




UltraTech

ABRASION RESISTANT PIPING SYSTEMS

Company Overview

Induction Line

Since its inception in 1989, Ultra Tech has been a global leader in the design, manufacture, distribution and service of safe, quality abrasion resistant piping systems and accessories. Headquartered in Port Washington,Wisconsin, USA, the company offers complete piping products and solutions for both standard and specialized high-abrasion applications, such as mining, coal fired power generation, pneumatic conveyance, foundries, steel mills and a variety of other applications. Since that time, Ultra Tech has helped customers solve thousands of abrasive wear problems.

Induction Bender

With nearly twenty years of experience, Ultra Tech has a long history of proven technological expertise and product development to draw upon. Customers receive high-quality application engineering and manufacturing expertise with worldwide support, making Ultra Tech a market leader in demanding piping applications.

Welding Station

Ultra Tech 110,000 square foot state-of-the-art-manufacturing and distribution facility

Cutting Station

For additional information or to place an order
Call us at : 800-626-8243

Partnership In Problem Solving

Ultra Tech can help you prevent the unwanted consequences of highly abrasive applications, including: excessive system wear, frequent replacement, downtime and lost productivity.

Whatever concerns you most, chances are that we can jointly find the solution. Not just any solution, but the solution best tailored to your particular applications, and their attendant problems. **Partnership** in problem-solving.

There is no single "best" answer, ...across the board ...all the time. Cost-effective solutions involve the transport medium, the required speed for suspension, system pressure, maintenance and lost production costs. Combine your knowledge of your system with our product and application experience, and together we will analyze and identify root causes to lead to the solution that meets your needs. The partnership of our collective skills assures the best outcome for you.

Because we design, engineer, catalog and manufacture a full range of abrasion resistant piping components, we can "mix & match" technologies to provide an effective system solution, customized to meet your particular challenges. Aggressive R & D ...advanced metallurgy ...innovative designs ...all combine to solve problems with stronger, longer wearing systems.

We'll provide an effective solution from an economic, as well as technological standpoint. We may indeed recommend replacing old pipe with new, made from a more expensive material. But not unless we can also show you how it will significantly reduce, rather than increase, the life-cycle cost of your system.

Solutions to problems through knowledge, innovation and diversity form the foundation of Ultra Tech's value to you. **Cost-effective abrasion resistant piping solutions prolong the life and reduce the total cost of your piping system.**

Factors Affecting Pipeline Material Selection

Hardness

- To effectively resist wear, the pipe surface must be harder than the material under transport.
- Just being "harder" is generally good enough. Studies have shown the rate of wear is not significantly decreased with surfaces substantially harder.
- But, "not hard enough" results in accelerating wear rates when the inner pipe surface is softer than the material being transported.

Softness

- But harder is not always better. With hardness comes brittleness.
- Premature wear could occur if the transport material has large particle size, high impact speeds or a high angle of impingement. The trade-off for hardness is ductility, where the pipe surface "gives" and deforms rather than possibly shatter.
- Additionally, brittleness through hardness is detrimental if the pipe cannot withstand normal handling methods during installation or maintenance. Pipe seldom is treated gently. Brittle material could shatter.

Relative Material Hardness

- A relative scale of hardness measurement is the Mohs Scale which graphically compares the hardness of minerals. (See page 7.)
- Low carbon steel, rated at 120-150 Brinell, has limitations in abrasive applications.
- Higher carbon steel has a nominal 180-220 BHN hardness.
- Through the technology of induction hardening, the inner surface of the pipe can be hardened to a Brinell of 480-650 while the outer surface remains ductile and workable.

Other Considerations

Spool Length

- With pipe, "longer is better" as fewer joints reduce installation costs and turbulence.

Maintenance

- Since wear is inevitable, monitoring of wall thickness is important to determine rolling schedules and useful life. Monolithic steel walls can be readily tested ultrasonically whereas double wall steel pipe, castings and synthetic materials cannot.

General Considerations

- Weight for handling and structural support; load bearing capabilities; ambient and medium temperatures to allow for any thermal expansion.

Selection Criteria

When abrasion resistant piping is required, several alternatives are available. Each possess unique characteristics. Each has pros and cons. Proper selection requires insight into the piping system, including detail, objectives and constraints.

Attributes, advantages and disadvantages of several alternatives are illustrated below.

Piping System Material Comparison

	Mild Steel Low Carbon	Fiberglass Plastic	APL 5L and AR Pipe	Induction Hardened Pipe	Chrome Carbide Inserts	Cast Pipe	Twin Wall Pipe
Hardness	120-150 BHN	N/A	150-220 BHN	480-650 BHN	> 650 BHN	300-700 BHN	600-650 BHN
Abrasion Resistant	Poor	Can be impregnated with abrasion resistant beads	Moderate	Very Good	Excellent	Excellent	Excellent
Impact Resistant	Good	Good	Good	Moderate	Low / Marginal	Poor	Low
Strength	Good	Poor can crush	Good	Excellent	Good	Excellent	Excellent
Sizes	Unlimited	Limited	100’	50’	Limited	18’	20’
Handling & Installation	Excellent	Excellent	Excellent	Excellent	Very Good	Very Heavy Very Brittle	Very Good
Fabrication	Unlimited	Limited (special equipment)	Unlimited	Some Limitations	Some Limitations	Very Limited (to patterns)	Some Limitations
Wear Monitored	Readily with Ultrasonic	No	Readily with Ultrasonic	Readily with Ultrasonic	No	No	No
Emergency Repair	Easily completed	Limited (special equipment)	Easily completed	Easily patched	Easily patched	No	Easily patched
Initial Cost		Less than Mild Steel	10-25% above Mild Steel	50-100% above Mild Steel	4-5 times Mild Steel	3-6 times Mild Steel	3-4 times Mild Steel
Typical Life Expectancy		Up to 3 times Mild Steel	Up to 2 times Mild Steel	Up to 6 times Mild Steel	Up to 15 times Mild Steel	Up to 15 times Mild Steel	Up to 15 times Mild Steel
Advantages	Low cost, readily available	Lightweight, Corrosion resistant lengths to 100’	Improvement in wear over Mild Steel lengths to 100’	Excellent combination of abrasion & impact resistant	Excellent for abrasion wear	Excellent for abrasion wear	Excellent for abrasion wear
Disadvantages	Poor abrasion resistance; Costly change out	Difficult repairs, Thermal movement	Limited in wear, no corrosion resistance	No corrosion resistance Limited ductility	Limited length and diameter	Very heavy, supports req’d., Very brittle, Costly	No corrosion, Limited ductility

