



***PRESENTS...***

# **SOLVENT CEMENTING & THREADED JOINTS**



# **PVC & CPVC**

**PLASTIC PIPE & FITTINGS**

**SOLV-3P-1006**

**1**

**READ THIS BOOK AND  
DIRECTIONS ON THE CAN.**



**MUCH OF THIS INFORMATION IS WELL KNOWN TO  
EXPERIENCED INSTALLERS. IF THAT'S YOU, PLEASE  
READ ABOUT IT ONE MORE TIME...**



# 2

## **ASSEMBLE MATERIALS NEEDED.**



✓ **CHECK PRIMER & CEMENT  
EXPIRATION DATES.**

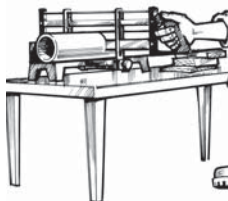
**EXPOSE PARTS TO THE OPEN AIR FOR AN HOUR  
IN ORDER TO ACCLIMATE THEM TO THE LOCAL  
WEATHER CONDITIONS. PROVIDE PROTECTION  
FROM EXCESSIVELY HOT OR EXTREMELY COLD  
ENVIRONMENTS.**



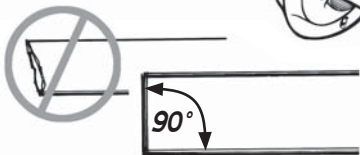
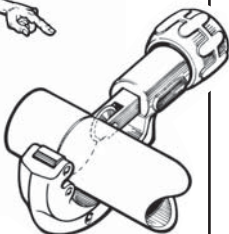
# 3

## CUT PIPE SQUARE.

SAW & MITER BOX



WHEEL CUTTER



**ALWAYS USE THE PROPER TOOLS FOR CUTTING PVC PIPE, SUCH AS A SAW & MITER BOX, WHEEL CUTTER OR A PIPE CUTTER. THESE TOOLS INSURE A SQUARE (90°) CUT.**



# 4

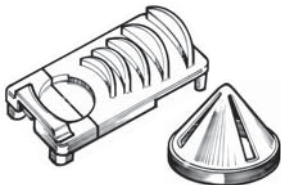
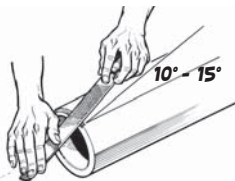
## REMOVE BURRS AND BEVEL OUTSIDE RIM.



CAREFULLY BEVEL  
PIPE WITH FILE.

**OR:**

USE DEBURRING AND  
BEVELING TOOLS.



**DEBURR WITH A KNIFE OR DEBURRING TOOL  
AND BEVEL EDGES TO 10° - 15° SO THE PIPE WILL  
FIT SNUGLY INTO SOCKET.**



**5**

**CLEAN PIPE AND FITTINGS.**



**WIPE OFF ALL JOINING SURFACES  
WITH A CLEAN, DRY RAG.**

**DUST, DIRT, GREASE (EVEN FINGERPRINTS)  
AND MOISTURE CAN INTERFERE WITH THE  
PENETRATION AND BONDING PROPERTIES OF  
PRIMER AND SOLVENT CEMENT.**



