

D&E LADLES

SIXTH EDITION



Div. of TeeMark Mfg.

CUSTOM AND STANDARD LADLES

With Front of Center Design
Custom Features built in *not* added on



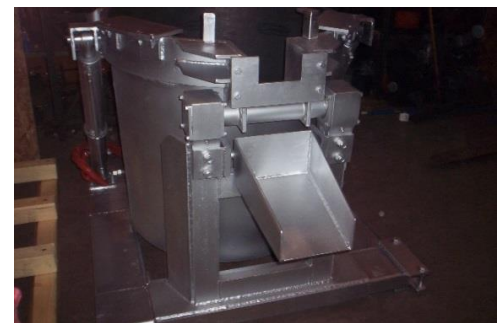
(A Division of TeeMark Manufacturing)

D&E Ladles manufacture a full range of standard and custom design ladles in sizes up to 30,000 pounds. D&E Ladles incorporate design innovations such as:

- Double enveloping worm gears for greater strength with reduced backlash
- Renewable trunnion bearing wear surfaces which eliminate shaft scoring for longer ladle life and smoother ladle rotation
- Replaceable ladle bottoms on certain models for lower refractory costs and ease of maintenance.

The Tight Cover Ductile Iron Treatment Ladles were introduced by D&E in 1982. *They pay for themselves* often before the purchase payment is due.

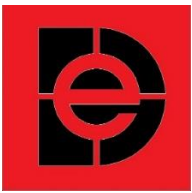
D&E welcomes opportunities to design and build custom ladles for special requirements.



D&E Foundry Ladles grew out of a foundry consulting business that was started in Easton, Pennsylvania in 1978. Wendell Dickmeyer and Tom Eberhardt, the “D” and “E” principals, brought extensive foundry operating experience to their consulting practice. In 1982, D&E clients needed a better way to make ductile iron. The “Tight Cover” ductile iron treatment ladle was developed for them.

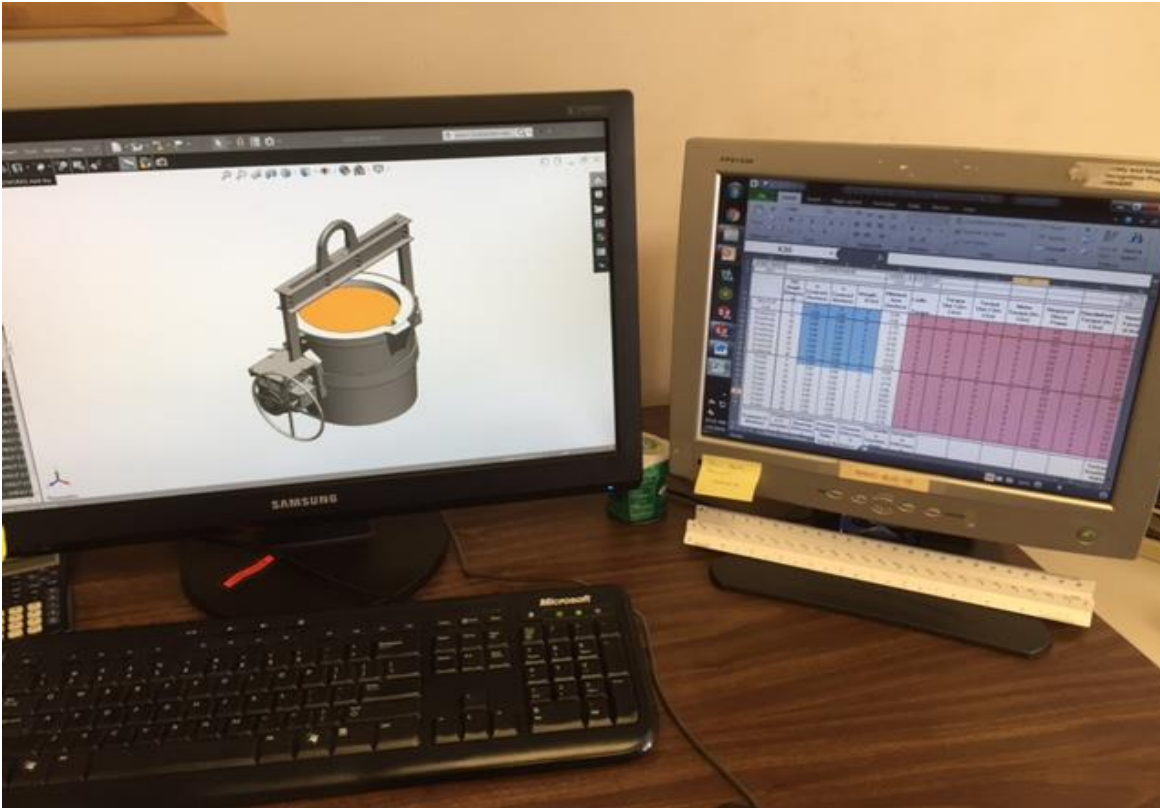
D&E relocated to Minnesota in 1987 and became TeeMark Corporation. In 2010 Tom Eberhardt passed away and his son Paul took over the company. In July 2012 the ownership of D&E Foundry Ladles and TeeMark Corporation was handed over to Dennis (Denny) Rach as the new owner.

Denny was the Sales and Marketing Manager for 7 years and then became General Manager just prior to purchasing the company and changing the name to D&E Ladles a division of TeeMark Manufacturing Inc. D&E Ladles offers custom built ladles to meet customers’ needs as well as a wide variety of standard models. In addition, we are looking to expand in the foundry industry in the near future.



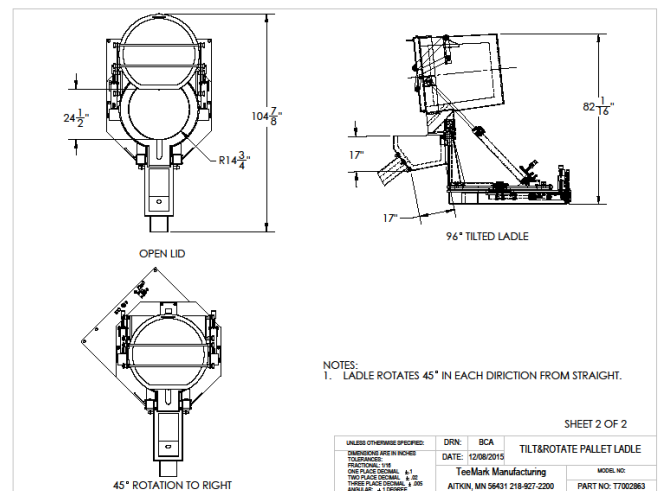
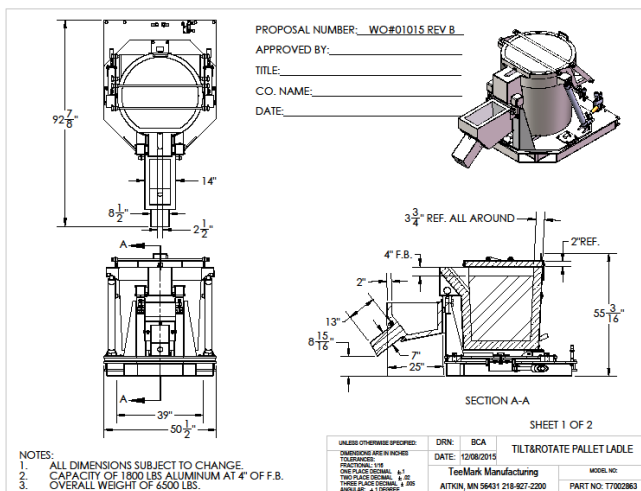
D&E Ladles

