

## PRE-INSULATED PIPEWORK

**Duracool is a completely innovative pre-insulated ABS pipework system that is specially designed to provide reduced installation costs.**

Duracool is a complete system of pre-insulated pipe with unique shells for the fittings, insulation is protected by an attractive polyethylene outer casing.

Fitting is quick and easy, eliminating the need for hot works or manual lagging and making installation an easy and convenient process.

### Key Product Information

- Size Range: 20mm to 225mm
- Pressure Rating: PN10
- Temperature Rating: -40°C to 70°C

### Key Product Features

- Lightweight
- Easy to install
- Cost-efficient installation
- Wide temperature range
- Tough and durable

### Typical Applications

- Chilled water
- Glycol systems
- Brine



# Duracool



## Duracool System Overview

Duracool is a custom designed insulated pipework system that offers exceptional performance and life. It is the perfect addition to our standard ABS system which includes pipe, fittings, valves and a full range of transition fittings. Designed to enable lower lifetime and operational costs.

The system can be used to both protect and insulate the carrier pipe and when installed correctly can offer exceptional performance compared to any type of standard insulation and is therefore ideal for the transportation of chilled water, iced water, salt solutions, glycol solutions and organic salt solutions. Thermo-Click shells are watertight, condensation proof and suitable for outside use. Fitting is quick and easy, eliminating the

need for hot works or manual lagging and allowing convenient, simple trimming. A complete system of pre-insulated pipe and unique Thermo-Click shells for fittings, insulation is provided by polyurethane foam protected by an attractive polystyrene outer casing. The insulation is able to perform along the full temperature range of ABS and the outer can live up to daily cleaning with various chemicals (max 50°C on the jacket).

We have various components which make it possible for you to build a complete insulated piping system. All our fittings are delivered complete with the tape and sealant you will need to complete the installation, more is available if needed.