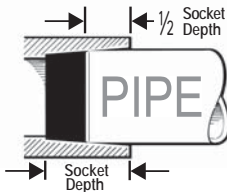
# 6

## CHECK DRY FIT.

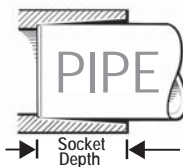


**A GOOD FIT IS INSURED  
WHEN USING ASTM  
STANDARDS AND CODE  
APPROVALS.**

### Full Interference Fit



### Net Fit



### Rough End-Cut



### Loose Fit

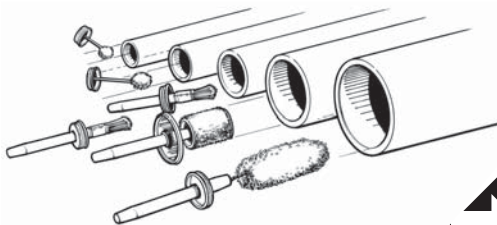


# 7

## USE THE CORRECT APPLICATOR SIZE FOR THE JOB.



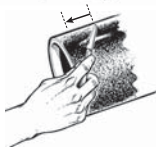
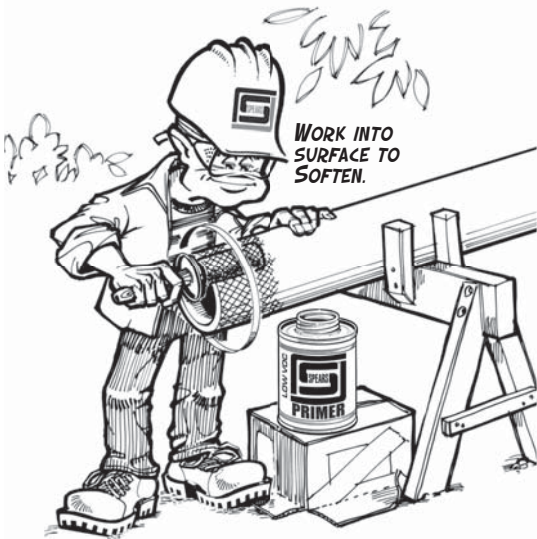
USE AN APPLICATOR AT LEAST  
1/2 THE SIZE OF PIPE.





8

**APPLY PRIMER\***  
**FITTING → PIPE → FITTING**



✓ **CHECK PENETRATION.**

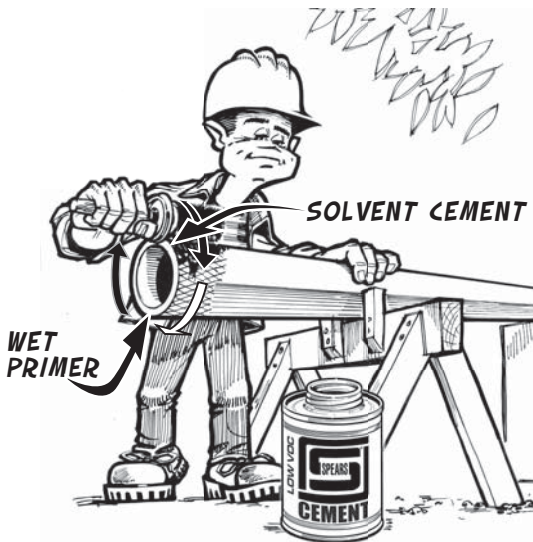
**WITHOUT SOFTENING, MOST SOLVENT CEMENTS WILL NOT BOND PROPERLY. USE 2 TO 3 THICK COATS.**

**\* SOME CEMENTS ARE "ONE-STEP" AND REQUIRE NO PRIMER. THIS TYPE OF CEMENT IS USED WITH SOME CPVC, ABS AND STYRENE PLASTICS.**



9

**APPLY SOLVENT CEMENT  
(PIPE → FITTING → PIPE)  
WHILE THE PRIMER IS STILL WET AND...**

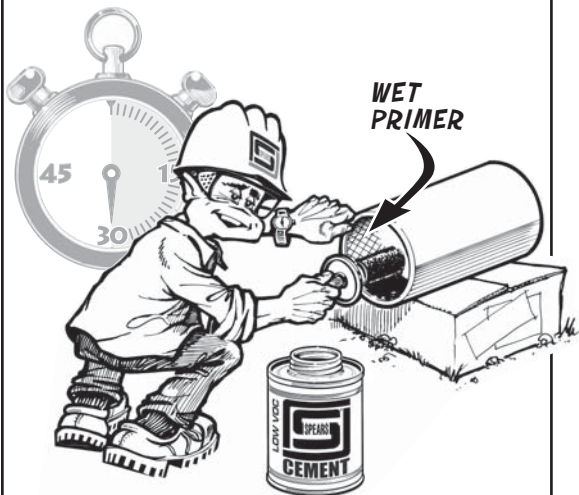


**...WORK CEMENT ONTO PIPE USING A CIRCULAR MOTION. FOLLOW WITH A THIN COAT IN THE FITTING, REPEAT. KEEP APPLICATOR IN CAN WHEN NOT IN USE.**



