

## SIFs & Tees

Activate by double-clicking the **SIFs and Tees** check box on the **Pipe Element** Spreadsheet. Deactivate by double-clicking a second time.

<input type="checkbox"/> Bend	<input type="checkbox"/> Reducer
<input type="checkbox"/> Rigid	<input checked="" type="checkbox"/> SIFs & Tees
<input type="checkbox"/> Expansion Joint	<input type="checkbox"/> Structural

SIFs/Tees	
Node:	50
Type:	2 - Unreinforced
SIF(i):	
SIF(o):	
Pad Thk:	
Ftg Ro:	
Crotch R:	
Weld(d):	
Fillet:	
Weld ID:	
B1:	
B2:	

There are two basic component types:

- Three element *intersection* components, and
- Two element *joint* components.

A fully defined *intersection model* requires that three pipes frame into the intersection node, and that two of them are co-linear. Partial intersection assumptions are made for junctions where the user has coded one or two pipes into the intersection node, but these models are not recommended. Two element “joint” components can be formed equally well with one or two elements framing into the node.

As usual, the intersection or joint type and properties need only be entered on one of the elements going to the junction. **CAESAR II** duplicates the intersection characteristics for all other pipes framing into the intersection. Users are urged to fully review the WARNING messages coming from **CAESAR II** during error checking. These messages detail to the user any assumptions made during the assembly and calculation of the intersection SIFs.

The available intersections and joint types are shown in the table that follows, along with the other parameters that can affect the stress intensification factors for the respective component.

## Input Items Optionally Effecting SIF Calculations

1	REINFORCED FABRICATED TEE	PAD THK	FTG RO	CROTCH	
2	UNREINFORCED FABRICATED TEE		FTG RO	CROTCH	
3	WELDING TEE		FTG RO	CROTCH	
4	SWEEPOLET			CROTCH	
5	WELDOLET			CROTCH	
6	EXTRUDED WELDING TEE		FTG RO	CROTCH	
7	GIRTH BUTT WELD				WELD D OR ID
8	SOCKET WELD (NO UNDERCUT)				FILLET
9	SOCKET WELD (AS WELDED)				FILLET
10	TAPERED TRANSITION				WELD D
11	THREADED JOINT				
12	DOUBLE WELDED SLIP-ON				
13	LAP JOINT FLANGE (B16.9)				
14	BONNEY FORGE SWEEPOLET				
15	BONNEY FORGE LATROLET				WELD ID
16	BONNEY FORGE INSERT WELDOLET				
17	FULL ENCIRCLEMENT TEE		FTG RO		WELD ID

## Node Number

Enter the node number where the Stress Intensification exists. This may be any node in the system, but is most often at a pipe intersection or joint.

If the node is at an Intersection, stress intensification factors will be automatically calculated for the intersection providing the intersection "TYPE" is specified. The intersection type needs to only be entered once. CAESAR II will find all other pipes framing into the intersection and calculate the SIFs accordingly.

Mr. Richard Ay, you defined this portion but I did not mean this (Confusion is, as per 5.1 manual this page # is 3-25). My requirement is on page # 3-32 & 3-33 as per 5.3 manual please refer it.

If the node is at a two-pipe Joint, i.e. a butt weld, stress intensification factors will be calculated for the two pipes going to the joint node providing the joint "TYPE" is specified. The joint type needs to only be entered once. CAESAR II will find the other pipe completing the joint.

If the node is not at an intersection or a joint then the **Type** field should be left BLANK and the "USER DEFINED" SIFs entered in the **SIF(i)** and **SIF(o)** fields. User entries in the **SIF(i)** and **SIF(o)** fields only apply to the element on which they are defined.

User defined stress intensification factors, must be greater than or equal to one.

You can get CAESAR II to calculate and display code defined SIFs while in the SIF scratchpad. This scratchpad is accessed via the **K-Aux** option on the pipe spreadsheet. Parameters used in the scratchpad may be modified so

that the effects of different geometries and thicknesses can be observed. Most changes made in the scratchpad may be automatically transferred back into the input, if desired.

If the node is on any part of a bend's curvature then the following applies:

- 1 User defined SIFs won't override code calculated SIFs for bends, although a SETUP file directive exists to override this default, i.e. ALLOW\_USERS\_BEND\_SIF=YES. If this parameter appears in the setup file then users may specify SIFs for bend "to" nodes. The SIFs so specified will apply for the entire bend curvature.
- 2 User defined SIFs will apply to straight pipe going to points on a bend curvature regardless of any parameter in the setup file. This option is commonly used to intensify injector tie-ins at bends, or dummy legs, or other bend attachment-type of supports.