ENGINEERING

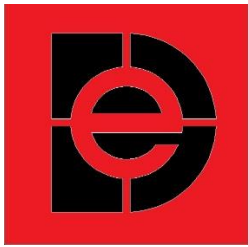


All D&E Ladles, standard or custom, are designed using 3D modeling. Each ladle is balanced with a combination of SOLIDWORKS and other computer software to ensure integrity and safety of the ladle. It is of the utmost importance the ladle rights itself in the event of a catastrophic failure of the tilting mechanism or other mishaps. Material used has gone through rigorous stress analysis for safety.

During the quoting process, a quote for the requested ladle size is provided along with a general arrangement drawing. Prior to issuing a work order an approval drawing, as shown below, is sent that requires a signature. This is to ensure all parties are in agreement to the size and design of the ladle. Communication in design and ordering is crucial as to not miss any details.



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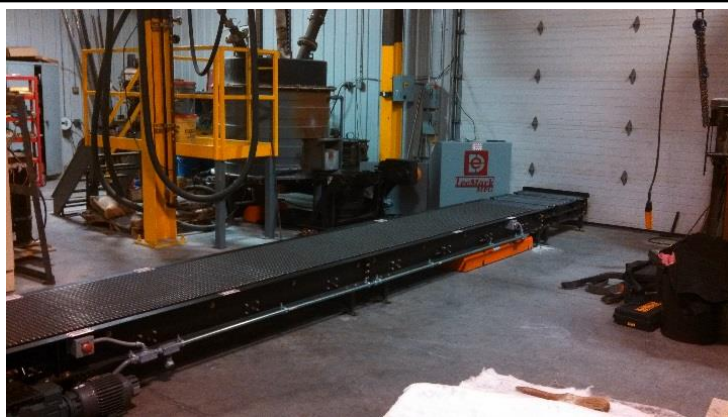


D&E Ladles



CUSTOM DESIGNED AND MODIFIED LADLES

Ninty percent of the ladles we manufacture are custom made. They are either built to the specifications of a customer or they are a standard design which is modified to meet special needs. Special features work best when they are “built in” rather than “added on”. Ladle balance, for instance, can be effected by modifications at the foundry. Balancing is best handled at the factory. If you do not find the right ladle configuration for your needs, give us a call. Our engineering department will be pleased to work with you.



Here is a custom designed conveyor used to pour magnetic glass. The ladle is filled from the furnace and hydraulically moved to the conveyor where it is hydraulically tilted. This is all being done while the conveyor is moving. The system is set up with speed controls on all moving components for precision pouring. Final product is a sheet of glass.



has developed a superior motorized tilt gearing package to provide uniform control and safety. The gearing utilizes the world renowned Baldor-Dodge gearing coupled with a Cone Drive Change Gear and a Baldor Brake Motor. To this we add a Right Angle Gearbox and a manual handwheel should power ever be lost.

Switching from motorized to manual is as simple as flipping a lever on the electric motor. This allows the operator to manually rotate the ladle using the handwheel.

These packages come in several sizes depending on the size of the ladle. Typically, the motors are 460 volt, three phase. However, other options are available.

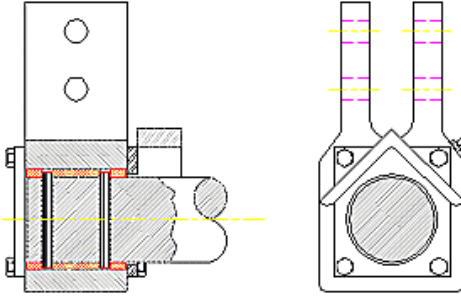
These packages can be operated by a tether or a remote radio control.

The element that distinguishes Cone Drive's products from all others is the double enveloping design. The term; double enveloping, is an apt description, as the worm and gear wrap around each other. This greatly increases load carrying by providing more tooth area contact and more teeth in mesh than other worm gear designs. This design difference leads to many advantages, among them:

- Extra torque with no increase in size, or conversely, smaller, more reliable speed reducers.
- High shock resistance and the ability to withstand heavy starting and stopping loads.
- Low backlash due to the inherent precision of the double enveloping design.
- Increase durability and longer gear life.
- Design flexibility resulting from smaller and lighter envelopes.

Simply stated, a Cone Drive speed reducer is a small machine doing the work of a big one.



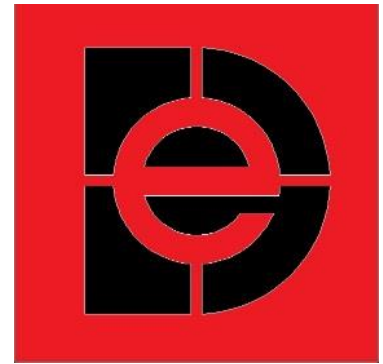


RENEWABLE TRUNNION BEARINGS

The wear surfaces in the trunnion bearing are the bronze bushing and the bearing block. Both bearing surfaces can easily be replaced. The bronze bushing is held in place on the shaft by the bearing retaining pins. The pinned bushing also locks the bearing assembly onto the trunnion, preventing rotation on the shaft.

HYDRAULIC LADLE

Fork truck mounted ladles feature hydraulic operation utilizing the fork truck hydraulics. These ladles can be operated from the seat of the fork truck. Range of motion includes 90-degree horizontal rotation and 90-degree vertical rotation. Hydraulics are equipped with quick disconnects for easy removal.



LONG REACH

Long reach ladles offer a solution to the reach problem without moving the monorail. The distance from the center line of the monorail to the most distant sprue cup determines the length of the spout. These spouts are removable which make them compatible with pre-cast liners. With the long reach spout, the ladle can also be emptied in as little as 30-degrees.