# 10

## ...WORK QUICKLY!



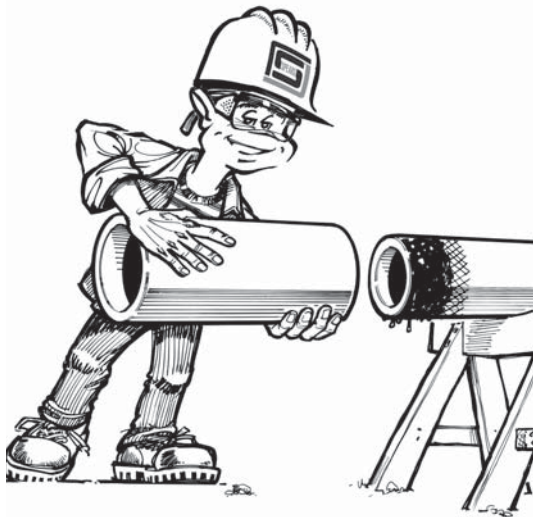
**DON'T LET CEMENT PUDDLE INSIDE  
FITTINGS OR RUN DOWN  
INSIDE THE PIPE.**

**USE OF THE PROPER APPLICATOR WILL  
SPEED UP YOUR WORK AND HELP LAY DOWN  
A **GENEROUS** AND **EVEN** COAT OF SOLVENT  
PRIMER AND CEMENT.**