System Components

- **Pipe** lengths can be cut to precise length in **Spools**, fitted with the preferred end option to fit in the system.
- **Bends** can be fabricated in long sweeps of varied radius and angle to reduce energy loss plus reduce deterioration from abrasive particle flow. The bends can be further fitted with **Wearbacks** to result in the particles impacting itself, reducing pipe wear.
- **Tees** can be fabricated to split or blend flows.
- **Wyes** and **Laterals** can achieve the same, but with lower energy losses.
- **Hose**, abrasion resistant and steel reinforced, can provide the flexibility where required.
- **End attachments**, custom designed or commercially available, can be adapted. These include flanges, snap/two-bolt couplings, weld rings and other options as required.

For additional information or to place an order
Call us at : ***800-626-8243***

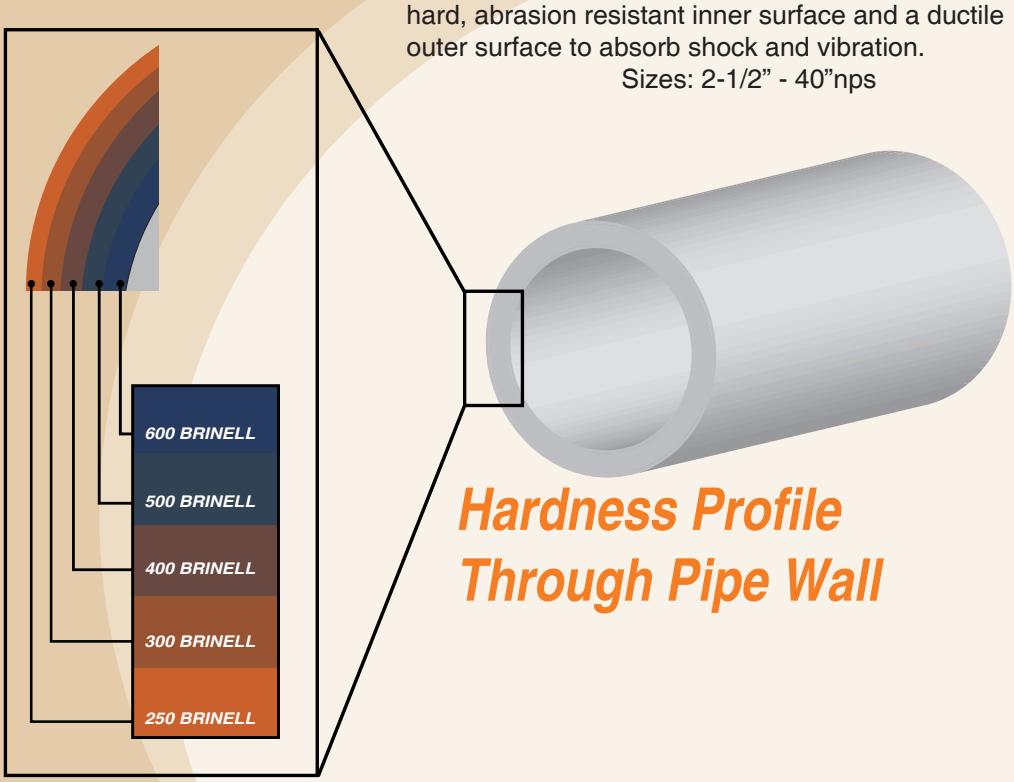
Ultra 600
Induction Hardened Pipe

The Induction Hardening Process

- In the hardening process, the raw pipe, a proprietary medium carbon, low alloy steel, is heated to a fully austenitic temperature, typically above 1550° F. At this temperature, the steel is transformed to a large face-centered cubic structure.
- The inside diameter is then rapidly quenched with a treated coolant. This procedure is extremely harsh and alters the microstructure, abundant with carbon atoms, to a body-centered tetragonal configuration.
- This needle-like structure, called martensite, is tightly packed and interlocked, leaving very little movement within the steel. This structure gives the steel its high hardness level that extends into the pipe wall.
- As the distance from the inner pipe wall increases, the effect of the quench is progressively less, as is the packing of the crystal structure. Correspondingly, the hardness tapers and the ductility increases to the outer surface of the pipe wall.

Hardness Profile
Ultra 600 is an induction heated and quenched steel pipe that uses a proprietary chemistry. The result is a pipe that has both an exceptionally hard, abrasion resistant inner surface and a ductile outer surface to absorb shock and vibration.

Sizes: 2-1/2" - 40"nps



Typical Ultra 600 Cross-Section

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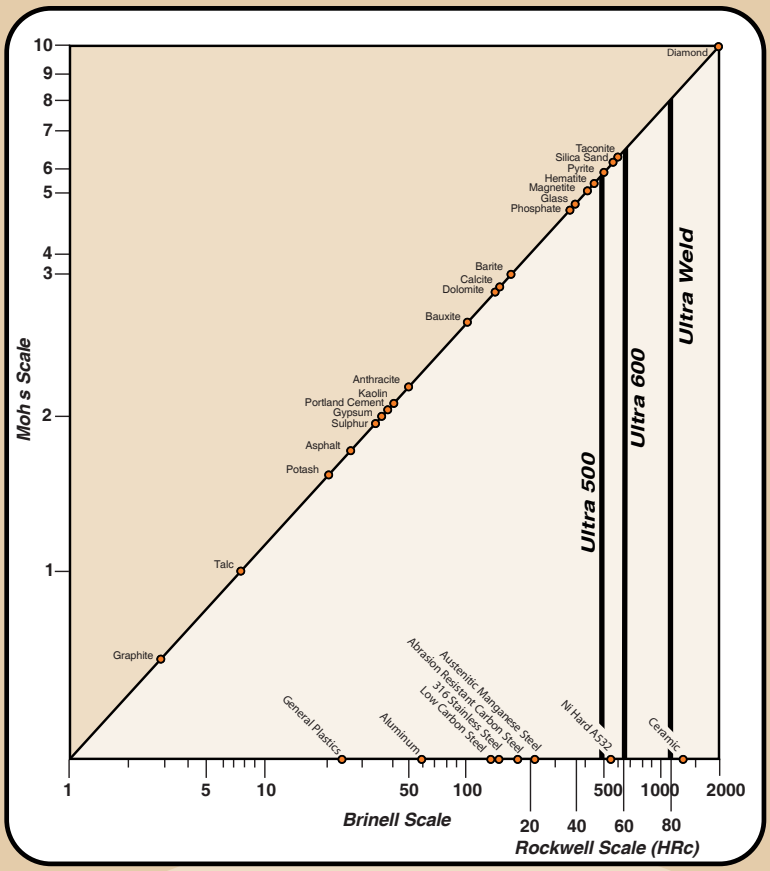