CYLINDRICAL LADLE

The cylindrical ladle is designed to split into two pieces to aid in the relining process. A lining form is available to simplify the process and provide consistent refractory thickness while reducing labor costs. These ladles come standard with hand tilt gearing and are available with optional motorized tilt in AC or DC power. Cylindrical ladles are available in sizes that range from 600 to 1,500 pounds of aluminum.



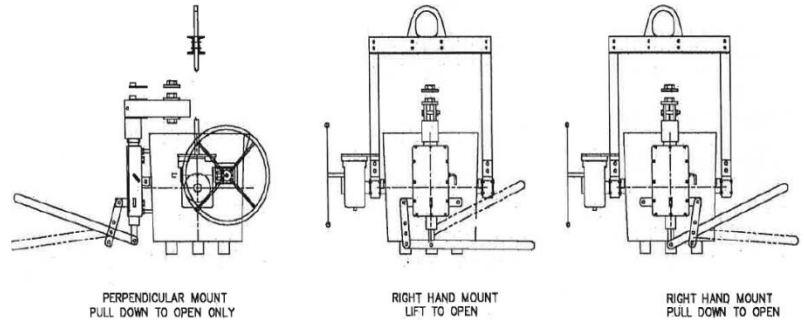
HIGH SPEED GEARING

D&E Ladles of 800 pound iron capacity and smaller offer a 1:4 ratio. This gear ratio offers greater safety and ergonomics over the hand tilt ladles. The 1:4 gear ratio provides 90-degree rotation in as little as two revolutions of the handwheel. Quick response and self-locking gearing mean safe operation and reduced fatigue providing increased production. The self-locking gearing stops the ladle when pressure is removed from the handwheel, and the ladle remains in that position.



BOTTOM POUR LADLE

The Bottom Pour mechanisms from D&E Ladles offer smoother operation for greater control during the pouring operation. The lift mechanism glides on sealed bearings, which also provide adjustable friction control for ease of operation. The mechanism is sized to fit your ladle, and it offers a wide range of adjustments to accept stopper rod diameters. The internal reach is adjustable to allow you to adapt to your existing ladle. The operating handle can be located in six positions to meet your specific application.



MARK IV DUCTILE IRON TREATMENT LADLE (DITL)

The Mark IV offers recoveries up to 70%, reduces heat loss, and provides better quality metal. See next page and back cover for additional information.



DUCTILE IRON TREATMENT LADLES

THE D&E TIGHTCOVER™ MARK IV Ladle offers big savings and improved product quality over other methods of treating ductile iron.

REDUCED ALLOY COST: In an open ladle, up to 70% of the magnesium present in the alloy is lost into the atmosphere in a great cloud of magnesium oxide vapor.

Because the D&E Tight Cover™ ladle is a closed vessel, very little oxygen is present during the reaction. The Mg vapor remains in the ladle environment instead of being lost as MgO. As the ladle fills, this Mg is stirred back into the bath. Using a 5% MgFeSi alloy, you can expect alloy additions in the range of 1.2 to 2.0% with typical Mg recoveries of 70 to 80%. Alloys of 3% to 4% Mg show even better recoveries.

ALTERNATIVE TO EMISION COLLECTION:

Under good process controls, the magnesium oxide emissions from the D&E Tight Cover™ ladle is less than 5% of that of an open ladle. The ladle has been accepted in a number of States as an alternative to dust collection in the treatment of ductile iron. The savings of the initial cost and upkeep of a dust collection system are quite substantial.

ELIMINATION OF COVER MATERIAL:

The D&E Tight Cover™ ladle is designed to coordinate the fill time with the reaction time for optimum Mg recovery. Cover steel used in open ladles to delay the Mg reaction is not recommended because it throws off the critical time and reduces the ladles efficiency.

Savings include not only the material and handling costs of the cover material, but the energy costs to melt and superheat it. Approximately 50°F is lost in heating, melting and superheating a 2% cover steel.

CONTROLLED VENTING: During the reaction the Mg boils, generating a pressure of over 200 psi. The MARK IV ladle has a controlled venting system to assure safety and excellent recoveries.

ENERGY SAVINGS: The D&E Tight Cover™ ladle is covered and insulated, its heat loss is about half of that of an open ladle. Tap temperatures can be reduced by as much as 100°F. In many cases these lower tap temperatures mean an increase in the number of tons that can be melted.

REMOVABLE BOTTOM: The D&E Tight Cover™ ladle has a removable bottom that allows refractory in the reaction zone to be repaired without removing the good refractory in the upper part of the ladle. Order a spare bottom to have lined and ready for hot or cold changes whenever needed.

NO SLAG BUILD UP: The large pour out spout lets you remove slag each time the ladle is emptied without having to turn the ladle upside down.

