



BOILER TUBE EXPANDERS

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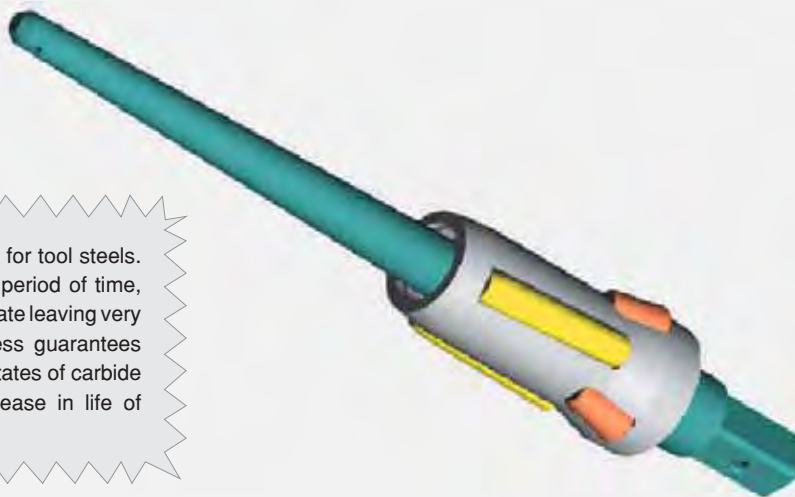


GENERATION II SERIES BOILER TUBE EXPANDERS

Features :

- Several improvements in the design and manufacture of tube expanders have been pioneered by Powermaster.
- The New Generation II series Boiler Tube Expanders will outlast any other manufacturers expanders! Guaranteed! Please contact us for warranty information.
- Powermaster expanders are competitively priced due to high production volumes and will offer you the best value for money by a long margin!
- Powermaster Generation II series Boiler Tube Expanders is the preferred tool of choice at over 3000 companies worldwide!

CRYOGENIC process - the best treatment ever for tool steels. This is a deep chilling treatment for prolonged period of time, which makes the alloy carbides in steel to precipitate leaving very tough matrix of martensite. Increased toughness guarantees resilience to abnormal shocks, while fine precipitates of carbide reduce wear. Experience suggests 100% increase in life of the tool.



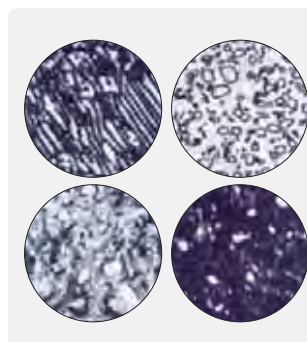
Optimal roll alignment for fast rolling. Maximum roll to tube contact reducing spring back effect. Equal load distribution leading to extended expander life.



CNC machined cages give precision guiding to rolls during expansion. Cages are double tempered for optimum toughness at very high hardness.



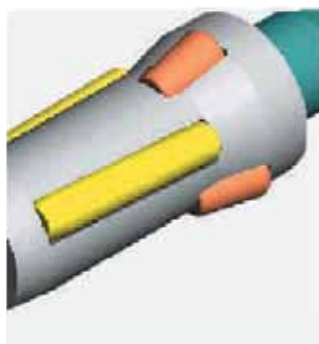
One piece constructed mandrel on all models mates with well contoured rolls to give un-bridged smooth expanded tube.



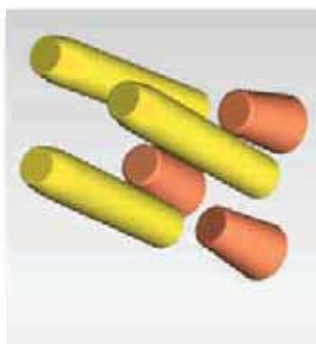
State of the art cryogenic and heat treatment facility guarantees best grain structure in both pre-machined and finished forms.



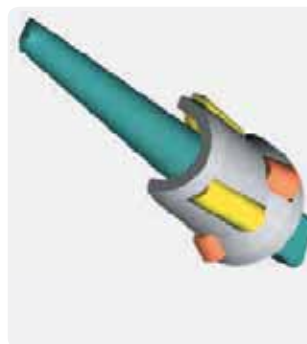
All components subjected to specific tests. Expander assembly is tested for optimum rolling, expansion and reversing speeds.



In operation, the initial positioning of the expander in the tube allows the self-feed rolls to draw the expander into the tube and to engage the flaring rolls at proper point during the operation.



High carbon chromium tool steel for rolls ensures non deformability. Smoother contour and fine ground finishing gives longer life by withstanding operational jerks.



Use of high end solid modeling design and finite element analysis software optimize results and eliminate design & assembly flaws.

Why **POWERMASTER** Boiler Tube Expanders ?

Versatility : POWERMASTER manufactures 12 series of Boiler Tube Expanders. More than any other manufacturer in the world. We have an expander for every conceivable need and every budget.

Availability : How often have you heard a manufacturer tell you that they do not have a Boiler Tube Expander on the shelf and quote you a delivery of a few weeks or months. POWERMASTER carries a very large inventory and can service you from stock in most cases.

Value : Production volumes ensure that our prices remain competitive. We offer products at a very competitive price.

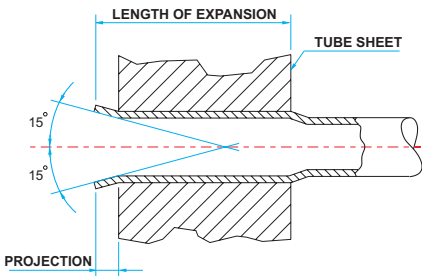
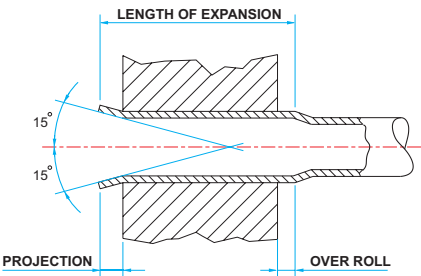
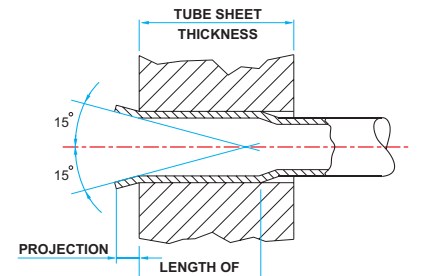
Service : Delivery to your doorstep via courier in 3-4 days - **ANYWHERE IN THE WORLD.**

Quality : Large percentages of our revenues are spent on research and development coupled with field testing make POWERMASTER the preferred choice worldwide.

Certifications : Powermaster facilities are certified to ISO-9002 by KPMG, USA. Most products manufactured conform to European CE directives.

History : You need experience to handle this vast array of products. We have been in the business Since 1971!

PLEASE MAKE A COPY OF THIS PAGE, FILL UP AND FAX TO US WHEN ORDERING BOILER TUBE EXPANDERS :

I	II	III
 TUBE EXPANDED THROUGHOUT THE DRUM / HEADER/ TUBE SHEET	 TUBE EXPANDED THROUGHOUT AND WITH OVER ROLL	 TUBE EXPANDED INTO PART OF DRUM / TUBE SHEET

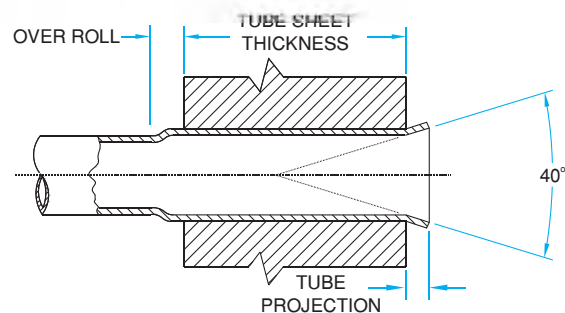
SR No.	DETAILS	1	2	3	4	5	6	7
1.	TUBE OUTSIDE DIAMETER							
2.	TUBE THICKNESS							
3.	TUBE SHEET / DRUM THICKNESS							
4.	LENGTH OF EXPANSION							
5.	TUBE END PROJECTION							
6.	TYPE OF TUBE EXPANDER							
7.	BELL MOUTHING REQUIRED	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO
8.	BEADING REQUIRED	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO

$2'' - 4\frac{1}{2}''$
O.D.

114 SERIES

Features :

- Overlapping rolls prevent ridging of tube.
- Can be converted for parallel expansion use - enquire with us.
- Self retained rolls in cage.
- Compact design for use through small hand holes, headers etc.
- Use - General purpose expander for expanding and flaring boiler tubes, water wall, downcomer, economizer, riser and air heater tubes.

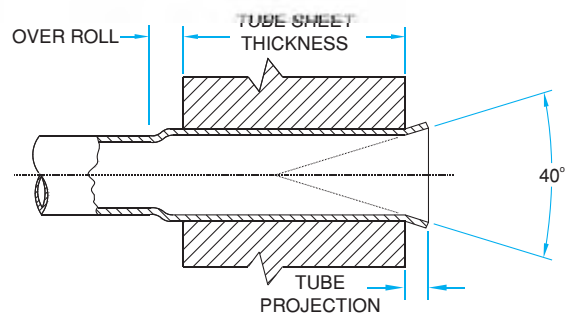


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch	mm	inch	mm	inch	1/2" To 7/8"	3/4" To 1.1/8"	1.1/8" To 1.5/8"	1.5/8" To 2.1/8"	2.1/8" To 2.5/8"
2	4 & 5	.238 & .220	1.3/4	11 - 13	.120 - .095	36.7	1.444	43.1	1.696	-	14172	14174	14176	14178
2	6 & 7	.203 & .180	1.3/4	14 - 16	.480 - .065	38.3	1.507	44.6	1.755	-	14182	14184	14186	14188
2	7 & 8	.180 & .165				39.9	1.570	46.4	1.826	14191	14192	14194	14196	14198
2	9 & 10	.148 & .134	2.1/4	13	.095	41.5	1.633	48.0	1.889	14201	14202	14204	14206	14208
2	11 - 13	.120 - .095	2.1/4	4 & 5	.238 & .220	43.1	1.696	49.6	1.952	14211	14212	14214	14216	14218
2.1/2	2	.284	2.1/4	6 - 8	.203 - .165	45.5	1.791	52.6	2.070	-	14222	14224	14226	14228
2.1/2	3 & 4	.259 & .238	2.1/4	9 - 11	.148 - .120	47.1	1.856	54.2	2.133	-	14232	14234	14236	14238
2.1/2	4 - 6	.238 - .203	2.1/4	12 - 15	.109 - .072	49.0	1.929	57.3	2.255	-	14242	14244	14246	14248
2.1/2	7 - 10	.180 - .134	2.3/4	2 & 3	.284 & .259	51.9	2.043	60.5	2.381	-	14252	14254	14256	14258
2.1/2	11 - 13	.120 - .095	2.3/4	4 & 5	.238 & .220	55.1	2.169	63.7	2.507	14261	14262	14264	14266	14268
3	1 - 3	.300 - .259	2.3/4	6 - 10	.203 - .134	57.4	2.259	66.6	2.622	-	14272	14274	14276	14278
3	4 - 6	.238 - .203	2.3/4	11 - 15	.120 - .072	60.6	2.385	70.0	2.755	-	14282	14284	14286	14288
3	7 - 11	.180 - .120	3.1/4	1 - 4	.300 - .238	63.8	2.511	73.9	2.909	-	14292	14294	14296	14298
3	10 - 12	.134 - .109	3.1/4	4 - 7	.238 - .180	66.9	2.635	77.3	3.043	14301	14302	14304	14306	14308
3.1/2	1 - 4	.300 - .238	3.1/4	7 - 11	.180 - .120	70.1	2.759	80.1	3.153	-	14312	14314	14316	14318
3.1/2	4 - 7	.238 - .180	3.1/4	10 - 15	.134 - .072	73.0	2.874	83.4	3.283	-	14322	14324	14326	14328
3.1/2	7 - 11	.180 - .120	3.3/4	2 & 3	.284 & .259	76.2	3.000	86.8	3.417	-	14332	14334	14336	14338
3.1/2	10 - 12	.134 - .109	3.3/4	4 & 5	.238 & .220	79.3	3.122	89.8	3.535	-	14342	14344	14346	14348
4	1 - 4	.300 - .238	3.3/4	6 - 10	.203 - .134	82.5	3.248	93.0	3.661	-	14352	14354	14356	14358
4	4 - 7	.238 - .180	3.3/4	11 - 15	.120 - .072	85.7	3.374	96.0	3.779	-	14362	14364	14366	14368
4	7 - 11	.180 - .120	4.1/4	2 & 3	.284 & .259	88.9	3.500	98.6	3.881	-	14372	14374	14376	14378
4	8 - 12	.165 - .109	4.1/4	3 & 5	.259 & .220	90.5	3.562	102.3	4.027	-	14382	14384	14386	14388
4.1/2	1 - 4	.300 - .238	4.1/4	6 - 9	.203 - .148	95.2	3.748	104.7	4.122	-	14392	14394	14396	14398
4.1/2	3 - 8	.238 - .165	4.1/4	10 - 13	.134 - .095	98.4	3.874	110.3	4.342	-	14402	14404	14406	14408
4.1/2	6 - 12	.203 - .109	-	-	-	101.6	4.000	113.5	4.468	-	14412	14414	14416	14418

114 SERIES

2" - 4 1/2"
O.D.

114 SERIES



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	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"		Drum Type	Header Type	Short Series 5 1/8 inch			Short Series 7 1/8 inch
-	34872	34874	34878	34948	3/4	32269	32289	32308 32309 32310 32311			34876, 34948
-	34879	34881	34883	34949	3/4	32269	32289	32309 32310 32311			-
34878	34879	34881	34883	34949	3/4	32270	32290	32309 32310 32311 32312			-
34878	34879	34881	34883	34949	3/4	32271	32291	32311 32312 32313			32346
34885	34886	34888	34890	34950	3/4	32270	32290	32310 32311 32312			32345
-	34893	34895	34897	34951	3/4	32270	32290	32310 32311 32312 32313			-
-	34893	34895	34897	34951	3/4	32271	32291	32311 32312 32313 32314			-
-	34893	34895	34897	34951	3/4	32272	32292	32312 32313 21214 32315 32316			-
-	34900	34902	34904	34952	3/4	32272	32292	32312 32313 32314 32315 32316			32347 32348 32349
34899	34900	34902	34904	34952	3/4	32273	32293	32315 32316 32317			33630 33631
-	34907	34909	34911	34953	3/4	32273	32293	32315 32316 32317 32318 32319			-
-	34907	34909	34911	34953	1	32274	32294	32317 32318 32319 32320 32321			-
-	34914	34916	34918	34954	1	32274	32294	32318 32319 32320 32321 32322			33632 33633 33634 33635
34913	34914	34916	34918	34954	1	32275	32295	32320 32321 32322			33634 33635
-	34921	34923	34925	34955	1	32274	32294	32318 32319 32320 32321 32322			-
-	34921	34923	34925	34955	1	32275	32295	32321 32322 32323 32324 32325			-
-	34921	34923	34925	34955	1	32276	32296	32323 32324 32325 32326 32327			-
-	34921	34923	34925	34955	1	32277	32297	32324 32325 32326 32327 32328			-
-	34928	34930	34932	34956	1	32276	32296	32324 32325 32326 32327 32328			-
-	34928	34930	34932	34956	1	32277	32297	32326 32327 32328 32329 32330			-
-	34928	34930	34932	34956	1	32278	32298	32328 32329 32330 32331 32332			-
-	34935	34937	34939	34957	1	32277	32297	32324 32325 32326 32327 32328			-
-	34935	34937	34939	34957	1	32278	32298	32329 32330 32331 32332 32350			-
-	34935	34937	34939	34957	1	32279	32299	32331 32332 32350 32337 32338			-
-	34942	34944	34946	34958	1	32278	32298	32326 32327 32328 32329 32330			-

$\frac{7}{8}" - 4\frac{1}{2}"$
O.D.

A SERIES

Features :

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

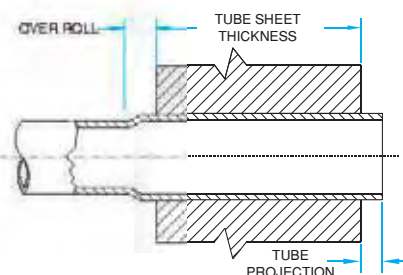


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch	mm	inch	mm	inch	1/2" To 7/8"	3/4" To 1.1/8"	1.1/8" To 1.5/8"	1.5/8" To 2.1/8"	2.1/8" To 2.5/8"
7/8	15	.072	1	10	.134	18.1	.712	20.4	.803	A-31/2	A-31/3	-	-	-
7/8	16	.065				18.4	.724	20.7	.814	A-32/2	A-32/3	-	-	-
7/8	17	.058	1	11	.120	18.8	.740	21.1	.830	A-33/2	A-33/3	-	-	-
7/8	18	.049	1	12	.109	19.4	.763	21.6	.850	A-34/2	A-34/3	-	-	-
7/8	19 & 20	.042 & .035	1.1/8	8	.165	19.7	.775	22.3	.877	A-35/2	A-35/3	-	-	-
1	13	.095				20.1	.791	22.4	.881	A-36/2	A-36/3	-	-	-
1	14	.083	1.1/8	9	.148	20.6	.811	23.1	.909	A-37/2	A-37/3	A-37/4	-	-
1	15 & 16	.072 & .065	1.1/8	10	.134	21.3	.838	23.8	.937	A-38/2	A-38/3	A-38/4	-	-
1	17 & 18	.058 & .048	1.1/8	11	.120	22.0	.866	24.5	.964	A-39/2	A-39/3	A-39/4	-	-
1	19 & 20	.042 & .035	1.1/8	12	.109	22.4	.881	25.0	.984	A-40/2	A-40/3	A-40/4	-	-
1.1/4	8	.165	1.1/8	13	.095	23.3	.917	25.9	1.019	A-41/2	A-41/3	A-41/4	-	-
1.1/4	9	.148	1.1/8	14	.083	23.8	.937	26.5	1.043	A-42/2	A-42/3	A-42/4	-	-
1.1/4	10	.134	1.1/8	15 & 16	.072 & .065	24.4	.960	27.2	1.070	A-43/2	A-43/3	A-43/4	-	-
1.1/4	11	.120				25.2	.992	28.0	1.102	A-44/2	A-44/3	A-44/4	-	-
1.1/4	12	.109				25.7	1.011	28.5	1.122	A-45/2	A-45/3	A-45/4	-	-
1.1/4	13	.095	1.3/8	8	.165	26.1	1.027	28.8	1.133	A-46/2	A-46/3	A-46/4	-	-
1.1/4	14	.083				26.4	1.039	29.2	1.149	A-47/2	A-47/3	A-47/4	-	-
1.1/4	15	.072	1.3/8	9	.148	26.9	1.059	29.7	1.169	A-48/2	A-48/3	A-48/4	-	-
1.1/4	16	.065	1.3/8	10	.134	27.6	1.086	30.4	1.196	A-49/2	A-49/3	A-49/4	A-49/5	A-49/6
1.1/2	7	.180	1.3/8	11	.120	28.3	1.114	31.2	1.228	A-50/2	A-50/3	A-50/4	A-50/5	A-50/6
1.1/2	8	.165	1.3/8	12	.109	28.8	1.133	31.7	1.248	A-51/2	A-51/3	A-51/4	A-51/5	A-51/6
1.1/2	9	.148	1.3/8	13 & 14	.095 & .083	29.5	1.161	33.4	1.314	A-52/2	A-52/3	A-52/4	A-52/5	A-52/6
1.1/2	10	.134	1.3/8	15 & 16	.072 & .065	30.0	1.181	34.1	1.342	A-53/2	A-53/3	A-53/4	A-53/5	A-53/6
1.1/2	11 & 12	.120 & .109				30.6	1.204	34.8	1.370	A-54/2	A-54/3	A-54/4	A-54/5	A-54/6
1.1/2	13	.095	1.3/4	5	.220	31.4	1.236	35.6	1.401	A-55/2	A-55/3	A-55/4	A-55/5	A-55/6
1.1/2	14 & 15	.083 & .072	1.3/4	6	.203	32.6	1.283	36.8	1.448	A-56/2	A-56/3	A-56/4	A-56/5	A-56/6
			1.3/4	7	.180	33.4	1.314	38.1	1.500	A-57/2	A-57/3	A-57/4	A-57/5	A-57/6
			1.3/4	8	.165	34.2	1.346	38.7	1.523	A-58/2	A-58/3	A-58/4	A-58/5	A-58/6
2	3	.259	1.3/4	9 & 10	.148 & .134	35.0	1.377	40.6	1.598	A-59/2	A-59/3	A-59/4	A-59/5	A-59/6
2	4	.238	1.3/4	11 & 12	.120 & .109	36.6	1.440	42.2	1.661	A-60/2	A-60/3	A-60/4	A-60/5	A-60/6
2	5 & 6	.220 & .203	1.3/4	13 & 14	.095 & .083	38.2	1.503	43.8	1.712	A-61/2	A-61/3	A-61/4	A-61/5	A-61/6
2	7 & 8	.180 & .165	1.3/4	15 & 16	.072 & .065	39.8	1.566	45.4	1.787	A-62/2	A-62/3	A-62/4	A-62/5	A-62/6
2	9 & 10	.148 & .134	2.1/4	3	.259	41.4	1.629	47.0	1.850	A-63/2	A-63/3	A-63/4	A-63/5	A-63/6
2	11 - 13	.120 - .095	2.1/4	4	.238	42.9	1.688	49.5	1.948	A-64/2	A-64/3	A-64/4	A-64/5	A-64/6
2	14 - 16	.083 - .065	2.1/4	6 & 7	.203 & .180	44.5	1.751	51.1	2.011	A-65/2	A-65/3	A-65/4	A-65/5	A-65/6
2	17 & 18	.058 & .049	2.1/4	8 & 9	.165 & .148	46.1	1.814	52.7	2.074	A-66/2	A-66/3	A-66/4	A-66/5	A-66/6

A SERIES

7/8"-4 1/2"
O.D.