# 11

**ASSEMBLE IMMEDIATELY -  
SOLVENTS QUICKLY EVAPORATE.**

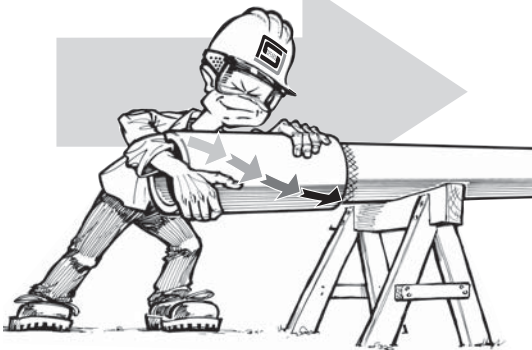


**ADDITIONAL HOLDING OR RESTRAINT OF PIPE  
MAY BE REQUIRED ON LARGER SIZES.**



# 12

**...WHILE CEMENT IS STILL WET, PUSH AND TWIST (1/4 TURN) SOCKET ON TO PIPE UNTIL IT BOTTOMS OUT.**



**HOLD PARTS TOGETHER FOR ABOUT 30 SECONDS TO AVOID PUSH-OUT.**



**DON'T LET GO! KEEP PRESSURE ON PIPE AND FITTING UNTIL CEMENT SETS. SEE PAGE 26 RECOMMENDED SET SCHEDULES.**



# 13

**REMOVE EXCESS CEMENT.  
(USE DISPOSABLE MATERIAL)**



**IF LEFT ON EXPOSED PIPE, THE  
SOFTENING EFFECT OF EXCESS  
SOLVENT COULD PERMANENTLY  
DISTORT OR WEAKEN PIPE.**

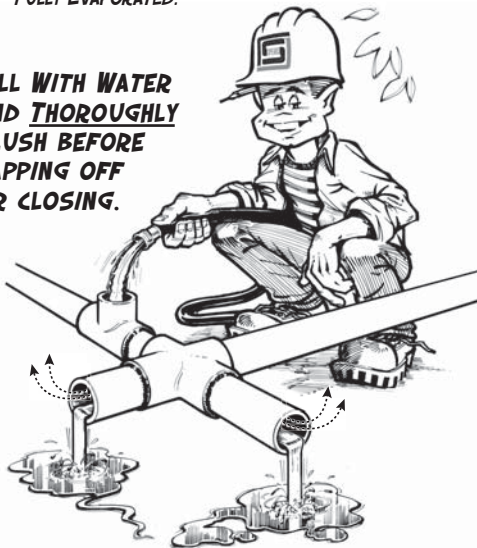


# 14

## **FLUSH ENTRAPPED SOLVENT CEMENT VAPORS.**

*SOLVENTS EVAPORATE THROUGH THE SYSTEM AND WALLS, SOFTENING BOTH PIPE AND FITTINGS. SOME SOFTENING WILL REMAIN UNTIL SOLVENTS HAVE FULLY EVAPORATED.*

**FILL WITH WATER AND THOROUGHLY FLUSH BEFORE CAPPING OFF OR CLOSING.**

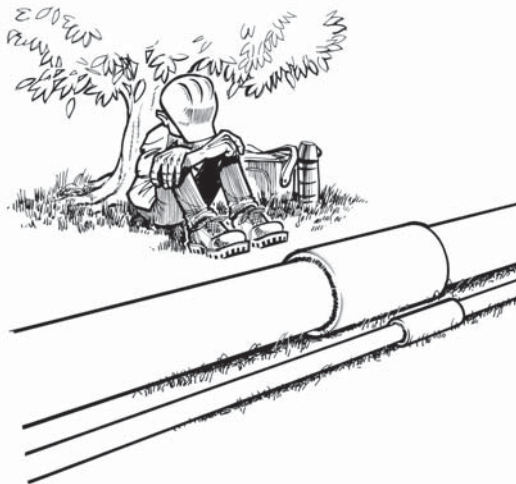


**AVOID PRESSURIZATION OF SYSTEM UNTIL ADEQUATELY CURED. IF THERE IS A STRONG SMELL OF SOLVENTS IN THE PIPING, VAPORS ARE BEING GENERATED.**



# 15

**WAIT FOR JOINTS TO SET  
BEFORE DISTURBING.**



**SEE PAGE 26 FOR  
RECOMMENDED CURE TIMES.**





# 16

**AFTER CEMENT HAS SET,  
CAREFULLY LAY ASSEMBLY IN  
FINAL POSITION...**

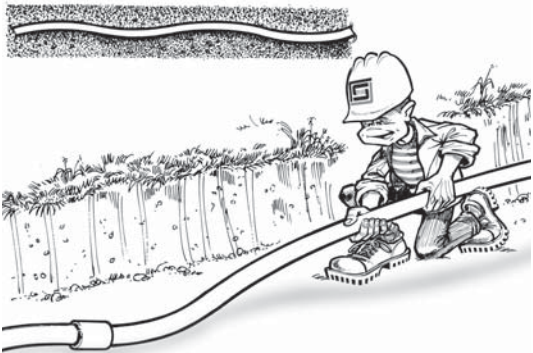


**...AND DON'T DROP IT!**



**17**

**SNAKE PIPE TO  
ALLOW FOR THERMAL  
EXPANSION/CONTRACTION.**



**LAY THE PIPE IN A SLIGHT S-CURVE.  
DO NOT LAY IT PERFECTLY STRAIGHT.**



**18**

*SHADE PIPE WITH BACKFILL.*



**LEAVE ALL JOINTS EXPOSED.**



# 19

*WAIT FOR FULL CURE...*



**REMEMBER...**

*JOINT SIZE, EXTREME TEMPERATURE  
(HOT OR COLD) AND HUMIDITY ALL HAVE AN  
EFFECT ON SOLVENT CEMENT CURE TIMES.*

*SEE PAGE 26 FOR  
RECOMMENDED CURE TIMES.*



# 20

**BRING SYSTEM UP TO ITS  
OPERATING TEMPERATURE  
BEFORE TESTING.**



***THIS CAN BE DONE BY...***

- 1) SHADING WITH BACK FILL***
- 2) FILL SYSTEM WITH WATER OF CORRECT TEMPERATURE***
- 3) LETTING THE SYSTEM "SETTLE IN" OVERNIGHT***