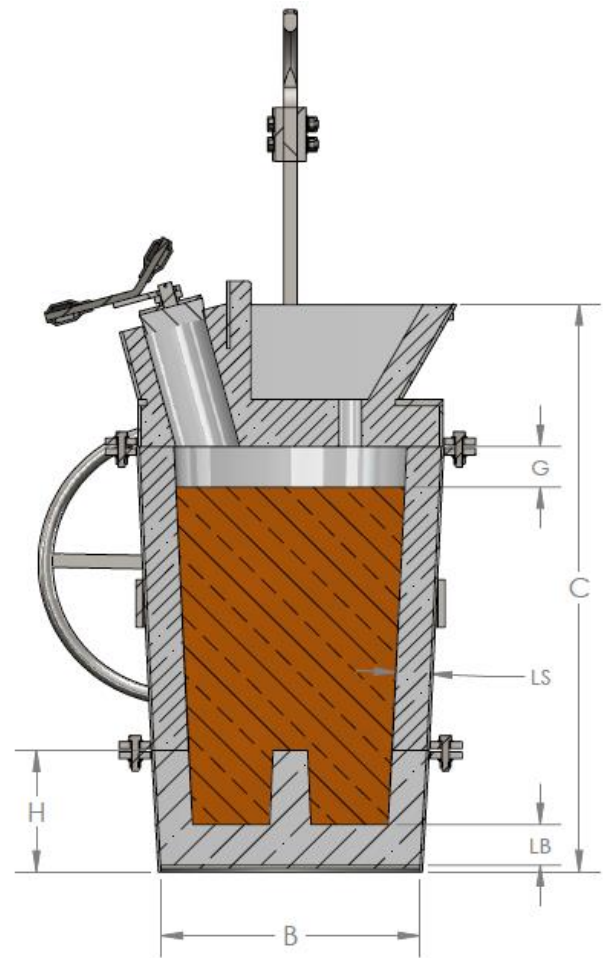
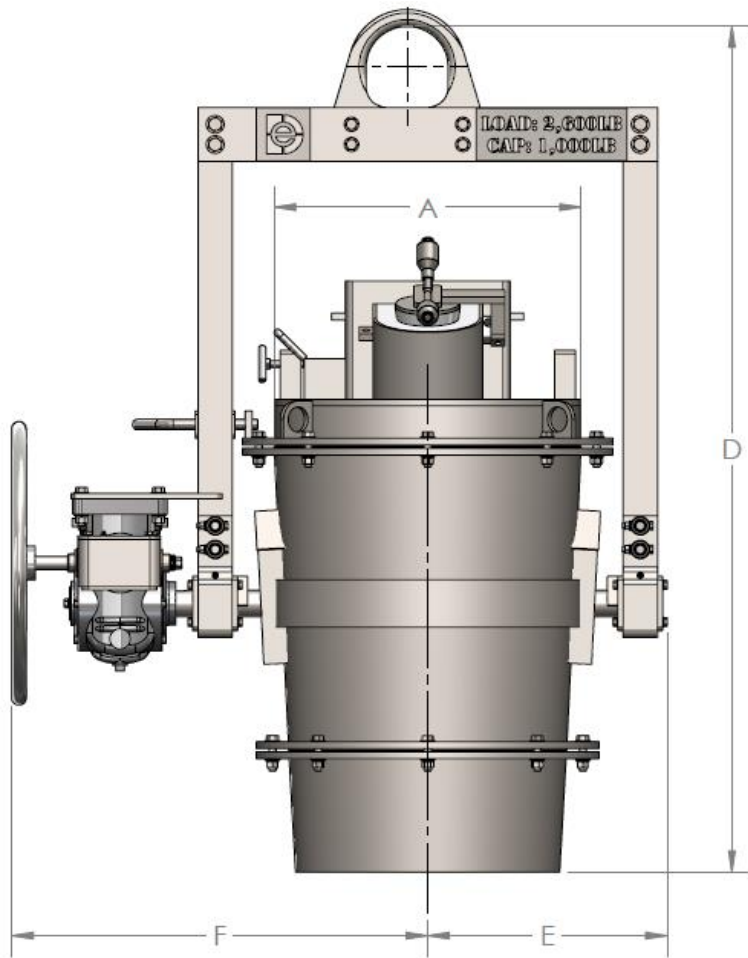
LONGER FADE TIME: The limited amount of oxygen in the closed vessel increases fade time. Because of reduced heat loss and increased Mg fade time, iron can be held longer in the D&E Tight Cover™ ladle, avoiding pigging and pour backs that delay production.

IMPROVED PRODUCT QUALITY: The simple fact that the operator cannot see the metal level inside the covered ladle, means that the iron must be measured (usually weighed) as it is poured into the ladle. The iron is metered into the ladle through a critically sized orifice to optimize the magnesium reaction. These factors, along with the increased Mg fade time, greatly increase control over the treatment process and result in improved quality, a more consistent product, and reduced scrap.

Standard sizes range from 600 to 20,000 pounds iron capacity. Larger and special sizes are available.



TIGHT COVER™ DUCTILE IRON TREATMENT LADLES
Designed for Foundrymen



Ladle lining forms and spare ladle bottoms are some of the accessories that help control maintenance costs and down time for D&E process ladles. Other options include motorized gear tilt and cradles that hold ladles for pouring. See catalog page 15 for a complete description of D&E Ladles innovations and accessories.

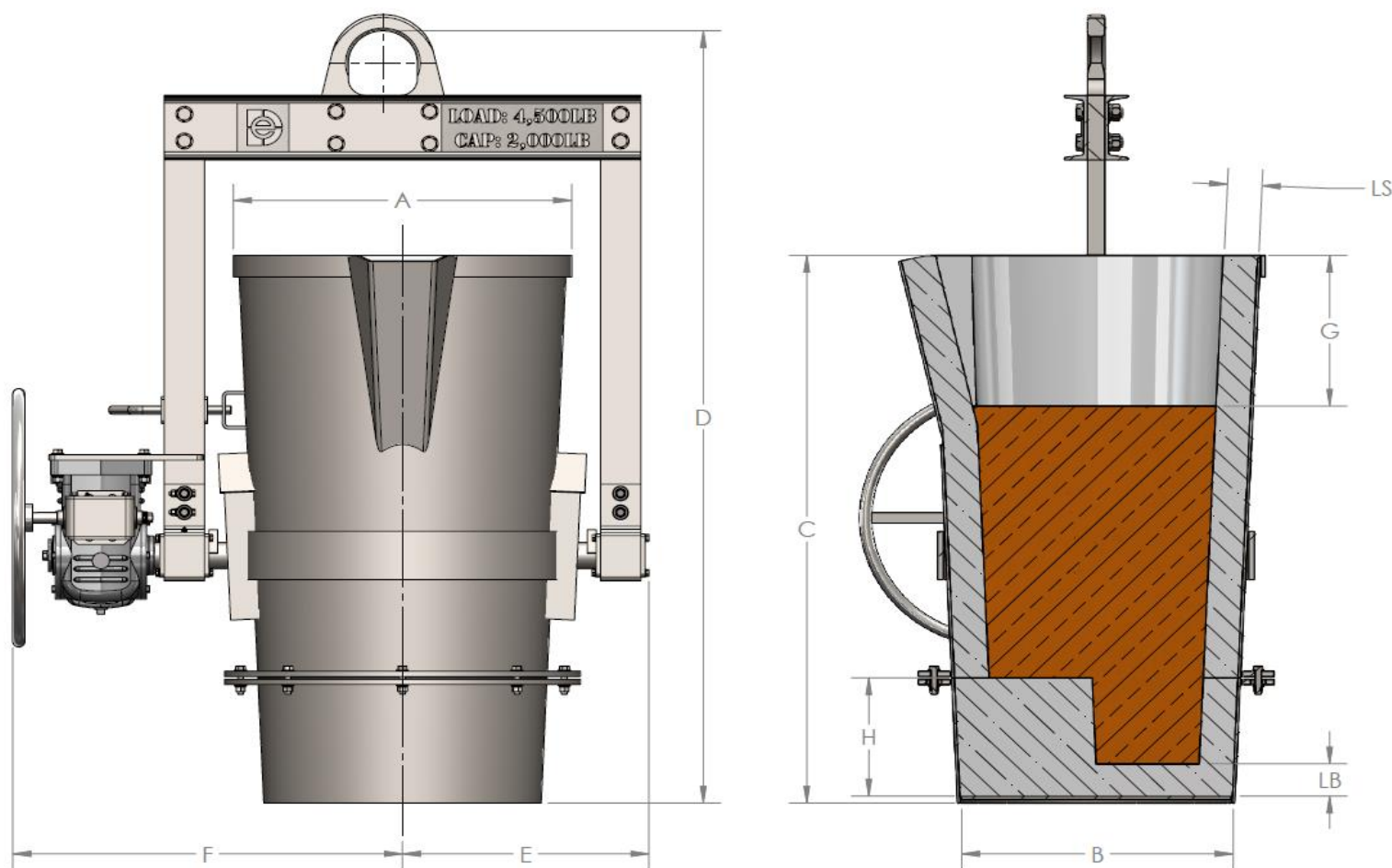
T1 Series										
Capacity (Iron)	A Top ID	B Bottom ID	C Height	D	LH*	E	F	H	G & LB	LS
600	19.5	17.5	36.0	56.8	8.0	16.0	28.3	8.3	3.0	2.5
1,000	22.0	19.0	40.3	61.3	8.0	17.0	29.3	9.0	3.0	2.5
1,500	24.0	20.3	45.8	68.8	8.9	18.3	30.5	10.0	3.0	2.5
2,000	26.0	22.0	47.5	72.5	8.9	20.3	34.3	10.5	3.0	2.5
3,000	30.0	25.3	53.8	81.8	8.9	23.0	36.6	12.0	4.0	3.0
4,000	34.0	29.3	56.8	84.8	8.9	25.0	38.5	13.0	4.0	3.5
6,000	38.0	32.8	63.8	91.0	15.8	26.8	40.3	14.0	4.0	3.5
8,000	42.0	36.0	71.0	103.0	15.8	31.0	48.0	16.0	5.0	4.0
10,000	45.5	39.0	76.0	117.0	N/A	32.5	50.0	18.0	5.0	4.5
12,000	47.5	41.0	82.0	124.0	N/A	33.5	51.0	18.0	5.0	4.5