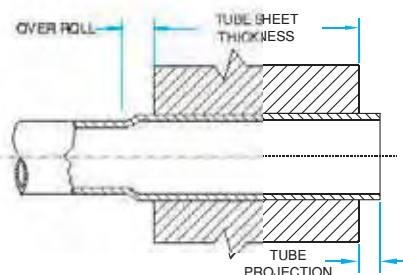
A SERIES



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	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"		Drum Type	Header Type	Short Series Mandrel Set (No. Of Mandrels)
15-2-RS	15-3-RS	-	-	-	3/8	DM-11	-	-
15-2-RS	15-3-RS	-	-	-	3/8	DM-12	-	-
16-2-RS	16-3-RS	-	-	-	3/8	DM-12	-	-
20-2-RS	20-3-RS	-	-	-	3/8	DM-12	-	-
17-2-RS	17-3-RS	-	-	-	3/8	DM-13	-	-
18-2-RS	18-3-RS	-	-	-	3/8	DM-12	-	-
18-2-RS	18-3-RS	18-4-RS	-	-	3/8	DM-13	HM-13	SM-13 (2)
19-2-RS	19-3-RS	19-4-RS	-	-	3/8	DM-13	HM-13	SM-13 (2)
21-2-RS	21-3-RS	21-4-RS	-	-	3/8	DM-13	HM-13	SM-13 (2)
21-2-RS	21-3-RS	21-4-RS	-	-	3/8	DM-14	HM-14	SM-14 (2)
22-2-RS	22-3-RS	22-4-RS	-	-	3/8	DM-14	HM-14	SM-14 (2)
23-2-RS	23-3-RS	23-4-RS	-	-	1/2	DM-15	HM-15	SM-15 (2)
24-2-RS	24-3-RS	24-4-RS	-	-	1/2	DM-15	HM-15	SM-15 (2)
26-2-RS	26-3-RS	26-4-RS	-	-	1/2	DM-16	HM-16	SM-16 (2)
27-2-RS	27-3-RS	27-4-RS	-	-	1/2	DM-16	HM-16	SM-16 (2)
31-2-RS	31-3-RS	31-4-RS	-	-	1/2	DM-16	HM-16	SM-16 (2)
28-2-RS	28-3-RS	28-4-RS	-	-	1/2	DM-17	HM-17	SM-17 (2)
29-2-RS	29-3-RS	29-4-RS	-	-	1/2	DM-17	HM-17	SM-17 (2)
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DM-17	HM-17	SM-17 (2)
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DM-18	HM-18	SM-18 (2)
32-2-RS	32-3-RS	32-4-RS	32-5-RS	32-6-RS	1/2	DM-18	HM-18	SM-18 (2)
28-2-RS	28-3-RS	28-4-RS	28-5-RS	28-6-RS	1/2	DM-20	HM-20	SM-20 (2)
29-2-RS	29-3-RS	29-4-RS	29-5-RS	29-6-RS	1/2	DM-20	HM-20	SM-20 (2)
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DM-20	HM-20	SM-20 (2)
33-2-RS	33-3-RS	33-4-RS	33-5-RS	33-6-RS	1/2	DM-20	HM-20	SM-20 (2)
32-2-RS	32-3-RS	32-4-RS	32-5-RS	32-6-RS	1/2	DM-21	HM-21	SM-21 (2)
36-2-RS	36-3-RS	36-4-RS	36-5-RS	36-6-RS	1/2	DM-21	HM-21	SM-21 (2)
37-2-RS	37-3-RS	37-4-RS	37-5-RS	37-6-RS	1/2	DM-21	HM-21	SM-21 (2)
33-2-RS	33-3-RS	33-4-RS	33-5-RS	33-6-RS	3/4	DM-22	HM-22	SM-22 (3)
37-2-RS	37-3-RS	37-4-RS	37-5-RS	37-6-RS	3/4	DM-22	HM-22	SM-22 (3)
38-2-RS	38-3-RS	38-4-RS	38-5-RS	38-6-RS	3/4	DM-22	HM-22	SM-22 (3)
39-2-RS	39-3-RS	39-4-RS	39-5-RS	39-6-RS	3/4	DM-22	HM-22	SM-22 (3)
40-2-RS	40-3-RS	40-4-RS	40-5-RS	40-6-RS	3/4	DM-22	HM-22	SM-22 (3)
40-2-RS	40-3-RS	40-4-RS	40-5-RS	40-6-RS	3/4	DM-23	HM-23	SM-23 (3)
41-2-RS	41-3-RS	41-4-RS	41-5-RS	41-6-RS	3/4	DM-23	HM-23	SM-23 (3)
42-2-RS	42-3-RS	42-4-RS	42-5-RS	42-6-RS	3/4	DM-23	HM-23	SM-23 (3)

$\frac{7}{8}'' - 4\frac{1}{2}''$
O.D.

A SERIES

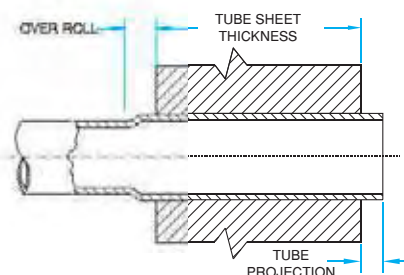


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch					1/2" To 7/8"	3/4" To 1.1/8"	1.1/8" To 1.5/8"	1.5/8" To 2.1/8"	2.1/8" To 2.5/8"
2.1/2	3	.259	2.1/4	10 & 11	.134 & .120	47.7	1.877	54.3	2.137	A-67/2	A-67/3	A-67/4	A-67/5	A-67/6
2.1/2	4 & 5	.238 & .220	2.1/4	12 & 13	.109 & .095	49.3	1.940	55.9	2.200	A-68/2	A-68/3	A-68/4	A-68/5	A-68/6
2.1/2	6 & 7	.203 & .180	2.1/4	14 - 16	.083 - .065	50.8	2.000	57.8	2.275	A-69/2	A-69/3	A-69/4	A-69/5	A-69/6
2.1/2	8 & 9	.165 & .148	2.3/4	3	.259	52.4	2.062	59.4	2.338	A-70/2	A-70/3	A-70/4	A-70/5	A-70/6
2.1/2	10 & 11	.134 & .120	2.3/4	4	.238	54.0	2.125	61.0	2.401	A-71/2	A-71/3	A-71/4	A-71/5	A-71/6
2.1/2	12 - 14	.109 - .083	2.3/4	5 & 6	.220 & .203	55.6	2.188	64.0	2.519	A-72/2	A-72/3	A-72/4	A-72/5	A-72/6
2.1/2	15 & 16	.072 & .065	2.3/4	7 & 8	.180 & .165	57.2	2.251	65.6	2.582	A-73/2	A-73/3	A-73/4	A-73/5	A-73/6
3	3	.259	2.3/4	9 & 10	.148 & .134	58.6	2.307	67.0	2.637	A-74/2	A-74/3	A-74/4	A-74/5	A-74/6
3	4	.238	2.3/4	11 - 13	.120 - .095	60.4	2.377	68.8	2.708	A-75/2	A-75/3	A-75/4	A-75/5	A-75/6
3	5 & 6	.220 & .203	2.3/4	14 - 16	.083 - .065	62.2	2.448	70.4	2.771	A-76/2	A-76/3	A-76/4	A-76/5	A-76/6
3	7 & 8	.180 & .165	-	-	-	63.6	2.503	72.0	2.834	A-77/2	A-77/3	A-77/4	A-77/5	A-77/6
3	9 & 10	.148 & .134	3.1/4	3	.259	65.0	2.559	73.4	2.889	A-78/2	A-78/3	A-78/4	A-78/5	A-78/6
3	11 - 13	.120 - .095	3.1/4	4	.238	66.6	2.622	75.0	2.952	A-79/2	A-79/3	A-79/4	A-79/5	A-79/6
3	14 - 16	.083 - .065	3.1/4	5 & 6	.220 & .203	68.3	2.688	76.9	3.027	A-80/2	A-80/3	A-80/4	A-80/5	A-80/6
3.1/2	2	.284	3.1/4	7 & 8	.180 & .165	69.9	2.751	78.5	3.090	A-81/2	A-81/3	A-81/4	A-81/5	A-81/6
3.1/2	3	.259	3.1/4	9 & 10	.148 & .134	71.5	2.814	80.1	3.153	A-82/2	A-82/3	A-82/4	A-82/5	A-82/6
3.1/2	4	.238	3.1/4	11 - 13	.120 - .095	73.1	2.877	81.7	3.216	A-83/2	A-83/3	A-83/4	A-83/5	A-83/6
3.1/2	5 & 6	.220 & .203	3.1/4	14 - 16	.083 - .065	74.6	2.937	84.2	3.314	A-84/2	A-84/3	A-84/4	A-84/5	A-84/6
3.1/2	7 & 8	.180 & .165	3.3/4	2	.084	76.2	3.000	85.5	3.366	A-85/2	A-85/3	A-85/4	A-85/5	A-85/6
3.1/2	9 - 10	.148 - .120	3.3/4	3	.259	77.8	3.062	87.4	3.440	A-86/2	A-86/3	A-86/4	A-86/5	A-86/6
3.1/2	12 - 16	.109 - .065	3.3/4	4	.238	79.4	3.125	89.0	3.503	A-87/2	A-87/3	A-87/4	A-87/5	A-87/6
			3.3/4	5 & 6	.220 & .203	81.0	3.188	90.6	3.566	A-88/2	A-88/3	A-88/4	A-88/5	A-88/6
4	2	.284	3.3/4	7 & 8	.180 & .165	82.6	3.251	92.2	3.629	A-89/2	A-89/3	A-89/4	A-89/5	A-89/6
4	3	.259	3.3/4	9 & 10	.148 & .134	84.2	3.314	93.8	3.629	A-90/2	A-90/3	A-90/4	A-90/5	A-90/6
4	4	.238	3.3/4	11 - 13	.120 - .095	85.8	3.377	96.2	3.787	A-91/2	A-91/3	A-91/4	A-91/5	A-91/6
4	5 & 6	.220 & .203	3.3/4	14 - 16	.083 - .065	87.4	3.440	97.8	3.850	A-92/2	A-92/3	A-92/4	A-92/5	A-92/6
4	7 & 8	.180 & .165	4.1/4	2		89.0	3.503	99.4	3.913	A-93/2	A-93/3	A-93/4	A-93/5	A-93/6
4	9 - 11	.148 - .120	4.1/4	3	.284	90.4	3.559	100.8	3.968	A-94/2	A-94/3	A-94/4	A-94/5	A-94/6
4	12 - 16	.109 - .065	4.1/4	4	.238	92.0	3.622	102.4	4.031	A-95/2	A-95/3	A-95/4	A-95/5	A-95/6
			4.1/4	5 & 6	.220 & .203	93.4	3.677	103.8	4.086	A-96/2	A-96/3	A-96/4	A-96/5	A-96/6
4.1/2	2	.284	4.1/4	7 & 8	.180 & .165	95.0	3.740	105.4	4.149	A-97/2	A-97/3	A-97/4	A-97/5	A-97/6
4.1/2	3	.259	4.1/4	9 - 11	.148 - .120	96.6	3.803	107.0	4.212	A-98/2	A-98/3	A-98/4	A-98/5	A-98/6
4.1/2	4 & 5	.238 & .220	4.1/4	11 - 13	.120 - .095	98.2	3.866	108.6	4.275	A-99/2	A-99/3	A-99/4	A-99/5	A-99/6
4.1/2	6 & 7	.203 & .180	-	-	-	101.2	3.984	110.0	4.330	A-100/2	A-100/3	A-100/4	A-100/5	A-100/6
4.1/2	8 & 9	.165 & .148	-	-	-	102.8	4.047	111.6	4.393	A-101/2	A-101/3	A-101/4	A-101/5	A-101/6
4.1/2	10 - 12	.134 - .109	-	-	-	104.4	4.110	113.2	4.456	A-102/2	A-102/3	A-102/4	A-102/5	A-102/6

A SERIES

7/8"-4 1/2"
O.D.

A SERIES



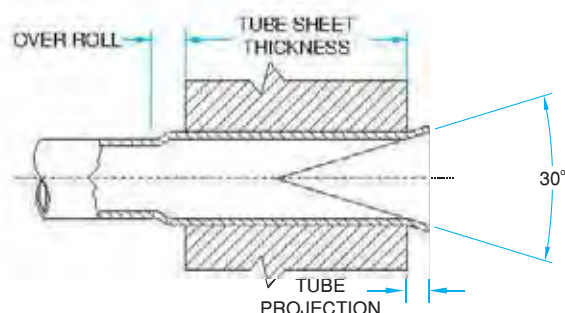
Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Spare Mandrel Model Number		
1/2" To 7/8"	3/4" To 1 1/8"	1 1/8" To 1 5/8"	1 5/8" To 2 1/8"	2 1/8" To 2 5/8"		Drum Type	Header Type	Short Series Mandrel Set (No. Of Mandrels)
43-2-RS	43-3-RS	43-4-RS	43-5-RS	43-6-RS	3/4	DM-23	HM-23	SM-23 (3)
44-2-RS	44-3-RS	44-4-RS	44-5-RS	44-6-RS	3/4	DM-23	HM-23	SM-23 (3)
43-2-RS	43-3-RS	43-4-RS	43-5-RS	43-6-RS	3/4	DM-24	HM-24	SM-24 (3)
44-2-RS	44-3-RS	44-4-RS	44-5-RS	44-6-RS	3/4	DM-24	HM-24	SM-24 (3)
45-2-RS	45-3-RS	45-4-RS	45-5-RS	45-6-RS	3/4	DM-24	HM-24	SM-24 (3)
47-2-RS	47-3-RS	47-4-RS	47-5-RS	47-6-RS	3/4	DM-24	HM-24	SM-24 (3)
46-2-RS	46-3-RS	46-4-RS	46-5-RS	46-6-RS	1	DM-25	HM-25	SM-25 (3)
47-2-RS	47-3-RS	47-4-RS	47-5-RS	47-6-RS	1	DM-25	HM-25	SM-25 (3)
48-2-RS	48-3-RS	48-4-RS	48-5-RS	48-6-RS	1	DM-25	HM-25	SM-25 (3)
49-2-RS	49-3-RS	49-4-RS	49-5-RS	49-6-RS	1	DM-25	HM-25	SM-25 (3)
50-2-RS	50-3-RS	50-4-RS	50-5-RS	50-6-RS	1	DM-25	HM-25	SM-25 (3)
51-2-RS	51-3-RS	51-4-RS	51-5-RS	51-6-RS	1	DM-25	HM-25	SM-25 (3)
52-2-RS	52-3-RS	52-4-RS	52-5-RS	52-6-RS	1	DM-25	HM-25	SM-25 (3)
51-2-RS	51-3-RS	51-4-RS	51-5-RS	51-6-RS	1	DM-26	HM-26	SM-26 (4)
52-2-RS	52-3-RS	52-4-RS	52-5-RS	52-6-RS	1	DM-26	HM-26	SM-26 (4)
53-2-RS	53-3-RS	53-4-RS	53-5-RS	53-6-RS	1	DM-26	HM-26	SM-26 (4)
54-2-RS	54-3-RS	54-4-RS	54-5-RS	54-6-RS	1	DM-26	HM-26	SM-26 (4)
54-2-RS	54-3-RS	54-4-RS	54-5-RS	54-6-RS	1	DM-27	HM-27	SM-27 (4)
55-2-RS	55-3-RS	55-4-RS	55-5-RS	55-6-RS	1	DM-27	HM-27	SM-27 (4)
56-2-RS	56-3-RS	56-4-RS	56-5-RS	56-6-RS	1	DM-27	HM-27	SM-27 (4)
57-2-RS	57-3-RS	57-4-RS	57-5-RS	57-6-RS	1	DM-27	HM-27	SM-27 (4)
58-2-RS	58-3-RS	58-4-RS	58-5-RS	58-6-RS	1	DM-27	HM-27	SM-27 (4)
59-2-RS	59-3-RS	59-4-RS	59-5-RS	59-6-RS	1	DM-27	HM-27	SM-27 (4)
60-2-RS	60-3-RS	60-4-RS	60-5-RS	60-6-RS	1	DM-27	HM-27	SM-27 (4)
59-2-RS	59-3-RS	59-4-RS	59-5-RS	59-6-RS	1	DM-28	HM-28	SM-28 (4)
60-2-RS	60-3-RS	60-4-RS	60-5-RS	60-6-RS	1	DM-28	HM-28	SM-28 (4)
61-2-RS	61-3-RS	61-4-RS	61-5-RS	61-6-RS	1	DM-28	HM-28	SM-28 (4)
62-2-RS	62-3-RS	62-4-RS	62-5-RS	62-6-RS	1	DM-28	HM-28	SM-28 (4)
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DM-28	HM-28	SM-28 (4)
62-2-RS	62-3-RS	62-4-RS	62-5-RS	62-6-RS	1	DM-29	HM-29	SM-29 (4)
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DM-29	HM-29	SM-29 (4)
64-2-RS	64-3-RS	64-4-RS	64-5-RS	64-6-RS	1	DM-29	HM-29	SM-29 (4)
63-2-RS	63-3-RS	63-4-RS	63-5-RS	63-6-RS	1	DM-30	HM-30	SM-30 (4)
64-2-RS	64-3-RS	64-4-RS	64-5-RS	64-6-RS	1	DM-30	HM-30	SM-30 (4)
65-2-RS	65-3-RS	65-4-RS	65-5-RS	65-6-RS	1	DM-30	HM-30	SM-30 (4)
66-2-RS	66-3-RS	66-4-RS	66-5-RS	66-6-RS	1	DM-30	HM-30	SM-30 (4)

$\frac{7}{8}" - 4\frac{1}{2}"$
O.D.