#### PAD THK

Thickness of the reinforcing pad for reinforced fabricated or full encirclement tees, intersection type #1 and #17 respectively. The pad thickness is only valid for these intersection types. Note that in most piping codes the beneficial effect of the pad's thickness is limited to 1.5 times the nominal thickness of the header. This factor does not apply in BS 806 or Z184, and is 2.5 in the Swedish piping code. If the thickness of a type 1 or type 17 intersection is left blank or zero the SIFs for an unreinforced fabricated tee are used.

#### FTG RO

*Fitting outside radius for branch connections.* Used for reduced branch connections in the ASME and B31.1 piping codes, Bonney Forge Insert Weldolets, and for WRC 329 intersection SIF calculations. Setup file directives exist to invoke the WRC 329 calculations, and to limit the application of the reduced branch connection rules to unreinforced fabricated tees, sweepolets, weldolets, and extruded welding tees. If omitted, FTG ro defaults to the outside radius of the branch pipe.

#### CROTCH R

The *crotch radius* of the formed lip on an extruded welding tee, intersection type 6. This is also the intersection weld crotch radius for WRC329 calculations. Specifying this value when it is known can result in a 50% reduction in the stress intensification at the WRC 329 intersection. Basically, if the user makes an attempt to reduce the stress riser at a fabricated intersection, by guaranteeing that there will be a smooth transition radius from the header to the branch pipe, then he may reduce the resulting stress intensification by a factor of 2.0.

#### WELD (D)

Defines the "average" *circumferential weld* mismatch measured at the inside diameter of the pipe. Used for *Butt Welds* and *Tapered transitions*. Note that this is the average, and not the maximum mismatch. Users must themselves verify that any maximum mismatch requirements are satisfied for their particular code.

#### FILLET

The fillet leg length, and is used only in conjunction with a socket weld component. For an unequal leg fillet weld, this value is the length of the shorter leg. Note that if a fillet leg is given, both socket weld types result in the same SIF. See appendix D of the B31 piping codes for further clarification.

**Weld ID**

The following are valid Weld ID values.

Values:

0 or BLANK - As Welded

1 - Finished/Ground Flush

Used for:

BONNEY FORGE SWEEPOLETS

BONNEY FORGE INSERT WELDOLETS

BUTT WELDS IN THE SWEDISH PIPING CODE

If entered as 1 then the weld is considered to be ground flush on the inside and out and the SIF is taken as 1.0.

Refer to the help on Weld Mismatch (Weld d) for more detail on how input parameters are used to compute SIFs for girth butt welds.

B1; Wc

**ASME Class 2 and ASME Class 3**

For ASME Class 2 and Class 3, this entry defines the *primary stress index* to be used for the given node on the current element.

For ASME Class 2 and Class 3 piping. Unless otherwise over-ridden by the user the following values are applied as:

*Straight Pipe:*  $B1 = 0.5 \quad B2 = 1.0$

*Curved Pipe:*  $B1 = -0.1 + 0.4h$ ; but not  $<0$  or  $>0.5$

$B2 = 1.30/h^{2/3}$  but not  $<1.0$ ;  $h = tR / r m^{2/3}$

*Intersections:*  $B1 = 0.5$

*Butt Welded Tees:*  $B2b = 0.4(R/T)^{2/3}$  but not  $< 1.0$

$B2r = 0.5(R/T)^{2/3}$  but not  $< 1.0$

*Branch Connections:*  $(r < 0.5R)$

$B2b = 0.50 \quad C2b$  but not  $< 1.0$

$B2r = 0.75 \quad C2r$  but not  $< 1.0$

$C2b = 3(R/T)^{2/3} (r/R)^{1/2} (t/T)(r/FTG \text{ ro})$  but not  $< 1.5$

$C2r = 1.15(r/t)^{1/4}$  but not  $< 1.5$

**B31.1 / B31.3**

For B31.1 and B31.3, this field is used to specify the *weld strength reduction factor* ( $W_c$ ), used to reduce the allowable stress for the Sustained load case.

## BS-7159 and UKOOA

For BS 7159 and UKOOA codes, **B1** is used to enter the *pressure stress multiplier* (m), if other than as per the code requirements. For straight pipe,  $m = 1.0$ ; for bends and tees,  $m$  is defined in Figures 7.1 and 7.12 of the BS 7159 Code.

