

HARCO JOINT RESTRAINT SELECTION GUIDE

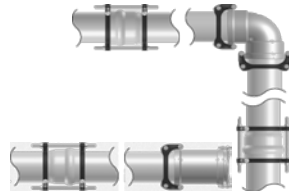
Tables below list number of adjacent pipe joints to be restrained for basic fitting configurations. These were calculated using the joint restraint calculator available at www.harcofittings.com for a set of assumptions that will envelop many applications. Check that the assumptions listed below meet or exceed your application. 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.

Bends, Reducers, Caps, and Valves

Size	Bends				Reductions			Dead Ends
	11¼	22½	45	90	1	2	3	
2	—	—	—	—	—	—	—	—
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

Bends & Caps/Dead Ends:

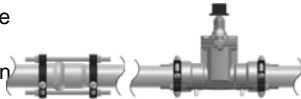
Restrain all bells and the adjacent joints listed in table (both directions for bends).



Reducers: Restrain large bell and adjacent joints listed in table.



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



Restraint Calculation Assumptions:

Maximum pressure: 125psi

Restrained Lengths: Each restraint connects 20' length of pipe

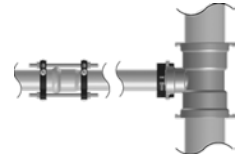
Soil Type: Type GM, gravel-sand-silt mixture

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.

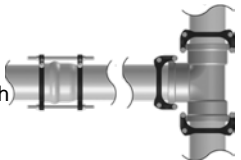
Safety Factor: 1.5

Tees - Branch bell only restrained: Use joint restraints 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	Use chart below for more economical method														
2½															
3															
4											—				
6											—	1	1		
8											—	1	1		
10											—	—	1	1	
12											—	—	1	1	
14											—	—	1	1	1
16											—	—	1	1	1

Tees - Branch bell only 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	Use Joint Restraint Calculator											
2½	—	—	—	—												
3	—	—	—	—												
4	—	—	—	—												
6	Use chart above			—							—	1	1			
8				—							—	—	—	2	2	3
10				—							—	—	—	1	1	2
12				—							—	—	—	—	1	2
14				—							—	—	—	—	—	1
16				—							—	—	—	—	—	1

Tees - With 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.

