24 BDM-24 BDM-24	BHM-24 BHM-24 BHM-24	BSM-24 BSM-24 BSM-24
46-2-F3S 47-2-F3S 48-2-F3S	46-3-F3S 47-3-F3S 48-3-F3S	46-4-F3S 47-4-F3S 48-4-F3S	46-5-F3S 47-5-F3S 48-5-F3S	46-6-F3S 47-6-F3S 48-6-F3S	1 1 1	BDM-25 BDM-25 BDM-25	BHM-25 BHM-25 BHM-25	BSM-25 BSM-25 BSM-25
49-2-F3S 50-2-F3S 51-2-F3S	49-3-F3S 50-3-F3S 51-3-F3S	49-4-F3S 50-4-F3S 51-4-F3S	49-5-F3S 50-5-F3S 51-5-F3S	49-6-F3S 50-6-F3S 51-6-F3S	1 1 1	BDM-25 BDM-25 BDM-25	BHM-25 BHM-25 BHM-25	BSM-25 BSM-25 BSM-25
52-2-F3S 51-2-F3S 52-2-F3S	52-3-F3S 51-3-F3S 52-3-F3S	52-4-F3S 51-4-F3S 52-4-F3S	52-5-F3S 51-5-F3S 52-5-F3S	52-6-F3S 51-6-F3S 52-6-F3S	1 1 1	BDM-25 BDM-26 BDM-26	BHM-25 BHM-26 BHM-26	BSM-25 BSM-26 BSM-26
53-2-F3S 54-2-F3S 54-2-F3S	53-3-F3S 54-3-F3S 54-3-F3S	53-4-F3S 54-4-F3S 54-4-F3S	53-5-F3S 54-5-F3S 54-5-F3S	53-6-F3S 54-6-F3S 54-6-F3S	1 1 1	BDM-26 BDM-26 BDM-27	BHM-26 BHM-26 BHM-27	BSM-26 BSM-26 BSM-27
55-2-F3S 56-2-F3S 57-2-F3S	55-3-F3S 56-3-F3S 57-3-F3S	55-4-F3S 56-4-F3S 57-4-F3S	55-5-F3S 56-5-F3S 57-5-F3S	55-6-F3S 56-6-F3S 57-6-F3S	1 1 1	BDM-27 BDM-27 BDM-27	BHM-27 BHM-27 BHM-27	BSM-27 BSM-27 BSM-27
58-2-F3S 59-2-F3S 60-2-F3S	58-3-F3S 59-3-F3S 60-3-F3S	58-4-F3S 59-4-F3S 60-4-F3S	58-5-F3S 59-5-F3S 60-5-F3S	58-6-F3S 59-6-F3S 60-6-F3S	1 1 1	BDM-27 BDM-27 BDM-27	BHM-27 BHM-27 BHM-27	BSM-27 BSM-27 BSM-27
59-2-F3S 60-2-F3S 61-2-F3S	59-3-F3S 60-3-F3S 61-3-F3S	59-4-F3S 60-4-F3S 61-4-F3S	59-5-F3S 60-5-F3S 61-5-F3S	59-6-F3S 60-6-F3S 61-6-F3S	1 1 1	BDM-28 BDM-28 BDM-28	BHM-28 BHM-28 BHM-28	BSM-28 BSM-28 BSM-28
62-2-F3S 63-2-F3S 62-2-F3S	62-3-F3S 63-3-F3S 62-3-F3S	62-4-F3S 63-4-F3S 62-4-F3S	62-5-F3S 63-5-F3S 62-5-F3S	62-6-F3S 63-6-F3S 62-6-F3S	1 1 1	BDM-28 BDM-28 BDM-29	BHM-28 BHM-28 BHM-29	BSM-28 BSM-28 BSM-29
63-2-F3S 64-2-F3S 63-2-F3S	63-3-F3S 64-3-F3S 63-3-F3S	63-4-F3S 64-4-F3S 63-4-F3S	63-5-F3S 64-5-F3S 63-5-F3S	63-6-F3S 64-6-F3S 63-6-F3S	1 1 1	BDM-29 BDM-29 BDM-30	BHM-29 BHM-29 BHM-30	BSM-29 BSM-29 BSM-30
64-2-F3S 65-2-F3S 66-2-F3S	64-3-F3S 65-3-F3S 66-3-F3S	64-4-F3S 65-4-F3S 66-4-F3S	64-5-F3S 65-5-F3S 66-5-F3S	64-6-F3S 65-6-F3S 66-6-F3S	1 1 1	BDM-30 BDM-30 BDM-30	BHM-30 BHM-30 BHM-30	BSM-30 BSM-30 BSM-30

## 'BAB' SERIES

### 3 PLAIN ROLLER TUBE EXPANDER WITH THRUST BEARING

#### FEATURES

- Its similar to BA series tube expander.
- Bearing reduces frictional build up for smoother expanding cycles.
- Bearing increases useful life of tool.
- Use: This tool is most useful for high productivity where flaring of tubes is not needed.



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOLS	TUBE EXPANDER MODEL NUMBER TUBE SHEET THICKNESS RANGE				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>								2	3	4	5	6
7/8	15	(.072)	1	10	(.134)	18.1 (.712)	20.4 (.803)	BAB-31/2	BAB-31/3	-	-	-
7/8	16	(.065)				18.4 (.724)	20.7 (.814)	BAB-32/2	BAB-32/3	-	-	-
7/8	17	(.058)	1	11	(.120)	18.8 (.740)	21.1 (.830)	BAB-33/2	BAB-33/3	-	-	-
7/8	18	(.049)	1	12	(.109)	19.4 (.763)	21.6 (.850)	BAB-34/2	BAB-34/3	-	-	-
7/8	19 & 20	(.042 & .035)	1. 1/8	8	(.165)	19.7 (.775)	22.3 (.877)	BAB-35/2	BAB-35/3	-	-	-
1	13	(.095)				20.1 (.791)	22.4 (.881)	BAB-36/2	BAB-36/3	-	-	-
1	14	(.083)	1. 1/8	9	(.148)	20.6 (.811)	23.1 (.909)	BAB-37/2	BAB-37/3	BAB-37/4	-	-
1	15 & 16	(.072 & .065)	1. 1/8	10	(.134)	21.3 (.838)	23.8 (.937)	BAB-38/2	BAB-38/3	BAB-38/4	-	-
1	17 & 18	(.058 & .048)	1. 1/8	11	(.120)	22.0 (.866)	24.5 (.964)	BAB-39/2	BAB-39/3	BAB-39/4	-	-
1. 1/4	19 & 20	(.042 & .035)	1. 1/8	12	(.109)	22.4 (.881)	25.0 (.984)	BAB-40/2	BAB-40/3	BAB-40/4	-	-
1. 1/4	8	(.165)	1. 1/8	13	(.095)	23.3 (.917)	25.9 (1.019)	BAB-41/2	BAB-41/3	BAB-41/4	-	-
1. 1/4	9	(.148)	1. 1/8	14	(.083)	23.8 (.937)	26.5 (1.043)	BAB-42/2	BAB-42/3	BAB-42/4	-	-
1. 1/4	10	(.134)	1. 1/8	15 & 16	(.072 & .065)	24.4 (.960)	27.2 (1.070)	BAB-43/2	BAB-43/3	BAB-43/4	-	-
1. 1/4	11	(.120)				25.2 (.992)	28.0 (1.102)	BAB-44/2	BAB-44/3	BAB-44/4	-	-
1. 1/4	12	(.109)				25.7 (1.011)	28.5 (1.122)	BAB-45/2	BAB-45/3	BAB-45/4	-	-
1. 1/4	13	(.095)	1. 3/8	8	(.165)	26.1 (1.027)	28.8 (1.133)	BAB-46/2	BAB-46/3	BAB-46/4	-	-
1. 1/4	14	(.083)				26.4 (1.039)	29.2 (1.149)	BAB-47/2	BAB-47/3	BAB-47/4	-	-
1. 1/4	15	(.072)	1. 3/8	9	(.148)	26.9 (1.059)	29.7 (1.169)	BAB-48/2	BAB-48/3	BAB-48/4	-	-
1. 1/4	16	(.065)	1. 3/8	10	(.134)	27.6 (1.086)	30.4 (1.196)	BAB-49/2	BAB-49/3	BAB-49/4	BAB-49/5	BAB-49/6
1. 1/2	7	(.180)	1. 3/8	11	(.120)	28.3 (1.114)	31.2 (1.228)	BAB-50/2	BAB-50/3	BAB-50/4	BAB-50/5	BAB-50/6
1. 1/2	8	(.165)	1. 3/8	12	(.109)	28.8 (1.133)	31.7 (1.248)	BAB-51/2	BAB-51/3	BAB-51/4	BAB-51/5	BAB-51/6
1. 1/2	9	(.148)	1. 3/8	13 & 14	(.095 & .083)	29.5 (1.161)	33.4 (1.314)	BAB-52/2	BAB-52/3	BAB-52/4	BAB-52/5	BAB-52/6
1. 1/2	10	(.134)	1. 3/8	15 & 16	(.072 & .065)	30.0 (1.181)	34.1 (1.342)	BAB-53/2	BAB-53/3	BAB-53/4	BAB-53/5	BAB-53/6
1. 1/2	11 & 12	(.120 & .109)				30.6 (1.204)	34.8 (1.370)	BAB-54/2	BAB-54/3	BAB-54/4	BAB-54/5	BAB-54/6
1. 1/2	13	(.095)	1. 3/4	5	(.220)	31.4 (1.236)	35.6 (1.401)	BAB-55/2	BAB-55/3	BAB-55/4	BAB-55/5	BAB-55/6
1. 1/2	14 & 15	(.083 & .072)	1. 3/4	6	(.203)	32.6 (1.283)	36.8 (1.448)	BAB-56/2	BAB-56/3	BAB-56/4	BAB-56/5	BAB-56/6
			1. 3/4	7	(.180)	33.4 (1.314)	38.1 (1.500)	BAB-57/2	BAB-57/3	BAB-57/4	BAB-57/5	BAB-57/6
2	3	(.259)	1. 3/4	8	(.165)	34.2 (1.346)	38.7 (1.523)	BAB-58/2	BAB-58/3	BAB-58/4	BAB-58/5	BAB-58/6
2	4	(.238)	1. 3/4	9 & 10	(.148 & .134)	35.0 (1.377)	40.6 (1.598)	BAB-59/2	BAB-59/3	BAB-59/4	BAB-59/5	BAB-59/6
			1. 3/4	11 & 12	(.120 & .109)	36.6 (1.440)	42.2 (1.661)	BAB-60/2	BAB-60/3	BAB-60/4	BAB-60/5	BAB-60/6
2	5 & 6	(.220 & .203)	1. 3/4	13 & 14	(.095 & .083)	38.2 (1.503)	43.8 (1.712)	BAB-61/2	BAB-61/3	BAB-61/4	BAB-61/5	BAB-61/6
2	7 & 8	(.180 & .165)	1. 3/4	15 & 16	(.072 & .065)	39.8 (1.566)	45.4 (1.787)	BAB-62/2	BAB-62/3	BAB-62/4	BAB-62/5	BAB-62/6
2	9 & 10	(.148 & .134)	2. 1/4	3	(.259)	41.4 (1.629)	47.0 (1.850)	BAB-63/2	BAB-63/3	BAB-63/4	BAB-63/5	BAB-63/6
2	11 - 13	(.120 - .095)	2. 1/4	4	(.238)	42.9 (1.688)	49.5 (1.948)	BAB-64/2	BAB-64/3	BAB-64/4	BAB-64/5	BAB-64/6
2	14 - 16	(.083 - .065)	2. 1/4	6 & 7	(.203 & .180)	44.5 (1.751)	51.1 (2.011)	BAB-65/2	BAB-65/3	BAB-65/4	BAB-65/5	BAB-65/6
2	17 & 18	(.058 & .049)	2. 1/4	8 & 9	(.165 & .148)	46.1 (1.814)	52.7 (2.074)	BAB-66/2	BAB-66/3	BAB-66/4	BAB-66/5	BAB-66/6



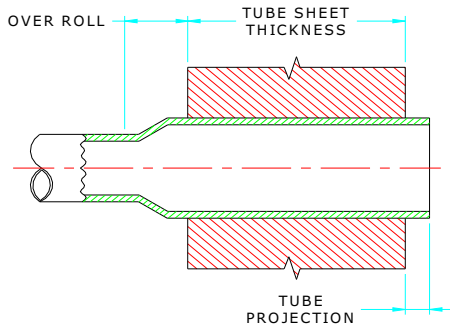
# BOILER TUBE EXPANDER



TUBE TOOLS

'BAB' SERIES

3 PLAIN ROLLER TUBE EXPANDER WITH THRUST BEARING



SPARE ROLLERS SET MODEL NUMBER TUBE SHEET THICKNESS RANGE					SPARE MANDREL MODEL NUMBER	
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"	MANDREL SIZE inch	DRUM TYPE
2	3	4	5	6	<<< Tube Sheet Thickness Codes	
15-2-RS 15-2-RS 16-2-RS	15-3-RS 15-3-RS 16-3-RS	- - -	- - -	- - -	3/8 3/8 3/8	DMB-11 DMB-12 DMB-12
20-2-RS 17-2-RS 18-2-RS	20-3-RS 17-3-RS 18-3-RS	- - -	- - -	- - -	3/8 3/8 3/8	DMB-12 DMB-13 DMB-12
18-2-RS 19-2-RS 21-2-RS	18-3-RS 19-3-RS 21-3-RS	18-4-RS 19-4-RS 21-4-RS	- - -	- - -	3/8 3/8 3/8	DMB-13 DMB-13 DMB-13
21-2-RS 22-2-RS 23-2-RS	21-3-RS 22-3-RS 23-3-RS	21-4-RS 22-4-RS 23-4-RS	- - -	- - -	3/8 3/8 1/2	DMB-14 DMB-14 DMB-15
24-2-RS 26-2-RS 27-2-RS	24-3-RS 26-3-RS 27-3-RS	24-4-RS 26-4-RS 27-4-RS	- - -	- - -	1/2 1/2 1/2	DMB-15 DMB-16 DMB-16
31-2-RS 28-2-RS 29-2-RS	31-3-RS 28-3-RS 29-3-RS	31-4-RS 28-4-RS 29-4-RS	- - -	- - -	1/2 1/2 1/2	DMB-16 DMB-17 DMB-17
30-2-RS 30-2-RS 32-2-RS	30-3-RS 30-3-RS 32-3-RS	30-4-RS 30-4-RS 32-4-RS	30-5-RS 30-5-RS 32-5-RS	30-6-RS 30-6-RS 32-6-RS	1/2 1/2 1/2	DMB-17 DMB-18 DMB-18
28-2-RS 29-2-RS 30-2-RS	28-3-RS 29-3-RS 30-3-RS	28-4-RS 29-4-RS 30-4-RS	28-5-RS 29-5-RS 30-5-RS	28-6-RS 29-6-RS 30-6-RS	1/2 1/2 1/2	DMB-20 DMB-20 DMB-20
33-2-RS 32-2-RS 36-2-RS	33-3-RS 32-3-RS 36-3-RS	33-4-RS 32-4-RS 36-4-RS	33-5-RS 32-5-RS 36-5-RS	33-6-RS 32-6-RS 36-6-RS	1/2 1/2 1/2	DMB-20 DMB-21 DMB-21
37-2-RS 33-2-RS 37-2-RS	37-3-RS 33-3-RS 37-3-RS	37-4-RS 33-4-RS 37-4-RS	37-5-RS 33-5-RS 37-5-RS	37-6-RS 33-6-RS 37-6-RS	1/2 3/4 3/4	DMB-21 DMB-22 DMB-22
38-2-RS 39-2-RS 40-2-RS	38-3-RS 39-3-RS 40-3-RS	38-4-RS 39-4-RS 40-4-RS	38-5-RS 39-5-RS 40-5-RS	38-6-RS 39-6-RS 40-6-RS	3/4 3/4 3/4	DMB-22 DMB-22 DMB-22
40-2-RS 41-2-RS 42-2-RS	40-3-RS 41-3-RS 42-3-RS	40-4-RS 41-4-RS 42-4-RS	40-5-RS 41-5-RS 42-5-RS	40-6-RS 41-6-RS 42-6-RS	3/4 3/4 3/4	DMB-23 DMB-23 DMB-23

