

Formelsammlung

Zwischen- und Abschlussprüfung

Produktveredler Textil

Flächenberechnung

Quadrat	$A = a^2$	$U = 4 \cdot a$	A	Fläche
			a	Seite a
Rechteck	$A = a \cdot b$	$U = 2 \cdot a + 2 \cdot b$	b	Seite b
			c	Seite c
Trapez	$A = \frac{a+c}{2} \cdot h$	$U = a + b + c + d$	h	Höhe
			U	Umfang
Dreieck	$A = \frac{g \cdot h}{2}$	$U = a + b + c$	g	Grundseite
			r	Radius
Kreis	$A = r^2 \cdot \pi = \frac{d^2}{4} \cdot \pi$	$U = 2 \cdot r \cdot \pi = d \cdot \pi$	d	Durchmesser
				

Körperberechnung

Würfel	$V = a^3$	V	Volumen
	$M = a^2 \cdot 4$	M	Mantelfläche
	$O = a^2 \cdot 6$	O	Oberfläche
Quader	$V = a \cdot b \cdot c$	a	Seite a
	$M = (a + b) \cdot 2 \cdot h$	b	Seite b
	$O = (a + b) \cdot 2 \cdot h + a \cdot b \cdot 2$	c	Seite c
Zylinder	$V = r^2 \cdot \pi \cdot h$	h	Höhe
	$M = d \cdot \pi \cdot h$	d	Durchmesser
	$O = r^2 \cdot \pi \cdot 2 + d \cdot \pi \cdot h$	r	Radius

Feinheitsberechnungen

Feinheitsberechnung Garn

$$Tt (tex) = \frac{\text{Masse in g} \cdot 1000}{\text{Länge in m}}$$

$$dtex = \frac{\text{Masse in g} \cdot 10000}{\text{Länge in m}}$$

$$Td = \frac{\text{Masse in g} \cdot 9000}{\text{Länge in m}}$$

$$Nm = \frac{\text{Länge in m}}{\text{Masse in g}}$$

Feinheitsberechnungen Zwirn

$$Tt_z = tex_1 + tex_2 + tex_3 + \dots + tex_n \quad tex_z$$

Feinheit des Zwirns

$$Nm_z = \frac{Nm_1 \cdot Nm_2 \cdot \dots \cdot Nm_n}{Nm_1 + Nm_2 + \dots + Nm_n}$$

Nm_z

Nummer metrisch des
Zwirns

Umrechnung von Feinheiten

$$Tt = \frac{1000}{Nm}$$

$$Tt = \frac{Td}{9}$$

$$Td = \frac{9000}{Nm}$$

Berechnung bei textilen Flächen

Flächenbezogene Masse m_A (in g/m²)

$$m_A = \frac{m_{St}}{A}$$

m_{St} Masse des Textils

$$m_A = \frac{m_L}{b}$$

A Fläche

b Breite des Textils

Längenbezogene Masse m_L (in g/m)

l Länge des Textils

$$m_L = \frac{m_{St}}{l}$$

$$m_L = m_A \cdot b$$

Berechnung der Handelsmasse

$$m_H = m_V \frac{(100\% + R \text{ in } \%)}{(100\% + F \text{ in } \%)}$$

m_H Handelsmasse

R Reprise

m_V Versandmasse

F Feuchtegehalt

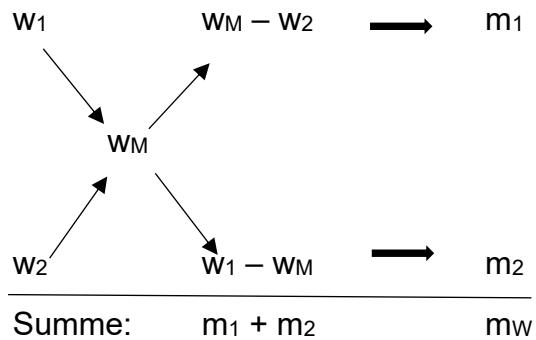
Mischungsgleichung

$$m_1 \cdot w_1 + m_2 \cdot w_2 + \dots + m_n \cdot w_n = m_{ges} \cdot w_{ges}$$