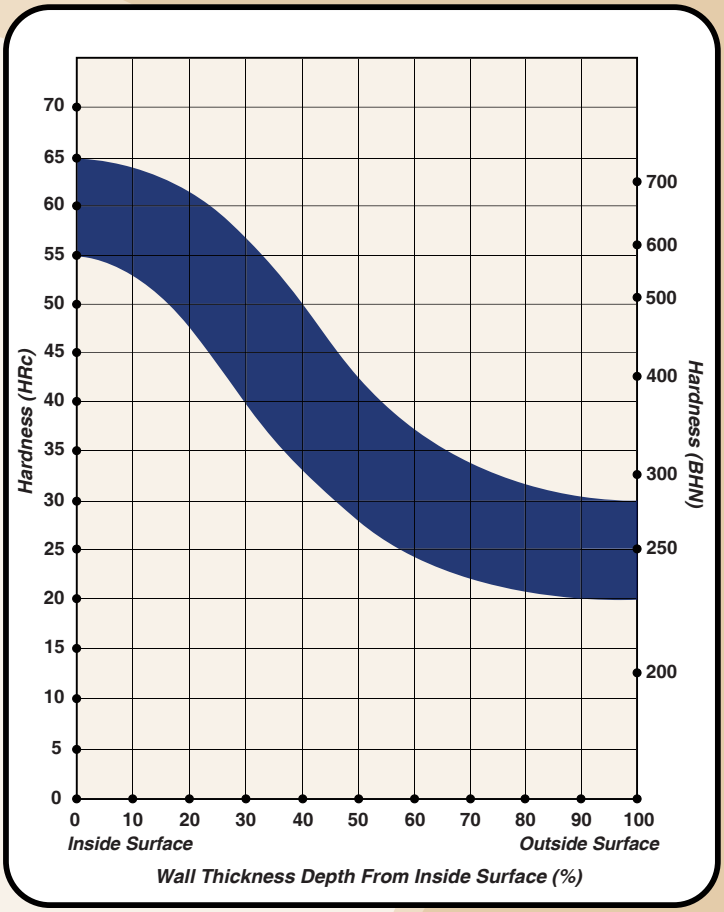

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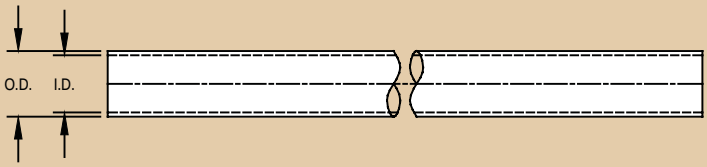
Standard Pipe Specifications



Pipe Size (nominal)	OD (Outside Diameter)	STANDARD WALL			EXTRA HEAVY WALL		
		ID (Inside Diameter)	Wall Thickness	Weight per Foot	ID (Inside Diameter)	Wall Thickness	Weight per Foot
2.50 63.5	**2.87** 72.9	— —	— —	— —	**2.32** 58.9	**.276** 7.01	**7.66** 11.40
3.00 76.2	**3.50** 88.9	— —	— —	— —	**2.90** 73.7	**.300** 7.62	**10.25** 15.25
4.00 101.6	**4.50** 114.3	**4.02** 102.1	**.237** 6.02	**10.79** 16.06	**3.82** 97.0	**.337** 8.56	**14.98** 22.29
5.00 127.0	**5.56** 141.2	**5.04** 128.0	**.258** 6.55	**14.62** 21.76	**4.81** 122.2	**.375** 9.53	**20.78** 30.93
6.00 152.4	**6.62** 168.2	**6.06** 153.9	**.280** 7.11	**18.97** 28.24	**5.76** 146.3	**.432** 10.97	**28.57** 42.52
8.00 203.2	**8.62** 219.0	**7.98** 202.7	**.322** 8.18	**28.55** 42.45	**7.62** 193.6	**.500** 12.7	**43.39** 64.57
10.00 254.0	**10.75** 273.0	**10.02** 254.5	**.365** 9.27	**40.48** 60.24	**9.75** 247.7	**.500** 12.7	**54.74** 81.46
12.00 304.8	**12.75** 323.9	**12.00** 304.8	**.375** 9.53	**49.56** 73.75	**11.75** 298.4	**.500** 12.7	**65.42** 97.36
14.00 355.6	**14.00** 355.6	**13.25** 336.6	**.375** 9.53	**54.57** 81.21	**13.00** 330.2	**.500** 12.7	**72.09** 107.28
16.00 406.4	**16.00** 406.4	**15.25** 387.4	**.375** 9.53	**62.58** 93.13	**15.00** 381.0	**.500** 12.7	**82.77** 123.18
18.00 457.2	**18.00** 457.2	**17.25** 438.1	**.375** 9.53	**70.59** 105.05	**17.00** 431.8	**.500** 12.7	**93.45** 139.07
20.00 508.0	**20.00** 508.0	**19.25** 489.0	**.375** 9.53	**78.60** 116.97	**19.00** 482.6	**.500** 12.7	**104.13** 154.97
24.00 609.6	**24.00** 609.6	**23.25** 590.6	**.375** 9.53	**94.62** 140.81	**23.00** 584.2	**.500** 12.7	**125.49** 186.75

Inches | Millimeters

Pounds per foot | Kilograms per meter

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Induction-Hardened Bends

Change Flow Direction Efficiently and Cost-Effectively

Induction-hardened bends combine the advantages of an abrasion resistant impact zone, custom-designed configurations, reduced piping system pressure and lower maintenance, installation and operating costs. The pipe wall is heated to austenizing temperature within a narrow band, formed to the required bend radius and quenched to achieve an inner wall surface hardness between 180 and 600 Brinell.