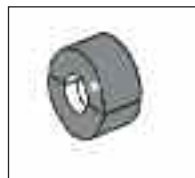
Straight socket



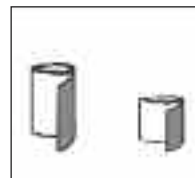
Elbow 90°



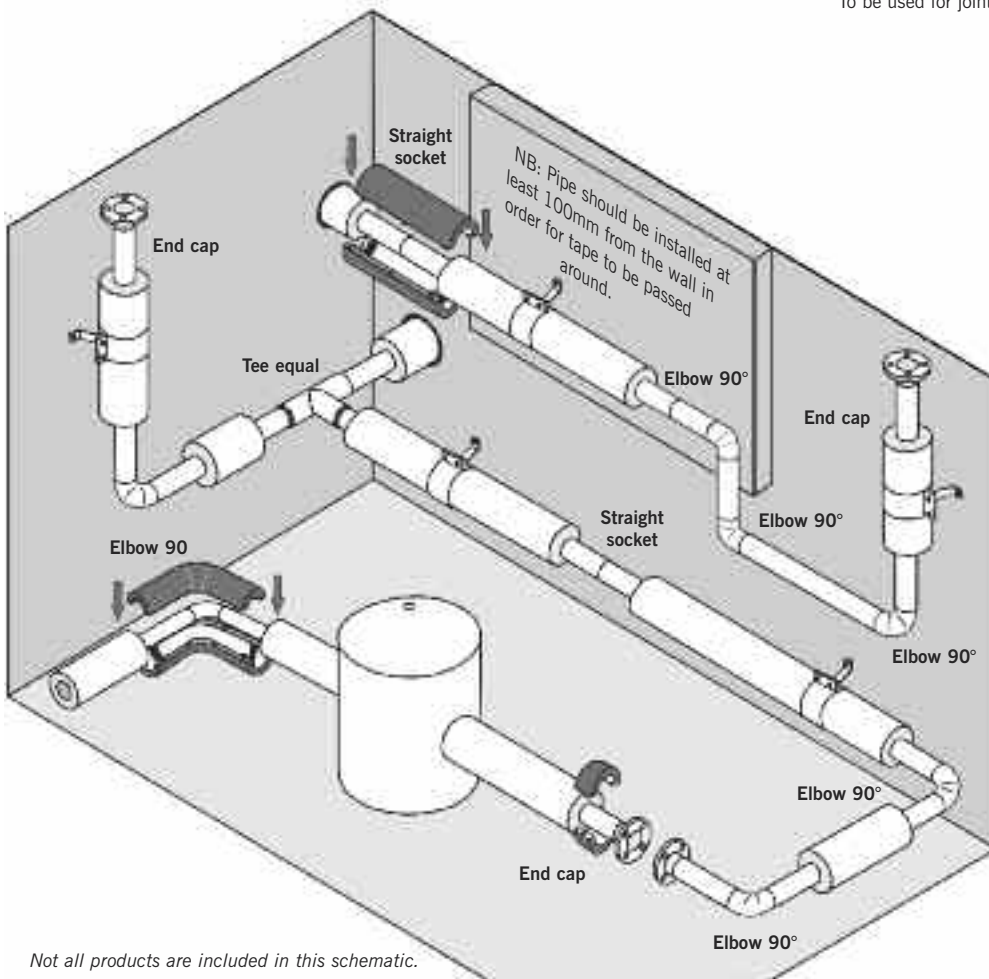
Tee equal



End cap



TC tape  
To be used for joints



Not all products are included in this schematic.

### Fields of Application:

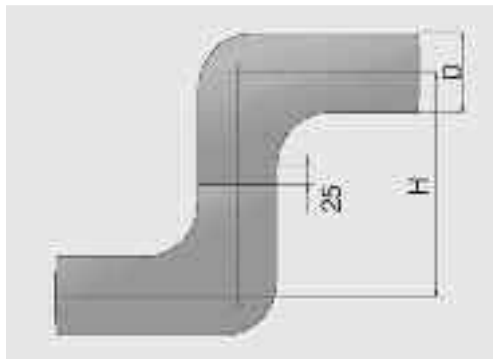
- Chilled water
- Secondary refrigeration
- Air conditioning
- Industrial cold/iced water
- Pharmaceutical industry
- Food and beverage industry
- Supermarkets
- Chemical industry
- Paper production

### Advantages:

- Easy-strip trimming for clean pipe ends
- Unique Thermo-Click shells for pipe fittings
- No hot works
- No manual lagging
- Lifetime cost savings
- No corrosion
- Top levels of energy efficiency
- Reduced costs for pipe hanging and can be applied directly onto the casing
- Simple installation
- Hygienic and aesthetically pleasing
- Joints can be opened for inspection.
- High mechanical strength
- Resistant to chemicals and UV rays

## Technical Considerations when Installing Duracool

To avoid unnecessary problems please examine the following before planning/installation of Duracool.



OD of Outer Pipe (mm)	H min (mm)	H max (mm)
90	220	500
110	290	560
125	340	590
140	370	650
160	430	710
180	440	740
200	480	720
225	536	830
250	604	910
280	660	900
315	634	910