## IGE/TD/12

For IGE/TD/12 this field is used to override the cyclic pressure Stress Intensification Factor  $I_p(\text{Cyc})$ , if other than as per the code calculations (calculated as per Table 9, Figure 5, and Figure 7 of the code).

## B2

This entry defines the *primary stress index* to be used for the given node on the current element. This entry is only applicable for ASME Class 2 and 3 piping.

If omitted, B1 and B2 are defaulted as shown as follows:

<i>Straight Pipe:</i>	$B1=0.5 \ B2=1.0$
<i>Curved Pipe:</i>	$B1=-0.1+0.4h$ ; but not $<0$ or $>0.5$ $B2=1.30/h^{2/3}$ ; but not $<1.0$ ; $h=tR/rm^2$
<i>Intersections:</i>	$B1=0.5$
<i>Butt-Welded Tees:</i>	$B2b=0.4(R/T)^{2/3}$ but not $<1.0$ $B2r=0.5(R/T)^{2/3}$ but not $<1.0$
<i>Branch Connections:</i>	$(r<0.5R)$ $B2b=0.50 \ C2b$ but not $<1.0$ $B2r=0.75 \ C2r$ but not $<1.0$ $C2b=3(R/T)^{2/3} (r/R)^{1/2} (t/T)(r/FTG \ r_o)$ but not $<1.5$ $C2r=1.15(r/t)^{1/4}$ but not $<1.5$

The **SIF(IN)** and **SIF(OUT)** fields may be used to override the CAESAR II calculated values for any intersection. Override values only apply for the single element they are defined on. SIFs may be calculated for partial intersections and dummy legs.

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**Note:** When IGE/TD/12 is active, the SIF/TEE spreadsheet changes its appearance to accommodate specialized SIF parameters. Refer to supplementary IGE/TD/12 documentation for further information.

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## Code Options (B31.1 & B31.8)

### B31.1:

Enabling this check box indicates that the tee meets the dimensional criteria of Figure D1 as well as Notes 6a, 6c, 6d, 6e, and 6f. This allows the use of the "branch equation" when determining the SIF value for the tee. Note that this option relies on the setting of the *Configuration Directives* **Reduced Intersection** and **No RFT / WLT in Reduced Fitting SIFs**.

**B31.8:**

Enabling this check box indicates that B31.8 Notes 6, 9, or 10 (as applicable) should be used when determining the SIF value for the tee.

**ASME NC and ND:**

Enabling this check box indicates that the tee meets the dimensional criteria of Figure 3673.2(b)-2 as well as Notes 10 and 11. This allows the use of the "branch equation" when determining the SIF value for the tee. Note that this option relies on the setting of the *Configuration Directives* **Reduced Intersection** and **No RFT / WLT in Reduced Fitting SIFs**.

**ASME NC/ND 3673.2(b)-1 Note 3**

Checking this check box indicates that the material for this tee is ferrous, which enables the "Y" value to be computed based on the highest temperature value specified.

**Input Items Optionally Effecting SIF Calculations For ISO 14692**

1 TEES    2 JOINTS

**User-Defined SIFs Anywhere in the Piping System**

Unless the piping element is a bend, SIFs for non-intersection points are normally taken to be 1.0. If for some reason the SIF should be greater than (1.0) the user may enter the non-unity SIF in the **Intersection Auxiliary** field without specifying the intersection type. Note that a user defined SIF only acts at the node on the current element.

**Stress Intensification Factors Details**

Stress intensification factors are calculated automatically for bends and defined intersections as specified by the applicable piping code. You may enter specific stress intensification factor for any point in the piping system by clicking the **SIFs and Tees** check box on the pipe spreadsheet. The node number where the stress is to be intensified is entered in the first available **Node** field, and the in-plane and out-plane stress intensification factors are entered in the **SIF(i)** and the **SIF(o)** fields, respectively. The only exception is that you cannot specify SIFs for bend elements unless the **Allow User's Bend SIF** directive is activated in the configuration file. Code defined SIFs always apply. **CAESAR II** will not allow user-defined stress intensification factors to be less than 1.0. The node to be intensified must be the TO or the FROM node on the current element.