Benefits of Induction-Hardened Bends

- Extend system life with a hardened wear surface.
- Reduce installation costs with optimum geometry.
- Reduce maintenance, repair and replacement costs.
- Reduce energy consumption with minimal line loss.
- Enhance total life-cycle cost savings.

Material

- Ultra 200 AR Pipe, Brinell 180-220
- Ultra 500 Induction-Hardened Pipe, Brinell 500 & HRc 45-55
- Ultra 600 Induction-Hardened Pipe, Brinell 600 & HRc 55-65

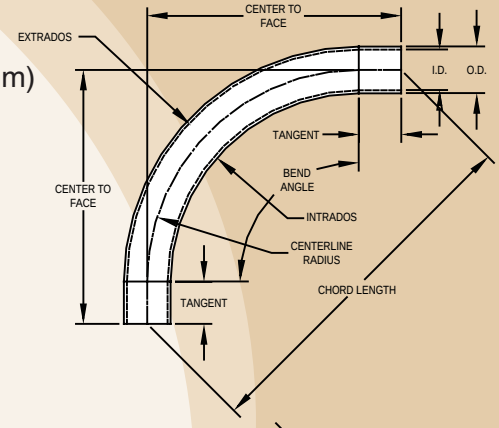
Sizes

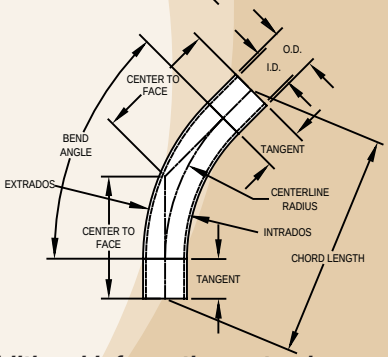
- Pipe diameter from 2-1/2" NPS (73.0 mm) to 26” O.D. (660 mm)
- Standard and extra heavy wall thickness
- Angles to 180°
- Minimum radius of 20”, 3D for diameters less than 6” and a maximum 180” CLR

Options

- Tangents available at bend ends
- End attachment alternatives include flanges, weld rings and mechanical couplings

Bend Nomenclature





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Induction-Hardened Bends / with Wearbacks

Added Precaution That May Be Taken As A "Second Line Of Defence"

Overview

Wearbacks are fabricated "chambers" which are fitted on the extrados of the pipe bend.

As the pipe material wears through from abrasion, the transport material collects in this chamber. The transport material flowing to the bend then impacts upon the collected material and, in essence, wears upon itself.

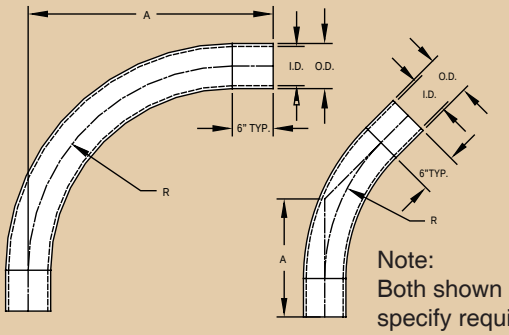
Wearbacks are either "permanent" or "replaceable".

- Permanent wearbacks are constructed from channel steel rolled to the same radius and welded to the pipe bend. They are "permanent" until the channel wears through and the entire assembly must be replaced.

- Replaceable wearbacks consist of two angle irons, rolled and welded, with a removable plate bolted through the angles.

The rate of erosion of the bend extrados cannot be ultrasonically tested during operation, only the condition of the wearback itself.

Fittings - 90° Bends
- 45° Bends



Note:
Both shown with 6" tangents, specify required length.

Standard Wall Specifications 90°

Pipe Size (nominal)	OD Diameter actual	ID Diameter nominal	Wall Thickness	1-1/2 D			3 D			5 D		
				R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.
2.50	2.87	2.47	.203	3.75	9.75	9	7.50	13.50	12	12.50	18.50	15
3.00	3.50	3.07	.216	4.50	10.50	12	9.00	15.00	17	15.00	21.00	22
4.00	4.50	4.03	.237	6.00	12.00	19	12.00	18.00	28	20.00	26.00	39
5.00	5.56	5.05	.258	7.50	13.50	29	15.00	21.00	43	25.00	31.00	62
6.00	6.62	6.07	.280	9.00	15.00	41	18.00	24.00	64	30.00	36.00	94
8.00	8.62	7.98	.322	12.00	18.00	73	24.00	30.00	118	40.00	46.00	178
10.00	10.75	10.02	.365	15.00	21.00	120	30.00	36.00	200	50.00	56.00	305
12.00	12.75	12.00	.375	18.00	24.00	166	36.00	42.00	283	60.00	66.00	439
14.00	14.00	13.25	.375	21.00	27.00	205	42.00	48.00	355	70.00	76.00	555
16.00	16.00	15.25	.375	24.00	30.00	260	48.00	54.00	456	80.00	86.00	718
18.00	18.00	17.25	.375	27.00	33.00	320	54.00	60.00	570	90.00	96.00	902
20.00	20.00	19.25	.375	30.00	36.00	387	60.00	66.00	696	100.00	106.00	1107
24.00	24.00	23.25	.375	36.00	42.00	541	72.00	78.00	986	120.00	126.00	1581