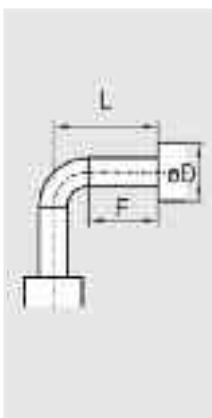
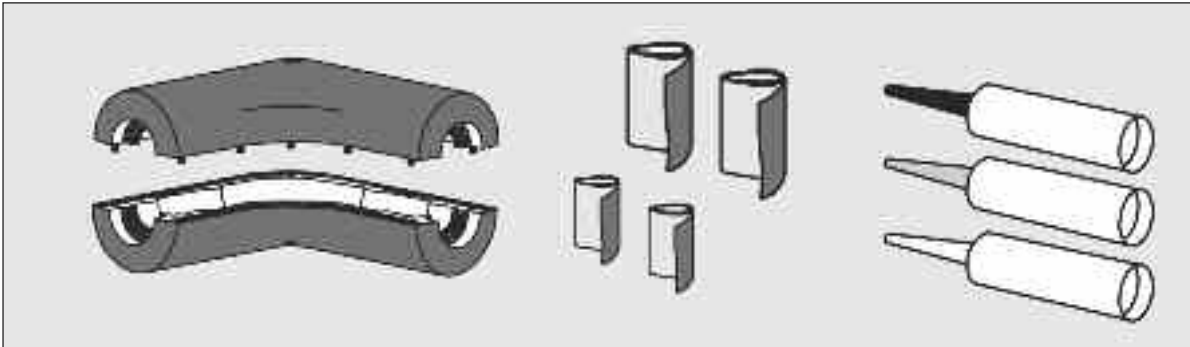
There is a minimum distance required between two 90° elbows, if your requirements fall between H min and H max then standard un-insulated pipe can be used between the elbows.

## Sealants for use with Duracool

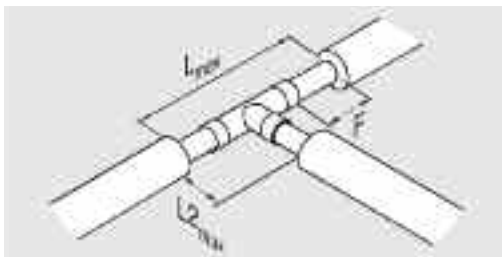
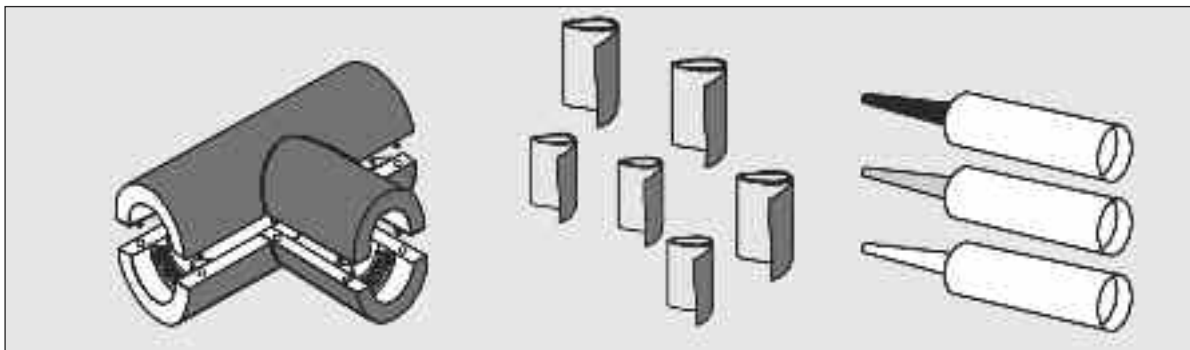
All Duracool Thermo-Click shells are supplied with the sealant required to make a joint. The sealant supplied has been tested and approved for use with ABS pipework. However, certain Intumescent mastics, mastic sealants and silicone sealants are formulated with components that can be hazardous when in contact with ABS, such as phthalates. Therefore confirmation of the suitability of any mastic sealant should be determined before being used in conjunction with ABS pipework or Duracool.

## Installation of Thermo-Click Shells

When you receive your Thermo-Click shells you will also receive the appropriate amount of sealant and tape to complete the installation. Please see note on page 71.



Carrier pipe d mm	Thermo-Click Diameter D (mm)	L max	L min
25, 32	90	250	110
40, 50	110	280	145
63	125	295	170
75	140	325	185
90	160	355	215
110	200	360	240
140	225	415	268
160	250	455	302
225	315	455	317



Carrier pipe d mm	Thermo-Click Diameter D (mm)	L max	L <sub>2</sub> min
25, 32	90	440 or 875*	230
40, 50	110		230
63	125		230
75	140		260
90	160		265
110	200		285
140	225		285
160	250		260
225	315		275

\*Tees are supplied standard with an L dimension of 440mm, but 875mm product is available as a special order, please enquire for details.

