

Scientific

HEAVY DUTY CHILL ROLL ATTACHMENTS



**HEAVY DUTY CHILL ROLL
ATTACHMENTS
TYPE LCCR-300-SR & LCCR-350-SR**



**LARGE COMBINED CHILL ROLL
AND CALENDERING ATTACHMENTS
TYPE LCCR-500-HD, LCCR-600-HD,
LCCR-700-HD, LCCR-1000-HD
AND LCCR-1200-HD**

Labtech Engineering

TECHLABSYSTEMS

HEAVY DUTY CHILL ROLL ATTACHMENTS TYPE LCCR-300-SR & LCCR-350-SR



Co-ex Cast Film And Sheet Lines Based On New Heavy Duty Chill Roll Attachment

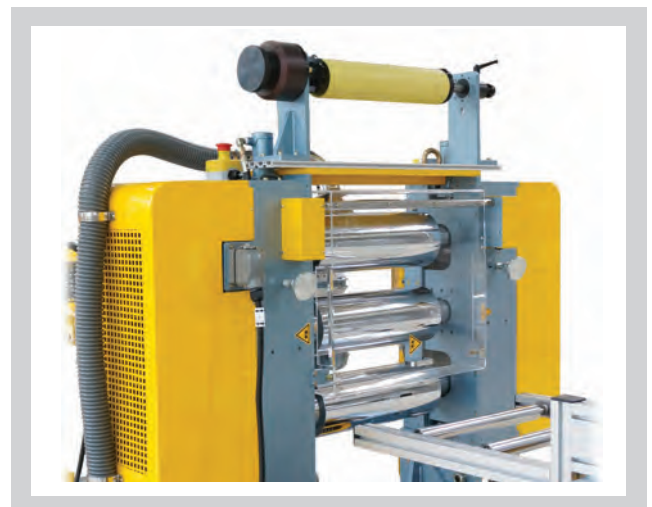
Main features of LCCR-300-SR and LCCR-350-SR

- Heavy duty versions with two hydraulic lay on of top and lower roll against center roll
- New design on roll stack mounted on a sturdy rail mounted trolley completely separated from the downstream out feed conveyor
- Rolling stack can be positioned both vertically or horizontally
- Three large 145 mm diameter rolls
- Individual Servo Motor drives for each roll
- Larger 350 mm roll width for LCCR-300-SR and 400 mm for LCCR-350-SR
- Extended out feed conveyor
- Calendering action



The Heavy Duty Chill Roll attachment type LCCR-300-SR & LCCR-350-SR has the following main features :

- The roll width for LCCR-300-SR is 350 mm and can produce films or sheets with a width of up to 300 mm. For the larger LCCR-350-SR, the roll widths are 400 mm and the film or sheet width is here up to 350 mm.
- All 3 rolls in the rolling stack have a diameter of 145 mm and they are all cored with internal chamber for water cooling and heating. The rolls can also be connected to oil heating units for high temperature applications
- The rolls are made of high grade tool steel of same high quality as we use for our two-roll mills. They are hardened and precision ground after which they are equipped with a hard chrome layer which again is precision ground and polished to a mirror surface.
- The whole rolling stack assembly can be positioned either vertically or horizontally.



- Both upper polishing and lower chill roll is laid against the center roll with high hydraulic force which enables production of very smooth films and sheets.
- The Heavy Duty version of the LCCR-300-SR and LCCR-350-SR attachment have a new drive system with three individual high precision variable speed 0.4 kW servo motors driving each roll through planetary gears.
- The rolls are made with heavy duty shafts and bearings to ensure they can fully withstand the lay on force from the hydraulic system.
- The upper roll and the lower roll are equipped with hydraulic quick opening system for emergency which, when activated, will instantly open up the gap between center and top roll as well as bottom roll against center roll at a distance of 50 mm.
- Chill roll attachment is mounted on rails and can easily be rolled away from the die and the extruder for access to the die opening.

• **The chill roll is equipped with a swing away control panel with the following instruments:**

- Five digital RPM speed controls for controlling the speed of:
 1. Chill rolls (Each roll – top middle & bottom)
 2. Nip-Rolls for pulling out the film/sheet
 3. Wind up

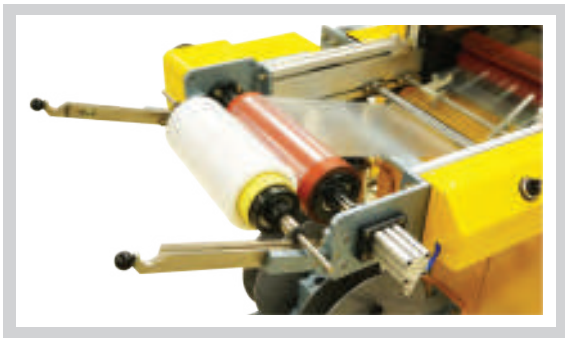
The instruments are equipped with UP/DOWN scroll buttons for speed regulation.