Standard Wall Specifications 45°

Pipe Size (nominal)	OD Diameter actual	ID Diameter nominal	Wall Thickness	1-1/2 D			3 D			5 D		
				R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.
2.50	2.87	2.47	.203	3.75	7.55	6	7.50	9.11	9	12.50	11.18	10
3.00	3.50	3.07	.216	4.50	7.86	10	9.00	9.73	12	15.00	12.21	15
4.00	4.50	4.03	.237	6.00	8.49	16	12.00	10.97	19	20.00	14.28	25
5.00	5.56	5.05	.258	7.50	9.11	21	15.00	12.21	29	25.00	16.36	38
6.00	6.62	6.07	.280	9.00	9.73	26	18.00	13.46	41	30.00	18.43	56
8.00	8.62	7.98	.322	12.00	10.97	37	24.00	15.94	73	40.00	22.57	103
10.00	10.75	10.02	.365	15.00	12.21	52	30.00	18.43	108	50.00	26.71	173
12.00	12.75	12.00	.375	18.00	13.46	64	36.00	20.91	166	60.00	30.85	244
14.00	14.00	13.25	.375	21.00	14.70	71	42.00	23.40	205	70.00	34.99	304
16.00	16.00	15.25	.375	24.00	15.94	81	48.00	25.88	259	80.00	39.14	390
18.00	18.00	17.25	.375	27.00	17.18	92	54.00	28.37	320	90.00	43.28	486
20.00	20.00	19.25	.375	30.00	18.43	102	60.00	30.85	393	100.00	47.42	529
24.00	24.00	23.25	.375	36.00	20.91	123	72.00	35.82	568	120.00	55.71	838

All dimensions are in inches. Weights shown do not include flanges or other end attachments. Other radii and dimensions available.
Consult factory for your specific requirements.

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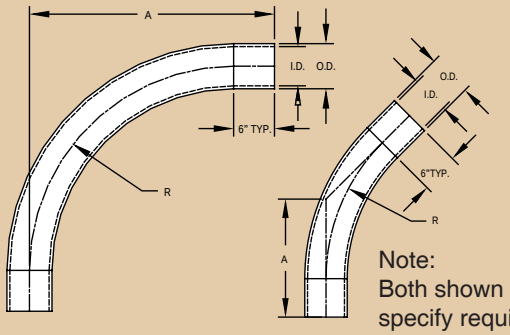
Fittings - 90° Bends
- 45° Bends



Note:
Both shown with 6" tangents, specify required length.

Extra Heavy Wall Specifications 90°

Pipe Size (nominal)	OD Diameter actual	ID Diameter nominal	Wall Thickness	1-1/2 D			3 D			5 D		
				R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.
2.50	2.87	2.32	.276	3.75	9.75	11	7.50	13.50	15	12.50	18.50	20
3.00	3.50	2.90	.300	4.50	10.50	16	9.00	15.00	22	15.00	21.00	30
4.00	4.50	3.83	.337	6.00	12.00	27	12.00	18.00	39	20.00	26.00	54
5.00	5.56	4.81	.375	7.50	13.50	41	15.00	21.00	62	25.00	31.00	89
6.00	6.62	5.76	.432	9.00	15.00	62	18.00	24.00	96	30.00	36.00	141
8.00	8.62	7.63	.500	12.00	18.00	112	24.00	30.00	180	40.00	46.00	271
10.00	10.75	9.75	.500	15.00	21.00	162	30.00	36.00	270	50.00	56.00	413
12.00	12.75	11.75	.500	18.00	24.00	220	36.00	42.00	374	60.00	66.00	579
14.00	14.00	13.00	.500	21.00	27.00	270	42.00	48.00	468	70.00	76.00	733
16.00	16.00	15.00	.500	24.00	30.00	343	48.00	54.00	603	80.00	86.00	945
18.00	18.00	17.00	.500	27.00	33.00	424	54.00	60.00	754	90.00	96.00	1194
20.00	20.00	19.00	.500	30.00	36.00	513	60.00	66.00	922	100.00	106.00	1467
24.00	24.00	23.00	.500	36.00	42.00	717	72.00	78.00	1308	120.00	126.00	2097

Extra Heavy Wall Specifications 45°

Pipe Size (nominal)	OD Diameter actual	ID Diameter nominal	Wall Thickness	1-1/2 D			3 D			5 D		
				R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.	R Bend Radius	A Center to Face	Approx. Weight, lbs.
2.50	2.87	2.32	.276	3.75	7.55	10	7.50	9.11	11	12.50	11.18	14
3.00	3.50	2.90	.300	4.50	7.86	13	9.00	9.73	16	15.00	12.21	20
4.00	4.50	3.81	.337	6.00	8.49	21	12.00	10.97	27	20.00	14.28	47
5.00	5.56	4.81	.375	7.50	9.11	30	15.00	12.21	41	25.00	16.36	55
6.00	6.62	5.76	.432	9.00	9.73	45	18.00	13.46	62	30.00	18.43	85
8.00	8.62	7.62	.500	12.00	10.97	77	24.00	15.94	112	40.00	22.57	157
10.00	10.75	9.75	.500	15.00	12.21	108	30.00	18.43	162	50.00	26.71	234
12.00	12.75	11.75	.500	18.00	13.46	142	36.00	20.91	220	60.00	30.85	322
14.00	14.00	13.00	.500	21.00	14.70	171	42.00	23.40	270	70.00	34.99	402
16.00	16.00	15.00	.500	24.00	15.94	212	48.00	25.88	343	80.00	39.14	516
18.00	18.00	17.00	.500	27.00	17.18	259	54.00	28.37	424	90.00	43.28	644
20.00	20.00	19.00	.500	30.00	18.43	309	60.00	30.85	513	100.00	47.42	786
24.00	24.00	23.00	.500	36.00	20.91	421	72.00	35.82	717	120.00	55.71	1110

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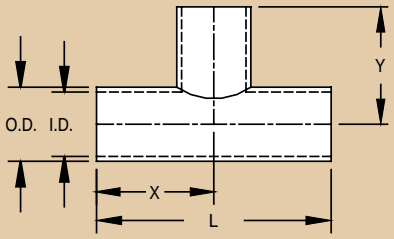
Fittings - 90° Tees



Standard Wall Specifications

Pipe Size (nominal)	OD (Outside Diameter)	ID (Inside Diameter)	Wall Thickness	X and Y Dimension	L Dimension	Approx. Weight, lbs.
2.50	2.87	2.46	.203	6.37	12.75	9
3.00	3.50	3.06	.216	6.87	13.75	12
4.00	4.50	4.02	.237	8.37	16.75	21
5.00	5.56	5.04	.258	9.62	19.25	32
6.00	6.62	6.06	.280	10.50	21.00	45
8.00	8.62	7.98	.322	12.50	25.00	79
10.00	10.75	10.02	.365	14.75	29.50	131
12.00	12.75	12.00	.375	16.37	32.75	177
14.00	14.00	13.25	.375	17.75	35.50	210
16.00	16.00	15.25	.375	19.25	38.50	259
18.00	18.00	17.25	.375	21.00	42.00	318
20.00	20.00	19.25	.375	22.75	45.50	382
24.00	24.00	23.25	.375	25.25	50.50	503