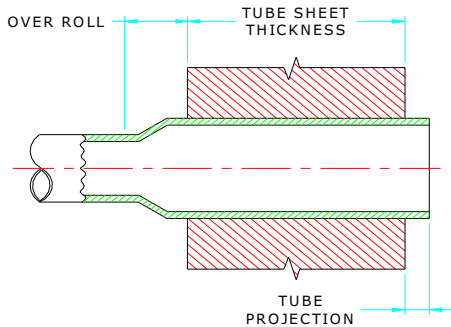
# BOILER TUBE EXPANDER



TUBE TOOLS

'BAB' SERIES

## 3 PLAIN ROLLER TUBE EXPANDER WITH THRUST BEARING



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOLS	TUBE EXPANDER MODEL NUMBER						
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			TUBE SHEET THICKNESS RANGE						
						Mm	Inch	Mm	Inch	1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
2. 1/2	3	(.259)	2. 1/4	10 & 11	(.134 & .120)	47.7	(1.877)	54.3	(2.137)	BAB-67/2	BAB-67/3	BAB-67/4	BAB-67/5	BAB-67/6
2. 1/2	4 & 5	(.238 & .220)	2. 1/4	12 & 13	(.109 & .095)	49.3	(1.940)	55.9	(2.200)	BAB-68/2	BAB-68/3	BAB-68/4	BAB-68/5	BAB-68/6
2. 1/2	6 & 7	(.203 & .180)	2. 1/4	14 - 16	(.083 -.065)	50.8	(2.000)	57.8	(2.275)	BAB-69/2	BAB-69/3	BAB-69/4	BAB-69/5	BAB-69/6
2. 1/2	8 & 9	(.165 & .148)	2. 3/4	3	(.259)	52.4	(2.062)	59.4	(2.338)	BAB-70/2	BAB-70/3	BAB-70/4	BAB-70/5	BAB-70/6
2. 1/2	10 & 11	(.134 & .120)	2. 3/4	4	(.238)	54.0	(2.125)	61.0	(2.401)	BAB-71/2	BAB-71/3	BAB-71/4	BAB-71/5	BAB-71/6
2. 1/2	12 - 14	(.109 -.083)	2. 3/4	5 & 6	(.220 & .203)	55.6	(2.188)	64.0	(2.519)	BAB-72/2	BAB-72/3	BAB-72/4	BAB-72/5	BAB-72/6
2. 1/2	15 & 16	(.072 & .065)	2. 3/4	7 & 8	(.180 & .165)	57.2	(2.251)	65.6	(2.582)	BAB-73/2	BAB-73/3	BAB-73/4	BAB-73/5	BAB-73/6
3	3	(.259)	2. 3/4	9 & 10	(.148 & .134)	58.6	(2.307)	67.0	(2.637)	BAB-74/2	BAB-74/3	BAB-74/4	BAB-74/5	BAB-74/6
3	4	(.238)	2. 3/4	11 - 13	(.120 -.095)	60.4	(2.377)	68.8	(2.708)	BAB-75/2	BAB-75/3	BAB-75/4	BAB-75/5	BAB-75/6
3	5 & 6	(.220 & .203)	2. 3/4	14 - 16	(.083 -.065)	62.2	(2.448)	70.4	(2.771)	BAB-76/2	BAB-76/3	BAB-76/4	BAB-76/5	BAB-76/6
3	7 & 8	(.180 & .165)	3. 1/4	3	(.259)	63.6	(2.503)	72.0	(2.834)	BAB-77/2	BAB-77/3	BAB-77/4	BAB-77/5	BAB-77/6
3	9 & 10	(.148 & .134)	3. 1/4	3	(.259)	65.0	(2.559)	73.4	(2.889)	BAB-78/2	BAB-78/3	BAB-78/4	BAB-78/5	BAB-78/6
3	11 - 13	(.120 -.095)	3. 1/4	4	(.238)	66.6	(2.622)	75.0	(2.952)	BAB-79/2	BAB-79/3	BAB-79/4	BAB-79/5	BAB-79/6
3	14 - 16	(.083 -.065)	3. 1/4	5 & 6	(.220 & .203)	68.3	(2.688)	76.9	(3.027)	BAB-80/2	BAB-80/3	BAB-80/4	BAB-80/5	BAB-80/6
3. 1/2	2	(.284)	3. 1/4	7 & 8	(.180 & .165)	69.9	(2.751)	78.5	(3.090)	BAB-81/2	BAB-81/3	BAB-81/4	BAB-81/5	BAB-81/6
3. 1/2	3	(.259)	3. 1/4	9 & 10	(.148 & .134)	71.5	(2.814)	80.1	(3.153)	BAB-82/2	BAB-82/3	BAB-82/4	BAB-82/5	BAB-82/6
3. 1/2	4	(.238)	3. 1/4	11 - 13	(.120 -.095)	73.1	(2.877)	81.7	(3.216)	BAB-83/2	BAB-83/3	BAB-83/4	BAB-83/5	BAB-83/6
3. 1/2	5 & 6	(.220 & .203)	3. 1/4	14 - 16	(.083 -.065)	74.6	(2.937)	84.2	(3.314)	BAB-84/2	BAB-84/3	BAB-84/4	BAB-84/5	BAB-84/6
3. 1/2	7 & 8	(.180 & .165)	3. 3/4	2	(.084)	76.2	(3.000)	85.5	(3.366)	BAB-85/2	BAB-85/3	BAB-85/4	BAB-85/5	BAB-85/6
3. 1/2	9 - 11	(.148 -.120)	3. 3/4	3	(.259)	77.8	(3.062)	87.4	(3.440)	BAB-86/2	BAB-86/3	BAB-86/4	BAB-86/5	BAB-86/6
3. 1/2	12 - 16	(.109 -.065)	3. 3/4	4	(.238)	79.4	(3.125)	89.0	(3.503)	BAB-87/2	BAB-87/3	BAB-87/4	BAB-87/5	BAB-87/6
4	2	(.284)	3. 3/4	5 & 6	(.220 & .203)	81.0	(3.188)	90.6	(3.566)	BAB-88/2	BAB-88/3	BAB-88/4	BAB-88/5	BAB-88/6
4	3	(.259)	3. 3/4	7 & 8	(.180 & .165)	82.6	(3.251)	92.2	(3.629)	BAB-89/2	BAB-89/3	BAB-89/4	BAB-89/5	BAB-89/6
4	4	(.238)	3. 3/4	9 & 10	(.148 & .134)	84.2	(3.314)	93.8	(3.692)	BAB-90/2	BAB-90/3	BAB-90/4	BAB-90/5	BAB-90/6
4	5 & 6	(.220 & .203)	3. 3/4	11 - 13	(.120 -.095)	85.8	(3.377)	96.2	(3.787)	BAB-91/2	BAB-91/3	BAB-91/4	BAB-91/5	BAB-91/6
4	7 & 8	(.180 & .165)	3. 3/4	14 - 16	(.083 -.065)	87.4	(3.440)	97.8	(3.850)	BAB-92/2	BAB-92/3	BAB-92/4	BAB-92/5	BAB-92/6
4	9 - 11	(.148 -.120)	4. 1/4	2	(.084)	89.0	(3.503)	99.4	(3.913)	BAB-93/2	BAB-93/3	BAB-93/4	BAB-93/5	BAB-93/6
4	12 - 16	(.109 -.065)	4. 1/4	3	(.284)	90.4	(3.559)	100.8	(3.968)	BAB-94/2	BAB-94/3	BAB-94/4	BAB-94/5	BAB-94/6
4	4	(.238)	4. 1/4	4	(.238)	92.0	(3.622)	102.4	(4.031)	BAB-95/2	BAB-95/3	BAB-95/4	BAB-95/5	BAB-95/6
4	5 & 6	(.220 & .203)	4. 1/4	5 & 6	(.220 & .203)	93.4	(3.677)	103.8	(4.086)	BAB-96/2	BAB-96/3	BAB-96/4	BAB-96/5	BAB-96/6
4. 1/2	2	(.284)	4. 1/4	7 & 8	(.180 & .165)	95.0	(3.740)	105.4	(4.149)	BAB-97/2	BAB-97/3	BAB-97/4	BAB-97/5	BAB-97/6
4. 1/2	3	(.259)	4. 1/4	9 - 11	(.148 -.120)	96.6	(3.803)	107.0	(4.212)	BAB-98/2	BAB-98/3	BAB-98/4	BAB-98/5	BAB-98/6
4. 1/2	4 & 5	(.238 & .220)	4. 1/4	11 - 13	(.120 -.095)	98.2	(3.866)	108.6	(4.275)	BAB-99/2	BAB-99/3	BAB-99/4	BAB-99/5	BAB-99/6
4. 1/2	6 & 7	(.203 & .180)				101.2	(3.984)	110.0	(4.330)	BAB-100/2	BAB-100/3	BAB-100/4	BAB-100/5	BAB-100/6
4. 1/2	8 & 9	(.165 & .148)				102.8	(4.047)	111.6	(4.393)	BAB-101/2	BAB-101/3	BAB-101/4	BAB-101/5	BAB-101/6
4. 1/2	10 - 12	(.134 -.109)				104.4	(4.110)	113.2	(4.456)	BAB-102/2	BAB-102/3	BAB-102/4	BAB-102/5	BAB-102/6

7/8" - 4.1/2" Tube O. D.

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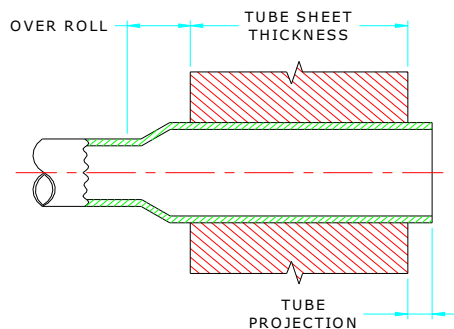
# BOILER TUBE EXPANDER



TUBE TOOLS

'BAB' SERIES

3 PLAIN ROLLER TUBE EXPANDER WITH THRUST BEARING

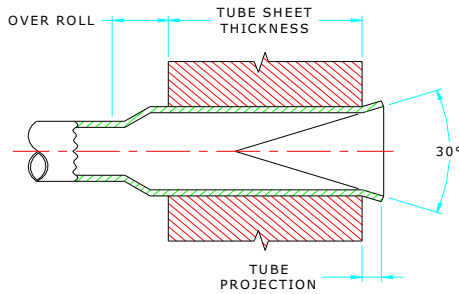


SPARE ROLLERS SET MODEL NUMBER TUBE SHEET THICKNESS RANGE					SPARE MANDREL MODEL NUMBER	
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"	MANDREL SIZE inch	DRUM TYPE
2	3	4	5	6	<<< Tube Sheet Thickness Codes	
43-2-RS	43-3-RS	43-4-RS	43-5-RS	43-6-RS	3/4	DMB-23
44-2-RS	44-3-RS	44-4-RS	44-5-RS	44-6-RS	3/4	DMB-23
43-2-RS	43-3-RS	43-4-RS	43-5-RS	43-6-RS	3/4	DMB-24
44-2-RS	44-3-RS	44-4-RS	44-5-RS	44-6-RS	3/4	DMB-24
45-2-RS	45-3-RS	45-4-RS	45-5-RS	45-6-RS	3/4	DMB-24
47-2-RS	47-3-RS	47-4-RS	47-5-RS	47-6-RS	3/4	DMB-24
46-2-RS	46-3-RS	46-4-RS	46-5-RS	46-6-RS	1	DMB-25
47-2-RS	47-3-RS	47-4-RS	47-5-RS	47-6-RS	1	DMB-25
48-2-RS	48-3-RS	48-4-RS	48-5-RS	48-6-RS	1	DMB-25
49-2-RS	49-3-RS	49-4-RS	49-5-RS	49-6-RS	1	DMB-25
50-2-RS	50-3-RS	50-4-RS	50-5-RS	50-6-RS	1	DMB-25
51-2-RS	51-3-RS	51-4-RS	51-5-RS	51-6-RS	1	DMB-25
52-2-RS	52-3-RS	52-4-RS	52-5-RS	52-6-RS	1	DMB-25
51-2-RS	51-3-RS	51-4-RS	51-5-RS	51-6-RS	1	DMB-26
52-2-RS	52-3-RS	52-4-RS	52-5-RS	52-6-RS	1	DMB-26
53-2-RS	53-3-RS	53-4-RS	53-5-RS	53-6-RS	1	DMB-26
54-2-RS	54-3-RS	54-4-RS	54-5-RS	54-6-RS	1	DMB-26
54-2-RS	54-3-RS	54-4-RS	54-5-RS	54-6-RS	1	DMB-27
55-2-RS	55-3-RS	55-4-RS	55-5-RS	55-6-RS	1	DMB-27
56-2-RS	56-3-RS	56-4-RS	56-5-RS	56-6-RS	1	DMB-27
57-2-RS	57-3-RS	57-4-RS	57-5-RS	57-6-RS	1	DMB-27
58-2-RS	58-3-RS	58-4-RS	58-5-RS	58-6-RS	1	DMB-27
59-2-RS	59-3-RS	59-4-RS	59-5-RS	59-6-RS	1	DMB-27
60-2-RS	60-3-RS	60-4-RS	60-5-RS	60-6-RS	1	DMB-27
59-2-RS	59-3-RS	59-4-RS	59-5-RS	59-6-RS	1	DMB-28
60-2-RS	60-3-RS	60-4-RS	60-5-RS	60-6-RS	1	DMB-28
61-2-RS	61-3-RS	61-4-RS	61-5-RS	61-6-RS	1	DMB-28
62-2-RS	62-3-RS	62-4-RS	62-5-RS	62-6-RS	1	DMB-28
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DMB-28
62-2-RS	62-3-RS	62-4-RS	62-5-RS	62-6-RS	1	DMB-29
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DMB-29
64-2-RS	64-3-RS	64-4-RS	64-5-RS	64-6-RS	1	DMB-29
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DMB-30
64-2-RS	64-3-RS	64-4-RS	64-5-RS	64-6-RS	1	DMB-30
65-2-RS	65-3-RS	65-4-RS	65-5-RS	65-6-RS	1	DMB-30
66-2-RS	66-3-RS	66-4-RS	66-5-RS	66-6-RS	1	DMB-30

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER WITH THRUST BEARING

#### FEATURES

- Its similar to BAF3 series tube expander.
- Bearing reduces frictional build up for smoother expanding cycles.
- Bearing increases useful life of tool.
- Use: This tool is most useful for high productivity where flaring of tubes is not needed.