*Height “D” is reduced by “LH” with Low Headroom Bail option.
 Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.



SANDWICH PROCESS DUCTILE IRON TREATMENT LADLES

Designed for Foundrymen



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T2 Series											
Capacity (Iron)	A Top ID	B Bottom ID	C Height	D	LH*	E	F	G	H	LB	LS
1,000	22.0	19.0	40.0	56.0	8.0	17.0	29.25	6.0	9.0	3.0	2.5
1,500	25.0	20.0	45.0	63.0	8.75	20.25	34.25	5.0	10.0	3.0	3.0
2,000	28.0	22.0	50.0	70.0	8.75	21.75	35.5	7.0	11.0	3.0	3.0
3,000	32.0	25.0	57.0	76.0	8.75	24.0	37.25	11.0	12.0	3.0	3.0
4,000	34.0	29.0	61.0	80.0	8.75	25.0	38.5	12.0	13.0	3.0	3.0
6,000	41.0	33.0	73.0	92.0	15.75	30.0	47.0	14.0	14.0	4.5	4.5
8,000	44.0	36.0	80.0	102.0	15.75	31.5	48.5	14.0	16.0	5.0	5.0
10,000	48.0	39.0	88.0	120.0	15.75	34.0	52.25	18.0	18.0	5.0	5.0

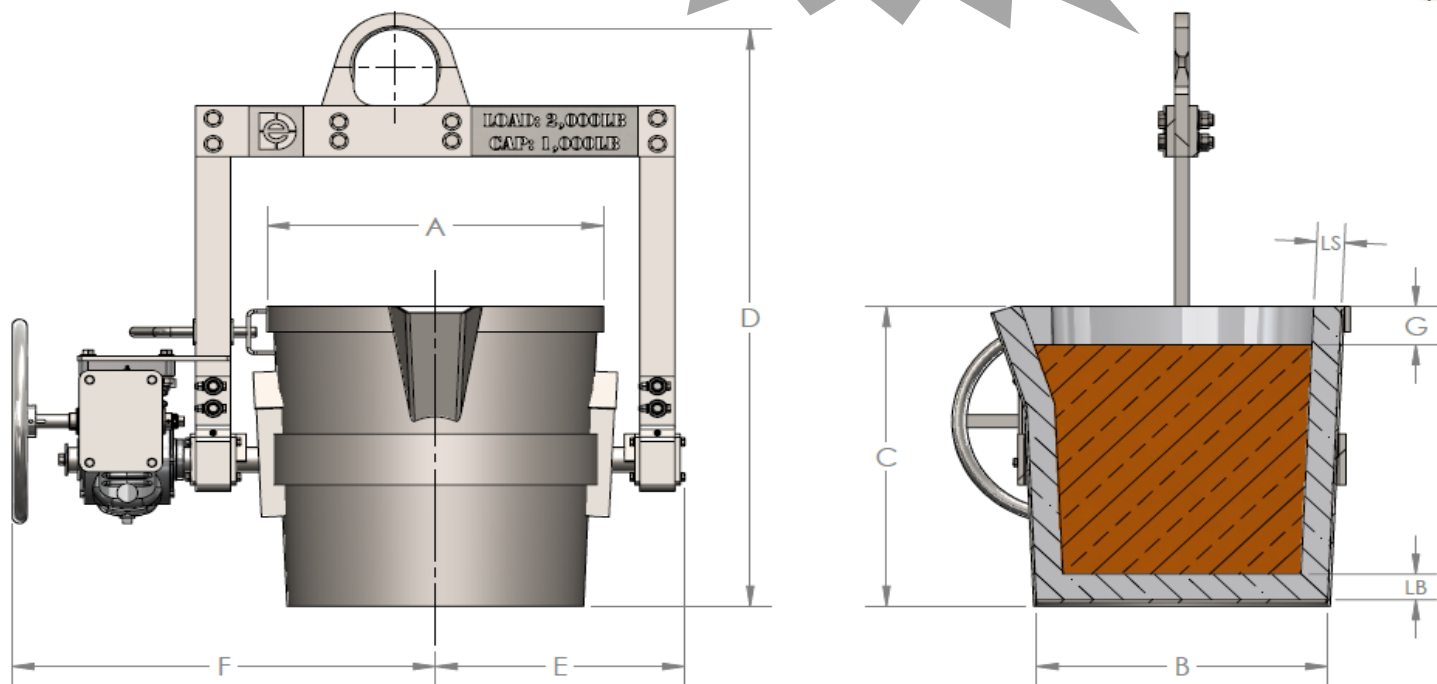
*Height "D" is reduced by "LH" with Low Headroom Bail option.

Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.