## Duracool Pipe Preparation

1. The pre-insulated pipe is supplied with a spigot of carrier pipe protruding from the end of the insulation. This is to make the installation as quick and simple as possible. However, if your installation does not require full lengths you will need to perform the following.



2. Determine the length of pipe you require and cut through the outer skin, insulation and carrier pipe to the required distance.



3. Perform a shallow cut around the pipe at the required distance from the end of the pipe, so that the outer skin can be removed (the distance will be dependent on the type of fitting that is being installed (please refer to the tables on page 72)).

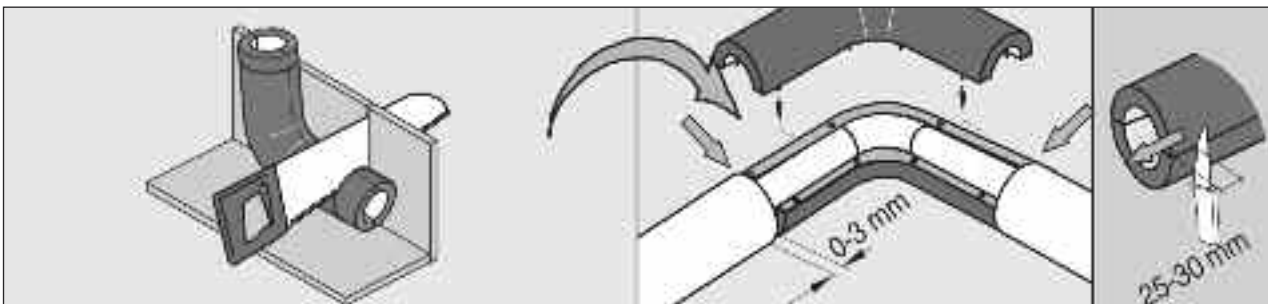


4. With a blunt instrument remove the remaining insulation so as to reveal the carrier pipe. There is a thin 'easy-peel' polythene layer between the insulation and the pipe to make this easier.



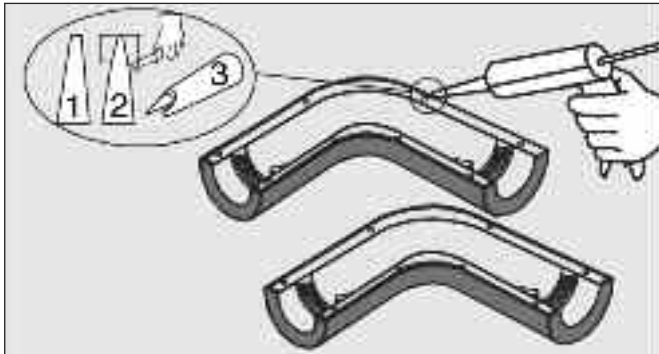
5. Use the appropriate fitting to make the joint, this is described on pages 16-18 of this technical catalogue. Complete this for the full system and perform a pressure test while all of the joints are exposed, so that any leaks can be identified and fixed.

6. Cut the Thermo-Click insulation shells to fit tight between the jacketed pipe and Thermo-Click shells. The plastic edge 25-30mm on the Thermo-Click shells must be removed.