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOL		TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch	Mm	Inch	Mm	Inch	TO	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
7/8	15	(.072)	1	10	(.134)	18.1	(.712)	20.4	(.803)	ABF3-31/2	ABF3-31/3	-	-	-
7/8	16	(.065)				18.4	(.724)	20.7	(.814)	ABF3-32/2	ABF3-32/3	-	-	-
7/8	17	(.058)	1	11	(.120)	18.8	(.740)	21.1	(.830)	ABF3-33/2	ABF3-33/3	-	-	-
7/8	18	(.049)	1	12	(.109)	19.4	(.763)	21.6	(.850)	ABF3-34/2	ABF3-34/3	-	-	-
7/8	19&20	(.042 &.035)	1. 1/8	8	(.165)	19.7	(.775)	22.3	(.877)	ABF3-35/2	ABF3-35/3	-	-	-
1	13	(.095)				20.1	(.791)	22.4	(.881)	ABF3-36/2	ABF3-36/3	-	-	-
1	14	(.083)	1. 1/8	9	(.148)	20.6	(.811)	23.1	(.909)	ABF3-37/2	ABF3-37/3	ABF3-37/4	-	-
1	15&16	(.072 &.065)	1. 1/8	10	(.134)	21.3	(.838)	23.8	(.937)	ABF3-38/2	ABF3-38/3	ABF3-38/4	-	-
1	17&18	(.058 &.048)	1. 1/8	11	(.120)	22.0	(.866)	24.5	(.964)	ABF3-39/2	ABF3-39/3	ABF3-39/4	-	-
1	19&20	(.042 &.035)	1. 1/8	12	(.109)	22.4	(.881)	25.0	(.984)	ABF3-40/2	ABF3-40/3	ABF3-40/4	-	-
1. 1/4	8	(.165)	1. 1/8	13	(.095)	23.3	(.917)	25.9	(1.019)	ABF3-41/2	ABF3-41/3	ABF3-41/4	-	-
1. 1/4	9	(.148)	1. 1/8	14	(.083)	23.8	(.937)	26.5	(1.043)	ABF3-42/2	ABF3-42/3	ABF3-42/4	-	-
1. 1/4	10	(.134)	1. 1/8	15&16	(.072 &.065)	24.4	(.960)	27.2	(1.070)	ABF3-43/2	ABF3-43/3	ABF3-43/4	-	-
1. 1/4	11	(.120)				25.2	(.992)	28.0	(1.102)	ABF3-44/2	ABF3-44/3	ABF3-44/4	-	-
1. 1/4	12	(.109)				25.7	(1.011)	28.5	(1.122)	ABF3-45/2	ABF3-45/3	ABF3-45/4	-	-
1. 1/4	13	(.095)	1. 3/8	8	(.165)	26.1	(1.027)	28.8	(1.133)	ABF3-46/2	ABF3-46/3	ABF3-46/4	-	-
1. 1/4	14	(.083)				26.4	(1.039)	29.2	(1.149)	ABF3-47/2	ABF3-47/3	ABF3-47/4	-	-
1. 1/4	15	(.072)	1. 3/8	9	(.148)	26.9	(1.059)	29.7	(1.169)	ABF3-48/2	ABF3-48/3	ABF3-48/4	-	-
1. 1/4	16	(.065)	1. 3/8	10	(.134)	27.6	(1.086)	30.4	(1.196)	ABF3-49/2	ABF3-49/3	ABF3-49/4	ABF3-49/5	ABF3-49/6
1. 1/2	7	(.180)	1. 3/8	11	(.120)	28.3	(1.114)	31.2	(1.228)	ABF3-50/2	ABF3-50/3	ABF3-50/4	ABF3-50/5	ABF3-50/6
1. 1/2	8	(.165)	1. 3/8	12	(.109)	28.8	(1.133)	31.7	(1.248)	ABF3-51/2	ABF3-51/3	ABF3-51/4	ABF3-51/5	ABF3-51/6
1. 1/2	9	(.148)	1. 3/8	13&14	(.095 &.083)	29.5	(1.161)	33.4	(1.314)	ABF3-52/2	ABF3-52/3	ABF3-52/4	ABF3-52/5	ABF3-52/6
1. 1/2	10	(.134)	1. 3/8	15&16	(.072 &.065)	30.0	(1.181)	34.1	(1.342)	ABF3-53/2	ABF3-53/3	ABF3-53/4	ABF3-53/5	ABF3-53/6
1. 1/2	11&12	(.120 &.109)				30.6	(1.204)	34.8	(1.370)	ABF3-54/2	ABF3-54/3	ABF3-54/4	ABF3-54/5	ABF3-54/6
1. 1/2	13	(.095)	1. 3/4	5	(.220)	31.4	(1.236)	35.6	(1.401)	ABF3-55/2	ABF3-55/3	ABF3-55/4	ABF3-55/5	ABF3-55/6
1. 1/2	14&15	(.083 &.072)	1. 3/4	6	(.203)	32.6	(1.283)	36.8	(1.448)	ABF3-56/2	ABF3-56/3	ABF3-56/4	ABF3-56/5	ABF3-56/6
			1. 3/4	7	(.180)	33.4	(1.314)	38.1	(1.500)	ABF3-57/2	ABF3-57/3	ABF3-57/4	ABF3-57/5	ABF3-57/6
2			1. 3/4	8	(.165)	34.2	(1.346)	38.7	(1.523)	ABF3-58/2	ABF3-58/3	ABF3-58/4	ABF3-58/5	ABF3-58/6
2	3	(.259)	1. 3/4	9 &10	(.148 &.134)	35.0	(1.377)	40.6	(1.598)	ABF3-59/2	ABF3-59/3	ABF3-59/4	ABF3-59/5	ABF3-59/6
2	4	(.238)	1. 3/4	11&12	(.120 &.109)	36.6	(1.440)	42.2	(1.661)	ABF3-60/2	ABF3-60/3	ABF3-60/4	ABF3-60/5	ABF3-60/6
2	5 & 6	(.220 &.203)	1. 3/4	13&14	(.095 &.083)	38.2	(1.503)	43.8	(1.712)	ABF3-61/2	ABF3-61/3	ABF3-61/4	ABF3-61/5	ABF3-61/6
2	7 & 8	(.180 &.165)	1. 3/4	15&16	(.072 &.065)	39.8	(1.566)	45.4	(1.787)	ABF3-62/2	ABF3-62/3	ABF3-62/4	ABF3-62/5	ABF3-62/6
2	9 &10	(.148 &.134)	2. 1/4	3	(.259)	41.4	(1.629)	47.0	(1.850)	ABF3-63/2	ABF3-63/3	ABF3-63/4	ABF3-63/5	ABF3-63/6
2	11 -13	(.120 - .095)	2. 1/4	4	(.238)	42.9	(1.688)	49.5	(1.948)	ABF3-64/2	ABF3-64/3	ABF3-64/4	ABF3-64/5	ABF3-64/6
2	14 -16	(.083 - .065)	2. 1/4	6 & 7	(.203 &.180)	44.5	(1.751)	51.1	(2.011)	ABF3-65/2	ABF3-65/3	ABF3-65/4	ABF3-65/5	ABF3-65/6
2	17&18	(.058 &.049)	2. 1/4	8 & 9	(.165 &.148)	46.1	(1.814)	52.7	(2.074)	ABF3-66/2	ABF3-66/3	ABF3-66/4	ABF3-66/5	ABF3-66/6

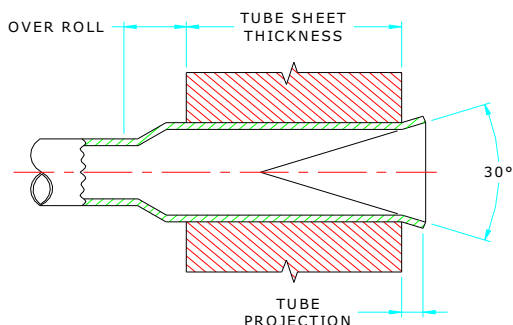
# BOILER TUBE EXPANDER



TUBE TOOLS

## 'BABF3' SERIES

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER WITH THRUST BEARING



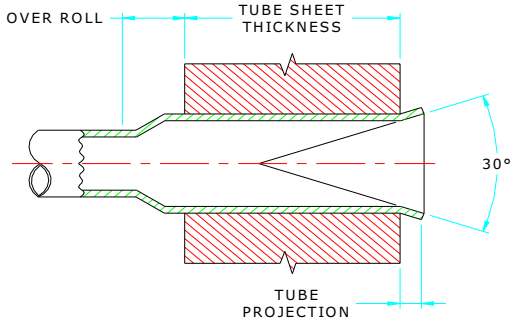
SPARE ROLLERS SET MODEL NUMBER					SPARE MANDREL MODEL NUMBER	
TUBE SHEET THICKNESS RANGE					MANDREL SIZE inch	DRUM TYPE
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"		
2	3	4	5	6	<<< Tube Sheet Thickness Codes	
B15-2-F3S B15-2-F3S B16-2-F3S	B15-3-F3S B15-3-F3S B16-3-F3S	- - -	- - -	- - -	3/8 3/8 3/8	BDMB-11 BDMB-12 BDMB-12
B20-2-F3S B17-2-F3S B18-2-F3S	B20-3-F3S B17-3-F3S B18-3-F3S	- - -	- - -	- - -	3/8 3/8 3/8	BDMB-12 BDMB-13 BDMB-12
B18-2-F3S B19-2-F3S B21-2-F3S	B18-3-F3S B19-3-F3S B21-3-F3S	B18-4-F3S B19-4-F3S B21-4-F3S	- - -	- - -	3/8 3/8 3/8	BDMB-13 BDMB-13 BDMB-13
B21-2-F3S B22-2-F3S B23-2-F3S	B21-3-F3S B22-3-F3S B23-3-F3S	B21-4-F3S B22-4-F3S B23-4-F3S	- - -	- - -	3/8 3/8 1/2	BDMB-14 BDMB-14 BDMB-15
B24-2-F3S B26-2-F3S B27-2-F3S	B24-3-F3S B26-3-F3S B27-3-F3S	B24-4-F3S B26-4-F3S B27-4-F3S	- - -	- - -	1/2 1/2 1/2	BDMB-15 BDMB-16 BDMB-16
B31-2-F3S B28-2-F3S B29-2-F3S	B31-3-F3S B28-3-F3S B29-3-F3S	B31-4-F3S B28-4-F3S B29-4-F3S	- - -	- - -	1/2 1/2 1/2	BDMB-16 BDMB-17 BDMB-17
B30-2-F3S B30-2-F3S B32-2-F3S	B30-3-F3S B30-3-F3S B32-3-F3S	B30-4-F3S B30-4-F3S B32-4-F3S	B30-5-F3S B30-5-F3S B32-5-F3S	B30-6-F3S B30-6-F3S B32-6-F3S	1/2 1/2 1/2	BDMB-17 BDMB-18 BDMB-18
B28-2-F3S B29-2-F3S B30-2-F3S	B28-3-F3S B29-3-F3S B30-3-F3S	B28-4-F3S B29-4-F3S B30-4-F3S	B28-5-F3S B29-5-F3S B30-5-F3S	B28-6-F3S B29-6-F3S B30-6-F3S	1/2 1/2 1/2	BDMB-20 BDMB-20 BDMB-20
B33-2-F3S B32-2-F3S B36-2-F3S	B33-3-F3S B32-3-F3S B36-3-F3S	B33-4-F3S B32-4-F3S B36-4-F3S	B33-5-F3S B32-5-F3S B36-5-F3S	B33-6-F3S B32-6-F3S B36-6-F3S	1/2 1/2 1/2	BDMB-20 BDMB-21 BDMB-21
B37-2-F3S B33-2-F3S B37-2-F3S	B37-3-F3S B33-3-F3S B37-3-F3S	B37-4-F3S B33-4-F3S 3B7-4-F3S	B37-5-F3S B33-5-F3S B37-5-F3S	B37-6-F3S B33-6-F3S B37-6-F3S	1/2 3/4 3/4	BDMB-21 BDMB-22 BDMB-22
B38-2-F3S B39-2-F3S B40-2-F3S	B38-3-F3S B39-3-F3S B40-3-F3S	B38-4-F3S B39-4-F3S B40-4-F3S	B38-5-F3S B39-5-F3S B40-5-F3S	B38-6-F3S B39-6-F3S B40-6-F3S	3/4 3/4 3/4	BDMB-22 BDMB-22 BDMB-22
B40-2-F3S B41-2-F3S B42-2-F3S	B40-3-F3S B41-3-F3S B42-3-F3S	B40-4-F3S B41-4-F3S B42-4-F3S	B40-5-F3S B41-5-F3S B42-5-F3S	B40-6-F3S B41-6-F3S B42-6-F3S	3/4 3/4 3/4	BDMB-23 BDMB-23 BDMB-23



