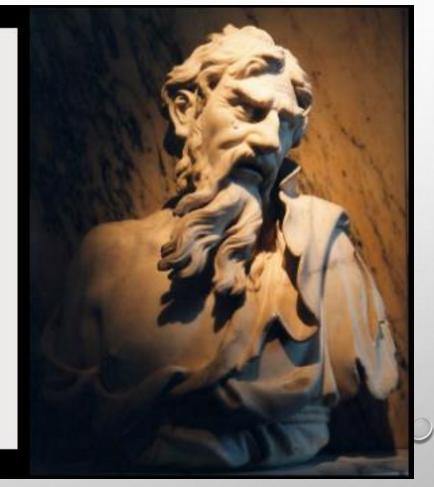


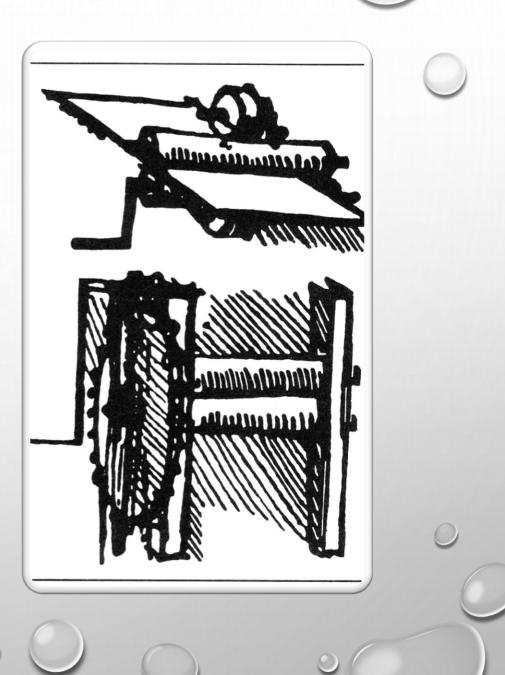
## THEN AND NOW

CHANGES IN STEEL MILLS, THE IRD &

### PASS DESIGN

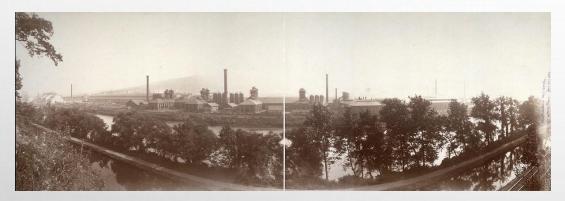
## The only thing that is constant is change. ~ Heraclitus





HISTORY OF ROLLING MILLS 1495 DA VINCI SKETCH OF ROLLING MILL 17<sup>TH</sup> CENTURY HOT ROLLING BEGINS 1783 HENRY CORT RECIEVES PATENT FOR **GROOVED ROLLING** LATE 19<sup>TH</sup> EARLY 20<sup>TH</sup> CENTURIES, LARGE STEEL MILLS ARE BUILT

# INTEGRATED MILLS



CONVERTED ORE TO PIG IRON CONVERTED PIG IRON TO LIQUID STEEL CAST AND SOLIDIFY THE LIQUID STEEL - INOT BLOCKS OR BLOOMS REHEAT & REDUCE THE SIZE OF THE BLOCKS FINISH THE SHAPE



#### INTEGRATED MILLS

LARGE FACILITIES – 2,000,000 TONS

FINISHED PRODUCTS - LARGE STUCTURAL SECTIONS, HEAVY PLATE, STRIP, RAIL WAY RAILS, OCCASIONALLY LONG PRODUCTS (BAR & PIPE)