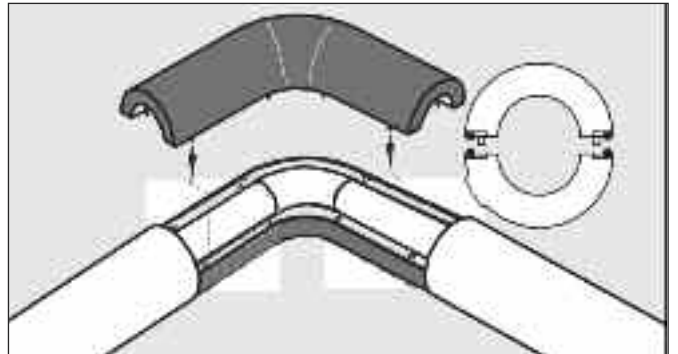


## Duracool Pipe Preparation

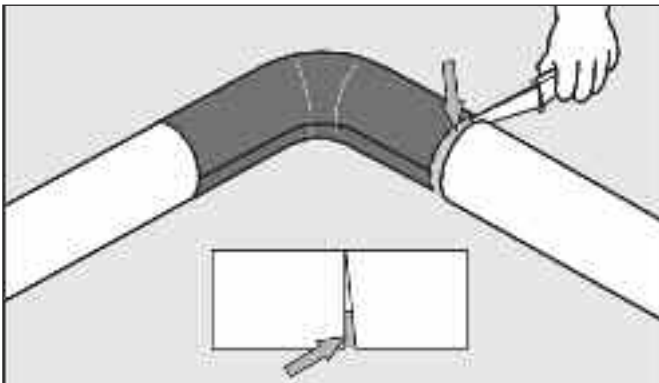
7. Apply sealant to both sides of the Thermo-Click shell, in a level layer,  $\varnothing 8\text{mm}$  along both edges.



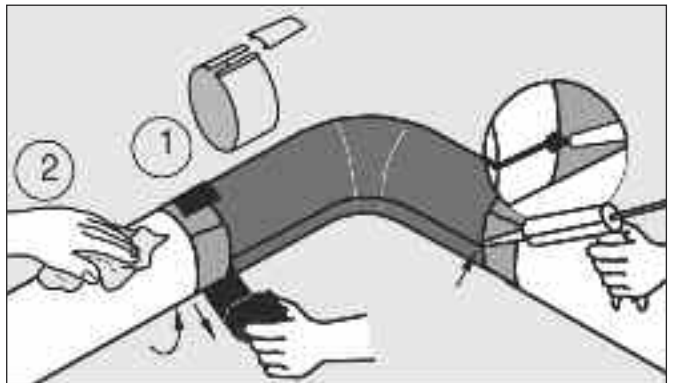
8. Mount the Thermo-Click shells by gently pressing them together. Check that the sealant has been squeezed out.



9. Any air-gaps of 0-3 mm between the pipe and the shells, must be sealed either with mineral wool, PU-foam or sealant.

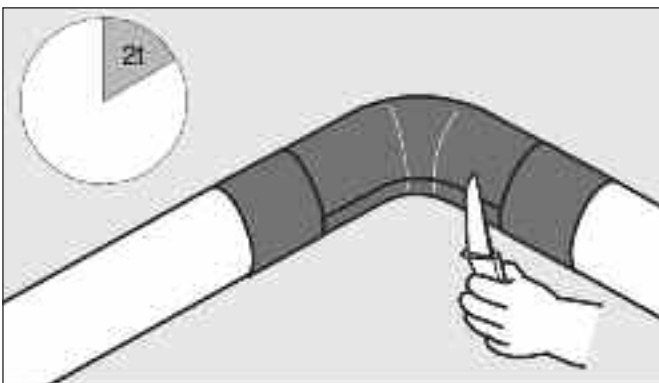


10. 1) Outer surfaces of the Thermo-Click shell must be CLEAN and DRY.  
 2) Wrap the Butyl-alutape around the assembly so that it bridges the gap evenly between the pipe and Thermo-Click shells. Wrap and stretch the black PVC tape around the assembly - making sure to leave at least a 100mm overlap.  
 3) If possible leave the tape overlap out of sight e.g. topside of pipe.