- Three digital programmable self-tuning temperature controllers for the flat die. The controllers regulate individually the left, centre and right side of the die. With this it is possible to obtain a very precise and even film thickness over the entire film or sheet width.

- If the optional fully computerized control of the line is selected, these controls will instead all be on the central touch screen



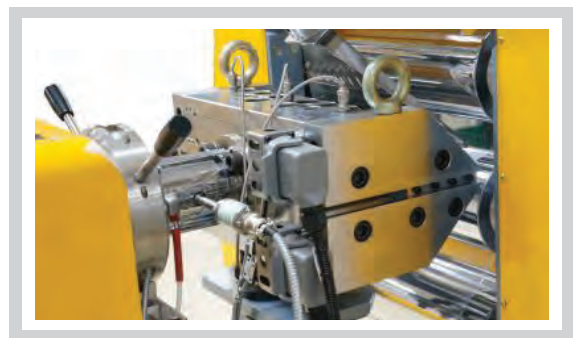
- The downstream conveyor is equipped with a multitude of smooth running steel rollers and an Haul Off station with rubber Nip-Rolls. These rolls are equipped with a variable speed AC drive and they are opened and closed pneumatically. The Nip-Rolls are covered with a fixed Plexiglas cover. The cover serves as a safety device, to prevent that the Nip-Rolls can be touched when in closed position.



- The wind up unit is now supplied as a combined surface and center winding system where the center winder has pneumatic bobbin grippers and the surface wind up system is made with slanting gear racks and shaft with bobbin gripper which rests against a rubber roller. The drive is from an individually torque controlled motor.

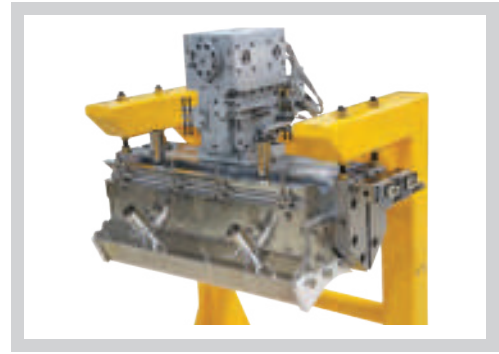
- The upper two rolls are also covered with an interlocked Polycarbonate window at the area facing the downstream conveyor. When the window is lifted up, the upper roll will move up and it cannot be lowered until the window is lowered.
- The Chill Roll stack is equipped with an air knife with adjustable nozzle height and angle to the Chill roll, connected to a high-pressure blower.

- Optionally each roll can be regulated individually by designated roll tempering units and the rolls can also be equipped with oil heating and cooling for high temperature applications.
- The chill roll can be equipped with optional edge cutter as well as pneumatic bobbin free wind up system.
- This attachment is also suitable for co-extrusion



Vacuum box with blower

The vacuum box is connected to two high power vacuum ring blowers and it is placed in front of the die lip close to the chill roll surface. It will create a high vacuum between the melt coming out of the die and the chill roll surface, ensuring a tight clinging of the melt to the chill roll. Due to the high vacuum, it will also efficiently remove any air trapped in-between melt and chill roll, ensuring a bubble free film without surface defects.



Flat coat hanger type dies

The flat die is equipped with adjustable lips from 0.3 to 2.0 mm and is suitable for thin films as well as thin sheets with a thickness up to around 1.5 mm. The die will be designed specifically for your resins. It is made with mirror polished hard chromes internal surface but it can also be supplied with high polished nickel plating and other surface treatment. The die lips are adjustable with a multitude of push-pull adjustment bolts. It is equipped with cartridge heaters that divide the die into 3 heating areas, left, center and right zones which are individually regulated with designated temperature controllers. The die as standard is made for a max temperature of 300 degree C but can also be supplied in a high heat version for up to 450 degree C.

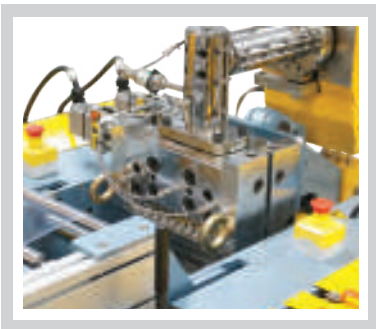


The dies can also be supplied with an interchangeable lip insert for other die lip openings. If this is required, please let us know of required die lip opening range.

