

# HARCO JOINT RESTRAINT SELECTION GUIDE

## NUMBER OF ADJACENT JOINTS TO RESTRAIN

Tables below list number of adjacent pipe joints to be restrained for basic fitting configurations. These were calculated using the joint restraint calculator available at [www.harcofittings.com](http://www.harcofittings.com) for a set of assumptions that will envelope many applications. If your situation is not covered by the assumptions or a more refined restraint scheme is desired, use the restraint calculator at [www.harcofittings.com](http://www.harcofittings.com).

### BENDS, REDUCERS, CAPS AND VALVES:

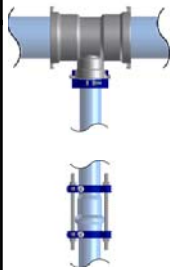
Size	Bends				Reductions			Dead Ends
	11½	22½	45	90	1	2	3	
2	-	-	-	-	1	-	-	-
2½	-	-	-	-	-	-	-	1
3	-	-	-	-	-	-	1	1
4	-	-	-	-	-	1	1	2
6	-	-	-	1	1	2	2	3
8	-	-	-	1	1	3	3	4
10	-	-	-	1	1	2	3	4
12	-	-	-	1	2	2	3	4
14	-	-	-	1	1	2	3	4
16	-	-	-	2	1	2	3	5

### TEES - BRANCH BELL ONLY RESTRAINED:

Use joint restraint ONLY on branch. Number below is number of 20' joints to be restrained with pipe to pipe restraints.

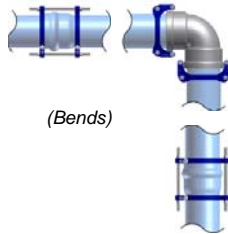
Run Size	Tees (Branch Size)									
	2	2½	3	4	6	8	10	12	14	16
2	-	-	-	-	-	-	-	-	-	-
2½	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-
6	-	1	1	-	-	-	-	-	-	-
8	-	1	1	-	-	-	-	-	-	-
10	-	-	1	1	-	-	-	-	-	-
12	-	-	1	1	-	-	-	-	-	-
14	-	-	1	1	1	-	-	-	-	-
16	-	-	1	1	1	1	-	-	-	-

*Use Chart below for more economical method*



### BENDS & CAPS/DEAD ENDS:

Restrain all bells and the adjacent joints listed in table, (both directions for bends).



### TEES - ALL BELLS RESTRAINED:

Use joint restraint on ALL three branches of tee. Number below is number of 20' joints to be restrained with pipe to pipe restraints in branch only direction.

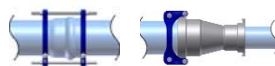
Run Size	Tees (Branch Size)									
	2	2½	3	4	6	8	10	12	14	16
2	-	-	-	1	-	-	-	-	-	-
2½	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-

*Use Joint Restraint Calculator*

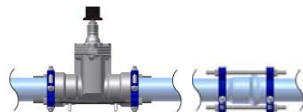
*Use Chart above*



**REDUCERS:** Restrain large bell and adjacent joints listed in table.

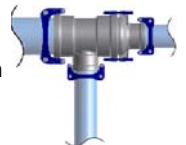


**VALVES:** Treat as Dead End. Use Valve Restrain and restrain adjacent upstream joints listed in table. If closed valve can have pressure from either sides, restrain adjacent joints both sides per table.



### TEES W/RUN REDUCTIONS:

Restrain all bells and adjacent branch joints noted. Treat run reduction as a reducer. Restrain as noted adjacent joints to large bell per reducer table.



### RESTRAINT CALCULATION ASSUMPTIONS:

Maximum Pressure: 125 psi  
 Restrained Lengths: Each restraint connects 20 ft. length of pipe.  
 Soil Type: Type GM, gravel-sand-silt mixture  
 Minimum Burial Depths: 2" - 2½", 18" cover; 3" - 8", 24" cover;  
 10" - 12", 30" cover; 14" - 16", 36" cover.  
 Trench Type: 3, pipe bedded in 4 inches minimum loose soil. Backfill lightly consolidated to top of the pipe.  
 Safety Factor: 1.5