AF3 SERIES

Features :

- Best 'Value For Money' tool in the world when flaring of tube ends is needed.
- Sturdy construction with rolls self contained in cage.
- Time tested, durable design.
- Overlapping flare rolls prevent ridging of tube.
- Use - Economical tool used for applications where small number of tubes are to be expanded with flaring.

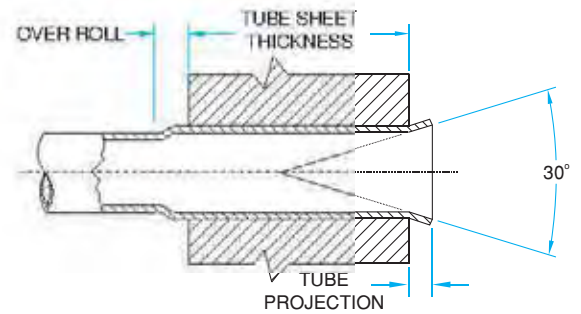


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch					1/2" To 7/8"	3/4" To 1.1/8"	1.1/8" To 1.5/8"	1.5/8" To 2.1/8"	2.1/8" To 2.5/8"
7/8		15	.072	1	10	.134	18.1	.712	20.4	.803	AF3-31/2	AF3-31/3	-	-
7/8		16	.065				18.4	.724	20.7	.814	AF3-32/2	AF3-32/3	-	-
7/8		17	.058	1	11	.120	18.8	.740	21.1	.830	AF3-33/2	AF3-33/3	-	-
7/8		18	.049	1	12	.109	19.4	.763	21.6	.850	AF3-34/2	AF3-34/3	-	-
7/8		19 & 20	.042 & .035	1.1/8	8	.165	19.7	.775	22.3	.877	AF3-35/2	AF3-35/3	-	-
1		13	.095				20.1	.791	22.4	.881	AF3-36/2	AF3-36/3	-	-
1		14	.083	1.1/8	9	.148	20.6	.811	23.1	.909	AF3-37/2	AF3-37/3	AF3-37/4	-
1		15 & 16	.072 & .065	1.1/8	10	.134	21.3	.838	23.8	.937	AF3-38/2	AF3-38/3	AF3-38/4	-
1		17 & 18	.058 & .048	1.1/8	11	.120	22.0	.866	24.5	.964	AF3-39/2	AF3-39/3	AF3-39/4	-
1		19 & 20	.042 & .035	1.1/8	12	.109	22.4	.881	25.0	.984	AF3-40/2	AF3-40/3	AF3-40/4	-
1.1/4		8	.165	1.1/8	13	.095	23.3	.917	25.9	1.019	AF3-41/2	AF3-41/3	AF3-41/4	-
1.1/4		9	.148	1.1/8	14	.083	23.8	.937	26.5	1.043	AF3-42/2	AF3-42/3	AF3-42/4	-
1.1/4		10	.134	1.1/8	15 & 16	.072 & .065	24.4	.960	27.2	1.070	AF3-43/2	AF3-43/3	AF3-43/4	-
1.1/4		11	.120				25.2	.992	28.0	1.102	AF3-44/2	AF3-44/3	AF3-44/4	-
1.1/4		12	.109				25.7	1.011	28.5	1.122	AF3-45/2	AF3-45/3	AF3-45/4	-
1.1/4		13	.095	1.3/8	8	.165	26.1	1.027	28.8	1.133	AF3-46/2	AF3-46/3	AF3-46/4	-
1.1/4		14	.083				26.4	1.039	29.2	1.149	AF3-47/2	AF3-47/3	AF3-47/4	-
1.1/4		15	.072	1.3/8	9	.148	26.9	1.059	29.7	1.169	AF3-48/2	AF3-48/3	AF3-48/4	-
1.1/4		16	.065	1.3/8	10	.134	27.6	1.086	30.4	1.196	AF3-49/2	AF3-49/3	AF3-49/4	AF3-49/5
1.1/2		7	.180	1.3/8	11	.120	28.3	1.114	31.2	1.228	AF3-50/2	AF3-50/3	AF3-50/4	AF3-50/5
1.1/2		8	.165	1.3/8	12	.109	28.8	1.133	31.7	1.248	AF3-51/2	AF3-51/3	AF3-51/4	AF3-51/5
1.1/2		9	.148	1.3/8	13 & 14	.095 & .083	29.5	1.161	33.4	1.314	AF3-52/2	AF3-52/3	AF3-52/4	AF3-52/5
1.1/2		10	.134	1.3/8	15 & 16	.072 & .065	30.0	1.181	34.1	1.342	AF3-53/2	AF3-53/3	AF3-53/4	AF3-53/5
1.1/2		11 & 12	.120 & .109				30.6	1.204	34.8	1.370	AF3-54/2	AF3-54/3	AF3-54/4	AF3-54/5
1.1/2		13	.095	1.3/4	5	.220	31.4	1.236	35.6	1.401	AF3-55/2	AF3-55/3	AF3-55/4	AF3-55/5
1.1/2		14 & 15	.083 & .072	1.3/4	6	.203	32.6	1.283	36.8	1.448	AF3-56/2	AF3-56/3	AF3-56/4	AF3-56/5
				1.3/4	7	.180	33.4	1.314	38.1	1.500	AF3-57/2	AF3-57/3	AF3-57/4	AF3-57/5
				1.3/4	8	.165	34.2	1.346	38.7	1.523	AF3-58/2	AF3-58/3	AF3-58/4	AF3-58/5
2		3	.259	1.3/4	9 & 10	.148 & .134	35.0	1.377	40.6	1.598	AF3-59/2	AF3-59/3	AF3-59/4	AF3-59/5
2		4	.238	1.3/4	11 & 12	.120 & .109	36.6	1.440	42.2	1.661	AF3-60/2	AF3-60/3	AF3-60/4	AF3-60/5
2		5 & 6	.220 & .203	1.3/4	13 & 14	.095 & .083	38.2	1.503	43.8	1.712	AF3-61/2	AF3-61/3	AF3-61/4	AF3-61/5
2		7 & 8	.180 & .165	1.3/4	15 & 16	.072 & .065	39.8	1.566	45.4	1.787	AF3-62/2	AF3-62/3	AF3-62/4	AF3-62/5
2		9 & 10	.148 & .134	2.1/4	3	.259	41.4	1.629	47.0	1.850	AF3-63/2	AF3-63/3	AF3-63/4	AF3-63/5
2		11 - 13	.120 - .095	2.1/4	4	.238	42.9	1.688	49.5	1.948	AF3-64/2	AF3-64/3	AF3-64/4	AF3-64/5
2		14 - 16	.083 - .065	2.1/4	6 & 7	.203 & .180	44.5	1.751	51.1	2.011	AF3-65/2	AF3-65/3	AF3-65/4	AF3-65/5
2		17 & 18	.058 & .049	2.1/4	8 & 9	.165 & .148	46.1	1.814	52.7	2.074	AF3-66/2	AF3-66/3	AF3-66/4	AF3-66/5

AF3 SERIES

7/8"-4 1/2"
O.D.

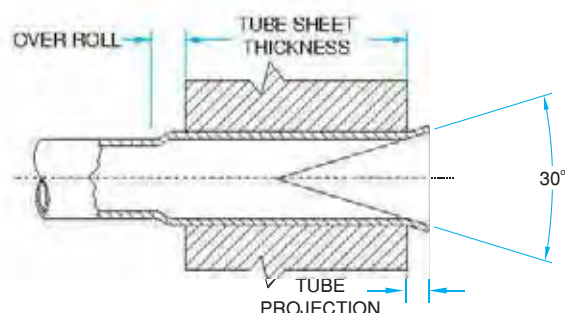
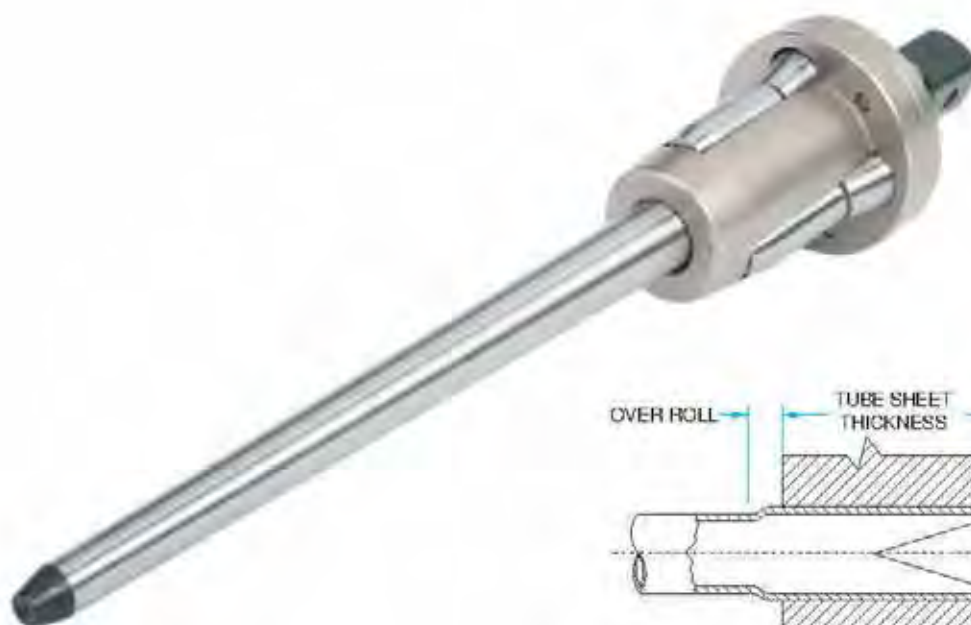
AF3 SERIES



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	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"		Drum Type	Header Type	Short Series Mandrel Set (No. Of Mandrels)
15-2-F3S	15-3-F3S	-	-	-	3/8	DM-11	-	-
15-2-F3S	15-3-F3S	-	-	-	3/8	DM-12	-	-
16-2-F3S	16-3-F3S	-	-	-	3/8	DM-12	-	-
20-2-F3S	20-3-F3S	-	-	-	3/8	DM-12	-	-
17-2-F3S	17-3-F3S	-	-	-	3/8	DM-13	-	-
18-2-F3S	18-3-F3S	-	-	-	3/8	DM-12	-	-
18-2-F3S	18-3-F3S	18-4-F3S	-	-	3/8	DM-13	HM-13	SM-13 (2)
19-2-F3S	19-3-F3S	19-4-F3S	-	-	3/8	DM-13	HM-13	SM-13 (2)
21-2-F3S	21-3-F3S	21-4-F3S	-	-	3/8	DM-13	HM-13	SM-13 (2)
21-2-F3S	21-3-F3S	21-4-F3S	-	-	3/8	DM-14	HM-14	SM-14 (2)
22-2-F3S	22-3-F3S	22-4-F3S	-	-	3/8	DM-14	HM-14	SM-14 (2)
23-2-F3S	23-3-F3S	23-4-F3S	-	-	1/2	DM-15	HM-15	SM-15 (2)
24-2-F3S	24-3-F3S	24-4-F3S	-	-	1/2	DM-15	HM-15	SM-15 (2)
26-2-F3S	26-3-F3S	26-4-F3S	-	-	1/2	DM-16	HM-16	SM-16 (2)
27-2-F3S	27-3-F3S	27-4-F3S	-	-	1/2	DM-16	HM-16	SM-16 (2)
31-2-F3S	31-3-F3S	31-4-F3S	-	-	1/2	DM-16	HM-16	SM-16 (2)
28-2-F3S	28-3-F3S	28-4-F3S	-	-	1/2	DM-17	HM-17	SM-17 (2)
29-2-F3S	29-3-F3S	29-4-F3S	-	-	1/2	DM-17	HM-17	SM-17 (2)
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DM-17	HM-17	SM-17 (2)
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DM-18	HM-18	SM-18 (2)
34-2-F3S	34-3-F3S	34-4-F3S	34-5-F3S	34-6-F3S	1/2	DM-18	HM-18	SM-18 (2)
28-2-F3S	28-3-F3S	28-4-F3S	28-5-F3S	28-6-F3S	1/2	DM-20	HM-20	SM-20 (2)
29-2-F3S	29-3-F3S	29-4-F3S	29-5-F3S	29-6-F3S	1/2	DM-20	HM-20	SM-20 (2)
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DM-20	HM-20	SM-20 (2)
33-2-F3S	33-3-F3S	33-4-F3S	33-5-F3S	33-6-F3S	1/2	DM-20	HM-20	SM-20 (2)
32-2-F3S	32-3-F3S	32-4-F3S	32-5-F3S	32-6-F3S	1/2	DM-21	HM-21	SM-21 (2)
36-2-F3S	36-3-F3S	36-4-F3S	36-5-F3S	36-6-F3S	1/2	DM-21	HM-21	SM-21 (2)
37-2-F3S	37-3-F3S	37-4-F3S	37-5-F3S	37-6-F3S	1/2	DM-21	HM-21	SM-21 (2)
33-2-F3S	33-3-F3S	33-4-F3S	33-5-F3S	33-6-F3S	3/4	DM-22	HM-22	SM-22 (3)
37-2-F3S	37-3-F3S	37-4-F3S	37-5-F3S	37-6-F3S	3/4	DM-22	HM-22	SM-22 (3)
38-2-F3S	38-3-F3S	38-4-F3S	38-5-F3S	38-6-F3S	3/4	DM-22	HM-22	SM-22 (3)
39-2-F3S	39-3-F3S	39-4-F3S	39-5-F3S	39-6-F3S	3/4	DM-22	HM-22	SM-22 (3)
40-2-F3S	40-3-F3S	40-4-F3S	40-5-F3S	40-6-F3S	3/4	DM-22	HM-22	SM-22 (3)
40-2-F3S	40-3-F3S	40-4-F3S	40-5-F3S	40-6-F3S	3/4	DM-23	HM-23	SM-23 (3)
41-2-F3S	41-3-F3S	41-4-F3S	41-5-F3S	41-6-F3S	3/4	DM-23	HM-23	SM-23 (3)
42-2-F3S	42-3-F3S	42-4-F3S	42-5-F3S	42-6-F3S	3/4	DM-23	HM-23	SM-23 (3)