# BOILER TUBE EXPANDER

## 'BABF3' SERIES

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER WITH THRUST BEARING

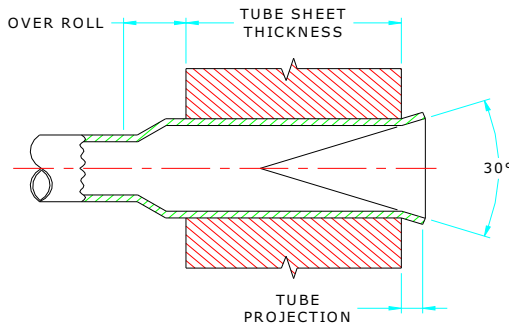


TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOL	TUBE EXPANDER MODEL NUMBER						
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch			TUBE SHEET THICKNESS RANGE						
						Mm	Inch	Mm	Inch	1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"
Tube Sheet Thickness Codes >>>										2	3	4	5	6
2.1/2	3	(.259)	2.1/4	10&11	(.134 &.120)	47.7	(1.877)	54.3	(2.137)	BABF3-67/2	BABF3-67/3	BABF3-67/4	BABF3-67/5	BABF3-67/6
2.1/2	4 & 5	(.238 &.220)	2.1/4	12&13	(.109 &.095)	49.3	(1.940)	55.9	(2.200)	BABF3-68/2	BABF3-68/3	BABF3-68/4	BABF3-68/5	BABF3-68/6
2.1/2	6 & 7	(.203 &.180)	2.1/4	14 -16	(.083 -.065)	50.8	(2.000)	57.8	(2.275)	BABF3-69/2	BABF3-69/3	BABF3-69/4	BABF3-69/5	BABF3-69/6
2.1/2	8 & 9	(.165 &.148)	2.3/4	3	(.259)	52.4	(2.062)	59.4	(2.338)	BABF3-70/2	BABF3-70/3	BABF3-70/4	BABF3-70/5	BABF3-70/6
2.1/2	10&11	(.134 &.120)	2.3/4	4	(.238)	54.0	(2.125)	61.0	(2.401)	BABF3-71/2	BABF3-71/3	BABF3-71/4	BABF3-71/5	BABF3-71/6
2.1/2	12 -14	(.109 -.083)	2.3/4	5 & 6	(.220 &.203)	55.6	(2.188)	64.0	(2.519)	BABF3-72/2	BABF3-72/3	BABF3-72/4	BABF3-72/5	BABF3-72/6
2.1/2	15&16	(.072 &.065)	2.3/4	7 & 8	(.180 &.165)	57.2	(2.251)	65.6	(2.582)	BABF3-73/2	BABF3-73/3	BABF3-73/4	BABF3-73/5	BABF3-73/6
3	3	(.259)	2.3/4	9 &10	(.148 &.134)	58.6	(2.307)	67.0	(2.637)	BABF3-74/2	BABF3-74/3	BABF3-74/4	BABF3-74/5	BABF3-74/6
3	4	(.238)	2.3/4	11 -13	(.120 -.095)	60.4	(2.377)	68.8	(2.708)	BABF3-75/2	BABF3-75/3	BABF3-75/4	BABF3-75/5	BABF3-75/6
3	5 & 6	(.220 &.203)	2.3/4	14 -16	(.083 -.065)	62.2	(2.448)	70.4	(2.771)	BABF3-76/2	BABF3-76/3	BABF3-76/4	BABF3-76/5	BABF3-76/6
3	7 & 8	(.180 &.165)	3.1/4	3	(.259)	63.6	(2.503)	72.0	(2.834)	BABF3-77/2	BABF3-77/3	BABF3-77/4	BABF3-77/5	BABF3-77/6
3	9 &10	(.148 &.134)	3.1/4	3	(.259)	65.0	(2.559)	73.4	(2.889)	BABF3-78/2	BABF3-78/3	BABF3-78/4	BABF3-78/5	BABF3-78/6
3	11 -13	(.120 -.095)	3.1/4	4	(.238)	66.6	(2.622)	75.0	(2.952)	BABF3-79/2	BABF3-79/3	BABF3-79/4	BABF3-79/5	BABF3-79/6
3	14 -16	(.083 -.065)	3.1/4	5 & 6	(.220 &.203)	68.3	(2.688)	76.9	(3.027)	BABF3-80/2	BABF3-80/3	BABF3-80/4	BABF3-80/5	BABF3-80/6
3.1/2	2	(.284)	3.1/4	7 & 8	(.180 &.165)	69.9	(2.751)	78.5	(3.090)	BABF3-81/2	BABF3-81/3	BABF3-81/4	BABF3-81/5	BABF3-81/6
3.1/2	3	(.259)	3.1/4	9 &10	(.148 &.134)	71.5	(2.814)	80.1	(3.153)	BABF3-82/2	BABF3-82/3	BABF3-82/4	BABF3-82/5	BABF3-82/6
3.1/2	4	(.238)	3.1/4	11 -13	(.120 -.095)	73.1	(2.877)	81.7	(3.216)	BABF3-83/2	BABF3-83/3	BABF3-83/4	BABF3-83/5	BABF3-83/6
3.1/2	5 & 6	(.220 &.203)	3.1/4	14 -16	(.083 -.065)	74.6	(2.937)	84.2	(3.314)	BABF3-84/2	BABF3-84/3	BABF3-84/4	BABF3-84/5	BABF3-84/6
3.1/2	7 & 8	(.180 &.165)	3.3/4	2	(.084)	76.2	(3.000)	85.5	(3.366)	BABF3-85/2	BABF3-85/3	BABF3-85/4	BABF3-85/5	BABF3-85/6
3.1/2	9 - 11	(.148 -.120)	3.3/4	3	(.259)	77.8	(3.062)	87.4	(3.440)	BABF3-86/2	BABF3-86/3	BABF3-86/4	BABF3-86/5	BABF3-86/6
3.1/2	12 -16	(.109 -.065)	3.3/4	4	(.238)	79.4	(3.125)	89.0	(3.503)	BABF3-87/2	BABF3-87/3	BABF3-87/4	BABF3-87/5	BABF3-87/6
4	2	(.284)	3.3/4	5 & 6	(.220 &.203)	81.0	(3.188)	90.6	(3.566)	BABF3-88/2	BABF3-88/3	BABF3-88/4	BABF3-88/5	BABF3-88/6
4	3	(.259)	3.3/4	7 & 8	(.180 &.165)	82.6	(3.251)	92.2	(3.629)	BABF3-89/2	BABF3-89/3	BABF3-89/4	BABF3-89/5	BABF3-89/6
4	3	(.259)	3.3/4	9 &10	(.148 &.134)	84.2	(3.314)	93.8	(3.692)	BABF3-90/2	BABF3-90/3	BABF3-90/4	BABF3-90/5	BABF3-90/6
4	4	(.238)	3.3/4	11 -13	(.120 -.095)	85.8	(3.377)	96.2	(3.787)	BABF3-91/2	BABF3-91/3	BABF3-91/4	BABF3-91/5	BABF3-91/6
4	5 & 6	(.220 &.203)	3.3/4	14 -16	(.083 -.065)	87.4	(3.440)	97.8	(3.850)	BABF3-92/2	BABF3-92/3	BABF3-92/4	BABF3-92/5	BABF3-92/6
4	7 & 8	(.180 &.165)	4.1/4	2		89.0	(3.503)	99.4	(3.913)	BABF3-93/2	BABF3-93/3	BABF3-93/4	BABF3-93/5	BABF3-93/6
4	9 - 11	(.148 -.120)	4.1/4	3	(.284)	90.4	(3.559)	100.8	(3.968)	BABF3-94/2	BABF3-94/3	BABF3-94/4	BABF3-94/5	BABF3-94/6
4	12 -16	(.109 -.065)	4.1/4	4	(.238)	92.0	(3.622)	102.4	(4.031)	BABF3-95/2	BABF3-95/3	BABF3-95/4	BABF3-95/5	BABF3-95/6
4.1/2	2	(.284)	4.1/4	5 & 6	(.220 &.203)	93.4	(3.677)	103.8	(4.086)	BABF3-96/2	BABF3-96/3	BABF3-96/4	BABF3-96/5	BABF3-96/6
4.1/2	3	(.259)	4.1/4	7 & 8	(.180 &.165)	95.0	(3.740)	105.4	(4.149)	BABF3-97/2	BABF3-97/3	BABF3-97/4	BABF3-97/5	BABF3-97/6
4.1/2	4 & 5	(.238 &.220)	4.1/4	9 -11	(.148 -.120)	96.6	(3.803)	107.0	(4.212)	BABF3-98/2	BABF3-98/3	BABF3-98/4	BABF3-98/5	BABF3-98/6
4.1/2	4 & 5	(.238 &.220)	4.1/4	11 -13	(.120 -.095)	98.2	(3.866)	108.6	(4.275)	BABF3-99/2	BABF3-99/3	BABF3-99/4	BABF3-99/5	BABF3-99/6
4.1/2	6 & 7	(.203 &.180)				101.2	(3.984)	110.0	(4.330)	BABF3-100/2	BABF3-100/3	BABF3-100/4	BABF3-100/5	BABF3-100/6
4.1/2	8 & 9	(.165 &.148)				102.8	(4.047)	111.6	(4.393)	BABF3-101/2	BABF3-101/3	BABF3-101/4	BABF3-101/5	BABF3-101/6
4.1/2	10 -12	(.134 -.109)				104.4	(4.110)	113.2	(4.456)	BABF3-102/2	BABF3-102/3	BABF3-102/4	BABF3-102/5	BABF3-102/6

# BOILER TUBE EXPANDER

## 'BABF3' SERIES

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER WITH THRUST BEARING



SPARE ROLLERS SET MODEL NUMBER						MANDREL SIZE inch	DRUM TYPE
TUBE SHEET THICKNESS RANGE							
1/2" TO 7/8"	3/4" TO 1. 1/8"	1. 1/8" TO 1. 5/8"	1. 5/8" TO 2. 1/8"	2. 1/8" TO 2. 5/8"	<<< Tube Sheet Thickness Codes		
2	3	4	5	6			
B43-2-BF3S B44-2-BF3S B43-2-BF3S	B43-3-BF3S B44-3-BF3S B43-3-BF3S	B43-4-BF3S B44-4-BF3S B43-4-BF3S	B43-5-BF3S B44-5-BF3S B43-5-BF3S	B43-6-BF3S B44-6-BF3S B43-6-BF3S	3/4 3/4 3/4	BDMB-23 BDMB-23 BDMB-24	
B44-2-BF3S B45-2-BF3S B47-2-BF3S	B44-3-BF3S B45-3-BF3S B47-3-BF3S	B44-4-BF3S B45-4-BF3S B47-4-BF3S	B44-5-BF3S B45-5-BF3S B47-5-BF3S	B44-6-BF3S B45-6-BF3S B47-6-BF3S	3/4 3/4 3/4	BDMB-24 BDMB-24 BDMB-24	
B46-2-BF3S B47-2-BF3S B48-2-BF3S	B46-3-BF3S B47-3-BF3S B48-3-BF3S	B46-4-BF3S B47-4-BF3S B48-4-BF3S	B46-5-BF3S B47-5-BF3S B48-5-BF3S	B46-6-BF3S B47-6-BF3S B48-6-BF3S	1 1 1	BDMB-25 BDMB-25 BDMB-25	
B49-2-BF3S B50-2-BF3S B51-2-BF3S	B49-3-BF3S B50-3-BF3S B51-3-BF3S	B49-4-BF3S B50-4-BF3S B51-4-BF3S	B49-5-BF3S B50-5-BF3S B51-5-BF3S	B49-6-BF3S B50-6-BF3S B51-6-BF3S	1 1 1	BDMB-25 BDMB-25 BDMB-25	
B52-2-BF3S B51-2-BF3S B52-2-BF3S	B52-3-BF3S B51-3-BF3S B52-3-BF3S	B52-4-BF3S B51-4-BF3S B52-4-BF3S	B52-5-BF3S B51-5-BF3S B52-5-BF3S	B52-6-BF3S B51-6-BF3S B52-6-BF3S	1 1 1	BDMB-25 BDMB-26 BDMB-26	
B53-2-BF3S B54-2-BF3S B54-2-BF3S	B53-3-BF3S B54-3-BF3S B54-3-BF3S	B53-4-BF3S B54-4-BF3S B54-4-BF3S	B53-5-BF3S B54-5-BF3S B54-5-BF3S	B53-6-BF3S B54-6-BF3S B54-6-BF3S	1 1 1	BDMB-26 BDMB-26 BDMB-27	
B55-2-BF3S B56-2-BF3S B57-2-BF3S	B55-3-BF3S B56-3-BF3S B57-3-BF3S	B55-4-BF3S B56-4-BF3S B57-4-BF3S	B55-5-BF3S B56-5-BF3S B57-5-BF3S	B55-6-BF3S B56-6-BF3S B57-6-BF3S	1 1 1	BDMB-27 BDMB-27 BDMB-27	
B58-2-BF3S B59-2-BF3S B60-2-BF3S	B58-3-BF3S B59-3-BF3S B60-3-BF3S	B58-4-BF3S B59-4-BF3S B60-4-BF3S	B58-5-BF3S B59-5-BF3S B60-5-BF3S	B58-6-BF3S B59-6-BF3S B60-6-BF3S	1 1 1	BDMB-27 BDMB-27 BDMB-27	
B59-2-BF3S B60-2-BF3S B61-2-BF3S	B59-3-BF3S B60-3-BF3S B61-3-BF3S	B59-4-BF3S B60-4-BF3S B61-4-BF3S	B59-5-BF3S B60-5-BF3S B61-5-BF3S	B59-6-BF3S B60-6-BF3S B61-6-BF3S	1 1 1	BDMB-28 BDMB-28 BDMB-28	
B62-2-BF3S B63-2-BF3S B62-2-BF3S	B62-3-BF3S B63-3-BF3S B62-3-BF3S	B62-4-BF3S B63-4-BF3S B62-4-BF3S	B62-5-BF3S B63-5-BF3S B62-5-BF3S	B62-6-BF3S B63-6-BF3S B62-6-BF3S	1 1 1	BDMB-28 BDMB-28 BDMB-29	
B63-2-BF3S B64-2-BF3S B63-2-BF3S	B63-3-BF3S B64-3-BF3S B63-3-BF3S	B63-4-BF3S B64-4-BF3S B63-4-BF3S	B63-5-BF3S B64-5-BF3S B63-5-BF3S	B63-6-BF3S B64-6-BF3S B63-6-BF3S	1 1 1	BDMB-29 BDMB-29 BDMB-30	
B64-2-BF3S B65-2-BF3S B66-2-BF3S	B64-3-BF3S B65-3-BF3S B66-3-BF3S	B64-4-BF3S B65-4-BF3S B66-4-BF3S	B64-5-BF3S B65-5-BF3S B66-5-BF3S	B64-6-BF3S B65-6-BF3S B66-6-BF3S	1 1 1	BDMB-30 BDMB-30 BDMB-30	

# BOILER TUBE EXPANDER

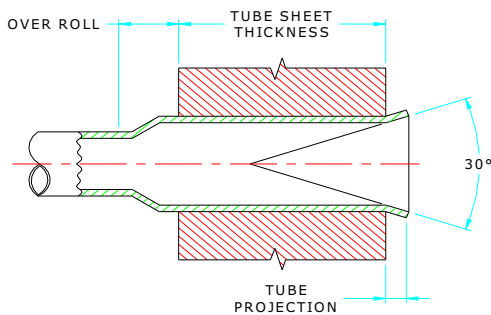


## 'B-1000 SERIES WITH COLLAR

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER

#### FEATURES

- Overlapping rolls prevent ridging of tube.
- Use: Ideal for use in limited access space like water boxes, small diameter drums.