Stresses are only intensified at the element end going to the specified node. For example, if two pipes frameare going into node 10, one going from 5 to 10, and the other from 10 to 15; and a stress intensification factor of 2.0 for node 10 is defined on the element from 5 to 10, then the 10 end of the element from 5 to 10 will have a stress intensification of 2.0, and the 10 end of the element from 10 to 15 will have a stress intensification of 1.0.

User defined stress intensification factors can be used to override code calculated values for nodes at intersections. For example, if node 40 is an intersection defined by an unreinforced fabricated tee. The header pipes framing into the intersection go from 35 to 40 and from 40 to 45. The branch pipe framing going into the intersection goes from 175 to 40. The code-calculated values for the stress intensification factors in the header pipes are:

SIF(i) = 4.50

SIF(o) = 3.75

and in the branch pipe are

SIF(i) = 6.70

SIF(o) = 5.58

First Query,  
In which code or case, the SIF for header and branch are different?

Also assume that finite element analysis of the intersection showed the header stress intensification factors to be 2.3 and 1.87, respectively, and the branch stress intensification factors to be equal to the code recommended values, i.e. 6.70 and 5.58. To properly override the code-calculated stress intensification factors for the header pipes, two pipe elements will have to be modified:

35 to 40      NODE 40

Type:

SIF(i): 2.3

SIF(o): 1.87

As per the clouded sentence, the "Type" field is left blank.

40 to 15      NODE 40

Type:

SIF(i): 2.3

SIF(o): 1.87

In my case, the intersection is a 45 deg lateral tee which is not available in the Caesar-II SIF/Tee option or ASME code, then how i can define the intersection type.

The stress intensification for the branch pipes can be calculated according to the code; so part of the branch pipe spreadsheet might appear:

175 to 40      NODE 40

Type: 2 - Unreinforced

SIF(i):

SIF(o):

This sentence is not clear, please clarify.

If either of the **SIF** fields for the header elements going to 40 were left blank, the code-calculated value would be used in its place. This is only true where code-calculated values exist along with user-specified values.

If the element from 110 to 115 needs the stress intensification factors for each of its ends is 2.0, then a part of that element's spreadsheet might appear:

110 to 115      NODE 110

Type:

SIF(i): 2.0

SIF(o):

Node: 115

Type:

SIF(i): 2.0

SIF(o):

Leaving the out-of-plane stress intensification factor blank implies that it is equal to the in-plane stress intensification factor. There are no code-calculated values to override these user-input values.

The user is not permitted to override code-calculated stress intensification factors for bend elements (unless the **Allow User's Bend SIF** directive is activated in the configuration file). Additionally, bend stress intensification factors will supersede any code-calculated intersection stress intensification factors for the same node. This characteristic allows the user to apply code-calculated intersection stress intensification factors to dummy legs without disturbing the normal bend stress intensification factors. The node on the dummy leg, which is also on the bend curvature, is defined as an intersection on the Intersection SIF Scratchpad. The intersection stress intensification factors will be calculated and can be applied to the dummy leg end that connects to the bend. Bend stress intensification factors are unchanged.

Stress intensification factors can be calculated for intersections having one, two, or three pipes framing into it. Where two pipes form a partial intersection, CAESAR II assumes that the larger pipe is the header and the smaller the branch.

Where one pipe forms a partial intersection, CAESAR II assumes that the intersection is full sized.

CAESAR II will not calculate stress intensification factors for intersections having more than three pipes framing into it.

### SIF Scratchpad

The stress intensification factors calculated by CAESAR II can be viewed interactively from the pipe spreadsheet by selecting either the ENVIRONMENT - REVIEW SIFs AT INTERSECTION NODES menu item or the KAUX - REVIEW SIFs AT BEND NODES menu item. One of the following SIF scratchpads will appear after typing in the node number to review when prompted. *Note that the Node must be a valid Bend node when Reviewing SIFs at Bends.*

Review Intersection SIF's	
Node:	50
Type:	2 - Unreinforced
Pad Thk:	
Ftg Ro:	
Crotch R:	
Weld ID:	
Weld(d):	
Fillet:	
Header OD:	12.750
Header Thk:	0.375
Branch OD:	12.750
Branch Thk:	0.375
Header SIF(i):	4.625
Header SIF(o):	5.833
Branch SIF(i):	4.625
Branch SIF(o):	5.833
Branch Section Modulus:	43.817
<input type="button" value="Recalculate"/> <input type="button" value="Cancel"/>	

At this point the user may interactively change any of the spreadsheet data and recalculate the SIFs. This feature allows the user to see the effect that changing geometries and properties have on code stress intensification



factors.