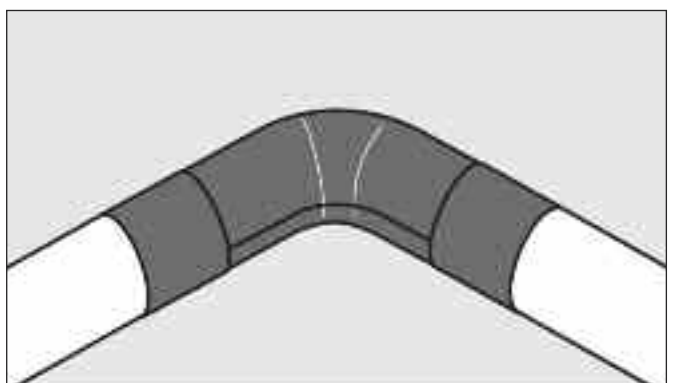


**Note:** It is also possible to use a painted steel wrap instead of black PVC tape to finish off the joint (shown in the image above). This offers greater protection to the system as well as an attractive finish. Please contact Durapipe UK for more details on the steel wrap.

11. After 2-4 hours remove the extra construction sealant with a knife. Alternatively if preferred the wet sealant can be shaped with a damp cloth for a smooth, attractive finish.



12. The Thermo-Click joint is complete.



## Data Sheet Thermo-Click Insulation Shells

This polyurethane system has been specially formulated for production of half shells. The waterbased foam has a fine cell structure, which results in a high strength. The system does not contain any HCFC – it is blown with CO<sub>2</sub> – and therefore has zero Ozone depletion potential (ODP).

### Foam Characteristics at 20°C (hand mixed)

Properties	Value	Test Method
Density, free rise:	43kg/m <sup>3</sup>	BS 4370 part 1 meth. 2
Density (packed in form)	88kg/m <sup>3</sup>	BS 4370 part 1 meth. 2
Closed cells	96%	ISO 4590
Cell size	< 0.2mm	EN253
Water absorption	2.2 %	EN253
Parallel to rise	0.31MPa	ISO 844
Perpendicular to rise	0.16MPa	ISO 844
E-modulus:		
Parallel to rise	11.7MPa	ISO 844
Perpendicular to rise	3.9MPa	ISO 844
Dimensional stability: (+140°C/0.02 MPa/48h) < - 5 % DIN 18159-1		
Thermal conductivity coefficient:		
λ <sub>10</sub> 0,026 W/m°K ISO 8301		
λ <sub>24</sub> 0,027 W/m°K ISO 8301		
λ <sub>50</sub> 0,030 W/m°K ISO 8301		

In Heat Transfer λ is used to denote the heat of vaporisation per mole or latent heat.  
 Burning characteristics: B2 DIN 4102.

### Thermo-Click shell outer

'Athpol' P90UV - extruded UV stabilised high-impact polystyrene (HIPS) sheet.

The following information represents typical property values that are based on information given by polymer raw material suppliers.

Properties	Value	Test Method
<b>Mechanical</b>		
Tensile Stress at Yield	23MPa	ISO 527
Flexural Strength	32MPa	ISO 178
Izod Impact Strength (notched)	23°C 12KJ/M2	ISO 180A
<b>Thermal</b>		
Heat Deflection Temperature	(1.8MPa) 75°C	ISO 75
Vicat Softening Temperature	(5kg - 50c/H) 84°C	ISO 306
<b>Density</b>	1.02	ISO 1183
Flammability at 1.6mm thickness HB UL94		
<b>Chemical Resistance Chart</b>		
Acids, Inorganic	Alcohols E	
- Weak E	Aliphatic Amines E	
- Strong E	Bases E	
- Strong oxidising F	Polyglycols E	
Acids, Organic	Vegetable oils G	
- Weak E	Pharmaceuticals E	
- Strong G	Salts E	

E = Excellent resistant - no attack.

G = Good resistant - minor attack.

F = Fair - limited resistance. Suitable for short term use only.