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOLS		TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch	Mm	Inch	Mm	Inch	TUBE SHEET THICKNESS RANGE				
										1/2" TO 3/4"	7/8" TO 1. 1/4"	1.3/8" TO 1.3/4"	1. 7/8" TO 2. 1/4"	2. 3/8" TO 2. 3/4"
Tube Sheet Thickness Codes >>>										3	5	7	9	11
1	13&14	(.095 &.083)	1.1/8	9	(.148)	19.7	(.775)	23.4	(.921)	BP1079/3	BP1079/5			
1	15&16	(.072 &.065)	1.1/8	10	(.134)	20.7	(.814)	24.4	(.961)	BP1083/3	BP1083/5			
1.1/4	7	(.180)	1.1/8	11&12	(.120 &.109)	21.7	(.854)	25.5	(1.004)	BP1087/3	BP1087/5			
1.1/4	8&9	(.165 &.148)	1.1/8	13&14	(.095 &.083)	22.7	(.893)	26.5	(1.043)	BP1091/3	BP1091/5			
1.1/4	10	(.134)	1.1/8	15&16	(.072 &.065)	23.7	(.933)	28.1	(1.105)	BP1095/3	BP1095/5			
1.1/4	11-13	(.120 -.095)	1.3/8	8	(.165)	24.7	(.972)	29.0	(1.142)	BP1099/3	BP1099/5			
1.1/4	14&15	(.083 &.072)	1.3/8	9	(.148)	25.7	(1.011)	30.0	(1.181)	BP1103/3	BP1103/5			
1.1/4	16	(.065)	1.3/8	10	(.134)	27.8	(1.094)	33.0	(1.299)	BP1111/3	BP1111/5			
1.1/2	10-12	(.134 -.109)	1.3/8	15&16	(.072 &.065)	30.7	(1.208)	35.0	(1.378)	BP1118/3	BP1118/5			
1.1/2	13-16	(.095 -.065)	1.3/4	6&7	(.203 &.180)	32.7	(1.287)	38.0	(1.496)	BP1126/3	BP1126/5			
2	3	(.259)	1.3/4	8&9	(.165 &.148)	34.7	(1.366)	40.0	(1.575)	BP1134/3	BP1134/5	BP1134/7	BP1134/9	BP1134/11
2	4&5	(.238 &.220)	1.3/4	10-12	(.134 -.109)	36.7	(1.444)	42.5	(1.673)	BP1142/3	BP1142/5	BP1142/7	BP1142/9	BP1142/11
2	6	(.203)	1.3/4	13-16	(.095 -.065)	38.7	(1.523)	44.5	(1.752)	BP1150/3	BP1150/5	BP1150/7	BP1150/9	BP1150/11
2	7-9	(.180 -.148)	2.1/4	3	(.259)	40.7	(1.602)	47.0	(1.850)	BP1158/3	BP1158/5	BP1158/7	BP1158/9	BP1158/11
2	10-12	(.134 -.109)	2.1/4	4	(.238)	42.7	(1.681)	49.0	(1.929)	BP1166/3	BP1166/5	BP1166/7	BP1166/9	BP1166/11
2	13-15	(.095 -.072)	2.1/4	5&6	(.220 &.203)	44.7	(1.760)	51.5	(2.027)	BP1174/3	BP1174/5	BP1174/7	BP1174/9	BP1174/11
2	16	(.065)	2.1/4	7-9	(.180 -.148)	46.7	(1.838)	54.0	(2.126)	BP1181/3	BP1181/5	BP1181/7	BP1181/9	BP1181/11
2.1/2	4&5	(.238 &.220)	2.1/4	10-13	(.134 -.095)	48.7	(1.917)	56.0	(2.205)	BP1189/3	BP1189/5	BP1189/7	BP1189/9	BP1189/11
2.1/2	6	(.203)	2.1/4	14-16	(.083 -.065)	50.7	(1.996)	60.0	(2.362)	BP1197/3	BP1197/5	BP1197/7	BP1197/9	BP1197/11
2.1/2	7-10	(.180 -.134)	2.3/4	2&3	(.284 &.259)	52.7	(2.074)	62.0	(2.441)	BP1205/3	BP1205/5	BP1205/7	BP1205/9	BP1205/11
2.1/2	11-13	(.120 -.095)	2.3/4	4&5	(.238 &.220)	54.7	(2.153)	64.0	(2.520)	BP1213/3	BP1213/5	BP1213/7	BP1213/9	BP1213/11
2.1/2	14-16	(.083 -.065)	2.3/4	6-8	(.203 -.165)	56.7	(2.232)	66.0	(2.598)	BP1221/3	BP1221/5	BP1221/7	BP1221/9	BP1221/11

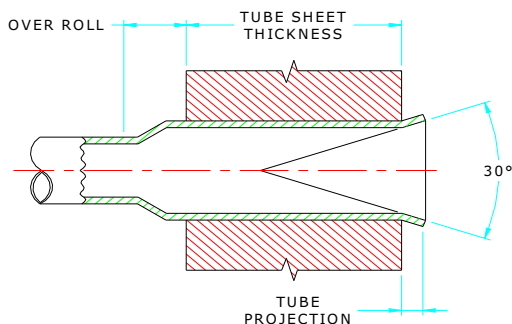
# BOILER TUBE EXPANDER



TUBE TOOLS

## 'B-1000' SERIES WITH COLLAR

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER



SPARE ROLLERS SET MODEL NUMBER					SPARE MANDREL MODEL NUMBER		
TUBE SHEET THICKNESS RANGE					MANDREL SIZE inch	DRUM TYPE	SHORT SERIES MANDRELS
1/2" TO 3/4"	7/8" TO 1. 1/4"	1. 3/8" TO 1. 3/4"	1. 7/8" TO 2. 1/4"	2. 3/8" TO 2. 3/4"			
3	5	7	9	11	<<< Tube Sheet Thickness Codes		
B079-3-FS B083-3-FS B087-3-FS	B079-5-FS B083-5-FS B087-5-FS				1/2 1/2 1/2	B83-MP B83-MP B91-MP	
B095-3-FS B095-3-FS B099-3-FS	B095-5-FS B095-5-FS B099-5-FS				1/2 1/2 1/2	B91-MP B99-MP B99-MP	
B103-3-FS B111-3-FS B118-3-FS	B103-5-FS B111-5-FS B118-5-FS				1/2 3/4 3/4	B99-MP B118-MP B118-MP	BMPS-1,2,3 BMPS-1,2,3
B126-3-FS B126-3-FS B142-3-FS	B126-5-FS B126-5-FS B142-5-FS	B126-7-FS B142-7-FS	B126-9-FS B142-9-FS	B126-11-FS B142-11-FS	3/4 3/4 3/4	B126-MP B134-MP B150-MP	BMPS-2,3,4 BMPS-3,4,5 BMPS-3,4,5,6
B150-3-FS B158-3-FS B166-3-FS	B150-5-FS B158-5-FS B166-5-FS	B150-7-FS B158-7-FS B166-7-FS	B150-9-FS B158-9-FS B166-9-FS	B150-11-FS B158-11-FS B166-11-FS	3/4 3/4 3/4	B150-MP B174-MP B174-MP	BMPS-3,4,5,6 BMPS-4,5,6,7,8 BMPS-4,5,6,7,8
B174-3-FS B181-3-FS B174-3-FS	B174-5-FS B181-5-FS B174-5-FS	B174-7-FS B181-7-FS B174-7-FS	B174-9-FS B181-9-FS B174-9-FS	B174-11-FS B181-11-FS B174-11-FS	3/4 1 1	B174-MP B197-MP B197-MP	BMPS-4,5,6,7,8 BMPS-7,8,9,10,11 BMPS-7,8,9,10,11
B205-3-FS B205-3-FS	B205-5-FS B205-5-FS	B205-7-FS B205-7-FS	B205-9-FS B205-9-FS	B205-11-FS B205-11-FS	1 1	B197-MP B221-MP	BMPS-6,7,8,9,10,11 BMPS-7,8,9,10,11,12
B213-3-FS B221-3-FS	B213-5-FS B221-5-FS	B213-7-FS B221-7-FS	B213-9-FS B221-9-FS	B213-11-FS B221-11-FS	1 1	B221-MP B221-MP	BMPS-7,8,9,10,11,12 BMPS-7,8,9,10,11,12

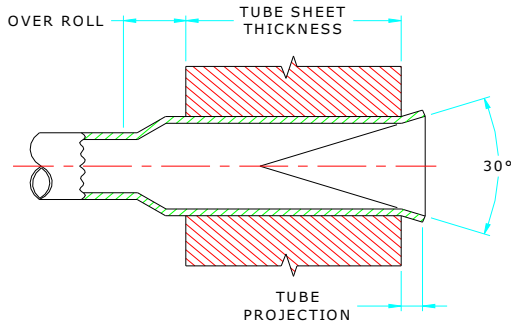
# BOILER TUBE EXPANDER



TUBE TOOLS

## 'B-1000 SERIES WITH COLLAR

## ROLLER TUBE EXPANDER WITH THRUST BEARING



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOLS		TUBE EXPANDER MODEL NUMBER				
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch	Mm	Inch	Mm	Inch	TUBE SHEET THICKNESS RANGE				
										1/2" TO 3/4"	7/8" TO 1. 1/4"	1.3/8" TO 1.3/4"	1. 7/8" TO 2. 1/4"	2. 3/8" TO 2. 3/4"
Tube Sheet Thickness Codes >>>										3	5	7	9	11
3	2	(.284)	2.3/4	7-9	(.180 -.148)	58.7	(2.311)	68.0	(2.677)	BP1229/3	BP1229/5	BP1229/7	BP1229/9	BP1229/11
3	3&4	(.259 &.238)	2.3/4	10-12	(.134 -.109)	60.7	(2.389)	70.0	(2.756)	BP1237/3	BP1237/5	BP1237/7	BP1237/9	BP1237/11
3	5&6	(.220 &.203)	2.3/4	13-16	(.095 -.065)	62.7	(2.468)	72.0	(2.835)	BP1244/3	BP1244/5	BP1244/7	BP1244/9	BP1244/11
3	7&8	(.180 &.165)	3.1/4	3	(.259)	64.7	(2.547)	74.0	(2.913)	BP1252/3	BP1252/5	BP1252/7	BP1252/9	BP1252/11
3	10-12	(.134 -.109)	3.1/4	4	(.259)	66.7	(2.625)	76.0	(2.992)	BP1260/3	BP1260/5	BP1260/7	BP1260/9	BP1260/11
3	13&14	(.095 &.083)	3.1/4			68.7	(2.704)	78.0	(3.071)	BP1268/3	BP1268/5	BP1268/7	BP1268/9	BP1268/11
3	15&16	(.072 &.065)	3.1/4	5&6	(.220 &.203)	70.7	(2.783)	80.0	(3.150)	BP1276/3	BP1276/5	BP1276/7	BP1276/9	BP1276/11
3.1/2	2&3	(.284 &.259)	3.1/4	7-11	(.180 -.120)	72.7	(2.862)	82.0	(3.228)	BP1284/3	BP1284/5	BP1284/7	BP1284/9	BP1284/11
3.1/2	4-6	(.259 -.203)	3.1/4	12-14	(.109 -.480)	74.7	(2.940)	84.0	(3.307)	BP1292/3	BP1292/5	BP1292/7	BP1292/9	BP1292/11
3.1/2	7-9	(.180 -.148)	3.1/4	15&16	(.072 &.065)	76.7	(3.019)	86.0	(3.386)	BP1300/3	BP1300/5	BP1300/7	BP1300/9	BP1300/11
3.1/2	10-12	(.134 -.109)	3.3/4	2&3	(.284 &.259)	78.7	(3.098)	88.0	(3.465)	BP1308/3	BP1308/5	BP1308/7	BP1308/9	BP1308/11
3.1/2	13-15	(.095 -.072)	3.3/4	4-6	(.259 -.203)	80.7	(3.177)	92.0	(3.622)	BP1315/3	BP1315/5	BP1315/7	BP1315/9	BP1315/11
3.1/2	16	(.065)	3.3/4	7&8	(.180 &.165)	82.7	(3.255)	94.0	(3.701)	BP1323/3	BP1323/5	BP1323/7	BP1323/9	BP1323/11
4	3	(.259)	3.3/4	9-12	(.148 -.109)	84.7	(3.334)	96.0	(3.780)	BP1331/3	BP1331/5	BP1331/7	BP1331/9	BP1331/11
4	4-6	(.259 -.203)	3.3/4	13-16	(.095 -.065)	86.7	(3.413)	98.0	(3.858)	BP1339/3	BP1339/5	BP1339/7	BP1339/9	BP1339/11
4	7&8	(.180 &.165)	4.1/4	2	(.284)	88.7	(3.492)	100.0	(3.937)	BP1347/3	BP1347/5	BP1347/7	BP1347/9	BP1347/11
4	9-12	(.148 -.109)	4.1/4	3	(.259)	90.7	(3.570)	102.0	(4.016)	BP1355/3	BP1355/5	BP1355/7	BP1355/9	BP1355/11
4	13-15	(.095 -.072)	4.1/4	4	(.259)	92.7	(3.649)	104.0	(4.094)	BP1363/3	BP1363/5	BP1363/7	BP1363/9	BP1363/11
4	16	(.065)	4.1/4	7&8	(.180 &.165)	94.7	(3.728)	106.0	(4.173)	BP1370/3	BP1370/5	BP1370/7	BP1370/9	BP1370/11
4.1/2	3	(.259)	4.1/4	9-11	(.148 -.120)	96.7	(3.807)	108.0	(4.252)	BP1378/3	BP1378/5	BP1378/7	BP1378/9	BP1378/11
4.1/2	4-6	(.259 -.203)	4.1/4	12-16	(.109 -.065)	98.7	(3.885)	110.0	(4.331)	BP1386/3	BP1386/5	BP1386/7	BP1386/9	BP1386/11
4.1/2	7-14	(.180 -.083)	4.1/4			100.7	(3.964)	111.0	(4.407)	BP1394/3	BP1394/5	BP1394/7	BP1394/9	BP1394/11

1" - 4.1/2" Tube O. D.