LITTLE ABLITY TO ADJUST PRODUCTION RATES

#### MINIMILLS

#### CONVERT SCRAP TO LIQUID STEEL CAST BILLET OR NEAR NET SHAPE REHEAT BILLETS REDUCE TO FINISHED SHAPE



#### MINIMILLS

SMALLER FACILITIES - 400,000 - 600,000 TON

FINISHED PRODUCTS - REBAR, FLATS, ANGLE, CHANNEL, PIPE, WIRE ROD, LIGHT RAILS, SPECIALTY SHAPES

GREATER ABLITY TO ADJUST PRODUCTION RATES TO MEET DEMAND

#### MICRO MILLS

#### COVERT SCRAP TO LIQUID STEEL

#### CAST DIRECTLY TO ROLL MILL FOR FINISH SHAPE



#### MICRO MILLS

SMALLER FACILITIES - 200,000 - 400,000 TON

IMPROVED YIELD – LESS NOSES TO COBBLE

FINISHED PRODUCTS ARE MOSTLY REBAR, CAN PRODUCE OTHER SMALL SHAPES AND SPECIALTY PRODUDCTS

GREATER ABLITY TO ADJUST PRODUCTION RATES TO MEET DEMAND

#### INSTITUTE OF ROLL DESIGN

SPRING 1975 ROB KIBLER DISTRUBUTES FLIER FIRST ORGANIZATIONAL MEETING SEPT. 13, 1975 FIRST ACTUAL MEETING DEC. 4 1975 42 CHARTER MEMBERS – 27 PRESENT JULY 8, 1977 FIRST SOLO MEETING WITH TOUR 1984 FIRST CANADIAN MEETING 1987 FIRST HOSPITALITY SUITE

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#### INSTITUTE OF ROLL DESIGN SEVERAL FIRSTS

1989-1991 KEYNOTE SPEAKER COMPUTERIZED RECORDS ROLL DESIGN CERTIFICATION TECHNICAL PAPER AWARDS WIRE ROD COMMITTEE MEMBERSHIP DIRECTORY ROUND TABLE DISCUSSION **1991-1995** HARDNESS COMMITTEE EDUCATION COMMITTEE CAD/CAM USERS GROUP

LADIES SUITE AND TOUR

SCHOLARSHIP AWARD

**OPERATOR MEMBERS** 

1997-PRESENT

INTERNET COMMITTEE

WEB PAGE

HOSPITALITY SUITE COMBINE

STRUCTURAL COMMITTEE MEETING

MERCHANT COMMITTEE MEETING

FIRST LADY OFFICER

FIRST ONLINE REGISTRATION PAYMENT





#### PRESENTATIONS

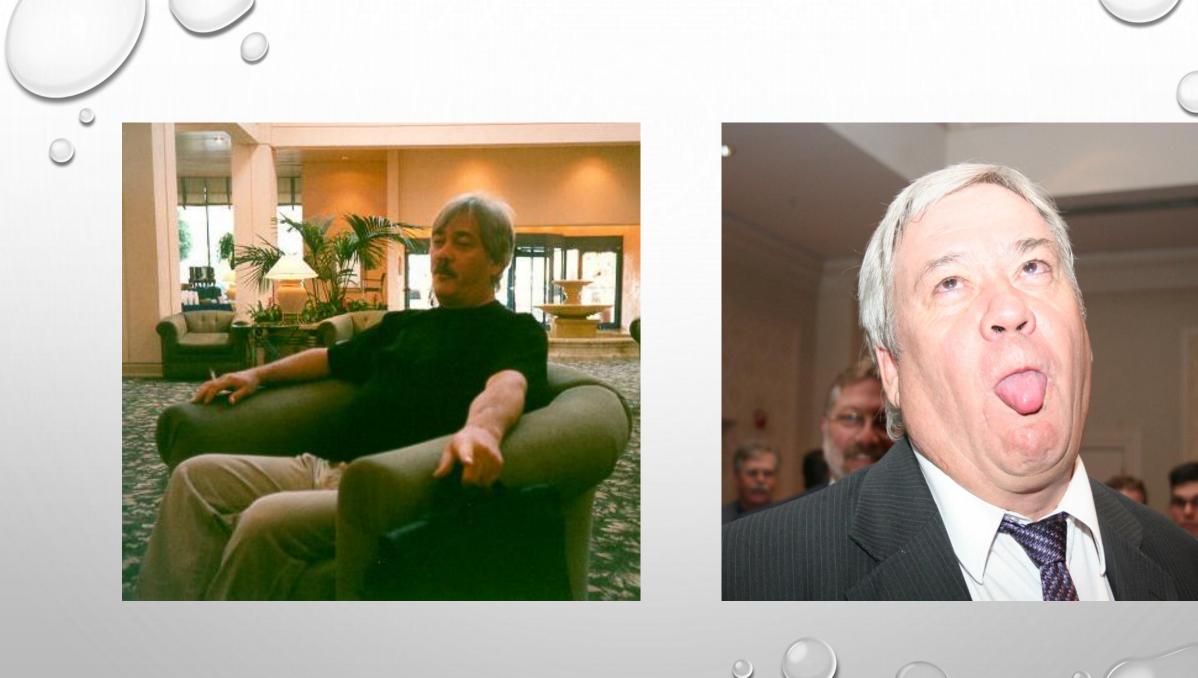
- DIE ROLLING HORSE SHOES
- GREASE OR AIR OIL
- IN HOUSE TRAINING PROGRAMS
- ROLL DESIGN JEOPARDY GAME
- HISTORIES OF ROLLING AND ROLLING MILLS
- EFFECTIVE ROLL COOLING
- ADVANTAGES AND DISADVANTAGES OF DIFFERENT ROLL MATERIALS
- PASS DESIGN CLASSES VARIOUS CHANNEL & ANGLE