CRANE LADLES

Designed for Foundrymen

**SIZES UP TO
30,000 LB**



Ladle lining forms, cradles that hold ladles for pouring, and motorized gear tilting options are available for all D&E Ladles products. See catalog page 15 for a complete description of D&E Ladles innovations and accessories.

T3 Series

Capacity (Iron)	A Top ID	B Bottom ID	C Height	D	LH*	E	F	G	LB & LS
400	18.0	16.5	18.0	34.75	8.0	15.25	27.5	3.0	2.0
700	20.5	18.5	20.5	40.5	8.0	16.5	28.75	3.0	2.0
830	21.5	19.5	21.5	42.5	8.0	17.0	29.25	3.0	2.0
1,050	23.0	21.0	23.0	44.0	8.0	17.75	30.0	3.0	2.0
1,150	25.5	23.5	25.5	50.0	8.75	20.25	34.25	4.0	3.0
1,450	27.0	25.0	27.0	51.75	8.75	21.0	35.0	4.0	3.0
1,800	28.5	26.0	28.5	54.75	8.75	21.75	35.5	4.0	3.0
2,200	30.0	27.5	30.0	55.5	8.75	23.0	36.25	4.0	3.0
2,650	31.5	28.5	31.5	59.25	8.75	23.75	37.0	4.0	3.0
3,350	34.5	31.0	34.5	66.75	8.75	25.0	38.5	4.5	3.5
4,125	36.5	33.0	36.5	69.25	8.75	26.0	39.5	4.5	3.5
6,100	40.5	36.5	40.5	75.5	15.75	30.0	47.0	4.5	3.5
8,000	43.5	39.0	43.5	80.75	15.75	31.5	48.5	4.5	3.5
8,700	45.5	41.0	45.5	85.5	15.75	32.5	49.5	4.5	4.0
10,200	48.0	43.0	48.0	91.25	15.75	34.0	52.25	5.0	4.0
11,900	51.0	46.5	51.0	96.0	15.75	35.5	53.75	6.0	4.5
13,900	54.0	49.0	54.0	99.5	15.75	37.0	55.25	6.0	5.0
15,900	56.0	51.0	56.0	106.25	15.75	38.0	56.25	6.0	5.0
19,000	58.5	53.5	58.5	111.0	15.75	39.25	57.75	6.0	5.0

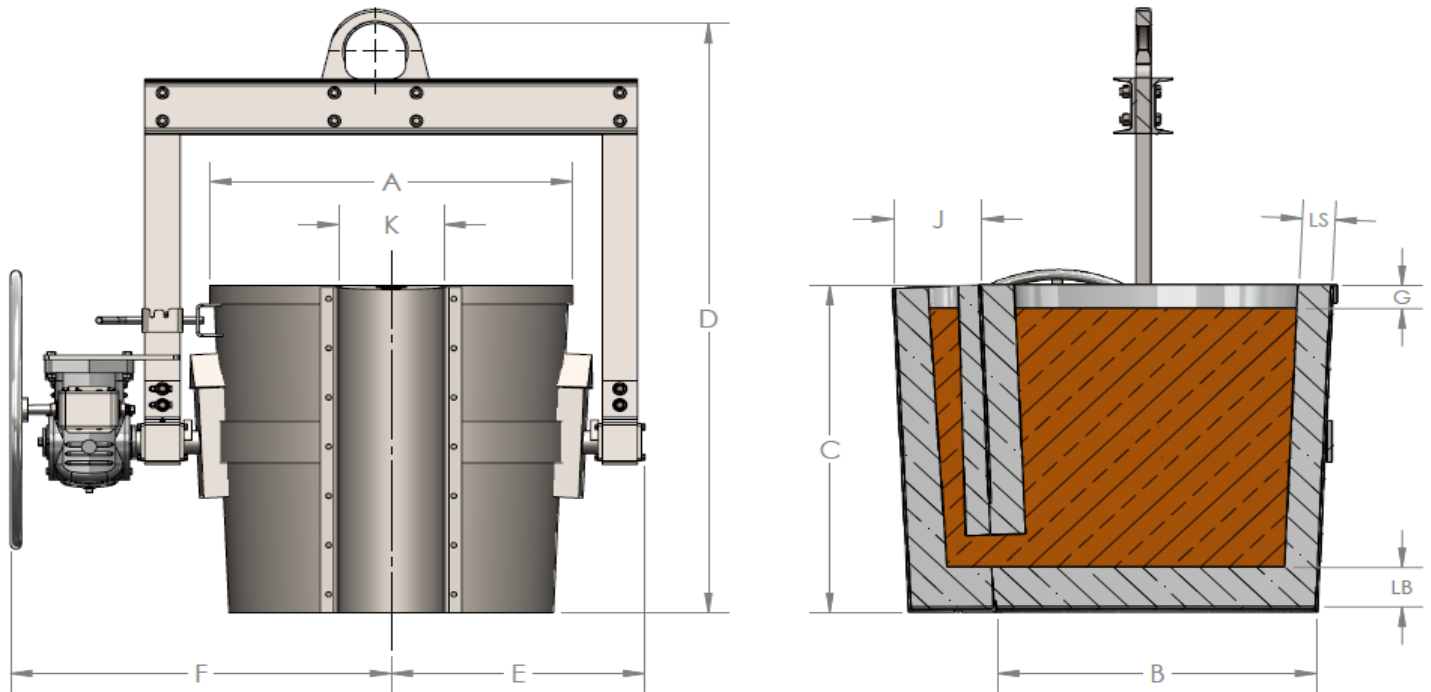
*Height "D" is reduced by "LH" with Low Headroom Bail option.

Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.



TEAPOT SPOUT CRANE LADLES

Designed for Foundrymen



Ladle lining forms, cradles that hold ladles for pouring, and motorized gear tilting options are available for all D&E Ladles products. See catalog page 15 for a complete description of D&E Ladles innovations and accessories.