AF3 SERIES

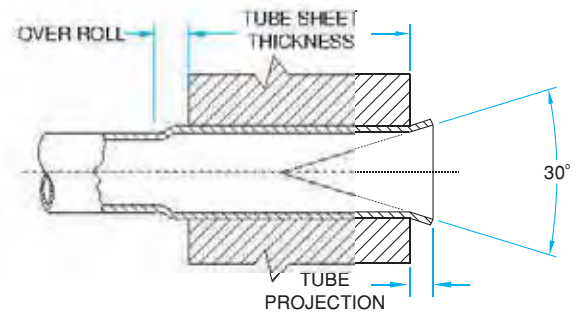


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg		inch	bwg	inch	mm	inch	mm	inch	1/2" To 7/8"	3/4" To 1.1/8"	1.1/8" To 1.5/8"	1.5/8" To 2.1/8"
2.1/2	3	.259	2.1/4	10 & 11	.134 & .120	47.7	1.877	54.3	2.137	AF3-67/2	AF3-67/3	AF3-67/4	AF3-67/5	AF3-67/6
2.1/2	4 & 5	.238 & .220	2.1/4	12 & 13	.109 & .095	49.3	1.940	55.9	2.200	AF3-68/2	AF3-68/3	AF3-68/4	AF3-68/5	AF3-68/6
2.1/2	6 & 7	.203 & .180	2.1/4	14 - 16	.083 - .065	50.8	2.000	57.8	2.275	AF3-69/2	AF3-69/3	AF3-69/4	AF3-69/5	AF3-69/6
2.1/2	8 & 9	.165 & .148	2.3/4	3	.259	52.4	2.062	59.4	2.338	AF3-70/2	AF3-70/3	AF3-70/4	AF3-70/5	AF3-70/6
2.1/2	10 & 11	.134 & .120	2.3/4	4	.238	54.0	2.125	61.0	2.401	AF3-71/2	AF3-71/3	AF3-71/4	AF3-71/5	AF3-71/6
2.1/2	12 - 14	.109 - .083	2.3/4	5 & 6	.220 & .203	55.6	2.188	64.0	2.519	AF3-72/2	AF3-72/3	AF3-72/4	AF3-72/5	AF3-72/6
2.1/2	15 & 16	.072 & .065	2.3/4	7 & 8	.180 & .165	57.2	2.251	65.6	2.582	AF3-73/2	AF3-73/3	AF3-73/4	AF3-73/5	AF3-73/6
3	3	.259	2.3/4	9 & 10	.148 & .134	58.6	2.307	67.0	2.637	AF3-74/2	AF3-74/3	AF3-74/4	AF3-74/5	AF3-74/6
3	4	.238	2.3/4	11 - 13	.120 - .095	60.4	2.377	68.8	2.708	AF3-75/2	AF3-75/3	AF3-75/4	AF3-75/5	AF3-75/6
3	5 & 6	.220 & .203	2.3/4	14 - 16	.083 - .065	62.2	2.448	70.4	2.771	AF3-76/2	AF3-76/3	AF3-76/4	AF3-76/5	AF3-76/6
3	7 & 8	.180 & .165				63.6	2.503	72.0	2.834	AF3-77/2	AF3-77/3	AF3-77/4	AF3-77/5	AF3-77/6
3	9 & 10	.148 & .134	3.1/4	3	.259	65.0	2.559	73.4	2.889	AF3-78/2	AF3-78/3	AF3-78/4	AF3-78/5	AF3-78/6
3	11 - 13	.120 - .095	3.1/4	4	.238	66.6	2.622	75.0	2.952	AF3-79/2	AF3-79/3	AF3-79/4	AF3-79/5	AF3-79/6
3	14 - 16	.083 - .065	3.1/4	5 & 6	.220 & .203	68.3	2.688	76.9	3.027	AF3-80/2	AF3-80/3	AF3-80/4	AF3-80/5	AF3-80/6
3.1/2	2	.284	3.1/4	7 & 8	.180 & .165	69.9	2.751	78.5	3.090	AF3-81/2	AF3-81/3	AF3-81/4	AF3-81/5	AF3-81/6
3.1/2	3	.259	3.1/4	9 & 10	.148 & .134	71.5	2.814	80.1	3.153	AF3-82/2	AF3-82/3	AF3-82/4	AF3-82/5	AF3-82/6
3.1/2	4	.238	3.1/4	11 - 13	.120 - .095	73.1	2.877	81.7	3.216	AF3-83/2	AF3-83/3	AF3-83/4	AF3-83/5	AF3-83/6
3.1/2	5 & 6	.220 & .203	3.1/4	14 - 16	.083 - .065	74.6	2.937	84.2	3.314	AF3-84/2	AF3-84/3	AF3-84/4	AF3-84/5	AF3-84/6
3.1/2	7 & 8	.180 & .165	3.3/4	2	.284	76.2	3.000	85.5	3.366	AF3-85/2	AF3-85/3	AF3-85/4	AF3-85/5	AF3-85/6
3.1/2	9 - 11	.148 - .120	3.3/4	3	.259	77.8	3.062	87.4	3.440	AF3-86/2	AF3-86/3	AF3-86/4	AF3-86/5	AF3-86/6
3.1/2	12 - 16	.109 - .065	3.3/4	4	.238	79.4	3.125	89.0	3.503	AF3-87/2	AF3-87/3	AF3-87/4	AF3-87/5	AF3-87/6
			3.3/4	5 & 6	.220 & .203	81.0	3.188	90.6	3.566	AF3-88/2	AF3-88/3	AF3-88/4	AF3-88/5	AF3-88/6
4	2	.284	3.3/4	7 & 8	.180 & .165	82.6	3.251	92.2	3.629	AF3-89/2	AF3-89/3	AF3-89/4	AF3-89/5	AF3-89/6
4	3	.259	3.3/4	9 & 10	.148 & .134	84.2	3.314	93.8	3.692	AF3-90/2	AF3-90/3	AF3-90/4	AF3-90/5	AF3-90/6
4	4	.238	3.3/4	11 - 13	.120 - .095	85.8	3.377	96.2	3.787	AF3-91/2	AF3-91/3	AF3-91/4	AF3-91/5	AF3-91/6
4	5 & 6	.220 & .203	3.3/4	14 - 16	.083 - .065	87.4	3.440	97.8	3.850	AF3-92/2	AF3-92/3	AF3-92/4	AF3-92/5	AF3-92/6
4	7 & 8	.180 & .165	4.1/4	2	.284	89.0	3.503	99.4	3.913	AF3-93/2	AF3-93/3	AF3-93/4	AF3-93/5	AF3-93/6
4	9 - 11	.148 - .120	4.1/4	3	.259	90.4	3.559	100.8	3.968	AF3-94/2	AF3-94/3	AF3-94/4	AF3-94/5	AF3-94/6
4	12 - 16	.109 - .065	4.1/4	4	.238	92.0	3.622	102.4	4.031	AF3-95/2	AF3-95/3	AF3-95/4	AF3-95/5	AF3-95/6
			4.1/4	5 & 6	.220 & .203	93.4	3.677	103.8	4.086	AF3-96/2	AF3-96/3	AF3-96/4	AF3-96/5	AF3-96/6
4.1/2	2	.284	4.1/4	7 & 8	.180 & .165	95.0	3.740	105.4	4.149	AF3-97/2	AF3-97/3	AF3-97/4	AF3-97/5	AF3-97/6
4.1/2	3	.259	4.1/4	9 - 11	.148 - .120	96.6	3.803	107.0	4.212	AF3-98/2	AF3-98/3	AF3-98/4	AF3-98/5	AF3-98/6
4.1/2	4 & 5	.238 & .220	4.1/4	11 - 13	.120 - .095	98.2	3.866	108.6	4.275	AF3-99/2	AF3-99/3	AF3-99/4	AF3-99/5	AF3-99/6
4.1/2	6 & 7	.203 & .180				101.2	3.984	110.0	4.330	AF3-100/2	AF3-100/3	AF3-100/4	AF3-100/5	AF3-100/6
4.1/2	8 & 9	.165 & .148				102.8	4.047	111.6	4.393	AF3-101/2	AF3-101/3	AF3-101/4	AF3-101/5	AF3-101/6
4.1/2	10 - 12	.134 - .109				104.4	4.110	113.2	4.456	AF3-102/2	AF3-102/3	AF3-102/4	AF3-102/5	AF3-102/6

AF3 SERIES

7/8"-4 1/2"
O.D.

AF3 SERIES



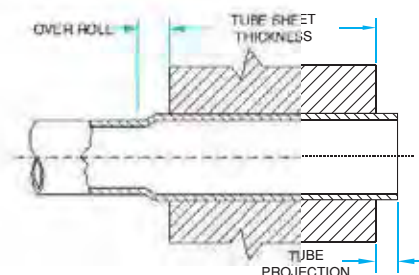
Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Spare Mandrel Model Number		
1/2" To 7/8"	3/4" To 1 1/8"	1 1/8" To 1 5/8"	1 5/8" To 2 1/8"	2 1/8" To 2 5/8"		Drum Type	Header Type	Short Series Mandrel Set (No. Of Mandrels)
43-2-F3S	43-3-F3S	43-4-F3S	43-5-F3S	43-6-F3S	3/4	DM-23	HM-23	SM-23 (3)
44-2-F3S	44-3-F3S	44-4-F3S	44-5-F3S	44-6-F3S	3/4	DM-23	HM-23	SM-23 (3)
43-2-F3S	43-3-F3S	43-4-F3S	43-5-F3S	43-6-F3S	3/4	DM-24	HM-24	SM-24 (3)
44-2-F3S	44-3-F3S	44-4-F3S	44-5-F3S	44-6-F3S	3/4	DM-24	HM-24	SM-24 (3)
45-2-F3S	45-3-F3S	45-4-F3S	45-5-F3S	45-6-F3S	3/4	DM-24	HM-24	SM-24 (3)
47-2-F3S	47-3-F3S	47-4-F3S	47-5-F3S	47-6-F3S	3/4	DM-24	HM-24	SM-24 (3)
46-2-F3S	46-3-F3S	46-4-F3S	46-5-F3S	46-6-F3S	1	DM-25	HM-25	SM-25 (3)
47-2-F3S	47-3-F3S	47-4-F3S	47-5-F3S	47-6-F3S	1	DM-25	HM-25	SM-25 (3)
48-2-F3S	48-3-F3S	48-4-F3S	48-5-F3S	48-6-F3S	1	DM-25	HM-25	SM-25 (3)
49-2-F3S	49-3-F3S	49-4-F3S	49-5-F3S	49-6-F3S	1	DM-25	HM-25	SM-25 (3)
50-2-F3S	50-3-F3S	50-4-F3S	50-5-F3S	50-6-F3S	1	DM-25	HM-25	SM-25 (3)
51-2-F3S	51-3-F3S	51-4-F3S	51-5-F3S	51-6-F3S	1	DM-25	HM-25	SM-25 (3)
52-2-F3S	52-3-F3S	52-4-F3S	52-5-F3S	52-6-F3S	1	DM-25	HM-25	SM-25 (3)
51-2-F3S	51-3-F3S	51-4-F3S	51-5-F3S	51-6-F3S	1	DM-26	HM-26	SM-26 (4)
52-2-F3S	52-3-F3S	52-4-F3S	52-5-F3S	52-6-F3S	1	DM-26	HM-26	SM-26 (4)
53-2-F3S	53-3-F3S	53-4-F3S	53-5-F3S	53-6-F3S	1	DM-26	HM-26	SM-26 (4)
54-2-F3S	54-3-F3S	54-4-F3S	54-5-F3S	54-6-F3S	1	DM-26	HM-26	SM-26 (4)
54-2-F3S	54-3-F3S	54-4-F3S	54-5-F3S	54-6-F3S	1	DM-27	HM-27	SM-27 (4)
55-2-F3S	55-3-F3S	55-4-F3S	55-5-F3S	55-6-F3S	1	DM-27	HM-27	SM-27 (4)
56-2-F3S	56-3-F3S	56-4-F3S	56-5-F3S	56-6-F3S	1	DM-27	HM-27	SM-27 (4)
57-2-F3S	57-3-F3S	57-4-F3S	57-5-F3S	57-6-F3S	1	DM-27	HM-27	SM-27 (4)
58-2-F3S	58-3-F3S	58-4-F3S	58-5-F3S	58-6-F3S	1	DM-27	HM-27	SM-27 (4)
59-2-F3S	59-3-F3S	59-4-F3S	59-5-F3S	59-6-F3S	1	DM-27	HM-27	SM-27 (4)
60-2-F3S	60-3-F3S	60-4-F3S	60-5-F3S	60-6-F3S	1	DM-27	HM-27	SM-27 (4)
59-2-F3S	59-3-F3S	59-4-F3S	59-5-F3S	59-6-F3S	1	DM-28	HM-28	SM-28 (4)
60-2-F3S	60-3-F3S	60-4-F3S	60-5-F3S	60-6-F3S	1	DM-28	HM-28	SM-28 (4)
61-2-F3S	61-3-F3S	61-4-F3S	61-5-F3S	61-6-F3S	1	DM-28	HM-28	SM-28 (4)
62-2-F3S	62-3-F3S	62-4-F3S	62-5-F3S	62-6-F3S	1	DM-28	HM-28	SM-28 (4)
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DM-28	HM-28	SM-28 (4)
62-2-F3S	62-3-F3S	62-4-F3S	62-5-F3S	62-6-F3S	1	DM-29	HM-29	SM-29 (4)
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DM-29	HM-29	SM-29 (4)
64-2-F3S	64-3-F3S	64-4-F3S	64-5-F3S	64-6-F3S	1	DM-29	HM-29	SM-29 (4)
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DM-30	HM-30	SM-30 (4)
64-2-F3S	64-3-F3S	64-4-F3S	64-5-F3S	64-6-F3S	1	DM-30	HM-30	SM-30 (4)
65-2-F3S	65-3-F3S	65-4-F3S	65-5-F3S	65-6-F3S	1	DM-30	HM-30	SM-30 (4)
66-2-F3S	66-3-F3S	66-4-F3S	66-5-F3S	66-6-F3S	1	DM-30	HM-30	SM-30 (4)



AB SERIES WITH BEARING

Features :

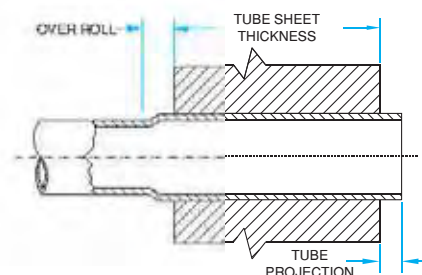
- Similar to 'A' Series expanders (Pg. 66)
- Bearing reduces frictional build up for smoother expanding cycles.
- Bearing increases useful life of tool.
- Use - High productivity tool used where flaring of tubes is not needed.



Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	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"
7/8	15	.072	1	10	.134	18.1	.712	20.4	.803	AB-31/2	AB-31/3	-	-	-
7/8	16	.065				18.4	.724	20.7	.814	AB-32/2	AB-32/3	-	-	-
7/8	17	.058	1	11	.120	18.8	.740	21.1	.830	AB-33/2	AB-33/3	-	-	-
7/8	18	.049	1	12	.109	19.4	.763	21.6	.850	AB-34/2	AB-34/3	-	-	-
7/8	19 & 20	.042 & .035	1.1/8	8	.165	19.7	.775	22.3	.877	AB-35/2	AB-35/3	-	-	-
1	13	.095				20.1	.791	22.4	.881	AB-36/2	AB-36/3	-	-	-
1	14	.083	1.1/8	9	.148	20.6	.811	23.1	.909	AB-37/2	AB-37/3	AB-37/4	-	-
1	15 & 16	.072 & .065	1.1/8	10	.134	21.3	.838	23.8	.937	AB-38/2	AB-38/3	AB-38/4	-	-
1	17 & 18	.058 & .048	1.1/8	11	.120	22.0	.866	24.5	.964	AB-39/2	AB-39/3	AB-39/4	-	-
1	19 & 20	.042 & .035	1.1/8	12	.109	22.4	.881	25.0	.984	AB-40/2	AB-40/3	AB-40/4	-	-
1.1/4	8	.165	1.1/8	13	.095	23.3	.917	25.9	1.019	AB-41/2	AB-41/3	AB-41/4	-	-
1.1/4	9	.148	1.1/8	14	.083	23.8	.937	26.5	1.043	AB-42/2	AB-42/3	AB-42/4	-	-
1.1/4	10	.134	1.1/8	15 & 16	.072 & .065	24.4	.960	27.2	1.070	AB-43/2	AB-43/3	AB-43/4	-	-
1.1/4	11	.120				25.2	.992	28.0	1.102	AB-44/2	AB-44/3	AB-44/4	-	-
1.1/4	12	.109				25.7	1.011	28.5	1.122	AB-45/2	AB-45/3	AB-45/4	-	-
1.1/4	13	.095	1.3/8	8	.165	26.1	1.027	28.8	1.133	AB-46/2	AB-46/3	AB-46/4	-	-
1.1/4	14	.083				26.4	1.039	29.2	1.149	AB-47/2	AB-47/3	AB-47/4	-	-
1.1/4	15	.072	1.3/8	9	.148	26.9	1.059	29.7	1.169	AB-48/2	AB-48/3	AB-48/4	-	-
1.1/4	16	.065	1.3/8	10	.134	27.6	1.086	30.4	1.196	AB-49/2	AB-49/3	AB-49/4	AB-49/5	AB-49/6
1.1/2	7	.180	1.3/8	11	.120	28.3	1.114	31.2	1.228	AB-50/2	AB-50/3	AB-50/4	AB-50/5	AB-50/6
1.1/2	8	.165	1.3/8	12	.109	28.8	1.133	31.7	1.248	AB-51/2	AB-51/3	AB-51/4	AB-51/5	AB-51/6
1.1/2	9	.148	1.3/8	13 & 14	.095 & .083	29.5	1.161	33.4	1.314	AB-52/2	AB-52/3	AB-52/4	AB-52/5	AB-52/6
1.1/2	10	.134	1.3/8	15 & 16	.072 & .065	30.0	1.181	34.1	1.342	AB-53/2	AB-53/3	AB-53/4	AB-53/5	AB-53/6
1.1/2	11 & 12	.120 & .109				30.6	1.204	34.8	1.370	AB-54/2	AB-54/3	AB-54/4	AB-54/5	AB-54/6
1.1/2	13	.095	1.3/4	5	.220	31.4	1.236	35.6	1.401	AB-55/2	AB-55/3	AB-55/4	AB-55/5	AB-55/6
1.1/2	14 & 15	.083 & .072	1.3/4	6	.203	32.6	1.283	36.8	1.448	AB-56/2	AB-56/3	AB-56/4	AB-56/5	AB-56/6
			1.3/4	7	.180	33.4	1.314	38.1	1.500	AB-57/2	AB-57/3	AB-57/4	AB-57/5	AB-57/6
			1.3/4	8	.165	34.2	1.346	38.7	1.523	AB-58/2	AB-58/3	AB-58/4	AB-58/5	AB-58/6
2	3	.259	1.3/4	9 & 10	.148 & .134	35.0	1.377	40.6	1.598	AB-59/2	AB-59/3	AB-59/4	AB-59/5	AB-59/6
2	4	.238	1.3/4	11 & 12	.120 & .109	36.6	1.440	42.2	1.661	AB-60/2	AB-60/3	AB-60/4	AB-60/5	AB-60/6
2	5 & 6	.220 & .203	1.3/4	13 & 14	.095 & .083	38.2	1.503	43.8	1.712	AB-61/2	AB-61/3	AB-61/4	AB-61/5	AB-61/6
2	7 & 8	.180 & .165	1.3/4	15 & 16	.072 & .065	39.8	1.566	45.4	1.787	AB-62/2	AB-62/3	AB-62/4	AB-62/5	AB-62/6
2	9 & 10	.148 & .134	2.1/4	3	.259	41.4	1.629	47.0	1.850	AB-63/2	AB-63/3	AB-63/4	AB-63/5	AB-63/6
2	11 - 13	.120 - .095	2.1/4	4	.238	42.9	1.688	49.5	1.948	AB-64/2	AB-64/3	AB-64/4	AB-64/5	AB-64/6
2	14 - 16	.083 - .065	2.1/4	6 & 7	.203 & .180	44.5	1.751	51.1	2.011	AB-65/2	AB-65/3	AB-65/4	AB-65/5	AB-65/6
2	17 & 18	.058 & .049	2.1/4	8 & 9	.165 & .148	46.1	1.814	52.7	2.074	AB-66/2	AB-66/3	AB-66/4	AB-66/5	AB-66/6

AB SERIES WITH BEARING

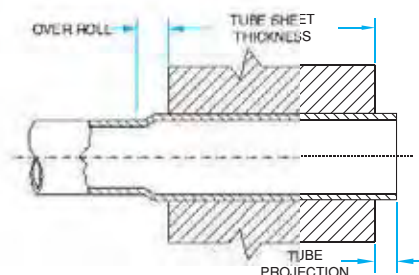
7/8"-4 1/2"
O.D.