# 21

## **PRESSURE TEST SYSTEM... DO NOT USE COMPRESSED AIR OR GAS.**



**WARNING:** Do not use compressed air or gas to test any PVC or CPVC thermoplastic piping product or system, and do not use devices propelled by compressed air or gas to clear the systems. These practices may result in explosive fragmentation of system piping and components causing *bodily injury or death*.

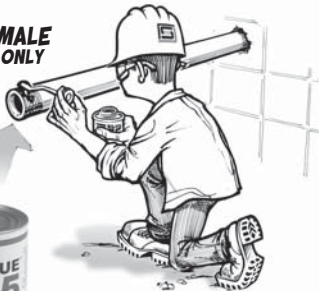
All air must be bled from the system during the initial fluid fill. Pressure testing of the system must not be made until all solvent cement joints have properly cured. Initial pressure testing must be made at approximately 10% of the system hydrostatic pressure rating to identify potential problems prior to testing at higher pressures.



# 22

## FOR THREADED CONNECTIONS...

**APPLY TO MALE  
THREADS ONLY**



**Spears®  
RECOMMENDS THE  
USE OF BLUE 75™  
THREAD SEALANT.**

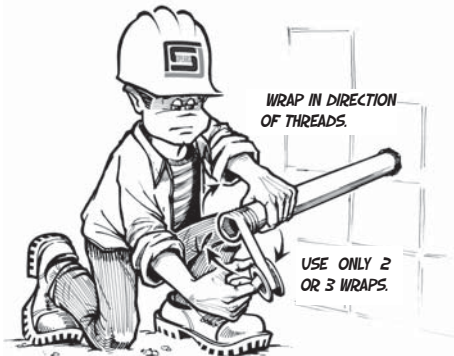


**USE OF INCOMPATIBLE PASTE SEALANTS  
MAY RESULT IN STRESS CRACKING IN  
PLASTIC PIPE AND FITTINGS.**



# 23

## **IF YOU MUST USE TAPE, USE IT CORRECTLY...**



**HOLD END AND PULL TAPE  
TIGHT INTO THREADS.**



**ALWAYS COVER END OF  
FITTING AT THE START  
TO PREVENT THREAD  
SEIZING PRIOR TO  
PROPER JOINT MAKEUP.**

### **NEVER COMBINE TAPE AND PASTE!**





**24**

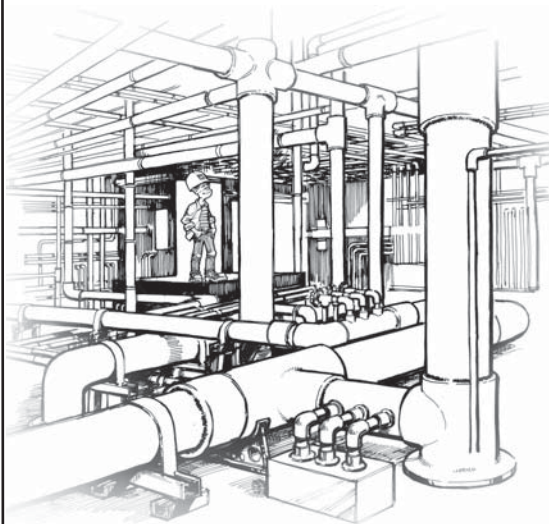
## **THREAD FITTING ONTO PIPE FINGER TIGHT.**