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**Note:** CAESAR II gives the user the opportunity to transfer back to the actual model any data, which might be changed in the scratchpad.

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### IGE\TD\12 Requirements

IGE\TD\12 requires different information than the other codes used in CAESAR II. When IGE/TD/12 is active, the **SIFs/Tees** spreadsheet changes its appearance to accommodate specialized SIF parameters. For more information regarding the specialized parameters refer to the text and figures at the end of this section.

The screenshot shows the 'SIFs/Tees' spreadsheet interface. It contains the following fields and controls:

- Node:** Two text input boxes.
- Type:** Two dropdown menus.
- Do/r3:** Two text input boxes.
- T/Th/T'b:** Two text input boxes.
- Te/Tb:** Two text input boxes.
- rp/do:** Two text input boxes.
- r2/rc:** Two text input boxes.
- r1/Tc/Lh:** Two text input boxes.
- L1/Lb:** Two text input boxes.
- Weld ID:** Two dropdown menus.
- Stress Intensification Factors (SIFs):** A grid of input boxes organized by branch (Ib, Ip, It, Iq, Is) and type (Sus, Cyc).
 

	Sus	Cyc	Sus	Cyc
Ib:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ip:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
It:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Iq:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
- Note:** branch Ib (Sus and Cyc) include the "w" term.
- Fatigue Class:** Two dropdown menus.

### Node Number

Enter the node number where the Stress Intensification exists. This may be any node in the system, but is most often at a pipe intersection or joint.

If the node is at an Intersection, stress intensification factors will be automatically calculated for all pipes going to the intersection providing the intersection "TYPE" is specified. The intersection type needs to only be entered once. CAESAR II will find all other pipes framing into the intersection and apply the appropriate SIFs accordingly.

If the node is at a two-pipe Joint, i.e. a butt weld, stress intensification factors will be calculated for the two pipes

going to the joint node providing the joint "TYPE" is specified. The joint type needs to only be entered once. CAESAR II will find the other pipe completing the joint.

If the node is not at an intersection or a joint then the **Type** field should be left BLANK and the "USER DEFINED" SIFs entered in the **SIF(i)** and **SIF(o)** fields. User entries in the **SIF(i)** and **SIF(o)** fields only apply to the element on which they are defined.

User defined stress intensification factors, must be greater than or equal to one.

The user can get CAESAR II to calculate and display code defined SIFs while in the SIF scratchpad. This scratchpad is accessed via the **K-Aux** option on the pipe spreadsheet. Parameters used in the scratchpad may be modified so that the effects of different geometries and thicknesses can be observed. Most changes made in the scratchpad may be automatically transferred back into the input, if desired.

If the node is on any part of a bend's curvature then the following applies:

- 1 User defined SIFs won't override code calculated SIFs for bends, although a SETUP file directive exists to override this default, i.e. ALLOW\_USERS\_BEND\_SIF=YES. If this parameter appears in the setup file then users may specify SIFs for bend "to" nodes. The SIFs so specified will apply for the entire bend curvature.
- 2 User defined SIFs will apply to straight pipe going to points on a bend curvature regardless of any parameter in the setup file. This option is commonly used to intensify injector tie-ins at bends, or dummy legs, or other bend attachment-type of supports.

Do/r3

This field corresponds to the following terms for each component type:

**Forged Tee to BS 1640:** For more information on *Do* refer to the *figures* (on page 3-39) at the end of this section.

**Weldolet:** For more information on *r3* refer to the *figures* (on page 3-39) at the end of this section.

**Drawn/Extruded Tee:** For more information on *Do* refer to the *figures* (on page 3-39) at the end of this section.

**Weldoflange:** For more information on *r3* refer to the *figures* (on page 3-39) at the end of this section.

T/Th/T'b

This field corresponds to the following terms for each component type:

**Forged Tee to BS 1640:** For more information on *T* refer to the *figures* (on page 3-39) at the end of this section.

**Weldolet:** For more information on *theta* refer to the *figures* (on page 3-39) at the end of this section.

**Drawn/Extruded Tee:** For more information on *T* refer to the *figures* (on page 3-39) at the end of this section.

**Weldoflange:** For more information on *theta* refer to the *figures* (on page 3-39) at the end of this section.

Te/Tb

This field corresponds to the following terms for each component type:

**Fabricated Tee with Pad:** For more information on *Te* refer to the *figures* (on page 3-39) at the end of this section.