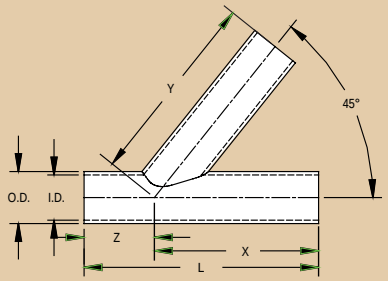
Extra Heavy Wall Specifications

Pipe Size (nominal)	OD (Outside Diameter)	ID (Inside Diameter)	Wall Thickness	X and Y Dimension	L Dimension	Approx. Weight, lbs.
2.50	2.87	2.32	.276	6.37	12.75	11
3.00	3.50	2.90	.300	6.87	13.75	16
4.00	4.50	3.82	.337	8.37	16.75	29
5.00	5.56	4.81	.375	9.62	19.25	45
6.00	6.62	5.76	.432	10.50	21.00	67
8.00	8.62	7.62	.500	12.50	25.00	120
10.00	10.75	9.75	.500	14.75	29.50	177
12.00	12.75	11.75	.500	16.37	32.75	233
14.00	14.00	13.00	.500	17.75	35.50	278
16.00	16.00	15.00	.500	19.25	38.50	343
18.00	18.00	17.00	.500	21.00	42.00	421
20.00	20.00	19.00	.500	22.75	45.50	506
24.00	24.00	23.00	.500	25.25	50.50	667

All dimensions are in inches. Weights shown do not include flanges or other end attachments. Other angles and dimensions available. Saddles may be applied for high pressure applications. *Consult factory for your specific requirements.*

For additional information or to place an order
Call us at : 800-626-8243

Fittings - 45° Laterals



Standard Wall Specifications

Pipe Size (nominal)	OD (Outside Diameter)	ID (Inside Diameter)	Wall Thickness	X and Y Dimension	Z Dimension	L Dimension	Approx. Weight, lbs.
2.50	2.87	2.46	.203	13.87	5.87	19.75	16
3.00	3.50	3.06	.216	14.50	6.50	21.00	23
4.00	4.50	4.02	.237	17.75	7.25	25.00	38
5.00	5.56	5.04	.258	19.75	8.25	28.00	58
6.00	6.62	6.06	.280	22.37	8.87	31.25	85
8.00	8.62	7.98	.322	26.25	10.75	37.00	150
10.00	10.75	10.02	.365	30.25	11.75	42.00	244
12.00	12.75	12.00	.375	33.87	12.37	46.25	331
14.00	14.00	13.25	.375	37.87	13.37	51.25	405
16.00	16.00	15.25	.375	41.75	14.75	56.50	512
18.00	18.00	17.25	.375	45.00	15.50	60.50	621
20.00	20.00	19.25	.375	48.25	16.25	64.50	739
24.00	24.00	23.25	.375	55.75	18.25	74.00	1023

Extra Heavy Wall Specifications

Pipe Size (nominal)	OD (Outside Diameter)	ID (Inside Diameter)	Wall Thickness	X and Y Dimension	Z Dimension	L Dimension	Approx. Weight, lbs.
2.50	2.87	2.32	.276	13.87	5.87	19.75	22
3.00	3.50	2.90	.300	14.50	6.50	21.00	31
4.00	4.50	3.82	.337	17.75	7.25	25.00	53
5.00	5.56	4.81	.375	19.75	8.25	28.00	83
6.00	6.62	5.76	.432	22.37	8.87	31.25	128
8.00	8.62	7.62	.500	26.25	10.75	37.00	229
10.00	10.75	9.75	.500	30.25	11.75	42.00	330
12.00	12.75	11.75	.500	33.87	12.37	46.25	437
14.00	14.00	13.00	.500	37.87	13.37	51.25	535
16.00	16.00	15.00	.500	41.75	14.75	56.50	678
18.00	18.00	17.00	.500	45.00	15.50	60.50	822
20.00	20.00	19.00	.500	48.25	16.25	64.50	978
24.00	24.00	23.00	.500	55.75	18.25	74.00	1357

All dimensions are in inches. Weights shown do not include flanges or other end attachments. Other angles and dimensions available. Saddles may be applied for high pressure applications. *Consult factory for your specific requirements.*

Visit us online at: www.ultratechpipe.com

Twin-Wall™ Piping Systems

Double-Walled Construction. Hardened Inner Liner For Abrasion Resistance And High Tensile Strength Outer Tube

Description

Twin-Wall™ utilizes two steel tubes. A high carbon steel tube is inserted into a mild steel tube. Then together they are mechanically sized to ensure outer and inner tube tightness, and induction heat-treated to create a through-hardened, wear-resistant liner.

Features

- An inner liner hardened to at least 600 Brinell throughout the inner pipe wall
- A low-carbon outer shell to absorb impact and contain pressure
- Abrasion resistant at temperatures up to 450° F
- Multiple end options available, including flanges, couplings, ends, weld rings or plain ends

Benefits

- Long life in highly abrasive applications
- Easy installation with weight similar to mild steel pipe of equivalent thickness
- Excellent service life at cost-effective pricing
- Superior quality compared to gas flame hardening

Applications

Twin-Wall™ applications include pneumatic and hydraulic piping systems for extremely abrasive materials such as concrete, paste fill, sand, gravel and mine tailings.

Twin-Wall™ provides a hard wear surface and is available in various liner thicknesses. Monitoring is limited to physical measurement.

For additional information or to place an order
Call us at : ***800-626-8243***

Cast Basalt

Outstanding Wear Resistance
For Piping Applications With Sliding Abrasion

Description

Natural basalt is melted at approximately 2400° F and cast into the desired shape. The controlled tempering process creates uniform pherolithic crystals producing exceptional hardness and wear resistance.