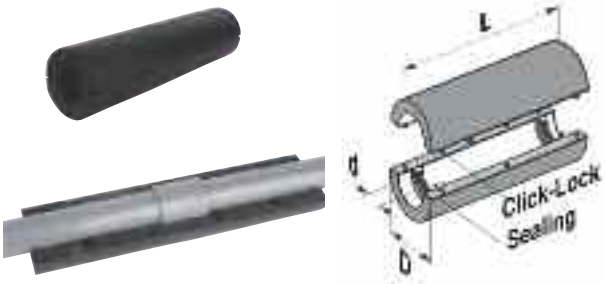
## Duracool Product Range

### Pre-Insulated ABS pipe Free spigot end for solvent welding



Carrier Pipe size (mm)	Wall Thickness of Carrier Pipe (mm)	Length (m)	Pipe OD (mm)	Code
25	1.9	5	90	21 555 307
32	2.1	5	90	21 555 308
40	2.7	5	110	21 555 309
50	3.4	5	110	21 555 310
63	4.2	5	125	21 555 311
75	5	5	140	21 555 312
90	6	5	160	21 555 313
110	7.3	5	200	21 555 314
140	9.3	5	225	21 555 316
160	10.5	5	250	21 555 317
200	13.2	5	280	21 555 318
225	14.8	5	315	21 555 319

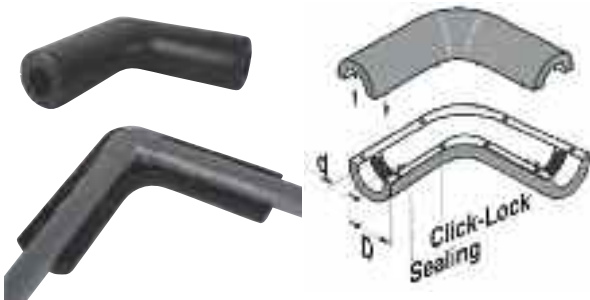
### Socket straights Thermo-Click Shells



Carrier Pipe Size d (mm)	Length L (mm)	Thermo-Click D (mm)	Code
25	440	90	21 100 313
32	440	90	21 100 313
40	440	110	21 100 314
50	440	110	21 100 314
63	440	125	21 100 315
75	440	140	21 100 316
90	440	160	21 100 317
110	440	200	21 100 318
140	440	225	21 100 319
160	440	250	21 100 320
225	440	315	21 100 323

*Note: ABS Fittings to be ordered separately.*

### Elbows 90° Thermo-Click Shells



Carrier Pipe Size d (mm)	Dimension E (mm)	Thermo-Click OD D (mm)	Code
25	250	90	21 115 313
32	250	90	21 115 313
40	275	110	21 115 314
50	275	110	21 115 314
63	295	125	21 115 315
75	325	140	21 115 316
90	355	160	21 115 317
110	360	200	21 115 318
140	410	225	21 115 319
160	425	250	21 115 320
225	450	315	21 115 323

*Note: ABS Fittings to be ordered separately.*



## Duracool Product Range

### Elbows 45° Thermo-Click Shells



Carrier Pipe Size d (mm)	Dimension F (mm)	Thermo-Click OD (D) (mm)	Code
25	250	90	21 119 313
32	250	90	21 119 313
40	260	110	21 119 314
50	260	110	21 119 314
63	260	125	21 119 315
75	290	140	21 119 316
90	310	160	21 119 317
110	325	200	21 119 318
140	320	225	21 119 319
160	315	250	21 119 320
225	350	315	21 119 323

*Note: ABS Fittings to be ordered separately.*

### Tee equal Thermo-Click Shells



Carrier Pipe Size d (mm)	Dimension G (mm)	Dimension H (mm)	Thermo-Click OD D (mm)	Code
25	440	250	90	21 122 313
32	440	250	90	21 122 313
40	440	260	110	21 122 314
50	440	260	110	21 122 314
63	440	260	125	21 122 315
75	440	290	140	21 122 316
90	440	310	160	21 122 317
110	440	325	200	21 122 318
140	440	320	225	21 122 319
160	440	315	250	21 122 320
225	440	350	315	21 122 323