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Drum 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"		
15-2-RS	15-3-RS	-	-	-	3/8	DMB-11
15-2-RS	15-3-RS	-	-	-	3/8	DMB-12
16-2-RS	16-3-RS	-	-	-	3/8	DMB-12
20-2-RS	20-3-RS	-	-	-	3/8	DMB-12
17-2-RS	17-3-RS	-	-	-	3/8	DMB-13
18-2-RS	18-3-RS	-	-	-	3/8	DMB-12
18-2-RS	18-3-RS	18-4-RS	-	-	3/8	DMB-13
19-2-RS	19-3-RS	19-4-RS	-	-	3/8	DMB-13
21-2-RS	21-3-RS	21-4-RS	-	-	3/8	DMB-13
21-2-RS	21-3-RS	21-4-RS	-	-	3/8	DMB-14
22-2-RS	22-3-RS	22-4-RS	-	-	3/8	DMB-14
23-2-RS	23-3-RS	23-4-RS	-	-	1/2	DMB-15
24-2-RS	24-3-RS	24-4-RS	-	-	1/2	DMB-15
26-2-RS	26-3-RS	26-4-RS	-	-	1/2	DMB-16
27-2-RS	27-3-RS	27-4-RS	-	-	1/2	DMB-16
31-2-RS	31-3-RS	31-4-RS	-	-	1/2	DMB-16
28-2-RS	28-3-RS	28-4-RS	-	-	1/2	DMB-17
29-2-RS	29-3-RS	29-4-RS	-	-	1/2	DMB-17
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DMB-17
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DMB-18
32-2-RS	32-3-RS	32-4-RS	32-5-RS	32-6-RS	1/2	DMB-18
28-2-RS	28-3-RS	28-4-RS	28-5-RS	28-6-RS	1/2	DMB-20
29-2-RS	29-3-RS	29-4-RS	29-5-RS	29-6-RS	1/2	DMB-20
30-2-RS	30-3-RS	30-4-RS	30-5-RS	30-6-RS	1/2	DMB-20
33-2-RS	33-3-RS	33-4-RS	33-5-RS	33-6-RS	1/2	DMB-20
32-2-RS	32-3-RS	32-4-RS	32-5-RS	32-6-RS	1/2	DMB-21
36-2-RS	36-3-RS	36-4-RS	36-5-RS	36-6-RS	1/2	DMB-21
37-2-RS	37-3-RS	37-4-RS	37-5-RS	37-6-RS	1/2	DMB-21
33-2-RS	33-3-RS	33-4-RS	33-5-RS	33-6-RS	3/4	DMB-22
37-2-RS	37-3-RS	37-4-RS	37-5-RS	37-6-RS	3/4	DMB-22
38-2-RS	38-3-RS	38-4-RS	38-5-RS	38-6-RS	3/4	DMB-22
39-2-RS	39-3-RS	39-4-RS	39-5-RS	39-6-RS	3/4	DMB-22
40-2-RS	40-3-RS	40-4-RS	40-5-RS	40-6-RS	3/4	DMB-22
40-2-RS	40-3-RS	40-4-RS	40-5-RS	40-6-RS	3/4	DMB-23
41-2-RS	41-3-RS	41-4-RS	41-5-RS	41-6-RS	3/4	DMB-23
42-2-RS	42-3-RS	42-4-RS	42-5-RS	42-6-RS	3/4	DMB-23



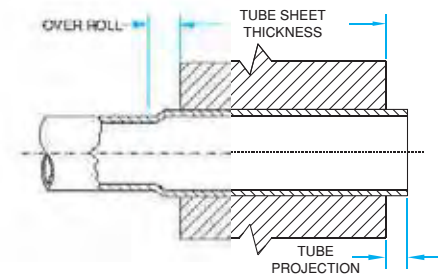
AB SERIES WITH BEARING



Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch					1/2\"	3/4\"	1.1/8\"	1.5/8\"	2.1/8\"
						mm	inch	mm	inch	To 7/8\"	To 1.1/8\"	To 1.5/8\"	To 2.1/8\"	To 2.5/8\"
2.1/2	3	.259	2.1/4	10 & 11	.134 & .120	47.7	1.877	54.3	2.137	AB-67/2	AB-67/3	AB-67/4	AB-67/5	AB-67/6
2.1/2	4 & 5	.238 & .220	2.1/4	12 & 13	.109 & .095	49.3	1.940	55.9	2.200	AB-68/2	AB-68/3	AB-68/4	AB-68/5	AB-68/6
2.1/2	6 & 7	.203 & .180	2.1/4	14 - 16	.083 - .065	50.8	2.000	57.8	2.275	AB-69/2	AB-69/3	AB-69/4	AB-69/5	AB-69/6
2.1/2	8 & 9	.165 & .148	2.3/4	3	.259	52.4	2.062	59.4	2.338	AB-70/2	AB-70/3	AB-70/4	AB-70/5	AB-70/6
2.1/2	10 & 11	.134 & .120	2.3/4	4	.238	54.0	2.125	61.0	2.401	AB-71/2	AB-71/3	AB-71/4	AB-71/5	AB-71/6
2.1/2	12 - 14	.109 - .083	2.3/4	5 & 6	.220 & .203	55.6	2.188	64.0	2.519	AB-72/2	AB-72/3	AB-72/4	AB-72/5	AB-72/6
2.1/2	15 & 16	.072 & .065	2.3/4	7 & 8	.180 & .165	57.2	2.251	65.6	2.582	AB-73/2	AB-73/3	AB-73/4	AB-73/5	AB-73/6
3	3	.259	2.3/4	9 & 10	.148 & .134	58.6	2.307	67.0	2.637	AB-74/2	AB-74/3	AB-74/4	AB-74/5	AB-74/6
3	4	.238	2.3/4	11 - 13	.120 - .095	60.4	2.377	68.8	2.708	AB-75/2	AB-75/3	AB-75/4	AB-75/5	AB-75/6
3	5 & 6	.220 & .203	2.3/4	14 - 16	.083 - .065	62.2	2.448	70.4	2.771	AB-76/2	AB-76/3	AB-76/4	AB-76/5	AB-76/6
3	7 & 8	.180 & .165				63.6	2.503	72.0	2.834	AB-77/2	AB-77/3	AB-77/4	AB-77/5	AB-77/6
3	9 & 10	.148 & .134	3.1/4	3	.259	65.0	2.559	73.4	2.889	AB-78/2	AB-78/3	AB-78/4	AB-78/5	AB-78/6
3	11 - 13	.120 - .095	3.1/4	4	.238	66.6	2.622	75.0	2.952	AB-79/2	AB-79/3	AB-79/4	AB-79/5	AB-79/6
3	14 - 16	.083 - .065	3.1/4	5 & 6	.220 & .203	68.3	2.688	76.9	3.027	AB-80/2	AB-80/3	AB-80/4	AB-80/5	AB-80/6
3.1/2	2	.284	3.1/4	7 & 8	.180 & .165	69.9	2.751	78.5	3.090	AB-81/2	AB-81/3	AB-81/4	AB-81/5	AB-81/6
3.1/2	3	.259	3.1/4	9 & 10	.148 & .134	71.5	2.814	80.1	3.153	AB-82/2	AB-82/3	AB-82/4	AB-82/5	AB-82/6
3.1/2	4	.238	3.1/4	11 - 13	.120 - .095	73.1	2.877	81.7	3.216	AB-83/2	AB-83/3	AB-83/4	AB-83/5	AB-83/6
3.1/2	5 & 6	.220 & .203	3.1/4	14 - 16	.083 - .065	74.6	2.937	84.2	3.314	AB-84/2	AB-84/3	AB-84/4	AB-84/5	AB-84/6
3.1/2	7 & 8	.180 & .165	3.3/4	2	.284	76.2	3.000	85.5	3.366	AB-85/2	AB-85/3	AB-85/4	AB-85/5	AB-85/6
3.1/2	9 - 11	.148 - .120	3.3/4	3	.259	77.8	3.062	87.4	3.440	AB-86/2	AB-86/3	AB-86/4	AB-86/5	AB-86/6
3.1/2	12 - 16	.109 - .065	3.3/4	4	.238	79.4	3.125	89.0	3.503	AB-87/2	AB-87/3	AB-87/4	AB-87/5	AB-87/6
			3.3/4	5 & 6	.220 & .203	81.0	3.188	90.6	3.566	AB-88/2	AB-88/3	AB-88/4	AB-88/5	AB-88/6
4	2	.284	3.3/4	7 & 8	.180 & .165	82.6	3.251	92.2	3.629	AB-89/2	AB-89/3	AB-89/4	AB-89/5	AB-89/6
4	3	.259	3.3/4	9 & 10	.148 & .134	84.2	3.314	93.8	3.692	AB-90/2	AB-90/3	AB-90/4	AB-90/5	AB-90/6
4	4	.238	3.3/4	11 - 13	.120 - .095	85.8	3.377	96.2	3.787	AB-91/2	AB-91/3	AB-91/4	AB-91/5	AB-91/6
4	5 & 6	.220 & .203	3.3/4	14 - 16	.083 - .065	87.4	3.440	97.8	3.850	AB-92/2	AB-92/3	AB-92/4	AB-92/5	AB-92/6
4	7 & 8	.180 & .165	4.1/4	2	.284	89.0	3.503	99.4	3.913	AB-93/2	AB-93/3	AB-93/4	AB-93/5	AB-93/6
4	9 - 11	.148 - .120	4.1/4	3	.259	90.4	3.559	100.8	3.968	AB-94/2	AB-94/3	AB-94/4	AB-94/5	AB-94/6
4	12 - 16	.109 - .065	4.1/4	4	.238	92.0	3.622	102.4	4.031	AB-95/2	AB-95/3	AB-95/4	AB-95/5	AB-95/6
			4.1/4	5 & 6	.220 & .203	93.4	3.677	103.8	4.086	AB-96/2	AB-96/3	AB-96/4	AB-96/5	AB-96/6
4.1/2	2	.284	4.1/4	7 & 8	.180 & .165	95.0	3.740	105.4	4.149	AB-97/2	AB-97/3	AB-97/4	AB-97/5	AB-97/6
4.1/2	3	.259	4.1/4	9 - 11	.148 - .120	96.6	3.803	107.0	4.212	AB-98/2	AB-98/3	AB-98/4	AB-98/5	AB-98/6
4.1/2	4 & 5	.238 & .220	4.1/4	11 - 13	.120 - .095	98.2	3.866	108.6	4.275	AB-99/2	AB-99/3	AB-99/4	AB-99/5	AB-99/6
4.1/2	6 & 7	.203 & .180				101.2	3.984	110.0	4.330	AB-100/2	AB-100/3	AB-100/4	AB-100/5	AB-100/6
4.1/2	8 & 9	.165 & .148				102.8	4.047	111.6	4.393	AB-101/2	AB-101/3	AB-101/4	AB-101/5	AB-101/6
4.1/2	10 - 12	.134 - .109				104.4	4.110	113.2	4.456	AB-102/2	AB-102/3	AB-102/4	AB-102/5	AB-102/6

AB SERIES WITH BEARING

$\frac{7}{8}" - 4\frac{1}{2}"$
O.D.



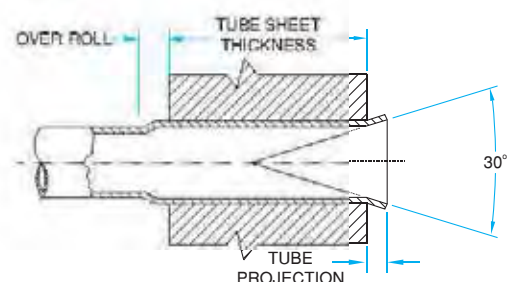
Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Drum Mandrel Model Number
1/2" To 7/8"	3/4" To 1 1/8"	1 1/8" To 1 5/8"	1 5/8" To 2 1/8"	2 1/8" To 2 5/8"		
43-2-RS	43-3-RS	43-4-RS	43-5-RS	43-6-RS	3/4	DMB-23
44-2-RS	44-3-RS	44-4-RS	44-5-RS	44-6-RS	3/4	DMB-23
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

$\frac{7}{8}" - 4\frac{1}{2}"$
O.D.

ABF3 SERIES WITH BEARING

Features :

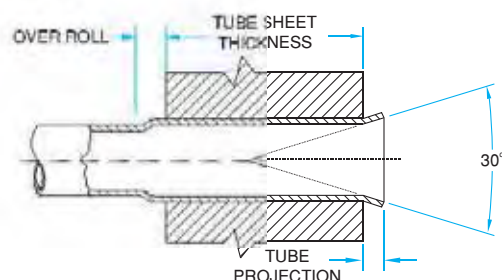
- Similar to 'AF3' Series expanders (Pg. 68)
- Bearing reduces frictional buildup for smoother expanding cycles.
- Bearing increases useful life of tool.
- Use : High productivity tool used where flaring of tubes is needed.



Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	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"
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
			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

ABF3 SERIES WITH BEARING

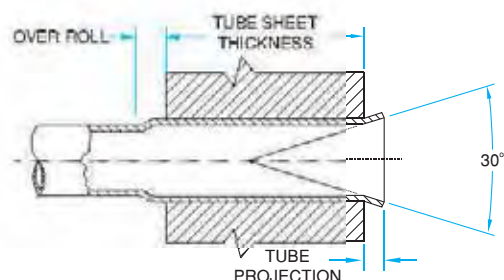
7/8"-4 1/2"
O.D.



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Drum 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"		
15-2-F3S	15-3-F3S	-	-	-	3/8	DMB-11
15-2-F3S	15-3-F3S	-	-	-	3/8	DMB-12
16-2-F3S	16-3-F3S	-	-	-	3/8	DMB-12
20-2-F3S	20-3-F3S	-	-	-	3/8	DMB-12
17-2-F3S	17-3-F3S	-	-	-	3/8	DMB-13
18-2-F3S	18-3-F3S	-	-	-	3/8	DMB-12
18-2-F3S	18-3-F3S	18-4-F3S	-	-	3/8	DMB-13
19-2-F3S	19-3-F3S	19-4-F3S	-	-	3/8	DMB-13
21-2-F3S	21-3-F3S	21-4-F3S	-	-	3/8	DMB-13
21-2-F3S	21-3-F3S	21-4-F3S	-	-	3/8	DMB-14
22-2-F3S	22-3-F3S	22-4-F3S	-	-	3/8	DMB-14
23-2-F3S	23-3-F3S	23-4-F3S	-	-	1/2	DMB-15
24-2-F3S	24-3-F3S	24-4-F3S	-	-	1/2	DMB-15
26-2-F3S	26-3-F3S	26-4-F3S	-	-	1/2	DMB-16
27-2-F3S	27-3-F3S	27-4-F3S	-	-	1/2	DMB-16
31-2-F3S	31-3-F3S	31-4-F3S	-	-	1/2	DMB-16
28-2-F3S	28-3-F3S	28-4-F3S	-	-	1/2	DMB-17
29-2-F3S	29-3-F3S	29-4-F3S	-	-	1/2	DMB-17
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DMB-17
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DMB-18
32-2-F3S	32-3-F3S	32-4-F3S	32-5-F3S	32-6-F3S	1/2	DMB-18
28-2-F3S	28-3-F3S	28-4-F3S	28-5-F3S	28-6-F3S	1/2	DMB-20
29-2-F3S	29-3-F3S	29-4-F3S	29-5-F3S	29-6-F3S	1/2	DMB-20
30-2-F3S	30-3-F3S	30-4-F3S	30-5-F3S	30-6-F3S	1/2	DMB-20
33-2-F3S	33-3-F3S	33-4-F3S	33-5-F3S	33-6-F3S	1/2	DMB-20
32-2-F3S	32-3-F3S	32-4-F3S	32-5-F3S	32-6-F3S	1/2	DMB-21
36-2-F3S	36-3-F3S	36-4-F3S	36-5-F3S	36-6-F3S	1/2	DMB-21
37-2-F3S	37-3-F3S	37-4-F3S	37-5-F3S	37-6-F3S	1/2	DMB-21
33-2-F3S	33-3-F3S	33-4-F3S	33-5-F3S	33-6-F3S	3/4	DMB-22
37-2-F3S	37-3-F3S	37-4-F3S	37-5-F3S	37-6-F3S	3/4	DMB-22
38-2-F3S	38-3-F3S	38-4-F3S	38-5-F3S	38-6-F3S	3/4	DMB-22
39-2-F3S	39-3-F3S	39-4-F3S	39-5-F3S	39-6-F3S	3/4	DMB-22
40-2-F3S	40-3-F3S	40-4-F3S	40-5-F3S	40-6-F3S	3/4	DMB-22
40-2-F3S	40-3-F3S	40-4-F3S	40-5-F3S	40-6-F3S	3/4	DMB-23
41-2-F3S	41-3-F3S	41-4-F3S	41-5-F3S	41-6-F3S	3/4	DMB-23
42-2-F3S	42-3-F3S	42-4-F3S	42-5-F3S	42-6-F3S	3/4	DMB-23



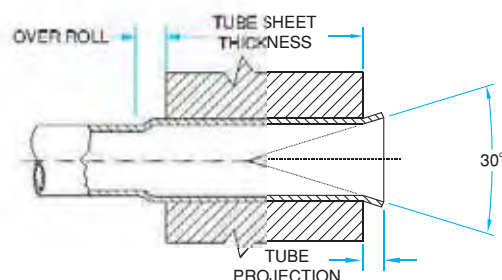
ABF3 SERIES WITH BEARING



Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	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"
2.1/2	3	.259	2.1/4	10 & 11	.134 & .120	47.7	1.877	54.3	2.137	ABF3-67/2	ABF3-67/3	ABF3-67/4	ABF3-67/5	ABF3-67/6
2.1/2	4 & 5	.238 & .220	2.1/4	12 & 13	.109 & .095	49.3	1.940	55.9	2.200	ABF3-68/2	ABF3-68/3	ABF3-68/4	ABF3-68/5	ABF3-68/6
2.1/2	6 & 7	.203 & .180	2.1/4	14 - 16	.083 - .065	50.8	2.000	57.8	2.275	ABF3-69/2	ABF3-69/3	ABF3-69/4	ABF3-69/5	ABF3-69/6
2.1/2	8 & 9	.165 & .148	2.3/4	3	.259	52.4	2.062	59.4	2.338	ABF3-70/2	ABF3-70/3	ABF3-70/4	ABF3-70/5	ABF3-70/6
2.1/2	10 & 11	.134 & .120	2.3/4	4	.238	54.0	2.125	61.0	2.401	ABF3-71/2	ABF3-71/3	ABF3-71/4	ABF3-71/5	ABF3-71/6
2.1/2	12 - 14	.109 - .083	2.3/4	5 & 6	.220 & .203	55.6	2.188	64.0	2.519	ABF3-72/2	ABF3-72/3	ABF3-72/4	ABF3-72/5	ABF3-72/6
2.1/2	15 & 16	.072 & .065	2.3/4	7 & 8	.180 & .165	57.2	2.251	65.6	2.582	ABF3-73/2	ABF3-73/3	ABF3-73/4	ABF3-73/5	ABF3-73/6
3	3	.259	2.3/4	9 & 10	.148 & .134	58.6	2.307	67.0	2.637	ABF3-74/2	ABF3-74/3	ABF3-74/4	ABF3-74/5	ABF3-74/6
3	4	.238	2.3/4	11 - 13	.120 - .095	60.4	2.377	68.8	2.708	ABF3-75/2	ABF3-75/3	ABF3-75/4	ABF3-75/5	ABF3-75/6
3	5 & 6	.220 & .203	2.3/4	14 - 16	.083 - .065	62.2	2.448	70.4	2.771	ABF3-76/2	ABF3-76/3	ABF3-76/4	ABF3-76/5	ABF3-76/6
3	7 & 8	.180 & .165				63.6	2.503	72.0	2.834	ABF3-77/2	ABF3-77/3	ABF3-77/4	ABF3-77/5	ABF3-77/6
3	9 & 10	.148 & .134	3.1/4	3	.259	65.0	2.559	73.4	2.889	ABF3-78/2	ABF3-78/3	ABF3-78/4	ABF3-78/5	ABF3-78/6
3	11 - 13	.120 - .095	3.1/4	4	.238	66.6	2.622	75.0	2.952	ABF3-79/2	ABF3-79/3	ABF3-79/4	ABF3-79/5	ABF3-79/6
3	14 - 16	.083 - .065	3.1/4	5 & 6	.220 & .203	68.3	2.688	76.9	3.027	ABF3-80/2	ABF3-80/3	ABF3-80/4	ABF3-80/5	ABF3-80/6
3.1/2	2	.284	3.1/4	7 & 8	.180 & .165	69.9	2.751	78.5	3.090	ABF3-81/2	ABF3-81/3	ABF3-81/4	ABF3-81/5	ABF3-81/6
3.1/2	3	.259	3.1/4	9 & 10	.148 & .134	71.5	2.814	80.1	3.153	ABF3-82/2	ABF3-82/3	ABF3-82/4	ABF3-82/5	ABF3-82/6
3.1/2	4	.238	3.1/4	11 - 13	.120 - .095	73.1	2.877	81.7	3.216	ABF3-83/2	ABF3-83/3	ABF3-83/4	ABF3-83/5	ABF3-83/6
3.1/2	5 & 6	.220 & .203	3.1/4	14 - 16	.083 - .065	74.6	2.937	84.2	3.314	ABF3-84/2	ABF3-84/3	ABF3-84/4	ABF3-84/5	ABF3-84/6
3.1/2	7 & 8	.180 & .165	3.3/4	2	.284	76.2	3.000	85.5	3.366	ABF3-85/2	ABF3-85/3	ABF3-85/4	ABF3-85/5	ABF3-85/6
3.1/2	9 - 11	.148 - .120	3.3/4	3	.259	77.8	3.062	87.4	3.440	ABF3-86/2	ABF3-86/3	ABF3-86/4	ABF3-86/5	ABF3-86/6
3.1/2	12 - 16	.109 - .065	3.3/4	4	.238	79.4	3.125	89.0	3.503	ABF3-87/2	ABF3-87/3	ABF3-87/4	ABF3-87/5	ABF3-87/6
			3.3/4	5 & 6	.220 & .203	81.0	3.188	90.6	3.566	ABF3-88/2	ABF3-88/3	ABF3-88/4	ABF3-88/5	ABF3-88/6
4	2	.284	3.3/4	7 & 8	.180 & .165	82.6	3.251	92.2	3.629	ABF3-89/2	ABF3-89/3	ABF3-89/4	ABF3-89/5	ABF3-89/6
4	3	.259	3.3/4	9 & 10	.148 & .134	84.2	3.314	93.8	3.692	ABF3-90/2	ABF3-90/3	ABF3-90/4	ABF3-90/5	ABF3-90/6
4	4	.238	3.3/4	11 - 13	.120 - .095	85.8	3.377	96.2	3.787	ABF3-91/2	ABF3-91/3	ABF3-91/4	ABF3-91/5	ABF3-91/6
4	5 & 6	.220 & .203	3.3/4	14 - 16	.083 - .065	87.4	3.440	97.8	3.850	ABF3-92/2	ABF3-92/3	ABF3-92/4	ABF3-92/5	ABF3-92/6
4	7 & 8	.180 & .165	4.1/4	2	.284	89.0	3.503	99.4	3.913	ABF3-93/2	ABF3-93/3	ABF3-93/4	ABF3-93/5	ABF3-93/6
4	9 - 11	.148 - .120	4.1/4	3	.259	90.4	3.559	100.8	3.968	ABF3-94/2	ABF3-94/3	ABF3-94/4	ABF3-94/5	ABF3-94/6
4	12 - 16	.109 - .065	4.1/4	4	.238	92.0	3.622	102.4	4.031	ABF3-95/2	ABF3-95/3	ABF3-95/4	ABF3-95/5	ABF3-95/6
			4.1/4	5 & 6	.220 & .203	93.4	3.677	103.8	4.086	ABF3-96/2	ABF3-96/3	ABF3-96/4	ABF3-96/5	ABF3-96/6
4.1/2	2	.284	4.1/4	7 & 8	.180 & .165	95.0	3.740	105.4	4.149	ABF3-97/2	ABF3-97/3	ABF3-97/4	ABF3-97/5	ABF3-97/6
4.1/2	3	.259	4.1/4	9 - 11	.148 - .120	96.6	3.803	107.0	4.212	ABF3-98/2	ABF3-98/3	ABF3-98/4	ABF3-98/5	ABF3-98/6
4.1/2	4 & 5	.238 & .220	4.1/4	11 - 13	.120 - .095	98.2	3.866	108.6	4.275	ABF3-99/2	ABF3-99/3	ABF3-99/4	ABF3-99/5	ABF3-99/6
4.1/2	6 & 7	.203 & .180				101.2	3.984	110.0	4.330	ABF3-100/2	ABF3-100/3	ABF3-100/4	ABF3-100/5	ABF3-100/6
4.1/2	8 & 9	.165 & .148				102.8	4.047	111.6	4.393	ABF3-101/2	ABF3-101/3	ABF3-101/4	ABF3-101/5	ABF3-101/6
4.1/2	10 - 12	.134 - .109				104.4	4.110	113.2	4.456	ABF3-102/2	ABF3-102/3	ABF3-102/4	ABF3-102/5	ABF3-102/6