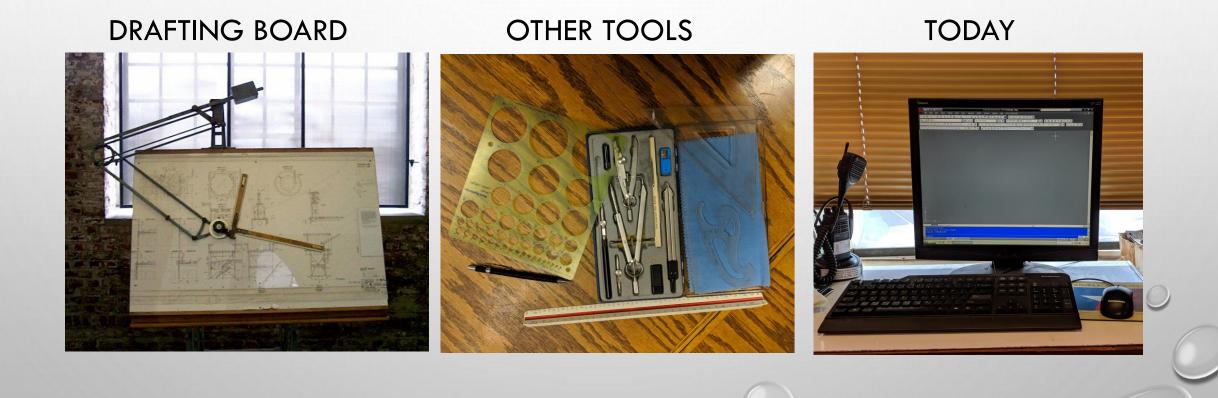


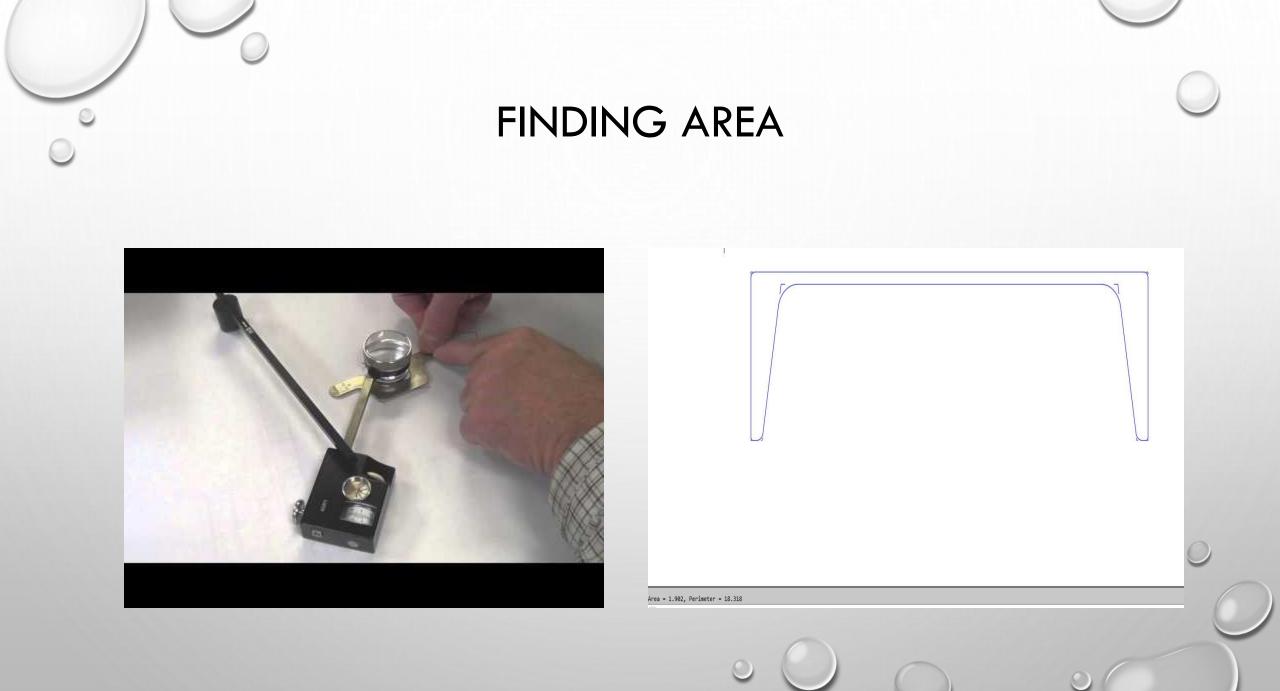




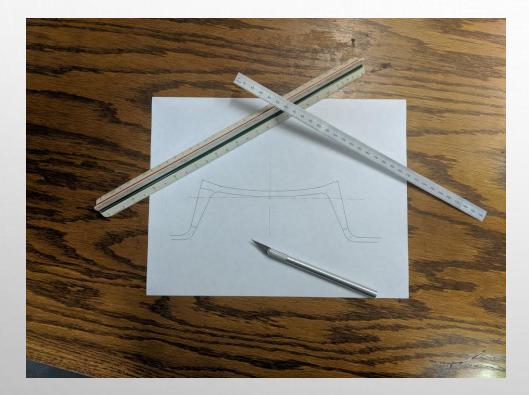


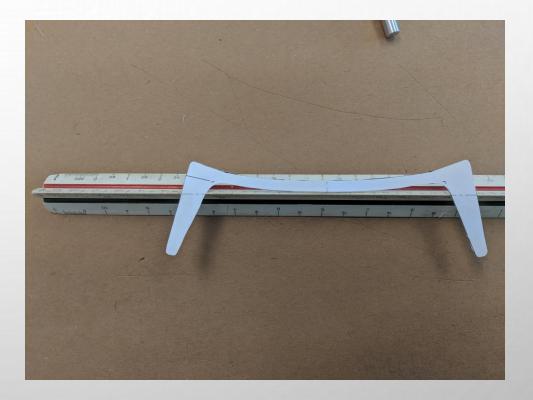
#### PASS DESIGN











#### WORKING DIAMETER

DIAMETER OF THE ROLL WHERE THE BAR AND THE ROLL ARE GOING THE SAME SPEED

ON NEW COLORADO FUEL & TRON CORP. F. M. MILL
DE 11.15625 ALL ROUNDS _ EX: 1.56x.074 = 115 = 1.
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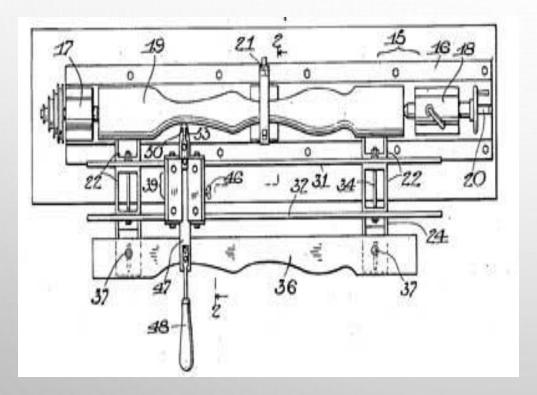
nucor steel \_\_\_\_\_\_ Siameters Ben Paer W.D. OVAL 2 NO. PART W. D. 3 Pars. 0.710 5 PRTS A=4.807 " don't add ... is