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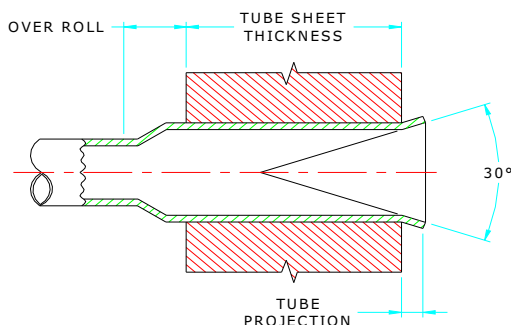
# BOILER TUBE EXPANDER



TUBE TOOLS

## 'B-1000' SERIES WITH COLLAR

### 3 PLAIN & 3 FLARE ROLLER TUBE EXPANDER



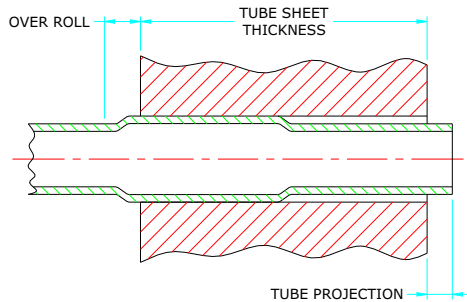
SPARE ROLLERS SET MODEL NUMBER TUBE SHEET THICKNESS RANGE					SPARE MANDREL MODEL NUMBER		
1/2" TO 3/4"	7/8" TO 1. 1/4"	1. 3/8" TO 1. 3/4"	1. 7/8" TO 2. 1/4"	2. 3/8" TO 2. 3/4"	MANDREL SIZE inch	DRUM TYPE	SHORT SERIES MANDRELS
3	5	7	9	11	<<< Tube Sheet Thickness Codes		
B221-3-FS B237-3-FS B252-3-FS	B221-5-FS B237-5-FS B252-5-FS	B221-7-FS B237-7-FS B252-7-FS	B221-9-FS B237-9-FS B252-9-FS	B221-11-FS B237-11-FS B252-11-FS	1 1 1	B244-MP B244-MP B244-MP	BMPS-8,9,10,11,12,13 BMPS-8,9,10,11,12,13 BMPS-8,9,10,11,12,13
B252-3-FS B260-3-FS B268-3-FS	B252-5-FS B260-5-FS B268-5-FS	B252-7-FS B260-7-FS B268-7-FS	B252-9-FS B260-9-FS B268-9-FS	B252-11-FS B260-11-FS B268-11-FS	1 1 1	B268-MP B268-MP B268-MP	BMPS-10,11,12,13,14 BMPS-10,11,12,13,14 BMPS-10,11,12,13,14
B276-3-FS B284-3-FS B292-3-FS	B276-5-FS B284-5-FS B292-5-FS	B276-7-FS B284-7-FS B292-7-FS	B276-9-FS B284-9-FS B292-9-FS	B276-11-FS B284-11-FS B292-11-FS	1 1 1	B300-MP B300-MP B300-MP	BMPS-12,13,14,15,16 BMPS-12,13,14,15,16 BMPS-12,13,14,15,16
B315-3-FS B284-3-FS B315-3-FS	B315-5-FS B284-5-FS B315-5-FS	B315-7-FS B284-7-FS B315-7-FS	B315-9-FS B284-9-FS B315-9-FS	B315-11-FS B284-11-FS B315-11-FS	1 1 1	B300-MP B347-MP B347-MP	BMPS-12,13,14,15,16 BMPS-15,16,17,18,19 BMPS-14,15,16,17,18,19
B323-3-FS B331-3-FS B355-3-FS	B323-5-FS B331-5-FS B355-5-FS	B323-7-FS B331-7-FS B355-7-FS	B323-9-FS B331-9-FS B355-9-FS	B323-11-FS B331-11-FS B355-11-FS	1 1 1	B347-MP B347-MP B347-MP	BMPS-14,15,16,17,18,19 BMPS-14,15,16,17,18,19 BMPS-14,15,16,17,18,19
B363-3-FS B355-3-FS B363-3-FS	B363-5-FS B355-5-FS B363-5-FS	B363-7-FS B355-7-FS B363-7-FS	B363-9-FS B355-9-FS B363-9-FS	B363-11-FS B355-11-FS B363-11-FS	1 1 1	B347-MP B394-MP B394-MP	BMPS-14,15,16,17,18,19 BMPS-17,18,19,20,21 BMPS-17,18,19,20,21
B370-3-FS B378-3-FS	B370-5-FS B378-5-FS	B370-7-FS B378-7-FS	B370-9-FS B378-9-FS	B370-11-FS B378-11-FS	1 1	B394-MP B394-MP	BMPS-17,18,19,20,21 BMPS-17,18,19,20,21
B386-3-FS B394-3-FS	B386-5-FS B394-5-FS	B386-7-FS B394-7-FS	B386-9-FS B394-9-FS	B386-11-FS B394-11-FS	1 1	B394-MP B394-MP	BMPS-17,18,19,20,21 BMPS-17,18,19,20,21

## 'B-1000 SERIES WITH COLLAR

### 3 PLAIN ROLLER TUBE EXPANDER WITH THRUST BEARING

#### FEATURES

- Expander can be accurately positioned in the boiler tube in relation to the drum for consistent expansions.
- Mandrels are interchangeable with B-2000 series.
- Use- For boilers tube sheets and drums thicker than 2.3/4" (70mm). Normally used in conjunction with B-1000, B-2000 series.



TUBE SIZE			TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS		MAX. EXPANSION OF TOOLS		TUBE EXPANDER MODEL NUMBER	
O.D. inch	THK. GA.	THK. inch	O.D. inch	THK. GA.	THK. inch	Mm	Inch	Mm	Inch	1/2" TO 4. 3/8"	1. 1/2" TO 5. 3/8"
Tube Sheet Thickness Codes >>>										7	11
1.1/4	16	(.065)	1.3/8	10	(.134)	27.8	(1.055)	33.0	(1.299)	BP3111/7	
1.1/2	10-12	(.134 -.109)	1.3/8	13-16	(.095 -.065)	30.7	(1.169)	35.0	(1.378)	BP3118/7	
1.1/2	13-16	(.095 -.065)	1.3/4	5-7	(.220 -.180)	32.7	(1.248)	38.0	(1.496)	BP3126/7	
2	3	(.259)	1.3/4	8&9	(.165 &.148)	34.7	(1.326)	40.0	(1.575)	BP3134/7	BP3134/11
2	4&5	(.238 &.220)	1.3/4	10-12	(.134 -.109)	36.7	(1.405)	42.5	(1.673)	BP3142/7	BP3142/11
2	6	(.203)	1.3/4	13-16	(.095 -.065)	38.7	(1.484)	44.5	(1.752)	BP3150/7	BP3150/11
2	7-9	(.180 -.148)	2.1/4	3	(.259)	40.7	(1.562)	47.0	(1.850)	BP3158/7	BP3158/11
2	10-12	(.134 -.109)	2.1/4	4&5	(.238 &.220)	42.7	(1.641)	49.0	(1.929)	BP3166/7	BP3166/11
2	13-15	(.095 -.072)	2.1/4	6&7	(.203 &.180)	44.7	(1.720)	51.5	(2.027)	BP3174/7	BP3174/11
2	16	(.065)	2.1/4	8&9	(.165 &.148)	46.7	(1.799)	54.0	(2.126)	BP3181/7	BP3181/11
2.1/2	4&5	(.238 &.220)	2.1/4	10-13	(.134 -.095)	48.7	(1.877)	56.0	(2.205)	BP3189/7	BP3189/11
2.1/2	6	(.203)	2.1/4	14-16	(.083 -.065)	50.7	(1.956)	60.0	(2.362)	BP3197/7	BP3197/11
2.1/2	7-10	(.180 -.134)	2.3/4	3	(.259)	52.7	(2.035)	62.0	(2.441)	BP3205/7	BP3205/11
2.1/2	11-13	(.120 -.095)	2.3/4	4&5	(.238 &.220)	54.7	(2.114)	64.0	(2.520)	BP3213/7	BP3213/11
2.1/2	14-16	(.083 -.065)	2.3/4	6	(.203)	56.7	(2.192)	66.0	(2.598)	BP3221/7	BP3221/11
3	2&3	(.284 &.259)	2.3/4	7-9	(.203 -.148)	58.7	(2.271)	68.0	(2.677)	BP3229/7	BP3229/11
3	4	(.238)	2.3/4	10-12	(.134 -.109)	60.7	(2.350)	70.0	(2.756)	BP3237/7	BP3237/11
3	5&6	(.220 &.203)	2.3/4	13-16	(.095 -.065)	62.7	(2.429)	72.0	(2.835)	BP3244/7	BP3244/11
3	7-9	(.180 -.148)	3.1/4	2&3	(.284 &.259)	64.7	(2.507)	74.0	(2.913)	BP3252/7	BP3252/11
3	10-12	(.134 -.109)	3.1/4	4	(.238)	66.7	(2.586)	76.0	(2.992)	BP3260/7	BP3260/11
3	13-14	(.095 -.083)	3.1/4	5	(.220)	68.7	(2.665)	78.0	(3.071)	BP3268/7	BP3268/11
3	15&16	(.072 &.065)	3.1/4	6	(.203)	70.7	(2.744)	80.0	(3.150)	BP3276/7	BP3276/11
3.1/2	3&4	(.284 &.238)	3.1/4	7-11	(.203 -.120)	72.7	(2.822)	82.0	(3.228)	BP3284/7	BP3284/11
3.1/2	5&6	(.220 &.203)	3.1/4	12-14	(.109 -.083)	74.7	(2.901)	84.0	(3.307)	BP3292/7	BP3292/11
3.1/2	7-9	(.180 -.148)	3.1/8	15&16	(.072 &.065)	76.7	(2.980)	86.0	(3.386)	BP3300/7	BP3300/11
3.1/2	10-12	(.134 -.109)	3.3/4	3&4	(.284 &.238)	78.7	(3.059)	88.0	(3.465)	BP3308/7	BP3308/11
3.1/2	13-15	(.095 -.072)	3.3/4	5&6	(.220 &.203)	80.7	(3.137)	92.0	(3.622)	BP3315/7	BP3315/11
3.1/2	16	(.065)	3.3/4	7&8	(.203 &.165)	82.7	(3.216)	94.0	(3.701)	BP3323/7	BP3323/11
4	3&4	(.284 &.238)	3.3/4	9-12	(.148 -.109)	84.7	(3.295)	96.0	(3.780)	BP3331/7	BP3331/11
4	5&6	(.220 &.203)	3.3/4	13-16	(.095 -.065)	86.7	(3.374)	98.0	(3.858)	BP3339/7	BP3339/11
4	7&8	(.180 &.165)	4.1/4	2	(.284)	88.7	(3.452)	100.0	(3.937)	BP3347/7	BP3347/11
4	9-12	(.148 -.109)	4.1/4	3&4	(.284 &.238)	90.7	(3.531)	102.0	(4.016)	BP3355/7	BP3355/11
4	13-15	(.095 -.072)	4.1/4	5&6	(.220 &.203)	92.7	(3.610)	104.0	(4.094)	BP3363/7	BP3363/11
4	16	(.065)	4.1/4	7&8	(.203 &.165)	94.7	(3.688)	106.0	(4.173)	BP3370/7	BP3370/11
4.1/2	3	(.284)	4.1/4	9-11	(.148 -.120)	96.7	(3.767)	108.0	(4.252)	BP3378/7	BP3378/11
4.1/2	4-6	(.238 -.203)	4.1/4	12-16	(.109 -.065)	98.7	(3.846)	110.0	(4.331)	BP3386/7	BP3386/11
4.1/2	7-14	(.180 -.083)	4.1/4			100.7	(3.925)	111.0	(4.407)	BP3394/7	BP3394/11