**Forged Tee to BS 1640:** For more information on *Tb* refer to the *figures* (on page 3-39) at the end of this section.

**Weldolet:** For more information on *Tb* refer to the *figures* (on page 3-39) at the end of this section.

**Drawn/Extruded Tee:** For more information on *Tb* refer to the *figures* (on page 3-39) at the end of this section.

**Full Encirclement Tee:** For more information on *Te* refer to the *figures* (on page 3-39) at the end of this section.

**Long Weldneck Flange:** For more information on *Tb* refer to the *figures* (on page 3-39) at the end of this section.

**Weldo-flange:** For more information on *Tb* refer to the *figures* (on page 3-39) at the end of this section.

rp/do

This field corresponds to the following terms for each component type:

**Fabricated Tee:** For more information on *rp* refer to the *figures* (on page 3-39) at the end of this section.

**Forged Tee to BS 1640:** For more information on *do* refer to the *figures* (on page 3-39) at the end of this section.

**Weldolet:** For more information on *rp* refer to the *figures* (on page 3-39) at the end of this section.

**Drawn/Extruded Tee:** For more information on *do* refer to the *figures* (on page 3-39) at the end of this section.

**Long Weldneck Flange:** For more information on *rp* refer to the *figures* (on page 3-39) at the end of this section.

**Weldo-flange:** For more information on *rp* refer to the *figures* (on page 3-39) at the end of this section.

r2/rc

This field corresponds to the following terms for each component type:

**Fabricated Tee:** For more information on *r2* refer to the *figures* (on page 3-39) at the end of this section.

**Forged Tee to BS 1640:** For more information on *rc* refer to the *figures* (on page 3-39) at the end of this section.

**Sweepolet:** For more information on *rc* refer to the *figures* (on page 3-39) at the end of this section.

**Weldolet:** For more information on *r2* refer to the *figures* (on page 3-39) at the end of this section.

**Drawn/Extruded Tee:** For more information on *rc* refer to the *figures* (on page 3-39) at the end of this section.

**Long Weldneck Flange:** For more information on *r2* refer to the *figures* (on page 3-39) at the end of this section.

**Weldo-flange:** For more information on *r2* refer to the *figures* (on page 3-39) at the end of this section

r1/Tc/Lh

This field corresponds to the following terms for each component type:

**Fabricated Tee:** For more information on *r1* refer to the *figures* (on page 3-39) at the end of this section

**Forged Tee to BS 1640:** For more information on *Tc* refer to the *figures* (on page 3-39) at the end of this section

**Sweepolet:** For more information on *r1* refer to the *figures* (on page 3-39) at the end of this section

**Weldolet:** For more information on  $r1$  refer to the *figures* (on page 3-39) at the end of this section

**Drawn/Extruded Tee:** For more information on  $Lh$  refer to the *figures* (on page 3-39) at the end of this section

**Long Weldneck Flange:** For more information on  $r1$  refer to the *figures* (on page 3-39) at the end of this section

**Weldo-flange:** For more information on  $r1$  refer to the *figures* (on page 3-39) at the end of this section

L1/Lb

This field corresponds to the following terms for each component type:

**Fabricated Tee:** For more information on  $L1$  refer to the *figures* (on page 3-39) at the end of this section

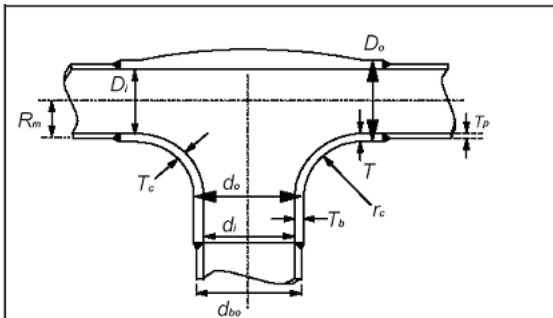
**Weldolet:** For more information on  $L1$  refer to the *figures* (on page 3-39) at the end of this section