ABF3 SERIES WITH BEARING

7/8"-4 1/2"
O.D.



Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Drum 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"		
43-2-F3S	43-3-F3S	43-4-F3S	43-5-F3S	43-6-F3S	3/4	DMB-23
44-2-F3S	44-3-F3S	44-4-F3S	44-5-F3S	44-6-F3S	3/4	DMB-23
43-2-F3S	43-3-F3S	43-4-F3S	43-5-F3S	43-6-F3S	3/4	DMB-24
44-2-F3S	44-3-F3S	44-4-F3S	44-5-F3S	44-6-F3S	3/4	DMB-24
45-2-F3S	45-3-F3S	45-4-F3S	45-5-F3S	45-6-F3S	3/4	DMB-24
47-2-F3S	47-3-F3S	47-4-F3S	47-5-F3S	47-6-F3S	3/4	DMB-24
46-2-F3S	46-3-F3S	46-4-F3S	46-5-F3S	46-6-F3S	1	DMB-25
47-2-F3S	47-3-F3S	47-4-F3S	47-5-F3S	47-6-F3S	1	DMB-25
48-2-F3S	48-3-F3S	48-4-F3S	48-5-F3S	48-6-F3S	1	DMB-25
49-2-F3S	49-3-F3S	49-4-F3S	49-5-F3S	49-6-F3S	1	DMB-25
50-2-F3S	50-3-F3S	50-4-F3S	50-5-F3S	50-6-F3S	1	DMB-25
51-2-F3S	51-3-F3S	51-4-F3S	51-5-F3S	51-6-F3S	1	DMB-25
52-2-F3S	52-3-F3S	52-4-F3S	52-5-F3S	52-6-F3S	1	DMB-25
51-2-F3S	51-3-F3S	51-4-F3S	51-5-F3S	51-6-F3S	1	DMB-26
52-2-F3S	52-3-F3S	52-4-F3S	52-5-F3S	52-6-F3S	1	DMB-26
53-2-F3S	53-3-F3S	53-4-F3S	53-5-F3S	53-6-F3S	1	DMB-26
54-2-F3S	54-3-F3S	54-4-F3S	54-5-F3S	54-6-F3S	1	DMB-26
54-2-F3S	54-3-F3S	54-4-F3S	54-5-F3S	54-6-F3S	1	DMB-27
55-2-F3S	55-3-F3S	55-4-F3S	55-5-F3S	55-6-F3S	1	DMB-27
56-2-F3S	56-3-F3S	56-4-F3S	56-5-F3S	56-6-F3S	1	DMB-27
57-2-F3S	57-3-F3S	57-4-F3S	57-5-F3S	57-6-F3S	1	DMB-27
58-2-F3S	58-3-F3S	58-4-F3S	58-5-F3S	58-6-F3S	1	DMB-27
59-2-F3S	59-3-F3S	59-4-F3S	59-5-F3S	59-6-F3S	1	DMB-27
60-2-F3S	60-3-F3S	60-4-F3S	60-5-F3S	60-6-F3S	1	DMB-27
59-2-F3S	59-3-F3S	59-4-F3S	59-5-F3S	59-6-F3S	1	DMB-28
60-2-F3S	60-3-F3S	60-4-F3S	60-5-F3S	60-6-F3S	1	DMB-28
61-2-F3S	61-3-F3S	61-4-F3S	61-5-F3S	61-6-F3S	1	DMB-28
62-2-F3S	62-3-F3S	62-4-F3S	62-5-F3S	62-6-F3S	1	DMB-28
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DMB-28
62-2-F3S	62-3-F3S	62-4-F3S	62-5-F3S	62-6-F3S	1	DMB-29
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DMB-29
64-2-F3S	64-3-F3S	64-4-F3S	64-5-F3S	64-6-F3S	1	DMB-29
63-2-F3S	63-3-F3S	63-4-F3S	63-5-F3S	63-6-F3S	1	DMB-30
64-2-F3S	64-3-F3S	64-4-F3S	64-5-F3S	64-6-F3S	1	DMB-30
65-2-F3S	65-3-F3S	65-4-F3S	65-5-F3S	65-6-F3S	1	DMB-30
66-2-F3S	66-3-F3S	66-4-F3S	66-5-F3S	66-6-F3S	1	DMB-30

1" - 4 1/2"
O.D.

P-1000 SERIES

Features :

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

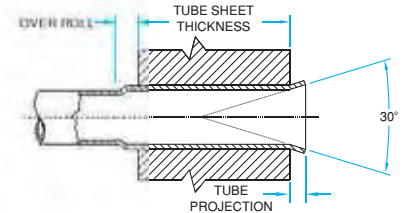


Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range				
	inch	bwg	inch	bwg	inch					1/2" To 3/4"	7/8" To 1.1/4"	1.3/8" To 1.3/4"	1.7/8" To 2.1/4"	2.3/8" To 2.3/4"
1	13 & 14	.095 & .083	1.1/8	9	.148	19.7	.775	23.4	.921	P1079/3	P1079/5	-	-	-
1	15 & 16	.072 & .065	1.1/8	10	.134	20.7	.814	24.4	.961	P1083/3	P1083/5	-	-	-
1.1/4	7	.180	1.1/8	11 & 12	.120 & .109	21.7	.854	25.5	1.004	P1087/3	P1087/5	-	-	-
1.1/4	8 & 9	.165 & .148	1.1/8	13 & 14	.095 & .083	22.7	.893	26.5	1.043	P1091/3	P1091/5	-	-	-
1.1/4	10	.134	1.1/8	15 & 16	.072 & .065	23.7	.933	28.1	1.105	P1095/3	P1095/5	-	-	-
1.1/4	11 - 13	.120 - .095	1.3/8	8	.165	24.7	.972	29.0	1.142	P1099/3	P1099/5	-	-	-
1.1/4	14 & 15	.083 & .072	1.3/8	9	.148	25.7	1.011	30.0	1.181	P1103/3	P1103/5	-	-	-
1.1/4	16	.065	1.3/8	10	.134	27.8	1.094	33.0	1.299	P1111/3	P1111/5	-	-	-
1.1/2	10 - 12	.134 - .109	1.3/8	15 & 16	.072 & .065	30.7	1.208	35.0	1.378	P1118/3	P1118/5	-	-	-
1.1/2	13 - 16	.095 - .065	1.3/4	6 & 7	.203 & .180	32.7	1.287	38.0	1.496	P1126/3	P1126/5	-	-	-
2	3	.259	1.3/4	8 & 9	.165 & .148	34.7	1.366	40.0	1.575	P1134/3	P1134/5	P1134/7	P1134/9	P1134/11
2	4 & 5	.238 & .220	1.3/4	10 - 12	.134 - .109	36.7	1.444	42.5	1.673	P1142/3	P1142/5	P1142/7	P1142/9	P1142/11
2	6	.203	1.3/4	13 - 16	.096 - .065	38.7	1.523	44.5	1.752	P1150/3	P1150/5	P1150/7	P1150/9	P1150/11
2	7 - 9	.180 - .148	2.1/4	3	.259	40.7	1.602	47.0	1.850	P1158/3	P1158/5	P1158/7	P1158/9	P1158/11
2	10 - 12	.134 - .109	2.1/4	4	.238	42.7	1.681	49.0	1.929	P1166/3	P1166/5	P1166/7	P1166/9	P1166/11
2	13 - 15	.095 - .072	2.1/4	5 & 6	.220 & .203	44.7	1.760	51.5	2.027	P1174/3	P1174/5	P1174/7	P1174/9	P1174/11
2	16	.065	2.1/4	7 - 9	.180 - .148	46.7	1.838	54.0	2.126	P1181/3	P1181/5	P1181/7	P1181/9	P1181/11
2.1/2	4 & 5	.238 & .220	2.1/4	10 - 13	.134 - .095	48.7	1.917	56.0	2.205	P1189/3	P1189/5	P1189/7	P1189/9	P1189/11
2.1/2	6	.203	2.1/4	14 - 16	.083 - .065	50.7	1.996	60.0	2.362	P1197/3	P1197/5	P1197/7	P1197/9	P1197/11
2.1/2	7 - 10	.180 - .134	2.3/4	2 & 3	.284 & .259	52.7	2.074	62.0	2.441	P1205/3	P1205/5	P1205/7	P1205/9	P1205/11
2.1/2	11 - 13	.120 - .095	2.3/4	4 & 5	.238 & .220	54.7	2.153	64.0	2.520	P1213/3	P1213/5	P1213/7	P1213/9	P1213/11
2.1/2	14 - 16	.083 - .065	2.3/4	6 - 8	.203 - .165	56.7	2.232	66.0	2.598	P1221/3	P1221/5	P1221/7	P1221/9	P1221/11
3	2	.284	2.3/4	7 - 9	.180 - .148	58.7	2.311	68.0	2.677	P1229/3	P1229/5	P1229/7	P1229/9	P1229/11
3	3 & 4	.259 & .238	2.3/4	10 - 12	.134 - .109	60.7	2.389	70.0	2.756	P1237/3	P1237/5	P1237/7	P1237/9	P1237/11
3	5 & 6	.220 & .203	2.3/4	13 - 16	.095 - .065	62.7	2.468	72.0	2.835	P1244/3	P1244/5	P1244/7	P1244/9	P1244/11
3	7 & 8	.180 & .165				64.7	2.547	74.0	2.913	P1252/3	P1252/5	P1252/7	P1252/9	P1252/11
3	10 - 12	.134 - .109	3.1/4	3	.259	66.7	2.625	76.0	2.992	P1260/3	P1260/5	P1260/7	P1260/9	P1260/11
3	13 & 14	.095 & .083	3.1/4	4	.238	68.7	2.704	78.0	3.071	P1268/3	P1268/5	P1268/7	P1268/9	P1268/11
3	15 & 16	.072 & .065	3.1/4	5 & 6	.220 & .203	70.7	2.783	80.0	3.150	P1276/3	P1276/5	P1276/7	P1276/9	P1276/11
3.1/2	2 & 3	.284 & .259	3.1/4	7 - 11	.180 - .120	72.7	2.862	82.0	3.228	P1284/3	P1284/5	P1284/7	P1284/9	P1284/11
3.1/2	4 - 6	.259 - .203	3.1/4	12 - 14	.109 - .480	74.7	2.940	84.0	3.307	P1292/3	P1292/5	P1292/7	P1292/9	P1292/11
3.1/2	7 - 9	.180 - .148	3.1/4	15 & 16	.072 & .065	76.7	3.019	86.0	3.386	P1300/3	P1300/5	P1300/7	P1300/9	P1300/11
3.1/2	10 - 12	.134 - .109	3.3/4	2 & 3	.284 & .259	78.7	3.098	88.0	3.465	P1308/3	P1308/5	P1308/7	P1308/9	P1308/11
3.1/2	13 - 15	.095 - .072	3.3/4	4 - 6	.259 - .203	80.7	3.177	92.0	3.622	P1315/3	P1315/5	P1315/7	P1315/9	P1315/11
3.1/2	16	.065	3.3/4	7 & 8	.180 & .165	82.7	3.255	94.0	3.701	P1323/3	P1323/5	P1323/7	P1323/9	P1323/11
4	3	.259	3.3/4	9 - 12	.148 - .109	84.7	3.334	96.0	3.780	P1331/3	P1331/5	P1331/7	P1331/9	P1331/11
4	4 - 6	.259 - .203	3.3/4	13 - 16	.095 - .065	86.7	3.413	98.0	3.858	P1339/3	P1339/5	P1339/7	P1339/9	P1339/11
4	7 & 8	.180 & .165	4.1/4	2	.284	88.7	3.492	100.0	3.937	P1347/3	P1347/5	P1347/7	P1347/9	P1347/11
4	9 - 12	.148 - .109	4.1/4	3	.259	90.7	3.570	102.0	4.016	P1355/3	P1355/5	P1355/7	P1355/9	P1355/11
4	13 - 15	.095 - .072	4.1/4	4	.238	92.7	3.649	104.0	4.094	P1363/3	P1363/5	P1363/7	P1363/9	P1363/11
4	16	.065	4.1/4	7 & 8	.180 & .165	94.7	3.728	106.0	4.173	P1370/3	P1370/5	P1370/7	P1370/9	P1370/11
4.1/2	3	.259	4.1/4	9 - 11	.148 - .120	96.7	3.807	108.0	4.252	P1378/3	P1378/5	P1378/7	P1378/9	P1378/11
4.1/2	4 - 6	.259 - .203	4.1/4	12 - 16	.109 - .065	98.7	3.885	110.0	4.331	P1386/3	P1386/5	P1386/7	P1386/9	P1386/11
4.1/2	7 - 14	.180 - .083				100.7	3.964	111.0	4.407	P1394/3	P1394/5	P1394/7	P1394/9	P1394/11

P-1000 SERIES

1"-4 1/2"
O.D.