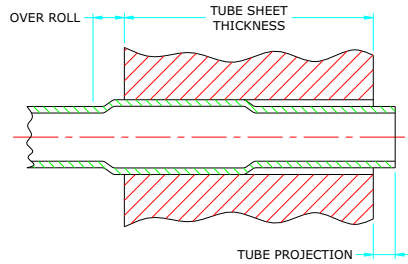
# BOILER TUBE EXPANDER



TUBE TOOLS

## 'B-3000' SERIES WITH COLLAR

## 3 PLAIN TUBE EXPANDER WITH TRUST BEARING



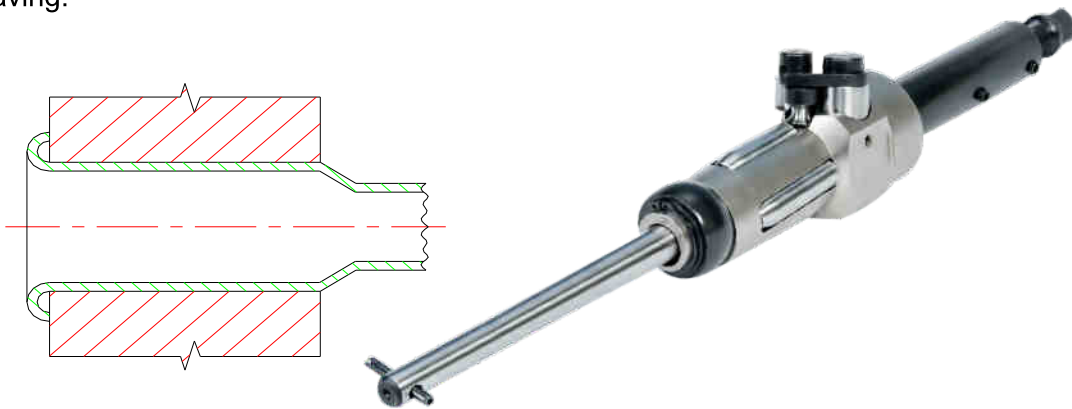
SPARE ROLLERS SET MODEL NUMBER		SPARE MANDREL MODEL NUMBER		
TUBE SHEET THICKNESS RANGE		MANDREL SIZE inch	DRUM TYPE	SHORT SERIES MANDRELS
1/2" TO 4. 3/8"	1. 1/2" TO 5. 3/8"			
7	11	<<< Tube Sheet Thickness Codes		
B111-7-RS B118-7-RS B126-7-RS		3/4 3/4 3/4	B118-M B118-M B126-M	BMS-1,2,3 BMS-1,2,3 BMS-2,3,4
B126-7-RS B142-7-RS B150-7-RS	B126-11-RS B142-11-RS B150-11-RS	3/4 3/4 3/4	B134-M B150-M B150-M	BMS-3,4,5 BMS-3,4,5,6 BMS-3,4,5,6
B158-7-RS B166-7-RS B174-7-RS	B158-11-RS B166-11-RS B174-11-RS	3/4 3/4 3/4	B174-M B174-M B174-M	BMS-4,5,6,7,8 BMS-4,5,6,7,8 BMS-4,5,6,7,8
B181-7-RS B174-7-RS B205-7-RS	B181-11-RS B174-11-RS B205-11-RS	1 1 1	B197-M B197-M B197-M	BMS-7,8,9,10,11,12 BMS-7,8,9,10,11,12 BMS-6,7,8,9,10,11,12
B205-7-RS B213-7-RS B221-7-RS	B205-11-RS B213-11-RS B221-11-RS	1 1 1	B221-M B221-M B221-M	BMS-7,8,9,10,11,12 BMS-7,8,9,10,11,12 BMS-7,8,9,10,11,12
B221-7-RS B237-7-RS B252-7-RS	B221-11-RS B237-11-RS B252-11-RS	1 1 1	B244-M B244-M B244-M	BMS-8,9,10,11,12,13 BMS-8,9,10,11,12,13 BMS-8,9,10,11,12,13
B252-7-RS B260-7-RS B268-7-RS	B252-11-RS B260-11-RS B268-11-RS	1 1 1	B268-M B268-M B268-M	BMS-10,11,12,13,14 BMS-10,11,12,13,14 BMS-10,11,12,13,14
B276-7-RS B284-7-RS B292-7-RS	B276-11-RS B284-11-RS B292-11-RS	1 1 1	B300-M 3B00-M B300-M	BMS-12,13,14,15,16 BMS-12,13,14,15,16 BMS-12,13,14,15,16
B315-7-RS B284-7-RS B315-7-RS	B315-11-RS B284-11-RS B315-11-RS	1 1 1	B300-M B347-M B347-M	BMS-12,13,14,15,16 BMS-15,16,17,18,19 BMS-14,15,16,17,18,19
B323-7-RS B331-7-RS B355-7-RS	B323-11-RS B331-11-RS B355-11-RS	1 1 1	B347-M B347-M B347-M	BMS-14,15,16,17,18,19 BMS-14,15,16,17,18,19 BMS-14,15,16,17,18,19
B363-7-RS B355-7-RS B363-7-RS	B363-11-RS B355-11-RS B363-11-RS	1 1 1	B347-M B394-M B394-M	BMS-14,15,16,17,18,19 BMS-17,18,19,20,21 BMS-17,18,19,20,21
B370-7-RS B378-7-RS	B370-11-RS B378-11-RS	1 1	B394-M B394-M	BMS-17,18,19,20,21 BMS-17,18,19,20,21
B386-7-RS B394-7-RS	B386-11-RS B394-11-RS	1 1	B394-M B394-M	BMS-17,18,19,20,21 BMS-17,18,19,20,21

## COMBINATION BEADING EXPANDER

### TUBE EXPANDING AND BEADING IN SINGLE OPERATION

#### FEATURES

- Expansion & beading takes place in single operation.
- Air hammering not required. Therefore operator fatiguereduces.
- Time saving.



	PREVIOUSLY	NOW
Tools Required	1 ] Flaring tube expander 2 ] Tube expander drive 3 ] Beading tool 4 ] Air hammer	1 ] COMBINATION BEADING EXPANDER 2 ] Tube expander drive
Operating Steps	1 ] Expand 2 ] Bead 3 ] Reroll	1 ] Expand and Bead [ single operation ]
Operator Fatigue	high... due largely to air hammer vibration and noise	minimal .... no air hammer for beading .... no re-rolling
Manhours		Reduced by 20%

TUBE SIZE			EXPANSION RANGE		MODEL NO.	MANDREL NO.	SPARE ROLLER SET	BEADING ROLL	GUIDE ROLL ASSEMBLY
O.D. Inch	THK. GA	THK. inch	mm	inch					
2	09	(.148)	42.0 - 47.50	(1.65 - 1.865)	B41633-0009	B41615	B41670	B41631-0009	B41701-0009
	10	(.134)	43.2 - 48.41	(1.70 - 1.906)	B41633-0010	B41615 (3/4")	B41670 Set of 4	B41631-0010	B41701-0010 B41701-0011 B41701-0012 B41701-0013
	11	(.120)			B41633-0011			B41631-0011	
	12	(.109)			B41633-0012			B41631-0012	
13	(.095)	B41633-0013			B41631-0013				
2.1/2	09	(.148)	54.5 - 62.00	(2.15 - 2.430)	B41634-0009	B41635	B41673	B41651-0009	B41702-0009
	10	(.134)	55.9 - 62.48	(2.20 - 2.460)	B41634-0010	B41635 (1")	B41673 Set of 5	B41651-0010	B41702-0010 B41702-0011 B41702-0012 B41702-0013
	11	(.120)			B41634-0011			B41651-0011	
	12	(.109)			B41634-0012			B41651-0012	
13	(.095)	B41634-0013			B41651-0013				
3	09	(.148)	67.5 - 75.0	(2.650 - 2.900)	B41359-0009	B41653	B41676	B41666-0009	B41703-0009
	10	(.134)	68.6 - 75.69	(2.700 - 2.980)	B41359-0010	B41653 (1")	B41676 Set of 5	B41666-0010	B41703-0010 B41703-0011 B41703-0012
	11	(.120)			B41359-0011			B41666-0011	
12	(.109)	B41359-0012			B41666-0012				

# BOILER TUBE EXPANDER

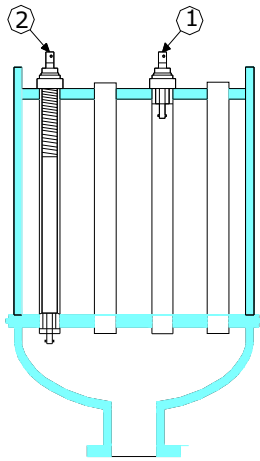


TUBE TOOLS

## 'BSB' PARALLEL TYPE 5 PLAIN ROLLER

### FEATURES

- '5-Roll' Design is used primarily for rolling thin walled tubes used in sugar mill pan, juice heaters etc.
- '5-Roll' gives a more concentric, uniform expansion vs a 3 roll expander in thin tubes & reduces spring back action.
- Time tested, durable design.
- Use - For TOP plate tube expansion in pan, juice heaters in sugar mills.



①



TUBE SIZE			MIN. I.D. TUBE ENTERS	MAX. EXPANSION OF TOOL	TUBE SHEET THICKNESS mm (inch)			SPARE MANDREL MODEL NUMBER	SQ. DRIVE inch	SPARE ROLLERS SET NUMBER		
O.D. inch	THK. GA.	THK. inch			31.75 (1.25)	38.1 (1.5)	50.8 (2.0)			TUBE EXPANDER MODEL	SPARE ROLLERS SET NUMBER	
1. 1/2	11 & 12	(.120 & .109)	31.0 (1.141)	33.2 (1.256)	BSB-00A	BSB-00B	BSB-00C	BSBM-1	1/2	BSBR-1A	BSBR-1B	BSBR-1C
1. 1/2	13 & 14	(.095 & .083)	32.5 (1.279)	36.0 (1.417)	BSB-0A	BSB-0B	BSB-0C	BSBM-2	1/2	BSBR-2A	BSBR-2B	BSBR-2C
1. 1/2	15 & 16	(.072 & .065)	33.5 (1.319)	37.2 (1.465)	BSB-1A	BSB-1B	BSB-1C	BSBM-2	1/2	BSBR-3A	BSBR-3B	BSBR-3C
1. 3/4	9 & 10	(.148 & .134)	35.2 (1.386)	39.1 (1.539)	BSB-2A	BSB-2B	BSB-2C	BSBM-3	3/4	BSBR-3A	BSBR-3B	BSBR-3C
1. 3/4	11 & 12	(.120 & .109)	36.5 (1.437)	40.5 (1.594)	BSB-3A	BSB-3B	BSB-3C	BSBM-3	3/4	BSBR-4A	BSBR-4B	BSBR-4C
1. 3/4	13 & 14	(.095 & .083)	38.1 (1.500)	42.7 (1.681)	BSB-4A	BSB-4B	BSB-4C	BSBM-3	3/4	BSBR-5A	BSBR-5B	BSBR-5C
1. 3/4	15 & 16	(.072 & .065)	39.1 (1.539)	44.2 (1.740)	BSB-5A	BSB-5B	BSB-5C	BSBM-4	3/4	BSBR-4A	BSBR-4B	BSBR-4C
2	7 & 8	(.180 & .165)	41.3 (1.626)	46.7 (1.838)	BSB-6A	BSB-6B	BSB-6C	BSBM-4	3/4	BSBR-5A	BSBR-5B	BSBR-5C
2	9 & 10	(.148 & .134)	42.8 (1.685)	48.3 (1.901)	BSB-7A	BSB-7B	BSB-7C	BSBM-4	3/4	BSBR-6A	BSBR-6B	BSBR-6C
2	11 - 13	(.120 - .095)	44.4 (1.748)	49.7 (1.957)	BSB-8A	BSB-8B	BSB-8C	BSBM-5	3/4	BSBR-6A	BSBR-6B	BSBR-6C
2	14 - 16	(.083 - .065)	46.0 (1.811)	52.2 (2.055)	BSB-9A	BSB-9B	BSB-9C	BSBM-5	3/4	BSBR-7A	BSBR-7B	BSBR-7C
2. 1/4	9 & 10	(.148 & .134)	47.6 (1.874)	53.8 (2.118)	BSB-10A	BSB-10B	BSB-10C	BSBM-5	3/4	BSBR-8A	BSBR-8B	BSBR-8C
2. 1/4	11 - 13	(.120 - .095)	49.2 (1.937)	55.4 (2.181)	BSB-11A	BSB-11B	BSB-11C	BSBM-5	3/4	BSBR-9A	BSBR-9B	BSBR-9C
2. 1/4	14 - 16	(.083 - .065)	50.7 (1.996)	57.8 (2.275)	BSB-12A	BSB-12B	BSB-12C	BSBM-6	3/4	BSBR-8A	BSBR-8B	BSBR-8C
2. 1/2	9 & 10	(.148 & .134)	54.9 (2.161)	61.0 (2.401)	BSB-13A	BSB-13B	BSB-13C	BSBM-6	3/4	BSBR-10A	BSBR-10B	BSBR-10C
2. 1/2	14 - 16	(.083 - .065)	57.1 (2.248)	65.6 (2.582)	BSB-14A	BSB-14B	BSB-14C	BSBM-7	1	BSBR-11A	BSBR-11B	BSBR-11C
2. 3/4	10 - 14	(.134 - .083)	60.3 (2.374)	68.8 (2.708)	BSB-15A	BSB-15B	BSB-15C	BSBM-7	1	BSBR-12A	BSBR-12B	BSBR-12C
3	7 - 9	(.180 - .148)	63.5 (2.500)	72.0 (2.835)	BSB-16A	BSB-16B	BSB-16C	BSBM-7	1	BSBR-13A	BSBR-13B	BSBR-13C
3	10 - 14	(.134 - .083)	66.5 (2.618)	75.0 (2.953)	BSB-17A	BSB-17B	BSB-17C	BSBM-7	1	BSBR-14A	BSBR-14B	BSBR-14C
3. 1/4	7 & 8	(.180 & .165)	69.8 (2.748)	78.5 (3.090)	BSB-18A	BSB-18B	BSB-18C	BSBM-8	1	BSBR-14A	BSBR-14B	BSBR-14C
3. 1/2	4 & 5	(.238 & .220)	73.0 (2.874)	81.7 (3.216)	BSB-19A	BSB-19B	BSB-19C	BSBM-8	1	BSBR-15A	BSBR-15B	BSBR-15C
3. 1/2	6 - 8	(.203 - .165)	76.1 (2.996)	85.8 (3.378)	BSB-20A	BSB-20B	BSB-20C	BSBM-9	1	BSBR-16A	BSBR-16B	BSBR-16C
3. 3/4	4 & 5	(.238 & .220)	79.3 (3.122)	89.0 (3.504)	BSB-21A	BSB-21B	BSB-21C	BSBM-9	1	BSBR-17A	BSBR-17B	BSBR-17C
3. 3/4	6 - 8	(.203 - .165)	82.5 (3.248)	92.2 (3.629)	BSB-22A	BSB-22B	BSB-22C	BSBM-9	1	BSBR-18A	BSBR-18B	BSBR-18C
4	3 & 4	(.259 & .238)	85.7 (3.374)	96.2 (3.787)	BSB-23A	BSB-23B	BSB-23C	BSBM-10	1	BSBR-18A	BSBR-18B	BSBR-18C
4	10 - 16	(.134 - .065)	90.3 (3.555)	100.8 (3.968)	BSB-24A	BSB-24B	BSB-24C	BSBM-10	1	BSBR-19A	BSBR-19B	BSBR-19C
4. 1/4	6 - 8	(.203 - .165)	94.9 (3.736)	105.2 (4.141)	BSB-25A	BSB-25B	BSB-25C	BSBM-11	1	BSBR-20A	BSBR-20B	BSBR-20C
4. 1/2	4 - 7	(.238 - .180)	89.7 (3.531)	110.9 (4.366)	BSB-26A	BSB-26B	BSB-26C	BSBM-11	1	BSBR-21A	BSBR-21B	BSBR-21C
4. 1/2	8 - 10	(.165 - .134)	104.3 (4.106)	113.1 (4.452)	BSB-27A	BSB-27B	BSB-27C	BSBM-12	1	BSBR-21A	BSBR-21B	BSBR-21C

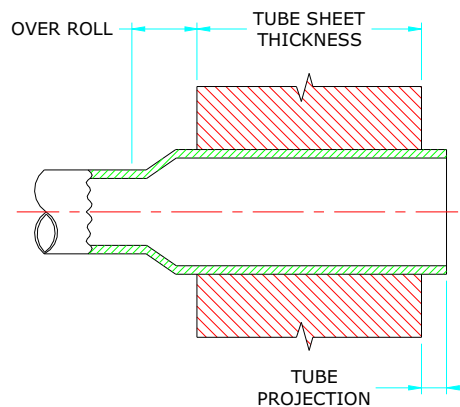


## TYPE 'BV' NON PARALLEL EXPANSION

## TUBE EXPANDING AND BEADING IN SINGLE OPERATION

### FEATURES

- Use- Type "BV" Expander for repair and erection of boiler having thin tube sheets. Its is approximate twice as fast during use than other conventional expanders. Use header Mandrel when expanders is to be used through a watering.