**USE A COMMERCIAL STRAP WRENCH  
TO ADD NO MORE THAN TWO TURNS  
TO THE FITTING**



# 25 CONGRATULATIONS...



**...ON A JOB WELL DONE.**

**SPEARS<sup>®</sup> MANUFACTURING COMPANY CONSIDERS YOUR SAFETY, THE QUALITY OF ITS PRODUCTS AND THE CLARITY OF ITS ASSEMBLY INSTRUCTIONS TO BE CRITICALLY IMPORTANT. CONSEQUENTLY, SPEARS<sup>®</sup> OFFERS DATA SHEETS, VIDEOS AND TRAINING FOR THOSE WHO WISH TO EXPAND THEIR KNOWLEDGE AND SKILLS WITH SOLVENT CEMENT JOINING METHODS.**

# 26

## SET AND CURE TIME SCHEDULES.

### Average Initial Set Schedule For PVC/CPVC Solvent Cements\*\*

Temperature Range	Pipe Sizes 1/2" to 1-1/4"	Pipe Sizes 1-1/2" to 2"	Pipe Sizes 2-1/2" to 8"	Pipe Sizes 10" to 15"	Pipe Sizes 15"+
60° - 100°F	2 Minutes	5 Minutes	30 Minutes	2 Hours	4 Hours
40° - 60°F	5 Minutes	10 Minutes	2 Hours	8 Hours	16 Hours
0° - 40°F	10 Minutes	15 Minutes	12 Hours	24 Hours	48 Hours

NOTE: Initial set schedule is the necessary time to allow before the joint can be carefully handled. In damp or humid weather allow 50% more set time.

(\*\* These figures are estimates based on our laboratory tests using water; extended set times are required for chemical applications. Due to the many variables in the field, these figures should be used as a general guide only.)

### Average Joint Cure Schedule for PVC/CPVC Solvent Cements††

Relative Humidity 60% or Less	Cure Time Pipe Sizes 1/2" to 1-1/4"		Cure Time Pipe Sizes 1-1/2" to 2"		Cure Time Pipe Sizes 2-1/2" to 8"		Cure Time Pipe Sizes 10" to 15"		Cure Time Pipe Sizes 15" +	
	up to 160 psi	above 160 to 370 psi	up to 160 psi	above 160 to 315 psi	up to 160 psi	above 160 to 315 psi	up to 100 psi	up to 100 psi	up to 100 psi	up to 100 psi
60° - 100°F	15 min	6 hrs	30 min	12 hrs	1-1/2 hrs	24 hrs	48 hrs	72 hrs		
40° - 60°F	20 min	12 hrs	45 min	24 hrs	4 hrs	48 hrs	96 hrs	6 days		
0° - 40°F	30 min	48 hrs	1 hour	96 hrs	72 hrs	8 days	8 days	14 days		

NOTE: Joint cure schedule is the necessary time to allow before pressurizing system. In damp or humid weather allow 50% more cure time.

(†† These figures are estimates based on our laboratory tests. Due to the many variables in the field, these figures should be used as a general guide only.)

### Average Number of Joints per Quart of Cement\*

Pipe Diameter	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	15"	18"	20"	24"
Number of Joints	300	200	125	90	60	40	30	10	5	2-3	1-2	3/4	1/2	7/16	5/16

(\* These figures are estimates based on our laboratory tests. Due to the many variables in the field, these figures should be used as a general guide only.)

**SUITABLE FOR LOW PRESSURE AIR HANDLING 5 PSI,  
NOT FOR DISTRIBUTION OF COMPRESSED AIR OR GAS.**

All air must be bled from the system during the initial fluid fill. Pressure testing of the system must not be made until all solvent cement joints have properly cured. Initial pressure testing must be made at approximately 10% of the system hydrostatic pressure rating to identify potential problems prior to testing at higher pressures.











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