JUST FOR FUN

NUCOT STEEL MOURS FREMULAS	SHEET OF DATE G-27-99 BY B. D.
Zoll R. P. M = C workaging Area x georratio (c-con	stant)
Finisher R.P.M. = FR.M. (Roll P.R.M.; Ratio) (WORKING DIA M.) IZ	
Tons/have = $\left(\frac{\log(k_{10}, d_{14}, \cdot T)}{12}\right) \times \frac{m}{2}$	10/10
F.R.M = (Tashr.) x 2000 / (WORKING DIA 40) + /ft	Emilians
% Reduction = <u>Ara, - Areaz</u> Area,	
Constant = Finsker R.R.M X AX Workingdia.	
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D.D. ANNER ECHNARSEL = FED (Horsenatin)	1
1013	

A	В	С	D	E	F	G	Н	1	J	K	L	M	N	0	Р	Q	R	S	Т	U	٧
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24	A	REAS	)		0.350	22.3%	30	384	1800	20	90%	0.4	0.8	1		89.0	27927.3	3.4	40.0	400	60
Drawing Number			PASS	Ø	Radius (hot)	H,	W2	Depth	Gap	T (°F)	Øof	Working Ø	Velocity (Fpm)	Velocity (In Sec)	Roll Rpm	Type of Rolls	Area (Sq.In.)	Proposed Work	Elongation	Mean W of Cont	Total draft
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-	E R	SV	120			5.060	5.268	2.135	0.790	2100	26.8	25.03	#DIV/0!	#DIV/0!	#DIV/0!	iron		#DIV/0!	#DIV/0!	4.683	2.586
	3	5				3.800	5.535	1.150	1.500	2075	20.3	19.85	#DIV/0!	#DIV/0!	#DIV/0!	iron	1	#DIV/0!	#DIV/0!	4.430	1.468
	4	0	12			3.060	0.000	0.780	1.500	2050	20.3	20.22	#DIV/0!	#DIV/0!	#DIV/0!	iron		#DIV/0!	#DIV/0!	1.900	0.740
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e a	6	0	141			2.560	0.000	1.030	0.500	2000	16.3	15.47	#DIV/0!	#DIV/0!	#DIV/0!	iron		20.7%	#DIV/0!	0.000	-2.560
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	12	0	13			0.607	2.608	0.210	0.188	1850	14.6	14.51	640	127.9	168.46	iron	1.548	26.5%	1.64	1.897	0.578
1.125	13	R	14		0.000	0.617	2.292	0.183	0.250	1825	14.6	14.54	700	140.1	184.04	iron	1.414	8.7%	1.09	0.612	0.316
	14	0	15			0.497	2.474	0.155	0.188	1800	13.6	13.56	1053	210.6	296.74	iron	0.940	33.2%	1.50	1.545	0.120
	15	R	16		0.000	0.429	2.500	0.152	0.125	1775	13.8	13.72	1280	255.9	356.34	iron	0.774	17.7%	1.21	0.463	0.068
	16	0	17			0.236	2.576	0.024	0.188	1750	13.8	13.82	1628	325.7	450.29	iron	0.608	22.2%	1.27	1.503	0.193
	17	R	18		0.000	0.350	1.571	0.144	0.063	1725	13.8	13.64	1800	360.0	504.42	iron	0.550	9.5%	1.11	0.293	0.165

#### CUTTING THE ROLLS



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N0020 G92 S190		
N0030 G96 S400		
N0040 T0101(TOOL 3/4)		
N0050 M24		
N0060 G04 X1.0		
N0070 M03		
N0080 G04 X1.0		
N0090 G00 X27.25 Z0.475		
N0100 Z-0.375		
N0110 G01 X26.75 Z-0.375 F0.020		
N0120 Z-35.058		
N0130 G03 X25.25 Z-35.808 I-0.75 K0.		
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## QUESTIONS?

## **COMMENTS!**