**Drawn/Extruded Tee:** For more information on  $Lb$  refer to the *figures* (on page 3-39) at the end of this section

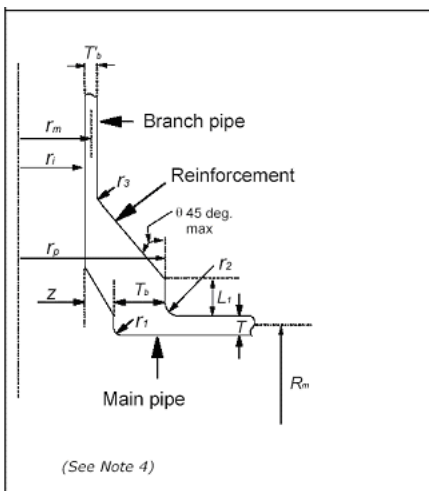
**Long Weldneck Flange:** For more information on  $L1$  refer to the *figures* (on page 3-39) at the end of this section

**Weldo-flange:** For more information on  $L1$  refer to the *figures* (on page 3-39) at the end of this section

Use the figures below to identify the specialized parameters.

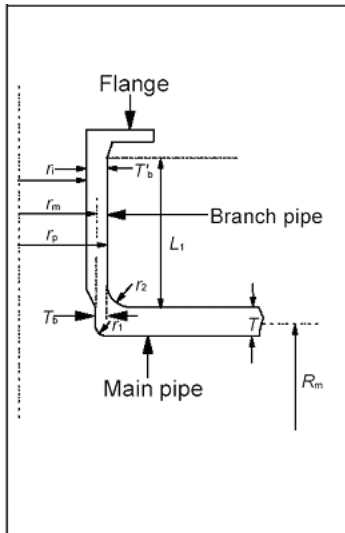


#### Forged Tee

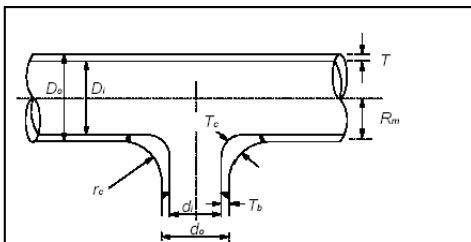


#### Weldolet

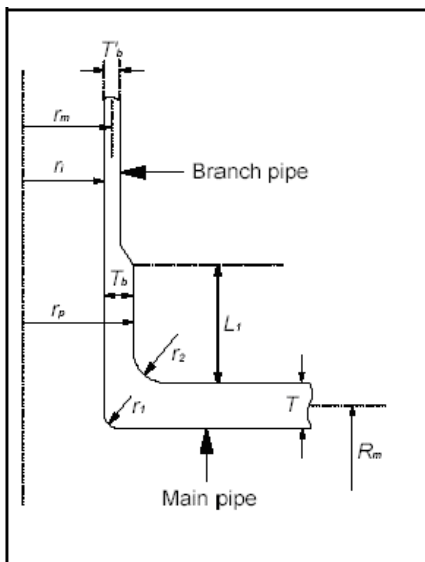




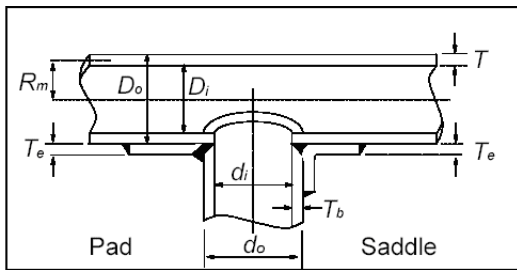
Long Weldneck Flange



Sweepolet



Fabricated Tee



#### Fabricated Tee with Pad

##### Weld ID

The following are valid Weld ID values.

Values:

0 or BLANK - As Welded

1 - Finished/Ground Flush

Used for:

BONNEY FORGE SWEEPOLETS

BONNEY FORGE INSERT WELDOLETS

BUTT WELDS IN THE SWEDISH PIPING CODE

If entered as 1 then the weld is considered to be ground flush on the inside and out and the SIF is taken as 1.0.

Refer to the help on Weld Mismatch (Weld d) for more detail on how input parameters are used to compute SIFs for girth butt welds.

##### Stress Concentration Factors

Entering Stress Concentration Factors here overrides those calculated according to the IGE/TD/12 Code equations. Note that any values entered here will apply only to the element on which they have been entered (except when entered on a bend node, they will apply throughout the bend).

Note that for branches of tees, any bending SCFs entered here must include the “w” term.

##### Fatigue Class

Selecting a fatigue class here overrides those calculated according to the IGE/TD/12 Code equations. Note that any values selected here will apply only to the element on which they have been entered (except when entered on a bend node, they will apply throughout the bend).