TUBE SIZE			EXPANSION RANGE *		EFFECTIVE ROLLING LENGTH		TUBE EXPANDER (WITH SHORT MANDREL) MODEL NO.	SPARE MANDREL			SPARE ROLLER SET
O.D. Inch	THK. GA	THK. inch	DIM. A mm	DIM. B inch	mm	inch		SHORT MANDREL NO.	HEADER MANDREL NO.	MANDREL SQ.	
1	10 - 13	(.134 - .095)	(17.3 - 23.7)	(.681 - .937)	84.20	(3.5/16)	BV - 1	BVSM - 1	BVHM - 1	1/2	BVR - 1
1.1/4	10 - 13	(.134 - .095)	(23.8 - 30.6)	(.940 - 1.206)	84.20	(3.5/16)	BV - 2	BVSM - 2	BVHM - 2	1/2	BVR - 2
1.1/2	10 - 13	(.134 - .095)	(29.3 - 37.3)	(1.156 - 1.469)	101.20	(4.000)	BV - 3	BVSM - 3	BVHM - 3	1/2	BVR - 3
2	10 - 13	(.134 - .095)	(42.3 - 49.7)	(1.665 - 1.960)	101.20	(4.000)	BV - 4	BVSM - 4	BVHM - 4	3/4	BVR - 4
2.1/2	10 - 13	(.134 - .095)	(54.5 - 62.7)	(2.145 - 2.469)	101.20	(4.000)	BV - 5	BVSM - 5	BVHM - 5	3/4	BVR - 5
3	10 - 13	(.134 - .095)	(68.2 - 76.6)	(2.687 - 3.015)	101.20	(4.000)	BV - 6	BVSM - 6	BVHM - 6	1	BVR - 6

NOTE : Other sizes available on request

# BOILER TUBE EXPANDER



TUBE TOOLS

LONG REACH 'BCSB' SERIES

PARALLEL - 5 PLAIN ROLLERS

## FEATURES

- '5-Roll' Design is used primarily for rolling thin walled tubes used in sugar mill pan, juice heaters etc.
- '5-Roll' gives a more concentric, uniform expansion vs a 3 roll expander in thin tubes & reduces spring back action.
- Time tested, durable design.
- Use - For **BOTTOM** plate tube expansion in pan, juice heaters in sugar mills.



TUBE SIZE			MIN. I.D. TUBE TOOL ENTERS	MAX. EXPANSION OF TOOL		TUBE SHEET THICKNESS 'T'		DEPTH MTRS		MANDREL SQ. Inch	OAL Mtrs	WEIGHT IN KGS	TUBE EXPANDER MODEL NUMBER	SPARE MANDREL MODEL NUMBER	SPARE ROLLERS SET NUMBER	
O.D. inch	THK. GA.	THK. inch		Mm	Inch	Mm	Inch	Min	Max							
<b>CSB-5 (3 ROLLERS)</b>																
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	1.7	2.0	3/4	2.258	10.00	BCSB-5STD	BCSBM-5STD	BCSBR-5
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	2.0	2.3	3/4	2.558	11.24	BCSB-5A	BCSBM-5A	BCSBR-5
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	2.3	2.3	3/4	2.858	12.48	BCSB-5B	BCSBM-5B	BCSBR-5
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	2.6	2.9	3/4	3.158	13.72	BCSB-5C	BCSBM-5C	BCSBR-5
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	2.9	3.2	3/4	3.458	14.96	BCSB-5D	BCSBM-5D	BCSBR-5
1.3/4	15&16	(.072 &.065)	39.8	(1.566)	45.3	(1.783)	32.0	(1.259)	3.2	3.5	3/4	3.758	16.20	BCSB-5E	BCSBM-5E	BCSBR-5
<b>CSB-9 (5 ROLLERS)</b>																
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	1.7	2.0	3/4	2.241	16.2	BCSB-9STD	BCSBM-9STD	BCSBR-9
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	2.0	2.3	3/4	2.541	18.3	BCSB-9A	BCSBM-9A	BCSBR-9
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	2.3	2.3	3/4	2.841	20.4	BCSB-9B	BCSBM-9B	BCSBR-9
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	2.6	2.9	3/4	3.141	22.5	BCSB-9C	BCSBM-9C	BCSBR-9
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	2.9	3.2	3/4	3.441	24.6	BCSB-9D	BCSBM-9D	BCSBR-9
2	14-16	(.083 -065)	46.2	(1.818)	50.8	(2.000)	32.0	(1.259)	3.2	3.5	3/4	3.741	26.7	BCSB-9E	BCSBM-9E	BCSBR-9
<b>CSB-24 (5 ROLLERS)</b>																
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	0.7	1.0	1	1.416	23.7	BCSB-24STD	BCSBM-24STD	BCSBR-24
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	1.0	1.3	1	1.716	29.4	BCSB-24A	BCSBM-24A	BCSBR-24
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	1.3	1.6	1	2.016	35.5	BCSB-24B	BCSBM-24B	BCSBR-24
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	1.6	1.9	1	2.316	40.8	BCSB-24C	BCSBM-24C	BCSBR-24
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	1.9	2.2	1	2.616	46.5	BCSB-24D	BCSBM-24D	BCSBR-24
4	12-18	(.109 -049)	90.5	(3.563)	102.4	(4.031)	32.0	(1.259)	2.2	2.5	1	2.916	52.5	BCSB-24E	BCSBM-24E	BCSBR-24

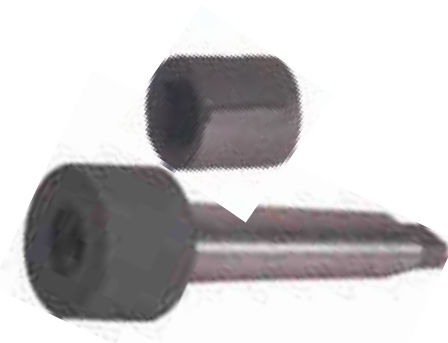
## MANDREL DRIVES

### FEATURES

- Use: Mandrel drives serve the purpose of adapting tube expander mandrels to existing air or electric drills. Loosening the knurled nut, releases the square insert type of socket for the introduction of another size of insert to couple to other size of mandrel square.

#### TAPER SHANK -INTERCHANGEABLE FEMALE SQUARE

MORSE TAPER NO.	SQUARE SIZE	MODEL NO.	SQUARE SIZE	MODEL NO.
2	3/8" 1/2"	BMD/2/95 BMD/2/127	3/8" 1/2"	BMDS/95 BMDS/127
3	3/8" 1/2" 3/4" 1"	BMM/3/95 BMM/3/127 BMM/3/190 BMM/3/254	3/8" 1/2" 3/4" 1"	BMDT/95 BMDT/127 BMDT/190 BMDT/254
4	3/8" 1/2" 3/4" 1"	BMM/4/95 BMM/4/127 BMM/4/190 BMM/4/254	3/8" 1/2" 3/4" 1"	BMDT/95 BMDT/127 BMDT/190 BMDT/254
5	3/8" 1/2" 3/4" 1"	BMM/5/95 BMM/5/127 BMM/5/190 BMM/5/254	3/8" 1/2" 3/4" 1"	BMDT/95 BMDT/127 BMDT/190 BMDT/254



#### TAPER SHANK - MALE SQUARE



MORSE TAPER NO.	SQUARE SIZE	MODEL NO.
1	3/8" 1/2"	BMTM/1/95 BMTM/1/127
2	3/8" 1/2"	BMTM/2/95 BMTM/2/127
3	3/4" 1"	BMTM/3/190 BMTM/3/254
4	3/4" 1"	BMTM/4/190 BMTM/4/254

Taper Shank No.  
Size of square Dimension "A"

#### TAPER SHANK -FE MALE SQUARE



MORSE TAPER NO.	SQUARE SIZE	MODEL NO.
1	3/8" 1/2"	BMTF/1/95 BMTF/1/127
2	3/8" 1/2"	BMTF/1/95 BMTF/1/127
3	3/4" 1"	BMTF/3/190 BMTF/3/254
4	3/4" 1"	BMTF/4/190 BMTF/4/254

#### TAPER SHANK - FEMALE SQUARE



SQUARE SIZE	CHUCK SIZE	MODEL NO.
3/8"	1/4"	BMTC/95/63
3/8"	3/8"	BMTC/95/95
3/8"	1/2"	BMTC/95/127
1/2"	1/2"	BMTC/127/127

#### REVERSIBLE RATCHET WRENCH



SQUARE SIZE	LENGTH	MODEL NO.
3/8"	8"	BHR/95
1/2"	10"	BHR/127
3/4"	20"	BHR/195
1"	24"	BHR/254

**Note:** Ratchets are also available with hexagonal female openings for driving one revolution tube cutters & other items.

## ACCESSORIES

### DRIVE EXTENSION



MALE SQUARE SIZES	MODEL NO.	OAL	DIA.
3/8"	BEB/95/6	6"	1/2"
	BEB/95/9	9"	
	BEB/95/12	12"	
	BEB/95/18	18"	
1/2"	BEB/127/6	6"	5/8"
	BEB/127/9	9"	
	BEB/127/12	12"	
	BEB/127/18	18"	
	BEB/127/24	24"	

MALE SQUARE SIZES	MODEL NO.	OAL	DIA.
3/4"	BEB/195/6	6"	1"
	BEB/195/9	9"	
	BEB/195/12	12"	
	BEB/195/18	18"	
	BEB/195/24	24"	
1"	BEB/254/6	6"	1. 1/4"
	BEB/254/12	12"	
	BEB/254/14	14"	
	BEB/254/18	18"	
	BEB/254/24	24"	

### EXTENSION COUPLING



SQUARE SIZE	MODEL NO.	OAL	DIA.
3/8" x 3/8"	BEC/95/95	1. 7/16"	13/16"
3/8" x 1/2"	BEC/95/127	1. 9/16"	1. 1/16"
3/8" x 5/8"	BEC/95/158	1. 1/2"	1. 1/4"
1/2" x 1/2"	BEC/127/127	1. 11/16"	1. 1/16"
1/2" x 5/8"	BEC/127/158	1. 5/8"	1. 1/4"
1/2" x 3/4"	BEC/127/195	1. 5/8"	1. 3/8"
1/2" x 7/8"	BEC/127/222	1. 5/8"	1. 5/8"
1/2" x 1"	BEC/127/254	1. 5/8"	1.7/8"
5/8" x 3/4"	BEC/158/195	1. 9/16"	1. 3/8"
5/8" x 7/8"	BEC/158/222	2"	1. 5/8"
5/8" x 1"	BEC/158/254	1. 13/16"	1. 7/8"
3/4" x 3/4"	BEC/195/195	1. 5/8"	1. 7/16"
3/4" x 7/8"	BEC/195/222	1. 5/8"	1. 3/4"
3/4" x 1"	BEC/195/254	1. 13/16"	1. 7/8"
7/8" x 7/8"	BEC/222/222	1. 11/16"	1. 3/4"
7/8" x 1"	BEC/222/254	2. 1/8"	2. 1/8"
1" x 1"	BEC/254/254	2. 1/16"	1. 7/8"

## UNIVERSAL JOINT

### UNIVERSAL JOINT FEMALE - FEMALE



SQUARE SIZE	MODEL NO.	OAL	MAJOR DIA.
3/8"	UJ/95	2. 1/4"	7/8"
1/2"	UJ/127	2. 5/8"	1"
3/4"	UJ/195	3"	1. 1/2"
1"	UJ/254	3. 3/4"	1. 3/4"

### UNIVERSAL JOINT MALE - FEMALE



SQUARE SIZE	MODEL NO.	OAL	MAJOR DIA.
3/8"	UC/95	2. 1/4"	7/8"
1/2"	UC/127	2. 19/32"	1"
3/4"	UC/195	3. 9/32"	1. 1/2"
1"	UC/254	4"	1. 3/4"

### DOUBLE UNIVERSAL JOINT FEMALE - FEMALE



SQUARE SIZE	MODEL NO.	OAL	MAJOR DIA.
3/8"	BDUJ/95	3. 15/16"	1. 1/8"
1/2"	BDUJ/127	4"	1. 5/16"
3/4"	BDUJ/195	4. 11/16"	1. 5/8"
1"	BDUJ/254	6. 1/32"	2. 1/4"

### EXTENSION UNIVERSAL JOINT FEMALE - MALE



SQUARE SIZE FEMALE	SQUARE SIZE MALE	MODEL NO.	OAL	MAJOR DIA.
3/8"	3/8"	BUE/95/6 BUE/95/9 BUE/95/12	6" 9" 12"	1. 1/8"
3/8"	1/2"	BUE/95S/9 BUE/95S/12 BUE/95S/16	9" 12" 16"	1. 1/8"
1/2"	1/2"	BUE/127/6 BUE/127/9 BUE/127/12 BUE/127/16 BUE/127/20	6" 9" 12" 16" 20"	1. 5/16"
3/4"	3/4"	BUE/195/9 BUE/195/12 BUE/195/16 BUE/195/20	9" 12" 16" 20"	1. 3/4"
1"	1"	BUE/254/9 BUE/254/12 BUE/254/16	9" 12" 16"	2. 1/4"



# BOILER TUBE EXPANDER



TUBE TOOLS

## GEAR DRIVE

### PARALLEL GEAR TRAIN DRIVE



SQUARE SIZE	NO. OPGS.	MODEL NO.	REPLACEMENT PARTS				DIMENSIONS	
			DOUBLE HUB GEAR		CENTER GEAR		OAL	WIDTH
			MODEL NO.	NOS. REQD	MODEL NO.	NOS. REQD		
3/8"	3	BG/3/95	BGH/3/95	3	BGC/3/95	4	8.1/2"	2"
1/2"	3	BG/3/127	BGH/3/127	3	BGC/3/1273	4	8.1/2"	2"
	4	BG/4/127	BGH/4/127	4	BGC/4/1272	3		
3/4"	3	BG/3/195	BGH/3/195	3	BGC/3/1952	4	9"	2.1/2"
	4	BG/4/195	BGH/4/195	4	BGC/4/1951	3		
1"	4	BG/4/254	BGH/4/254	4	BGC/4/254	3	9	2.1/2"

### RIGHT ANGLE WORM GEAR



MALE SQUARE	FEMALE SQUARE	MODEL NO.	OVL.	GEAR HOUSING			MINIMUM HAND HOLE DIAMETER	GEAR RATIO
				LENGTH	WIDTH	THICK.		
1/2"	1/2"	BRW/127/127	10.3/16"	3.3/16"	2.1/4"	1.3/8"	3.3/8"	4.1/2 to 1
1/2"	3/4"	BRW/127/195	10.3/16"	3.3/16"	2.1/4"	1.3/8"	3.3/8"	4.1/2 to 1
3/4"	3/4"	BRW/195/195	11.9/32"	3.27/32"	2.5/8"	1.7/8"	4"	4.1/2 to 1
3/4"	1"	BRW/195/254	11.9/32"	4.1/4"	3.1/16"	1.7/8"	4.1/2"	4.1/2 to 1

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