P-1000 SERIES



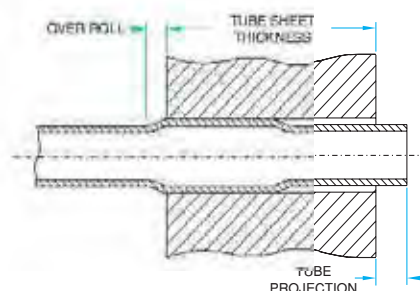
Spare Rollers Set Model Number Tube Sheet Thickness Range					Mandrel Square Drive Size inch	Spare Mandrel Model Number	
1/2" To 3/4"	7/8" To 1 1/4"	1 3/8" To 1 3/4"	1 7/8" To 2 1/4"	2 3/8" To 2 3/4"		Drum Type	Short Series Mandrels
079-3-FS	079-5-FS	-	-	-	1/2	83-MP	-
083-3-FS	083-5-FS	-	-	-	1/2	83-MP	-
087-3-FS	087-5-FS	-	-	-	1/2	91-MP	-
095-3-FS	095-5-FS	-	-	-	1/2	91-MP	-
095-3-FS	095-5-FS	-	-	-	1/2	99-MP	-
099-3-FS	099-5-FS	-	-	-	1/2	99-MP	-
103-3-FS	103-5-FS	-	-	-	1/2	99-MP	-
111-3-FS	111-5-FS	-	-	-	3/4	118-MP	MPS-1,2,3
118-3-FS	118-5-FS	-	-	-	3/4	118-MP	MPS-1,2,3
126-3-FS	126-5-FS	-	-	-	3/4	126-MP	MPS-2,3,4
126-3-FS	126-5-FS	126-7-FS	126-9-FS	126-11-FS	3/4	134-MP	MPS-3,4,5
142-3-FS	142-5-FS	142-7-FS	142-9-FS	142-11-FS	3/4	150-MP	MPS-3,4,5,6
150-3-FS	150-5-FS	150-7-FS	150-9-FS	150-11-FS	3/4	150-MP	MPS-3,4,5,6
158-3-FS	158-5-FS	158-7-FS	158-9-FS	158-11-FS	3/4	174-MP	MPS-4,5,6,7,8
166-3-FS	166-5-FS	166-7-FS	166-9-FS	166-11-FS	3/4	174-MP	MPS-4,5,6,7,8
174-3-FS	174-5-FS	174-7-FS	174-9-FS	174-11-FS	3/4	174-MP	MPS-4,5,6,7,8
181-3-FS	181-5-FS	181-7-FS	181-9-FS	181-11-FS	1	197-MP	MPS-7,8,9,10,11
174-3-FS	174-5-FS	174-7-FS	174-9-FS	174-11-FS	1	197-MP	MPS-7,8,9,10,11
205-3-FS	205-5-FS	205-7-FS	205-9-FS	205-11-FS	1	197-MP	MPS-6,7,8,9,10,11
205-3-FS	205-5-FS	205-7-FS	205-9-FS	205-11-FS	1	221-MP	MPS-7,8,9,10,11,12
213-3-FS	213-5-FS	213-7-FS	213-9-FS	213-11-FS	1	221-MP	MPS-7,8,9,10,11,12
221-3-FS	221-5-FS	221-7-FS	221-9-FS	221-11-FS	1	221-MP	MPS-7,8,9,10,11,12
221-3-FS	221-5-FS	221-7-FS	221-9-FS	221-11-FS	1	244-MP	MPS-8,9,10,11,12,13
237-3-FS	237-5-FS	237-7-FS	237-9-FS	237-11-FS	1	244-MP	MPS-8,9,10,11,12,13
252-3-FS	252-5-FS	252-7-FS	252-9-FS	252-11-FS	1	244-MP	MPS-8,9,10,11,12,13
252-3-FS	252-5-FS	252-7-FS	252-9-FS	252-11-FS	1	268-MP	MPS-10,11,12,13,14
260-3-FS	260-5-FS	260-7-FS	260-9-FS	260-11-FS	1	268-MP	MPS-10,11,12,13,14
268-3-FS	268-5-FS	268-7-FS	268-9-FS	268-11-FS	1	268-MP	MPS-10,11,12,13,14
276-3-FS	276-5-FS	276-7-FS	276-9-FS	276-11-FS	1	300-MP	MPS-12,13,14,15,16
284-3-FS	284-5-FS	284-7-FS	284-9-FS	284-11-FS	1	300-MP	MPS-12,13,14,15,16
292-3-FS	292-5-FS	292-7-FS	292-9-FS	292-11-FS	1	300-MP	MPS-12,13,14,15,16
315-3-FS	315-5-FS	315-7-FS	315-9-FS	315-11-FS	1	300-MP	MPS-12,13,14,15,16
284-3-FS	284-5-FS	284-7-FS	284-9-FS	284-11-FS	1	347-MP	MPS-15,16,17,18,19
315-3-FS	315-5-FS	315-7-FS	315-9-FS	315-11-FS	1	347-MP	MPS-14,15,16,17,18,19
323-3-FS	323-5-FS	323-7-FS	323-9-FS	323-11-FS	1	347-MP	MPS-14,15,16,17,18,19
331-3-FS	331-5-FS	331-7-FS	331-9-FS	331-11-FS	1	347-MP	MPS-14,15,16,17,18,19
355-3-FS	355-5-FS	355-7-FS	355-9-FS	355-11-FS	1	347-MP	MPS-14,15,16,17,18,19
363-3-FS	363-5-FS	363-7-FS	363-9-FS	363-11-FS	1	347-MP	MPS-14,15,16,17,18,19
355-3-FS	355-5-FS	355-7-FS	355-9-FS	355-11-FS	1	394-MP	MPS-17,18,19,20,21
363-3-FS	363-5-FS	363-7-FS	363-9-FS	363-11-FS	1	394-MP	MPS-17,18,19,20,21
370-3-FS	370-5-FS	370-7-FS	370-9-FS	370-11-FS	1	394-MP	MPS-17,18,19,20,21
378-3-FS	378-5-FS	378-7-FS	378-9-FS	378-11-FS	1	394-MP	MPS-17,18,19,20,21
386-3-FS	386-5-FS	386-7-FS	386-9-FS	386-11-FS	1	394-MP	MPS-17,18,19,20,21
394-3-FS	394-5-FS	394-7-FS	394-9-FS	394-11-FS	1	394-MP	MPS-17,18,19,20,21

$\frac{1}{4}$ "- $\frac{1}{2}$ "
O.D.

P-3000 SERIES WITH COLLAR

Features :

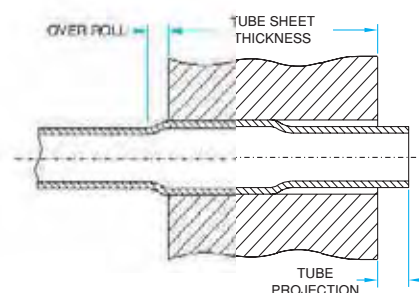
- Expander can be accurately positioned in the boiler tube in relation to the drum, for consistent expansions.
- Use - For boiler tube sheets and drums thicker than 2.3/4" (70mm). Normally used in conjunction with P-1000 Series.



Tube O.D.	Tube Thickness		Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Expander Model Number Tube Sheet Thickness Range	
	bwg	inch		bwg	inch					1/2" To 4.3/8"	1.1/2" To 5.3/8"
1.1/4	16	.065	1.3/8	10	.134	27.8	1.094	33.0	1.299	P3111/7	-
1.1/2	10 - 12	.134 - .109	1.3/8	13 - 16	.095 - .065	30.7	1.208	35.0	1.378	P3118/7	-
1.1/2	13 - 16	.095 - .065	1.3/4	5 - 7	.220 - .180	32.7	1.287	38.0	1.496	P3126/7	-
2	3	.259	1.3/4	8 & 9	.165 & .148	34.7	1.366	40.0	1.575	P3134/7	P3134/11
2	4 & 5	.238 & .220	1.3/4	10 - 12	.134 - .109	36.7	1.444	42.5	1.673	P3142/7	P3142/11
2	6	.203	1.3/4	13 - 16	.095 - .065	38.7	1.523	44.5	1.752	P3150/7	P3150/11
2	7 - 9	.180 - .148	2.1/4	3	.259	40.7	1.602	47.0	1.850	P3158/7	P3158/11
2	10 - 12	.134 - .109	2.1/4	4 & 5	.238 & .220	42.7	1.681	49.0	1.929	P3166/7	P3166/11
2	13 - 15	.095 - .072	2.1/4	6 & 7	.203 & .180	44.7	1.760	51.5	2.027	P3174/7	P3174/11
2	16	.065	2.1/4	8 & 9	.165 & .148	46.7	1.838	54.0	2.126	P3181/7	P3181/11
2.1/2	4 & 5	.238 - .220	2.1/4	10 - 13	.134 - .095	48.7	1.917	65.0	2.205	P3189/7	P3189/11
2.1/2	6	.203	2.1/4	14 - 6	.083 - .065	50.7	1.996	60.0	2.362	P3197/7	P3197/11
2.1/2	7 - 10	.180 - .134	2.3/4	3	.259	52.7	2.074	62.0	2.441	P3205/7	P3205/11
2.1/2	11 - 13	.120 - .095	2.3/4	4 & 5	.238 & .220	54.7	2.153	64.0	2.520	P3213/7	P3213/11
2.1/2	14 - 16	.083 - .065	2.3/4	6	.203	56.7	2.232	66.0	2.598	P3221/7	P3221/11
3	2 & 3	.284 & .259	2.3/4	7 - 9	.203 - .148	58.7	2.311	68.0	2.677	P3229/7	P3229/11
3	4	.238	2.3/4	10 - 12	.134 - .109	60.7	2.389	70.0	2.756	P3237/7	P3237/11
3	5 & 6	.220 - .203	2.3/4	13 - 16	.095 - .065	62.7	2.468	72.0	2.835	P3244/7	P3244/11
3	7 - 9	.180 - .148	3.1/4	2 & 3	.284 & .259	64.7	2.547	74.0	2.913	P3252/7	P3252/11
3	10 - 12	.134 - .109	3.1/4	4	.238	66.7	2.625	76.0	2.992	P3260/7	P3260/11
3	13 - 14	.095 - .083	3.1/4	5	.220	68.7	2.704	78.0	3.071	P3268/7	P3268/11
3	15 & 16	.072 & .065	3.1/4	6	.203	70.7	2.783	80.0	3.150	P3276/7	P3276/11
3.1/2	3 & 4	.284 & .238	3.1/4	7 - 11	.203 - .120	72.7	2.862	82.0	3.228	P3284/7	P3284/11
3.1/2	5 & 6	.220 & .203	3.1/4	12 - 14	.109 - .083	74.7	2.940	84.0	3.307	P3292/7	P3292/11
3.1/2	7 - 9	.180 - .148	3.1/8	15 & 16	.072 & .065	76.7	3.019	86.0	3.386	P3300/7	P3300/11
3.1/2	10 - 12	.134 - .109	3.1/4	3 & 4	.284 & .238	78.7	3.098	88.0	3.465	P3308/7	P3308/11
3.1/2	13 - 15	.095 - .072	3.3/4	5 & 6	.220 & .203	80.7	3.177	92.0	3.622	P3315/7	P3315/11
3.1/2	16	.065	3.3/4	7 & 8	.203 & .165	82.7	3.255	94.0	3.701	P3323/7	P3323/11
4	3 & 4	.284 & .238	3.3/4	9 - 12	.148 - .109	84.7	3.334	96.0	3.780	P3331/7	P3331/11
4	5 & 6	.220 & .203	3.3/4	13 - 16	.095 - .065	86.7	3.413	98.0	3.858	P3339/7	P3339/11
4	7 & 8	.180 & .165	4.1/4	2	.284	88.7	3.492	100.0	3.937	P3347/7	P3347/11
4	9 - 12	.148 - .109	4.1/4	3 & 4	.284 & .238	90.7	3.570	102.0	4.016	P3355/7	P3355/11
4	13 - 15	.095 - .072	4.1/4	5 & 6	.220 & .203	92.7	3.649	104.0	4.094	P3363/7	P3363/11
4	16	.065	4.1/4	7 & 8	.203 & .165	94.7	3.728	106.0	4.173	P3370/7	P3370/11
4.1/2	3	.284	4.1/4	9 - 11	.148 - .120	96.7	3.807	108.0	4.252	P3378/7	P3378/11
4.1/2	4 - 6	.238 - .203	4.1/4	12 - 16	.109 - .065	98.7	3.885	110.0	4.331	P3386/7	P3386/11
4.1/2	7 - 14	.180 - .083				100.7	3.964	111.0	4.407	P3394/7	P3394/11

P-3000 SERIES WITH COLLAR

1/4" - 4 1/2"
O.D.

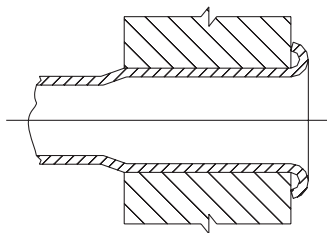


Spare Rollers Set Model Number Tube Sheet Thickness Range		Mandrel Square Drive Size inch	Spare Mandrel Model Number	
1/2" To 4.3/8"	1.1/2" To 5.3/8"		Drum Type	Short Series Mandrels
111-7-RS	-	3/4	118-M	MS-1,2,3
118-7-RS	-	3/4	118-M	MS-1,2,3
126-7-RS	-	3/4	126-M	MS-2,3,4
126-7-RS	126-11-RS	3/4	134-M	MS-3,4,5
142-7-RS	142-11-RS	3/4	150-M	MS-3,4,5,6
150-7-RS	150-11-RS	3/4	150-M	MS-3,4,5,6
158-7-RS	158-11-RS	3/4	174-M	MS-4,5,6,7,8
166-7-RS	166-11-RS	3/4	174-M	MS-4,5,6,7,8
174-7-RS	174-11-RS	3/4	174-M	MS-4,5,6,7,8
181-7-RS	181-11-RS	1	197-M	MS-7,8,9,10,11,12
174-7-RS	174-11-RS	1	197-M	MS-7,8,9,10,11,12
205-7-RS	205-11-RS	1	197-M	MS-6,7,8,9,10,11,12
205-7-RS	205-11-RS	1	221-M	MS-7,8,9,10,11,12
213-7-RS	213-11-RS	1	221-M	MS-7,8,9,10,11,12
221-7-RS	221-11-RS	1	221-M	MS-7,8,9,10,11,12
221-7-RS	221-11-RS	1	244-M	MS-8,9,10,11,12,13
237-7-RS	237-11-RS	1	244-M	MS-8,9,10,11,12,13
252-7-RS	252-11-RS	1	244-M	MS-8,9,10,11,12,13
252-7-RS	252-11-RS	1	268-M	MS-10,11,12,13,14
260-7-RS	260-11-RS	1	268-M	MS-10,11,12,13,14
268-7-RS	268-11-RS	1	268-M	MS-10,11,12,13,14
276-7-RS	276-11-RS	1	300-M	MS-12,13,14,15,16
284-7-RS	284-11-RS	1	300-M	MS-12,13,14,15,16
292-7-RS	292-11-RS	1	300-M	MS-12,13,14,15,16
315-7-RS	315-11-RS	1	300-M	MS-12,13,14,15,16
284-7-RS	284-11-RS	1	347-M	MS-15,16,17,18,19
315-7-RS	315-11-RS	1	347-M	MS-14,15,16,17,18,19
323-7-RS	323-11-RS	1	347-M	MS-14,15,16,17,18,19
331-7-RS	331-11-RS	1	347-M	MS-14,15,16,17,18,19
355-7-RS	355-11-RS	1	347-M	MS-14,15,16,17,18,19
363-7-RS	363-11-RS	1	347-M	MS-14,15,16,17,18,19
355-7-RS	355-11-RS	1	394-M	MS-17,18,19,20,21
363-7-RS	363-11-RS	1	394-M	MS-17,18,19,20,21
370-7-RS	370-11-RS	1	394-M	MS-17,18,19,20,21
378-7-RS	378-11-RS	1	394-M	MS-17,18,19,20,21
386-7-RS	386-11-RS	1	394-M	MS-17,18,19,20,21
394-7-RS	394-11-RS	1	394-M	MS-17,18,19,20,21

2"-3"
O.D.

COMBINATION BEADING EXPANDERS

TUBE EXPANDING AND BEADING IN SINGLE OPERATION



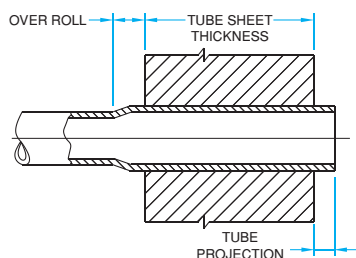
	Previously	Now
Tools Required	1) Flaring tube expander 2) Tube expander drive 3) Beading tool 4) Air hammer	1) COMBINATION BEADING EXPANDER 2) Tube Expander Drive
Operating Steps	1) Expand 2) Bead 3) Reroll	1) Expand and Bead (single operation)
Operator Fatigue	high...largely due to air hammer vibration and noise	Reduced significantly no air hammer for beading ... no rerolling

Tube O.D. inch	Tube Thickness		Expansion Range		Model No.	Mandrel Model No. (Square)	Spare Roller Set Model No.	Beading Roll Model No.	Guide Roll Assembly Model No.
	bwg	inch	mm	inch					
2	10	.134	43.2 - 48.41	1.700 - 1.906	41633 - 0010	41615 (3/4")	41670 set of 4	41631 - 0010	41701 - 0010
	11	.120			41633 - 0011			41631 - 0011	41701 - 0011
	12	.109			41633 - 0012			41631 - 0012	41701 - 0012
	13	.095			41633 - 0013			41631 - 0013	41701 - 0013
2.1/2	10	.134	55.9 - 62.48	2.200 - 2.460	41634 - 0010	41635 (1")	41673 set of 5	41651 - 0010	41702 - 0010
	11	.120			41634 - 0011			41651 - 0011	41702 - 0011
	12	.109			41634 - 0012			41651 - 0012	41702 - 0012
	13	.095			41634 - 0013			41651 - 0013	41702 - 0013
3	10	.134	68.6 - 75.69	2.700 - 2.980	41359 - 0010	41653 (1")	41676 set of 5	41666 - 0010	41703 - 0010
	11	.120			41359 - 0011			41666 - 0011	41703 - 0011
	12	.109			41359 - 0012			41666 - 0012	41703 - 0012

Note : Refer to operation manual for other spare parts. Reverse mandrels are available.

1"-3"
O.D.

V SERIES NON PARALLEL EXPANSION



- Use : Type 'V' Expander is used for repair and erection of boilers having thin tube sheets. It is approximately twice as fast during use than other conventional expanders. Use Header Mandrel when expander is to be used through a waterleg.

Tube O.D. inch	Tube Thickness		Expansion Range		Effective Rolling Length		Tube Expander Model No.	Spare Mandrel			Spare Roller Set Model No.
	bwg	inch	Dim.A - Dim.B mm	Dim.A - Dim.B inch	mm	inch		Short Mandrel Model No.	Header Mandrel Model No.	Mandrel Sq. Size inch	
1	10 - 13	.134 - .095	17.3 - 23.7	.681 - .937	84.20	3.5/16	V - 1	VSM - 1	VHM - 1	1/2	VR - 1
1.1/4	10 - 13	.134 - .095	23.8 - 30.6	.940 - 1.206	84.20	3.5/16	V - 2	VSM - 2	VHM - 2	1/2	VR - 2
1.1/2	10 - 13	.134 - .095	29.3 - 37.3	1.156 - 1.469	101.20	4.000	V - 3	VSM - 3	VHM - 3	1/2	VR - 3
2	10 - 13	.134 - .095	42.3 - 49.7	1.665 - 1.960	101.20	4.000	V - 4	VSM - 4	VHM - 4	3/4	VR - 4
2.1/2	10 - 13	.134 - .095	54.5 - 62.7	2.145 - 2.469	101.20	4.000	V - 5	VSM - 5	VHM - 5	3/4	VR - 5
3	10 - 13	.134 - .095	68.2 - 76.6	2.687 - 3.015	101.20	4.000	V - 6	VSM - 6	VHM - 6	1	VR - 6

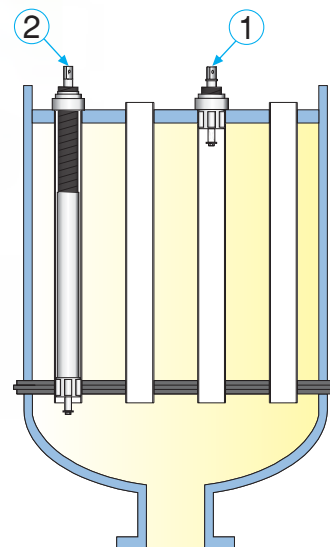
Note : Other sizes available on request.

SB SERIES FOR SUGAR MILLS

1 1/2" - 4 1/2"
O.D.

Features :

- '5 Roll' design is used primarily for rolling thin walled tubes used in sugar mill juice heaters, pans.
- '5 Rolls' give you a more concentric, uniform expansion vs. a '3 roll' expander in thin tubes and reduces tube 'spring back' effect.
- Use - For top plate tube expansion in pans, juice heaters in sugar mills.