T4 Series											
Capacity (Iron)	A Top ID	B Bottom ID	C Height	D	LH*	E	F	G	J	K	LB & LS
1,150	25.5	23.5	25.5	50.0	8.75	20.25	34.25	4.0	8.5	10.0	3.0
1,450	27.0	25.0	27.0	51.75	8.75	21.0	35.0	4.0	8.5	10.0	3.0
1,800	28.5	26.0	28.5	54.75	8.75	21.75	35.5	4.0	8.5	10.0	3.0
2,200	30.0	27.5	30.0	55.5	8.75	23.0	36.25	4.0	8.5	10.0	3.0
2,650	31.5	28.5	31.5	59.25	8.75	23.75	37.0	4.0	8.5	10.0	3.0
3,350	34.5	31.0	34.5	66.75	8.75	25.0	38.5	4.5	8.5	10.0	3.5
4,125	36.5	33.0	36.5	69.25	8.75	26.0	39.5	4.5	8.5	10.0	3.5
6,100	40.5	36.5	40.5	75.5	15.75	30.0	47.0	4.5	8.5	10.0	3.5
8,000	43.5	39.0	43.5	80.75	15.75	31.5	48.5	4.5	10	12.0	3.5
8,700	45.5	41.0	45.5	85.5	15.75	32.5	49.5	4.5	10	12.0	4.0
10,200	48.0	43.0	48.0	91.25	15.75	34.0	52.25	5.0	12	14.0	4.0
11,900	51.0	46.5	51.0	96.0	15.75	35.5	53.75	6.0	12	14.0	4.5
13,900	54.0	49.0	54.0	99.5	15.75	37.0	55.25	6.0	12	14.0	5.0
15,900	56.0	51.0	56.0	106.25	15.75	38.0	56.25	6.0	12	14.0	5.0
19,000	58.5	53.5	58.5	111.0	15.75	39.25	57.75	6.0	12	14.0	5.0

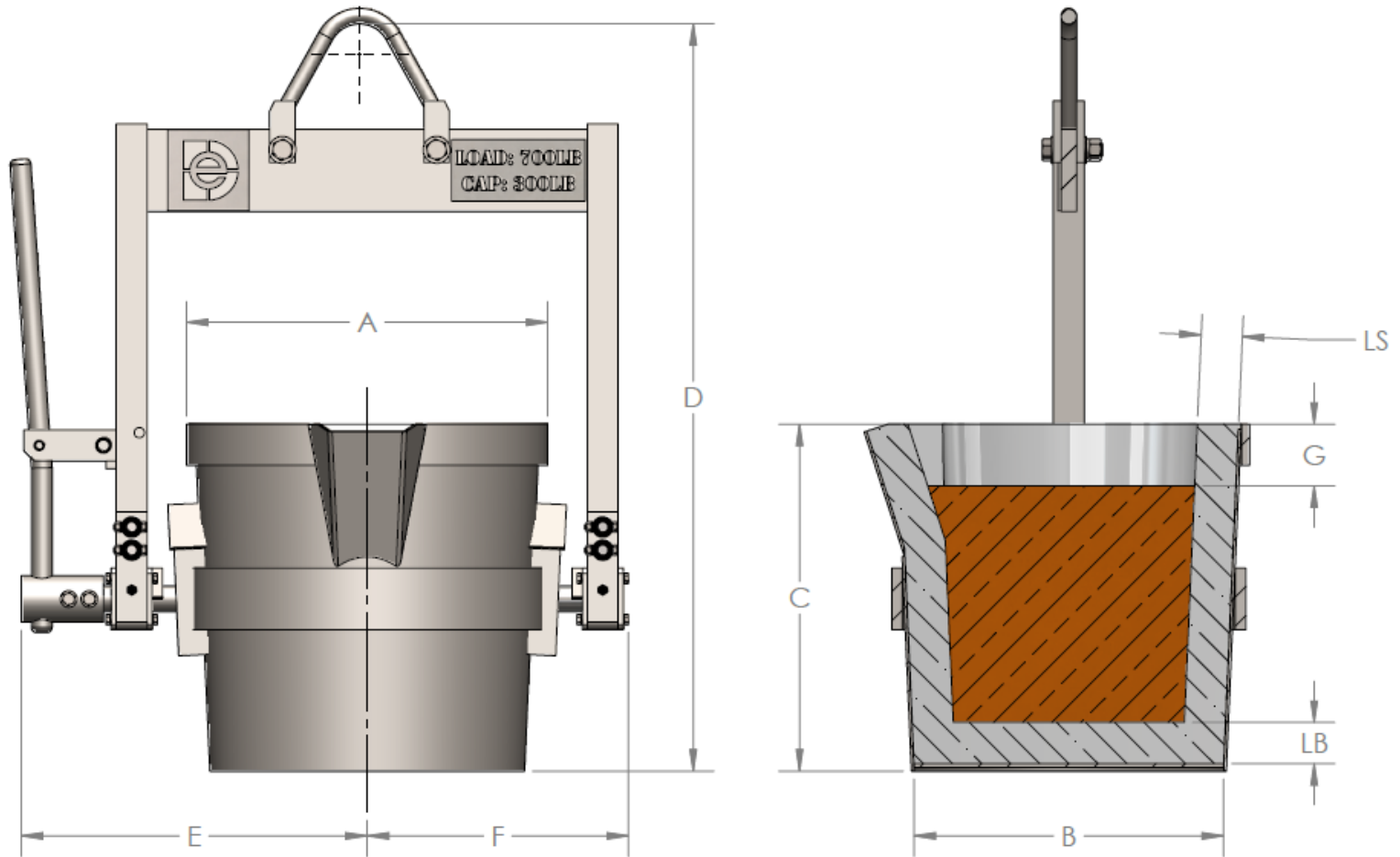
*Height "D" is reduced by "LH" with Low Headroom Bail option.

Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.



HAND TILT POURING LADLES

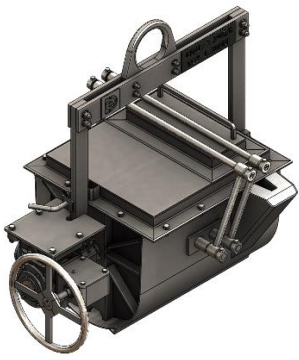
Designed for Foundrymen



Ladle lining forms, cradles that hold ladles for pouring, and motorized gear tilting options are available for all D&E Ladles products. See catalog page 15 for a complete description of D&E Ladles innovations and accessories.