Features

- 8 on the Mohs hardness scale (diamond has a value of 10)
- Service temperatures up to 700° F or down to -40° F
- Maintains a smooth even surface for favorable flow conditions
- Available in straight pipe, bends and fittings
- Straight lengths available to 18 feet
- Multiple end options available, including flanges and weld ends

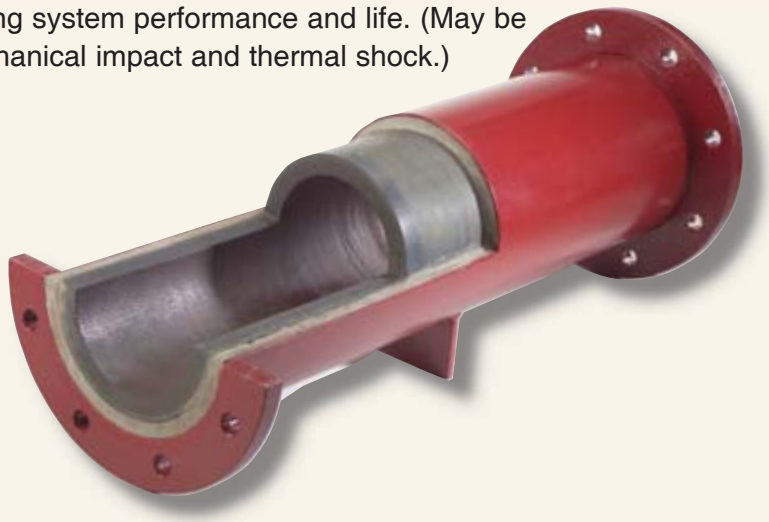
Benefits

- Long life in highly abrasive and corrosive applications
- Improved performance compared to alternate linings
- Excellent service life at cost-effective pricing

Applications

Cast basalt applications include hydraulic piping systems for materials such as bottom ash, fly ash, pulverized coal, lime and many other abrasive transport applications.

Cast Basalt is ideal for improving system performance and life. (May be susceptible to damage from mechanical impact and thermal shock.)



Chrome Carbide
Insert Lined Components

Chrome Carbide Lined Pipe and Bends
Designed For Long Life In High Abrasion Piping Systems

Features

- Chrome carbide wear material maximizes abrasion resistance
- Chrome carbide wear performance is similar to hard face overlay
- Cast segments offer a thick outer wall on bends where impact and sliding abrasion occur
- Cast chromium carbide inserts offer 360 degree protection
- Chrome carbide inserts are contained in a carbon steel outer tube
- Available sizes of 3" through 8" NPS
- Various tangent lengths provide dimensional flexibility, CCI lined tangents available for continued wear resistance
- Multiple end options available, including flanges, couplings or plain ends

Benefits

- Long life in highly abrasive applications
- Smooth laminar flow, low ΔP - superior to pocket elbows or blind tees
- Improved performance compared to alternate linings - steel, basalt, or castings
- Excellent service life at cost-effective pricing

Applications

CCI Lined Component applications include pneumatic and hydraulic piping systems for extremely abrasive materials such as foundry sand, lime/ash injection, glass transport and mine backfill.

CCI Lined Components are ideal for improving systems performance and life for upgrades, renovations, or component replacement.

For additional information or to place an order
Call us at : ***800-626-8243***

Ultra 4000 Diversion Valve

For Abrasive Slurry Applications

Description

The hydraulically operated Ultra 4000 Diversion Valve is designed for rugged use in mining or similar bulk transport applications. Dual 6” rams withstand 4000 PSI working pressure.

Features

- High duty applications
- Variable cycle time dependant upon power pack option selected
- Hardened face seals
- 6” dual hydraulic rams
- Smooth operation
- Lifting eyes for ease of movement

Options

- Optional 7.5 or 10 H.P. 230 Vac, three-phase power pack with 10 gallon reservoir
- Optional control valves for remote operation
- Optional bleed valve
- Optional slurry port

Specifications

- Maximum working pressure at 3:1 safety factor: 4000 PSI
- Dimensions: 46.25” W x 57” D x 78.5” H
- Weight: 3,250 lbs.
- 7-12 GPM at 4000 PSI nominal flow requirements
- Valve sizes: 3”, 4”, 5”, 6” and 8”

Applications

Applications include paste fill and sand fill, hydraulic tailings, together with other systems where multi-line outlet with single inlet is the operating mode.

Hydraulic Power Packs

For Use With Ultra Tech Diversion Valves

Ultra Tech Hydraulic Power Packs provide an engineered solution tailored to each application. Most hydraulic power packs are custom specified.

Features

- Custom engineered compact unit with all necessary components to safely and effectively operate Ultra Tech Diversion Valves
- 1.5 to 10HP TEFC motor with fixed gear pumps at 2.9 to 10.6 GPM flow
- Hydraulic fluid reservoir
- Relief valve
- Filter assembly with filter element
- Flanged base for bolted installation
- Manual control lever for valve actuation. Note: On the Ultra 4000 Diversion Valve, the manual control lever is provided on the diversion valve itself, not on the hydraulic power pack.

Options

- Two-section mono block valve with two manual control levers for operation of two diversion valves using one hydraulic power pack
- Solenoid type directional control valve for hook-up to remote programmable logic control
- Custom configurations available
- Gas powered models for remote locations

For additional information or to place an order
Call us at : 800-626-8243

UltraFlex Hose

Where Piping Systems Need To Be Flexible

Many applications experience high vibration, flow surges and periodic shock. UltraFlex Hose is an ideal solution to combine wear resistance, layout flexibility and isolation in both hydraulic and pneumatic piping systems. The hose is designed to withstand heavy compressive loads and vacuums. It is available in two styles with lengths up to 50’ (15.24m).

Style I - 2” through 6" diameter (DN50 - DN150)

- Three-ply construction
- Hose body, full flow and hardened with double-crimped ferrule
- Reinforcement
  - Two steel cord plies: 2" and 2-1/2" (50.8 - 63.5mm) diameter hose
  - Four steel cord plies: 3" through 6" (76.2 - 152.4mm) diameter hose
- Maximum Working Pressure @ 3:1 safety factor: 1000 psig (68.0 BAR)
- Maximum Vacuum: 10 psig (0.68 BAR)
- Cut to required length, 50' (15.24m) maximum

Style II - 8” through 39.4” diameter (DN200 - DN1000)

- Four-ply construction
  - Reinforcement, Inner - Synthetic textile cord
  - Reinforcement, Outer - Helix wire, steel, embedded
- Material selection will vary to fit application
- Maximum Working Pressure @ 3:1 safety factor: 150 psig (10.2 BAR)
- Maximum Vacuum: 13 psig (0.88 BAR)
- End options - Plain, Square cut steel nipple, re-attachable split flange
- Cut to required length, 40' (12.19m) maximum
- Style II hose is custom-engineered to the application. Please Consult Factory.

