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HARDNESS CONVERSION TABLE
PRIMERJALNA TABELA TRDOT

Date/datum: 08.2015

Vickers (HV)	Rockwell (HRc)	Scleroscope Hardnes No. (Shore HSc, HSd)	Scleroscope hardness (Shore HFRSc)	Shore HS (HSC/HSD)	Leeb	
					(HLd)	(HLe)
ASTM E 140			*ASTM A 427*	*JIS B 7731*	*Eqoutip - Proceq*	
940	68	97,3	-	98	890	855
926	67,6	96,8	105	97,2	886	850
913	67,3	95,9	104	96,4	882	846
900	67	95	103	95,6	879	843
888	66,7	94,4	102	94,8	876	840
875	66,3	93,8	101	94,0	872	836
862	65,9	92,4	100	93,2	868	832
850	65,6	91,6	99	92,4	865	829
837	65,2	90,6	98	91,5	861	825
825	64,8	90,1	97	90,7	858	821
812	64,4	89,8	96	89,9	854	817
800	64	88,5	95	89,0	850	814
787	63,7	87,6	94	88,1	847	811
774	63,1	86,7	93	87,2	841	805
761	62,4	85,7	92	86,3	834	798
748	62,1	84,7	91	85,4	831	795
735	61,6	83,9	90	84,4	826	791
723	61,1	82,9	89	83,5	822	786
710	60,6	81,8	88	82,5	817	781
698	60	80,9	87	81,6	811	776
685	59,5	80,3	86	80,6	797	771
672	58,9	78,8	85	79,6	796	765
660	58,3	78,2	84	78,6	795	760
647	57,7	76,6	83	77,6	790	754
635	57,2	75,8	82	76,6	785	750
622	56,5	74,7	81	75,5	769	744
610	55,7	73,6	80	74,5	767	736
597	55,1	72,6	79	73,4	766	731
584	54,5	71,8	78	72,3	761	725
571	53,7	70,2	77	71,2	753	718
558	52,9	69,2	76	70,0	746	711
545	52	67,9	75	68,8	739	703
533	51,5	67,1	74	67,8	734	699
520	50,7	65,7	73	66,6	727	692
508	49,6	64,5	72	65,4	718	682
495	48,8	63,3	71	64,2	711	676
482	47,9	62,1	70	63,0	704	669
470	47	61	69	61,8	696	662
457	46	59,7	68	60,5	688	653
445	45	58,4	67	59,3	680	646
432	43,9	57	66	58,0	672	637
420	42,8	55,9	65	56,7	663	628
412	42	54,9	-	55,9	658	622
402	41	53,7	-	54,9	650	615
392	40	52,6	-	53,8	642	608
382	39	51,5	-	52,7	634	601
372	38	50,4	-	51,6	628	594
363	37	49,3	-	50,6	620	587
354	36	48,2	-	49,6	612	580
345	35	47,1	-	48,6	606	573
336	34	46,1	-	47,6	598	567
327	33	45,1	-	46,6	592	561
318	32	44,1	-	45,5	584	554
310	31	43,1	-	44,6	578	548
302	30	42,2	-	43,6	572	542
294	29	41,3	-	42,7	566	536
286	28	40,4	-	41,7	560	531
279	27	39,5	-	40,9	552	525
272	26	38,7	-	40,0	546	519
266	25	37,8	-	39,3	540	514
260	24	37	-	38,5	534	508
254	23	36,3	-	37,7	528	503
248	22	35,5	-	37,0	522	-
243	21	34,8	-	36,4	516	-
238	20	34,2	-	35,7	510	-

Note 1:
Roll hardness is measured with metal hardness tester from company Proceq (Equotip).

Note 2: HV and HRc
Conversion "HV" in "HRc" is based on ASTM E 140 (alloy and tool steels) and partially ISO 18265:2013 (unalloyed
and low-alloy steels and cast iron).

Note 3: HLd **and HLe**
Conversion is based on tables for Equotip measuring device (Proceq) and compared to HRC.

Note 4: Shore HSc/HSd
Symbol:
HSc (« Hardness Scleroscope MODEL c»)
HSd (« Hardness Scleroscope MODEL d »)
Standard Calibration
“ MODEL c ” Direct reading from the rebound height.
“ MODEL d ” Hardness reading on graduated dial.
Official standards:
ASTM E448 (description, precautions, calibration, standard practice...)
ASTM E140 (conversion HRc -> HV -> HB -> HSc).
ASTM E448 standard only differentiates equipment by the reading method (rebound or dial). Theoretically, hardness values are announced as identical. However, some non-official tables show a difference.

Note 5: Shore HS (HSC/HSD)
Symbol:
HSC (“ Hardness Scleroscope MODEL C ”)
HSD (“ Hardness Scleroscope MODEL D ”).
Standard calibration:
Japanese origin testing block (brand YAMAMOTO).
Values “C” or “D” are identical. Only the reading method varies -> “C” (rebound height), “D” (on graduated dial).
Official standards:
JIS B7727 (equipment description)
JIS Z2246 (measure method).
Conversion to HV based on JIS 7731.

Note 6: Shore HFRSc/HFRSd
Symbol:
HFRSc (« Hardness Forged Roll Scleroscope Model c »).
HFRSd (« Hardness Forged Roll Scleroscope Model d »).
Calibration for forged steel.
“ MODEL c” Direct reading from the rebound height.
“ MODEL d” Hardness reading on graduated dial.
Official standards:
ASTM E448 (description, precautions, etc.).
ASTM A427 (conversion HFRSc <-> HV).
ASTM E448 standard only differentiates the equipment by the reading method (rebound or dial). Theoretically hardness values are announced as identical. However, some non-official tables show a difference.
ASTM A427 official conversion table stops at 65 HFRSc.