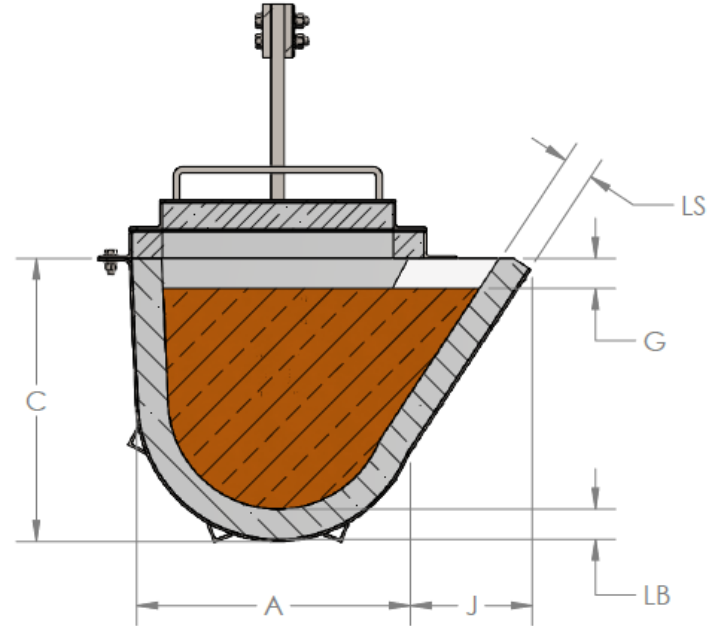
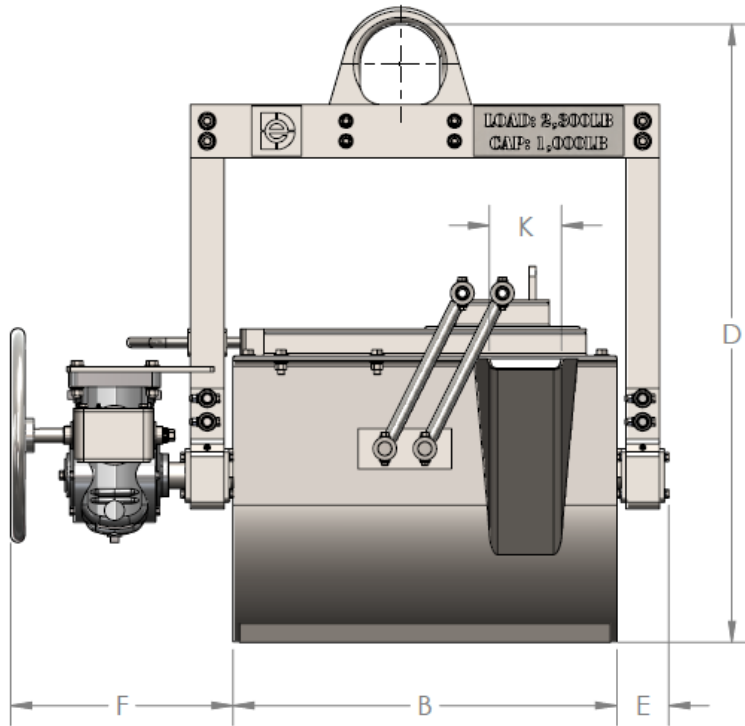
T5 Series								
Capacity (Iron)	A Top ID	B Bottom ID	C Height	D	E	F	G	LB & LS
70	12	11	12	19.25	11	14	3	2
98	12.75	11.5	12.75	20.75	11.5	14.5	3	2
150	14	12.75	14	21	12	15	3	2
170	14.5	13	14.5	22	12.25	15.25	3	2
225	15.5	14	15.5	25.5	12.75	15.75	3	2
300	16.5	15	16.5	27	13.25	16.25	3	2
375	17.5	16	17.5	28.5	13.75	16.75	3	2
425	18	16.5	18	29.75	14	17	3	2

Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.



"U" SHAPED LADLES

Designed for Foundrymen

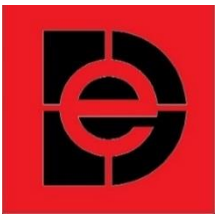


Ladle lining forms, cradles that hold ladles for pouring, and motorized gear tilting options are available for all D&E Ladles products. See catalog page 15 for a complete description of D&E Ladles innovations and accessories. V-Bails and Low Headroom Bails are available.

T6 Series											
Capacity (Iron)	A Width	B Length	C Height	D	E	F	G	LH*	J	K	LB & LS
850	21	23	21	41	6.5	21.5	3	8	8	5	3
1,275	23	26	23	44	6.5	21.5	3	8	8	5	3
1,550	24	28	24	47	6.5	21.5	3	8	9	6	3
1,560	26	30	26	48	8	23	4	8.75	9	6	4
2,100	28	32	28	51	8	23	4	8.75	10	7	4
2,625	28	38	28	51	8	23	4	8.75	10	7	4
3,280	31	40	31	60	9	25.25	4.5	8.75	10	7	4.5
3,700	34	36	34	62	9	25.25	4.5	8.75	12	9	4.5
4,525	34	42	34	62	9	25.25	4.5	8.75	12	9	4.5
6,175	37	45	37	80.25	9	25.25	4.5	8.75	12	12	4.5
8,000	41	48	41	87.75	10	27.75	5	15	14.5	12	5

*Height "D" is reduced by "LH" with Low Headroom Bail option.

Note: Capacities are in pounds. Dimensions are in inches. All specs are subject to change.



D&E Ladles

LADLE ACCESSORIES & OPTIONS

ACCESSORIES FOR PROCESS LADLES

Spare Ladle Bottoms: The reactions in process ladles occur primarily in the bottom of the ladle. This subjects the bottom refractory to more wear than the rest of the ladle and means that more maintenance of the bottom is required. This maintenance is greatly facilitated when a spare bottom is available.

Spare Refractory Plug Assembly for Tight Cover Ladles: The refractory lined swing cover closes the port used for pour out, alloy addition, and slagging. The spare allows the assembly to be replaced without incurring downtime.

Preheat Torch for Tight Cover Ladles: Preheating of Tight Cover Ladles presents some special challenges because the ladle is covered and access is limited. This preheat torch is designed to work effectively within those limitations.

Pail Top Funnel for Tight Cover Ladles: The pail top funnel simplifies alloy addition to covered ladles. Recommended for ladles through 6,000 lb capacity.

ACCESSORIES FOR ALL LADLES

Ladle Lining Forms: Custom made for each ladle, these forms guarantee a consistent lining thickness and low labor cost. Refractory can be rammed, cast or vibrated.

Motorized Gear Tilt: All ladles are available with motorized gear tilt features. The motors are typically electric, but air and hydraulic models are also available. In addition, wireless remote is also available.

Ladle Cradles: Cradles are available to hold ladles for pouring. Special fork lift cradles are also available for transport and pouring.

Replacement Ladle Tilt Gearing: D&E Ladles gearboxes are built with Cone Drive and Dodge gear cases. They combine low backlash and great strength. This means that foundries may be able to replace other manufacturer's worn or damaged gearboxes with high quality D&E gearing that guarantees long life and superior ladle control.

Low Headroom Bail Option: All D&E Ladles are available with low headroom bail at no additional cost. These bails reduce vertical operating space requirements by 8 to 15 inches. This is accomplished by eliminating the hook eye and capturing the hook with a removable pin that is inserted between the horizontal bail channels.

MARK-IV

D&E TIGHT-COVER™

DUCTILE IRON TREATMENT LADLE

IRON CAPACITY 600 TO 20,000 POUNDS