90 degree angled adaptor between extruder and die, to allow for production of thin films with the roll stack laying down in horizontal position including die support stand on casters

Additional price for Silicone Rubber Roll

For use with embossing where the center roll has been engraved with an embossing pattern. Or for use with sticky resin types. The rolls can also be supplied with matt surface as shown here for center chill roll. We will be pleased to quote for any other roll surface you require.



Technical Data on Chill Roll unit type

		LCCR-350-SR	LCCR-300-SR
Roll width	mm	400	350
Max. film/sheet width	mm	350	300
Max. Die Width	mm	400	350
Roll diameter, all 3 rolls	mm	145	145
Max. bearing force per side	kN	20	8
Max. line pressure	(N/cm)/Bar	570/90	260/90
Max. pressure force	N/Bar	22,500/90	9,100/90
Hydraulic power for roll stack	kW	0.37	0.37
Roll stack Servo motor drive power	kW	3x0.4	3x0.4
Hydraulic quick opening	mm	50	50
Gap fine adjustment	mm	1.0-6	1.0-6
Take-off speed	m/min	0.5-15	0.5-15
Winding diameter	mm	400	400
Water tempering unit, heating power	W	9	9
Water tempering unit, pump power	kW	0.5	0.5

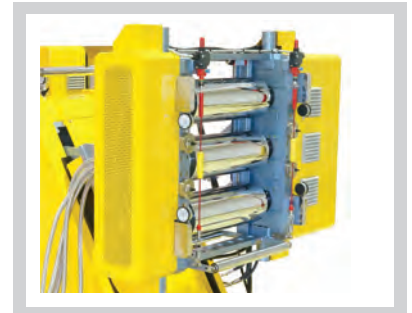
LARGE COMBINED CHILL ROLL AND CALENDERING ATTACHMENTS

TYPE LCCR-500-HD, LCCR-600-HD, LCCR-700-HD, LCCR-1000-HD AND LCCR-1200-HD



The attachment has the following main features :

- LCCR-500 has a width of rolling stack of 500 mm and is suitable for production of films and sheets with a width of 450 mm. All 3 rolls have a diameter of 175 mm
- LCCR-600 has a width of rolling stack of 600 mm and is suitable for production of films and sheets with a width of 550 mm. All 3 rolls have a diameter of 175 mm
- LCCR-700 has a width of rolling stack of 700 mm and is suitable for production of films and sheets with a width of 650 mm. All 3 rolls have a diameter of 200 mm
- LCCR-1000 has a width of rolling stack of 1000 mm and is suitable for production of films and sheets with a width of 950 mm. All 3 rolls have a diameter of 250 mm
- LCCR-1200 has a width of rolling stack of 1200 mm and is suitable for production of films and sheets with a width of 1100 mm. All 3 rolls have a diameter of 250 mm
- All rolls are equipped with machined internal spiral water or oil heating and cooling channels placed near the roll surface for optimum heat distribution
- The rolls are made of high grade tool steel of same high quality as we use for our two-roll mills. They are hardened and precision ground after which they are equipped with a hard chrome layer which again is precision ground and polished to a mirror surface.
- The whole rolling stack assembly is made so that it easily can be tilted in any angle between vertical and horizontal position. For instance for thin films, when running with low viscosity polymers, a 45 degree position of the rolling stack is suitable and also more convenient than with the rolling stack laying down in horizontal position.
- The whole stack is moved up or down with heavy duty gear motor.
- The upper and lower rolls are laid against the center roll with high hydraulic force which enables calendering of very smooth films and sheets.
- Each roll is driven individually by a shaft coupled geared variable speed AC servo motor which drive ensures a very precise control of the roll speeds.



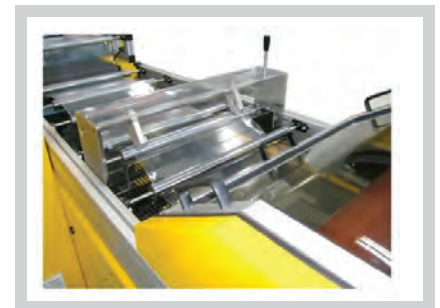
- The rolls are made with heavy duty shafts and bearings to endure they can fully withstand the high lay on force from the hydraulic system.
- The rolls are equipped with hydraulic quick opening which will open up with a distance between rolls of 50 mm.
- The roll gap in closed position is set with precision tapered blocks through ratchet handles which allows for a very accurate adjustment. The gaps are indicated with four precision dial gauges.