End Attachment Options

Overview

In addition to the wide range of available standard end connection options, Ultra Tech can provide customized sizes and configurations to meet the requirements of your system. For snap coupling and two-bolt coupling options, consult factory.

Selection of the appropriate option, or combination of options, is dictated by maintenance considerations, performance expectations, life cycle, and other variables.

While end options can, in most cases, be installed in the field utilizing proper procedures, improved performance will result when factory fitted. Care must be taken to cool the inner surface of the pipe wall to prevent tempering, thus softening, of the martensitic microstructure. Consideration must also be given to the end option bore. With induction hardening and the change in the microstructure, the pipe actually increases in diameter. The pipe diameter and the end option bore must fit for integrity.

Available Options

- Standard flanges - 150#, 300# or 600#, single or double-drilled, raised face or flat, slip-on or butt-weld (butt welding not recomended for hardened pipe), fixed or rotating
- Weld rings - conventional or self aligning
- Cast couplings - two-bolt or snap action
- Wear bands or collars to counter downstream turbulence after each connection
- End options can be applied to all spools, bends and components

Available Sizes

- Pipe Diameter 2-1/2" to 24" NPS (73.0 to 610mm) for Induction-Hardened pipe
- Standard & Extra-Heavy Wall

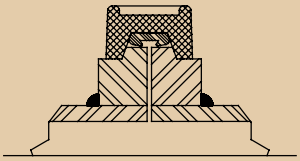
Process

- For each welded attachment, the inner surface is water-cooled to avoid tempering and loss of hardness
- All attachments are square to the spool axis

Engineering Support

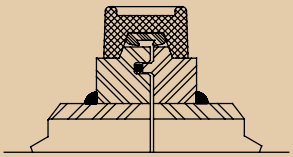
- Technical application support is available from the factory
- Custom design services are available

For additional information or to place an order
Call us at : 800-626-8243



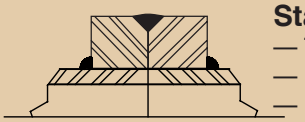
UT Raised System

— Fast installation time
— Easy cleaning
— Full wall thickness
— 20˚ tapered faces aid installation
— Face weld if required



UT High Pressure System

— Field proven for sludge service
— Male/Female interlocking design
— Dual sealing; cavity gasket plus Quad seal
— 20˚ tapered faces aid installation



Standard Weld Rings

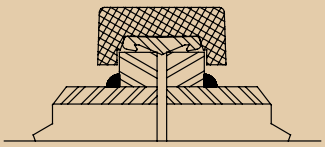
— Typically no face seal weld
— Most common style
— Butt weld field applied

Self Aligning Weld Rings

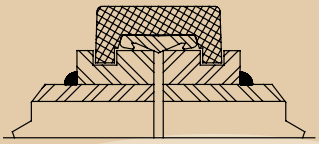
— Male/Female recess
— Butt weld field applied

VICTAULIC ® SYSTEM

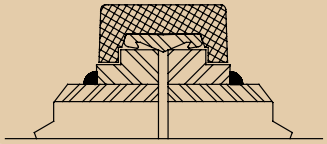
— Fast installation time
— Cavity Gasket
— Recessed Groove
— Low working pressure



VICTAULIC "C" SYSTEM

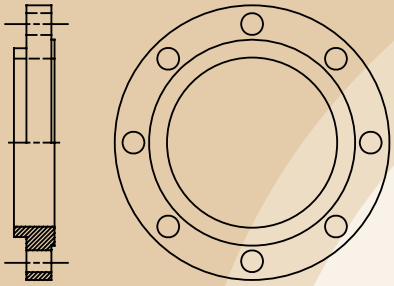


VICTAULIC "D" SYSTEM



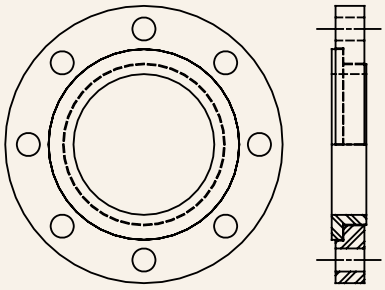
VICTAULIC "E" SYSTEM

® Registered Trademark of Victaulic Company of America



Standard Flanges

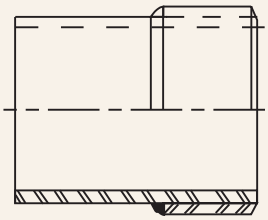
— 150#, 300#, 600# most common; others available
— Industry standard dimensions
— Raised face (shown) and plate flanges



Rotating Flanges

— Rotating Collar over Fixed Hub
— Sizes 2-1/2" to 24" (63.5 to 609.6mm
— Raised face (shown) and plate flanges

Other ends and styles are available - consult factory for details.



OD Cast Pipe Collar

— Mild steel collar over standard pipe
— OD matches actual OD of Cast Pipe

Visit us online at: www.ultratechpipe.com

Worldwide Locations

U.S.A.
Ultra Tech
777 Maritime Drive
P.O. Box 308
Port Washington, WI 53074
Toll Free: 800-626-8243
Tel: 262-284-7800
Fax:262-284-7878
E-mail: utinfo@ultratechpipe.com

Europe
Con Forms Europe
Wern Industrial Estate
Rogerstone
Newport
South Wales NP10 9FQ
UNITED KINGDOM
Tel: +44 (0) 1633 897 700
Fax: +44 (0) 1633 897 711
E-mail: info@conforms.co.uk

Asia
Con Forms Asia Sdn Bhd
No.6, Jalan Belati 1
Taman Perindustrain Maju Jaya
81300 Skudai, Johor Bahru
MALAYSIA
Tel: ++ 60 7 559-1868
Fax: ++ 60 7 557-3868
Email: info@cfasia.com.my

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