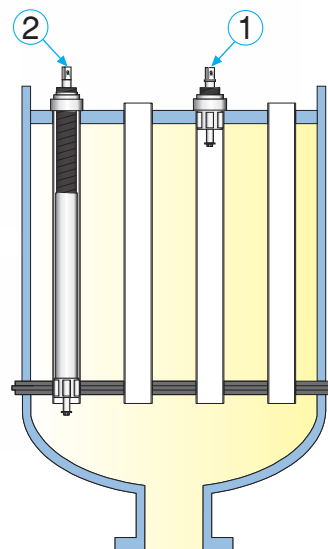
Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Sheet Thickness mm (inch)			Spare Mandrel Model No.	Mandrel Sq. Drive	Spare Rollers Set Model No.		
							31.75 (1.25)	38.1 (1.5)	50.8 (2.0)					
	inch	bwg	inch	mm	inch	mm	inch	Tube Expander Model No.						
1.1/2	11 & 12	.120 & .109	31.0	1.220	33.2	1.307	SB-00A	SB-00B	SB-00C	SBM-1	1/2	SBR-1A	SBR-1B	SBR-1C
1.1/2	13 & 14	.095 & .083	32.5	1.279	36.0	1.417	SB-0A	SB-0B	SB-0C	SBM-2	1/2	SBR-2A	SBR-2B	SBR-2C
1.1/2	15 & 16	.072 & .065	33.5	1.319	37.2	1.465	SB-1A	SB-1B	SB-1C	SBM-2	1/2	SBR-3A	SBR-3B	SBR-3C
1.3/4	9 & 10	.148 & .134	35.2	1.386	39.1	1.539	SB-2A	SB-2B	SB-2C	SBM-3	3/4	SBR-3A	SBR-3B	SBR-3C
1.3/4	11 & 12	.120 & .109	36.5	1.437	40.5	1.594	SB-3A	SB-3B	SB-3C	SBM-3	3/4	SBR-4A	SBR-4B	SBR-4C
1.3/4	13 & 14	.095 & .083	38.1	1.500	42.7	1.681	SB-4A	SB-4B	SB-4C	SBM-3	3/4	SBR-5A	SBR-5B	SBR-5C
1.3/4	15 & 16	.072 & .065	39.1	1.539	44.2	1.740	SB-5A	SB-5B	SB-5C	SBM-4	3/4	SBR-4A	SBR-4B	SBR-4C
2	7 & 8	.180 & .165	41.3	1.626	46.7	1.838	SB-6A	SB-6B	SB-6C	SBM-4	3/4	SBR-5A	SBR-5B	SBR-5C
2	9 & 10	.148 & .134	42.8	1.685	48.3	1.901	SB-7A	SB-7B	SB-7C	SBM-4	3/4	SBR-6A	SBR-6B	SBR-6C
2	11 - 13	.120 - .095	44.4	1.748	49.7	1.957	SB-8A	SB-8B	SB-8C	SBM-5	3/4	SBR-6A	SBR-6B	SBR-6C
2	14 - 16	.083 - .065	46.0	1.811	52.2	2.055	SB-9A	SB-9B	SB-9C	SBM-5	3/4	SBR-7A	SBR-7B	SBR-7C
2.1/4	9 & 10	.148 & .134	47.6	1.874	53.8	2.118	SB-10A	SB-10B	SB-10C	SBM-5	3/4	SBR-8A	SBR-8B	SBR-8C
2.1/4	11 - 13	.120 - .095	49.2	1.937	55.4	2.181	SB-11A	SB-11B	SB-11C	SBM-5	3/4	SBR-9A	SBR-9B	SBR-9C
2.1/4	14 - 16	.083 - .065	50.7	1.996	57.8	2.275	SB-12A	SB-12B	SB-12C	SBM-6	3/4	SBR-8A	SBR-8B	SBR-8C
2.1/2	9 & 10	.148 & .134	54.9	2.161	61.0	2.401	SB-13A	SB-13B	SB-13C	SBM-6	3/4	SBR-10A	SBR-10B	SBR-10C
2.1/2	14 - 16	.083 - .065	57.1	2.248	65.6	2.582	SB-14A	SB-14B	SB-14C	SBM-7	1	SBR-11A	SBR-11B	SBR-11C
2.3/4	10 - 14	.134 - .083	60.3	2.374	68.8	2.708	SB-15A	SB-15B	SB-15C	SBM-7	1	SBR-12A	SBR-12B	SBR-12C
3	7 - 9	.180 - .148	63.5	2.500	72.0	2.835	SB-16A	SB-16B	SB-16C	SBM-7	1	SBR-13A	SBR-13B	SBR-13C
3	10 - 14	.134 - .083	66.5	2.618	75.0	2.953	SB-17A	SB-17B	SB-17C	SBM-7	1	SBR-14A	SBR-14B	SBR-14C
3.1/4	7 & 8	.180 & .165	69.8	2.748	78.5	3.090	SB-18A	SB-18B	SB-18C	SBM-8	1	SBR-14A	SBR-14B	SBR-14C
3.1/2	4 & 5	.238 & .220	73.0	2.874	81.7	3.216	SB-19A	SB-19B	SB-19C	SBM-8	1	SBR-15A	SBR-15B	SBR-15C
3.1/2	6 - 8	.203 - .165	76.1	2.996	85.8	3.378	SB-20A	SB-20B	SB-20C	SBM-9	1	SBR-16A	SBR-16B	SBR-16C
3.3/4	4 & 5	.238 & .220	79.3	3.122	89.0	3.504	SB-21A	SB-21B	SB-21C	SBM-9	1	SBR-17A	SBR-17B	SBR-17C
3.3/4	6 - 8	.203 - .165	82.5	3.248	92.2	3.629	SB-22A	SB-22B	SB-22C	SBM-9	1	SBR-18A	SBR-18B	SBR-18C
4	3 & 4	.259 & .238	85.7	3.374	96.2	3.787	SB-23A	SB-23B	SB-23C	SBM-10	1	SBR-18A	SBR-18B	SBR-18C
4	10 - 16	.134 - .065	90.3	3.555	100.8	3.968	SB-24A	SB-24B	SB-24C	SBM-10	1	SBR-19A	SBR-19B	SBR-19C
4.1/4	6 - 8	.203 - .165	94.9	3.736	105.2	4.141	SB-25A	SB-25B	SB-25C	SBM-11	1	SBR-20A	SBR-20B	SBR-20C
4.1/2	4 - 7	.238 - .180	89.7	3.531	110.9	4.366	SB-26A	SB-26B	SB-26C	SBM-11	1	SBR-21A	SBR-21B	SBR-21C
4.1/2	8 - 10	.165 - .134	104.3	4.106	113.1	4.452	SB-27A	SB-27B	SB-27C	SBM-12	1	SBR-21A	SBR-21B	SBR-21C

$1\frac{3}{4}" - 4"$
O.D.

LONG REACH CSB SERIES

Features :

- '5 Roll' design is used primarily for rolling thin walled tubes used in sugar mill juice heaters, pans.
- '5 Rolls' give you a more concentric, uniform expansion vs. a '3 roll' expander in thin tubes and reduces tube 'spring back' effect.
- Use - For bottom plate tube expansion in pans, juice heaters in sugar mills.



Tube O.D.	Tube Thickness		Minimum I.D. Tool Enters		Maximum Expansion Of Tool		Tube Sheet Thickness 'T'		Depth in Mtrs.		Mandrel Sq. Size	Oal	Weight in Kgs.	Tube Expander Model No.	Spare Mandrel Model No.	Spare Rollers Set Model No.
inch	bwg	inch	mm	inch	mm	inch	mm	inch	min	max	inch	Mtrs.				
CSB-5 (3 Rollers)																
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	10.0	CSB-5STD	CSBM-5STD	CSBR-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	11.2	CSB-5A	CSBM-5A	CSBR-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	12.4	CSB-5B	CSBM-5B	CSBR-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	13.7	CSB-5C	CSBM-5C	CSBR-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	14.9	CSB-5D	CSBM-5D	CSBR-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	16.2	CSB-5E	CSBM-5E	CSBR-5
CSB-9 (5 Rollers)																
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	CSB-9STD	CSBM-9STD	CSBR-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	CSB-9A	CSBM-9A	CSBR-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	CSB-9B	CSBM-9B	CSBR-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	CSB-9C	CSBM-9C	CSBR-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	CSB-9D	CSBM-9D	CSBR-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	CSB-9E	CSBM-9E	CSBR-9
CSB-24 (5 Rollers)																
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	CSB-24STD	CSBM-24STD	CSBR-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	CSB-24A	CSBM-24A	CSBR-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	CSB-24B	CSBM-24B	CSBR-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	CSB-24C	CSBM-24C	CSBR-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	CSB-24D	CSBM-24D	CSBR-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	CSB-24E	CSBM-24E	CSBR-24

Note : Other sizes, special lengths are available on request.

Taper Shank - Interchangeable Female Square

Morse Taper No.	Square Size	Model No.	Insert Square Size	Insert Model No.
2	3/8"	MM/2/95	3/8"	MDT/95
	1/2"	MM/2/127	1/2"	MDT/127
3	3/8"	MM/3/95	3/8"	MDT/95
	1/2"	MM/3/127	1/2"	MDT/127
	3/4"	MM/3/190	3/4"	MDT/190
	1"	MM/3/254	1"	MDT/254
4	3/8"	MM/4/95	3/8"	MDT/95
	1/2"	MM/4/127	1/2"	MDT/127
	3/4"	MM/4/190	3/4"	MDT/190
	1"	MM/4/254	1"	MDT/254
5	3/8"	MM/5/95	3/8"	MDT/95
	1/2"	MM/5/127	1/2"	MDT/127
	3/4"	MM/5/190	3/4"	MDT/190
	1"	MM/5/254	1"	MDT/254



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 - Male Square



Morse Taper No.	Square Size	Model No.
1	3/8"	MTM/1/95
	1/2"	MTM/1/127
2	3/8"	MTM/2/95
	1/2"	MTM/2/127
3	3/4"	MTM/3/190
	1"	MTM/3/254
4	3/4"	MTM/4/190
	1"	MTM/4/254

Taper Shank - Female Square



Morse Taper No.	Square Size	Model No.
1	3/8"	MTF/1/95
	1/2"	MTF/1/127
2	3/8"	MTF/2/95
	1/2"	MTF/2/127
3	3/4"	MTF/3/190
	1"	MTF/3/254
4	3/4"	MTF/4/190
	1"	MTF/4/254

Triangle Shank - Female Square



Square Size	Chuck Size	Model No.
3/8"	1/4"	MTC/95/63
3/8"	3/8"	MTC/95/95
3/8"	1/2"	MTC/95/127
1/2"	1/2"	MTC/127/127

Reversible Ratchet Wrench



Square Size	Length	Model No.
3/8"	8"	HR/95
1/2"	10"	HR/127
3/4"	20"	HR/195
1"	24"	HR/254

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

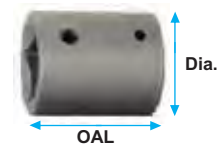
ACCESSORIES

Male x Male Drive Extensions



Square Sizes	Model No.	OAL	Dia.
3/8"	EB/95/6	6"	1/2"
	EB/95/9	9"	
	EB/95/12	12"	
	EB/95/18	18"	
1/2"	EB/127/6	6"	5/8"
	EB/127/9	9"	
	EB/127/12	12"	
	EB/127/18	18"	
	EB/127/24	24"	
3/4"	EB/195/6	6"	1"
	EB/195/9	9"	
	EB/195/12	12"	
	EB/195/18	18"	
	EB/195/24	24"	
1"	EB/254/6	6"	1.1/4"
	EB/254/12	12"	
	EB/254/14	14"	
	EB/254/18	18"	
	EB/254/24	24"	

Female x Female Extension Couplings



Square Sizes	Model No.	OAL	Dia.
3/8" x 3/8"	EC/95/95	1.7/16"	13/16"
3/8" x 1/2"	EC/95/127	1.9/16"	1.1/16"
3/8" x 5/8"	EC/95/158	1.1/2"	1.1/4"
1/2" x 1/2"	EC/127/127	1.11/16"	1.1/16"
1/2" x 5/8"	EC/127/158	1.5/8"	1.1/4"
1/2" x 3/4"	EC/127/195	1.5/8"	1.3/8"
1/2" x 7/8"	EC/127/222	1.5/8"	1.5/8"
1/2" x 1"	EC/127/254	1.5/8"	1.7/8"
5/8" x 3/4"	EC/158/195	1.9/16"	1.3/8"
5/8" x 7/8"	EC/158/222	2"	1.5/8"
5/8" x 1"	EC/158/254	1.13/16"	1.7/8"
3/4" x 3/4"	EC/195/195	1.5/8"	1.7/16"
3/4" x 7/8"	EC/195/222	1.5/8"	1.3/4"
3/4" x 1"	EC/195/254	1.13/16"	1.7/8"
7/8" x 7/8"	EC/222/222	1.11/16"	1.3/4"
7/8" x 1"	EC/222/254	2.1/8"	2.1/8"
1" x 1"	EC/254/254	2.1/16"	1.7/8"

UNIVERSAL JOINTS

Universal Joint Female-Female

Square Sizes	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 Sizes	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"



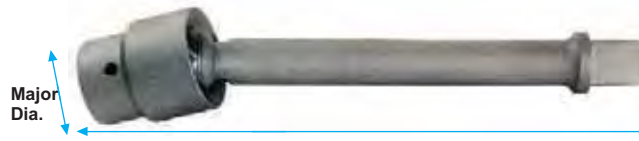
Double Universal Joint Female-Female

Square Sizes	Model No.	OAL	Major Dia.
3/8"	DUJ/95	3.15/16"	1.1/8"
1/2"	DUJ/127	4"	1.5/16"
3/4"	DUJ/195	4.11/16"	1.5/8"
1"	DUJ/254	6.1/32"	2.1/4"



UNIVERSAL JOINTS

Extension Universal Joint Female - Male



Square Size Female	Square Size Male	Model No.	OAL	Major Dia.	Square Size Female	Square Size Male	Model No.	OAL	Major Dia.
3/8"	3/8"	UE/95/6	6"	1.1/8"	3/4"	3/4"	UE/195/9	9"	1.3/4"
		UE/95/9	9"				UE/195/12	12"	
		UE/95/12	12"				UE/195/16	16"	
3/8"	1/2"	UE/95S/9	9"	UE/195/20			20"		
		UE/95S/12	12"	1.1/8"			1"	1"	UE/254/9
		UE/95S/16	16"		UE/254/12	12"			
1/2"	1/2"	UE/127/6	6"	1.5/16"	1"	1"	UE/254/16	16"	
		UE/127/9	9"						
		UE/127/12	12"						
		UE/127/16	16"						
		UE/127/20	20"						

GEAR DRIVES

Parallel Gear Train Drive



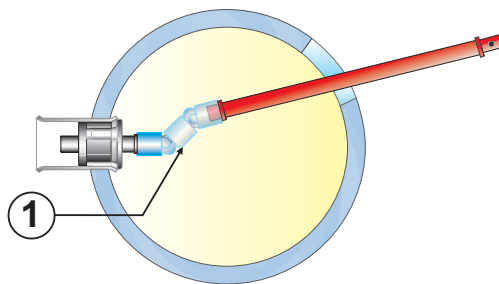
Square Size	Number of Openings	Model No.	Replacement Parts				Dimensions	
			Double Hub Gear		Center Gear		OAL	Width (W)
			Model No.	Nos. Req'd.	Model No.	Nos. Req'd.		
3/8"	3	BG/3/95	BGH/3/95	3	BGC/3/95	4	8.1/2"	2"
1/2"	3	BG/3/127	BGH/3/127	3	BGC/3/127	4	8.1/2"	2"
	4	BG/4/127	BGH/4/127	4	BGC/4/127	3		
3/4"	3	BG/3/195	BGH/3/195	3	BGC/3/195	4	9"	2.1/2"
	4	BG/4/195	BGH/4/195	4	BGC/4/195	3		
1"	4	BG/4/254	BGH/4/254	4	BGC/4/254	3	9"	2.1/2"

Right Angle Worm Gear Drive



Male Square	Female Square	Model No.	OAL	Gear Housing			Minimum Hand Hole Diameter	Gear Ratio
				Length (L)	Width (W)	Thick (T)		
1/2"	1/2"	RW/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"	RW/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"	RW/195/195	11.9/32"	3.27/32"	2.5/8"	1.7/8"	4"	4.1/2 to 1
3/4"	1"	RW/195/254	11.9/32"	4.1/4"	3.1/16"	1.7/8"	4.1/2"	4.1/2 to 1

BOILER TUBE EXPANDING ACCESSORIES



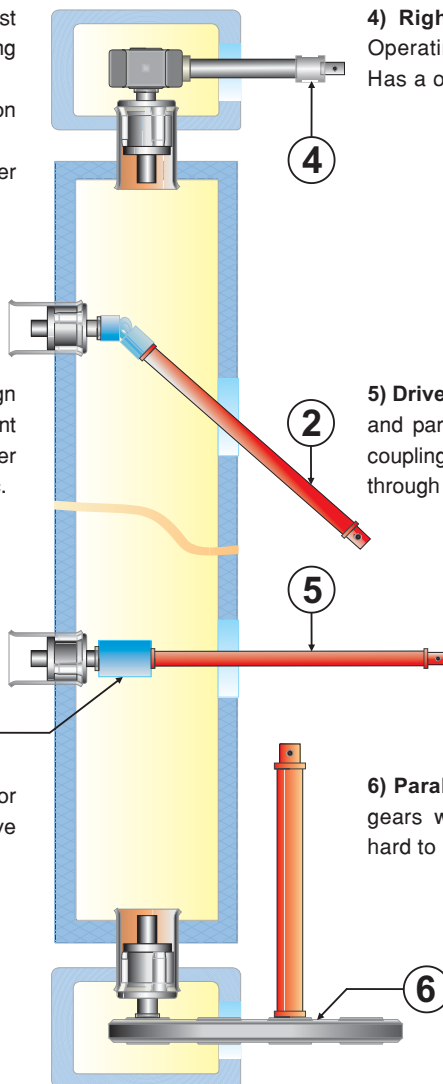
1) Universal Joints - Female x Female are most common and are used to create flexibility in reaching hard to get to spots.

Double Universal Joints - Allow more deflection than Female x Female universal joints.

Male x Male - are suitable for use in super heater headers.

2) Extension Universal Joint - Integral design eliminates coupling an extension with a universal joint and are used when expanding tubes through water wall headers, super heater headers, water legs etc.

3) Extension Couplings - Are available in plain or reducing type and are used to connect drive extensions, mandrels, and universal joints.



4) Right Angle Worm Gear Drive - Used for Operating in very confined areas of boiler headers. Has a one piece construction for maximum life.

5) Drive Extensions - Are used with universal joints and parallel gear train drives as well as extension couplings for extending expander mandrel reach through water legs, headers etc.

6) Parallel Gear Train Drive - Have high strength gears with bronze bushings to expand tubes in hard to reach places.

LUBE-A-TUBE

For expander rolling tube ends into tube sheets.

Application : Apply directly to the inside of the tube ends by hand.

Removal : Any excess of Lube-A-Tube is removed by wiping or the residue will be completely removed during hydrotest / boil-out operations.

Features :

- Being a soft, paste lubricant, Tube-A-Tube is easy to apply and “stays put” in the tube prior to the actual rolling operation - it will not run like oil.
- No chance of entering between the tube sheet and tube end OD.
- Will not carbonize under the heat and pressure encountered during the tube rolling operation.
- Lube-A-Tube is its own indicator serving to show the operator what tubes are still to be expanded, eliminating the possibility of missed tubes.
- Lube-A-Tube keeps the expanding tool cool and prolongs tool life.
- Equally effective for rolling condenser tubes, boiler tubes and heavy wall cracking still tubes in refining equipment.



Sold in 100 ml tubes or 2 kg cans.