*Note: ABS Fittings to be ordered separately.*

### End caps Thermo-Click Shells



Carrier Pipe Size d (mm)	Thermo-Click OD pipe d (mm)	Dimension (m) D (mm)	Code
25	90	60	21 149 313
32	90	60	21 149 313
40	110	60	21 149 314
50	110	60	21 149 314
63	125	60	21 149 315
75	140	60	21 149 316
90	160	60	21 149 317
110	200	60	21 149 318
140	225	60	21 149 319
160	250	60	21 149 320
225	315	60	21 149 323

*Note: ABS Fittings to be ordered separately.*

## Duracool Product Range

### Tees 90° reducing Thermo-Click Shells



Carrier Pipe Size d (mm)	Dimension J (mm)	Dimension K (mm)	Thermo-Click OD D (mm)	Code
40 x 25	440	250	110 x 90	21 109 451
40 x 32	440	250	110 x 90	21 109 451
50 x 25	440	250	110 x 90	21 109 451
50 x 32	440	250	110 x 90	21 109 451
63 x 25	440	250	125 x 90	21 109 458
63 x 32	440	250	125 x 90	21 109 458
63 x 40	440	260	125 x 110	21 109 459
63 x 50	440	260	125 x 110	21 109 459
75 x 25	440	250	140 x 90	21 109 465
75 x 32	440	250	140 x 90	21 109 465
75 x 40	440	260	140 x 110	21 109 466
75 x 50	440	260	140 x 110	21 109 466
75 x 63	440	260	140 x 125	21 109 467
90 x 25	440	250	160 x 90	21 109 473
90 x 32	440	250	160 x 90	21 109 473
90 x 40	440	250	160 x 110	21 109 474
90 x 50	440	250	160 x 110	21 109 474
90 x 63	440	250	160 x 125	21 109 475
90 x 75	440	290	160 x 140	21 109 476
110 x 25	440	250	200 x 90	21 109 483
110 x 32	440	250	200 x 90	21 109 483
110 x 40	440	260	200 x 110	21 109 484
110 x 50	440	260	200 x 110	21 109 484
110 x 63	440	260	200 x 125	21 109 485
110 x 75	440	290	200 x 140	21 109 486
110 x 90	440	310	200 x 160	21 109 487
140 x 25	440	250	225 x 90	21 109 491
140 x 32	440	250	225 x 90	21 109 491
140 x 40	440	260	225 x 110	21 109 492
140 x 50	440	260	225 x 110	21 109 492
140 x 75	440	290	225 x 140	21 109 493
140 x 90	440	310	225 x 160	21 109 494
140 x 110	440	325	225 x 200	21 109 495
160 x 25	440	250	250 x 90	21 109 490
160 x 32	440	250	250 x 90	21 109 490
160 x 40	440	260	250 x 110	21 109 469
160 x 50	440	260	250 x 110	21 109 469
160 x 63	440	260	250 x 125	20 109 508
160 x 75	440	290	250 x 140	21 109 516
160 x 90	440	310	250 x 160	21 109 497
160 x 110	440	325	250 x 200	21 109 498
160 x 140	440	320	250 x 225	21 109 499
225 x 25	440	250	315 x 90	21 109 506
225 x 32	440	250	315 x 90	21 109 506
225 x 40	440	260	315 x 110	21 109 505
225 x 50	440	260	315 x 110	21 109 505
225 x 63	440	260	315 x 125	20 109 510
225 x 75	440	290	315 x 140	20 109 518
225 x 90	440	310	315 x 160	20 109 525
225 x 110	440	325	315 x 200	21 109 536
225 x 140	440	320	315 x 225	21 109 502
225 x 160	440	315	315 x 250	21 109 503

*Note: ABS Fittings to be ordered separately.*