• **The control panel has the following instruments :**

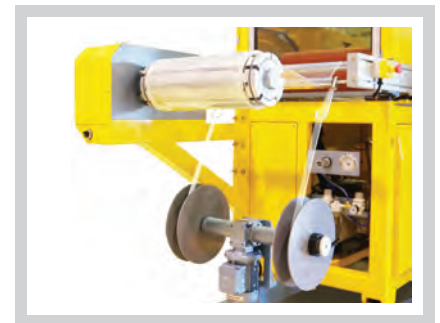
- Digital speed control to each of the three servo motors on the rolling stack
- Synchronous drive for all the rolling stack motors
- Three temperature regulators for controlling right center and left side of the flat die.
- Digital speed controls for the Nip-Roll and the wind up.
- Buttons for opening and closing individually the upper and lower Nip-Gaps between the three rolls
- Up-Down movement of the rolling stack assembly.



- The down side of the chill roll and calendering line is equipped with heavy duty rubber Nip-Rolls which are driven individually by a servo motor. The speed is regulated on the control panel.
- Optionally the Calander and Chill Roll unit can be equipped with two or three built in water tempering unit for a max temperature of around 140 °C.
- With another option the rolls can be heated and cooled with oil tempering units for max temp of around 200°C



- Each roll can also be regulated with individual tempering units.
- The unit can be equipped with optional edge cutter with motorized wind up cassettes for the edge trims.
- The wind up unit is now supplied as a combined surface and center winding system where the center winder has pneumatic bobbin grippers and the surface wind up system is made with slanting gear racks and shaft with bobbin gripper which rests against a rubber roller. The drive is from an individually torque controlled motor.



- Optionally the wind up station can be equipped with a bobbin free pneumatic expansion shaft system as shown to the right.
- The attachment can be used with our 25, 30 and 45 mm screw as well as with our larger 20 and 26 mm twin screw extruders.
- Can be used with die widths up to 450 mm for LCCR500, 550 for LCCR600 and 650 for LCCR700
- This attachment is also suitable for co-extrusion with our new larger feed block.

Optional Edge cutter with wind up cassettes for the edge trims

The cutter has two sideways adjustable knives and is equipped with a practical Plexiglas safety cover and a handle outside the cover to lower and lock the knives in the cutting position. A separate AC gear motor drives the edge strip windup and each cassette is equipped with adjustable clutches for safe and easy threading of the trims.



Windup options :

Fully automatic surface wind up station for films

This unit is connected after the above unfolding device and it uses a high friction rubber roller to surface wind up the film and when the wound up film roll has reached a pre-set length, the machine will automatically cut the film and move the finished roll, replacing it instantly with a new bobbin which will start to wind up the film without any interruption.



The Auto surface winder has the following features :

- Auto Tension Control : Standard Dancing Roller with VR Feedback Control
- Auto Bobbin Change : by Pneumatic Cylinders
- Auto Cutting Air Knife : Fixed High Speed Flying Air Knife
- Length Counter : For Automatic cutting and bobbin change
- Winder Motor : 1.5 kW Servo Motor
- Friction Rubber Roller : Ø 260 mm x 700 mm and 1200 mm
- Banana Roller : Ø 75mm x 700 mm and 1200mm
- Bobbin Shaft : 3" Air Shaft x 2 pcs
- Effective Film Width: Max. 600 mm and 1100 mm
- Film Reel Dia.: Max. 1100 mm
- Control panel: Independent control switch, Potentiometer.

Technical Data on Chill Roll unit type

		LCCR-500	LCCR-600	LCCR-700	LCCR-1000	LCCR-1200
Roll width	mm	500	600	700	1000	1200
Max. film width	mm	450	550	650	950	1100
Max. die width	mm	500	600	700	950	1200
Roll diameter, all 3 rolls	mm	175	175	200	250	250
Max. line pressure	N/cm	450	450	450	450	450
Max. Nip-Gap pressure	kN	22.5	27	31.5	54	54
Hydraulic power for upper and lower roll	kW	0.75	0.75	0.75	0.75	0.75
AC servo motors drive power	kW	3 x 1	3 x 1	3 x 1.5	3 x 2	3 x 2
Hydraulic quick opening	mm	50	50	50	50	50
Gap fine adjustment	mm	0.1 - 6	0.1 - 6	0.1 - 6	0.1 - 6	0.1 - 6
Take-off speed	m/min	0.5 - 6	0.5 - 6	0.5 - 15	0.5 - 30	0.5 - 30
Max. winding diameter of film roll	mm	500	500	500	500	500
Winding diameter	kW	0.5	0.5	0.5	0.5	0.5
Water tempering unit, heating power	kW	9	9	9	9	9

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