w Massenanteil

m Masse an gelöster
Substanz

Mischungskreuz



w Massenanteil
m Masse an gelöster
Substanz

Dichte ρ

$$\rho = \frac{m}{V}$$

m Masse

V Volumen

Wirkungsgrad η (Nutzeffekt)

$$\eta = NE = \frac{P_2}{P_1}$$

Wirkungsgrad in Prozent

$$\eta = NE = \frac{P_2}{P_1} \cdot 100\%$$

Gesamtwirkungsgrad

$$\eta_{ges} = \eta_1 \cdot \eta_2 \cdot \dots \cdot \eta_n$$

Ohm'sches Gesetz

$$U = R \cdot I$$

U	Spannung in V
R	Widerstand in Ω
I	Stromstärke in A

Kirchhoff'sche Gesetze

Parallelschaltung von Widerständen

$$I_{ges} = I_1 + I_2 + \dots + I_n$$

$$U_{ges} = U_1 = U_2 = \dots = U_n$$

$$\frac{1}{R_{ges}} = \frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n}$$

U	Spannung
R	Widerstand
I	Stromstärke

Reihenschaltung von Widerständen

$$U_{ges} = U_1 + U_2 + \dots + U_n$$

$$I_{ges} = I_1 = I_2 = \dots = I_n$$

$$R_{ges} = R_1 + R_2 + \dots + R_n$$

Leistung

$$P = U \cdot I$$

P	Leistung in W
U	Spannung in V
I	Stromstärke in A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																																														
1 1.0079 H Wasserstoff 2.2 0.09	3 6.941 Li Lithium 0.88 0.53 1.57 1.85	4 9.0122 Be Beryllium	5 12.011 B Bor 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	6 10.813 C Kohlenstoff 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	7 14.007 N Stickstoff 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	8 15.999 O Sauerstoff 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	9 18.998 F Fluor 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	10 20.180 Ne Neon 2.04 2.46 2.55 2.26 3.04 1.25 3.44 1.43 3.98 1.70	11 22.990 Na Natrium 0.88 0.53 1.57 1.85	12 24.305 Mg Magnesium 0.88 0.53 1.57 1.85	13 26.981 Al Aluminium 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78	14 28.085 Si Silicium 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78	15 30.974 P Phosphor 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78	16 32.067 S Schwefel 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78	17 35.451 Cl Chlor 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78	18 39.948 Ar Argon 1.61 2.70 1.9 2.34 2.19 2.69 2.58 2.07 3.16 3.21 0.82 1.78																																															
19 39.098 K Kalium 0.82 0.86 1.0 1.55 1.36 2.98	20 40.078 Ca Calcium 0.82 0.86 1.0 1.55 1.36 2.98	21 44.956 Sc Scandium	22 47.867 Ti Titan 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	23 50.941 V Vanadium 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	24 51.996 Cr Chrom 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	25 54.938 Mn Mangan 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	26 55.845 Fe Eisen 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	27 58.933 Co Cobalt 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	28 58.933 Ni Nickel 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	29 63.546 Cu Kupfer 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	30 65.380 Zn Zink 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	31 68.923 Ga Gallium 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	32 72.631 Ge Germanium 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	33 74.922 As Arsen 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	34 78.972 Se Selen 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	35 79.904 Br Brom 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	36 83.798 Kr Krypton 1.54 4.50 1.63 6.11 1.66 7.14 1.55 7.43 1.83 7.87 1.91 8.90 1.88 8.91 1.9 8.92 1.65 7.14 1.81 5.90 2.01 5.32 2.18 5.73 2.55 4.82 2.96 3.12 3.75	37 85.468 Rb Rubidium 0.82 1.53 0.95 2.53 1.22 4.47	38 87.620 Sr Strontium 0.82 1.53 0.95 2.53 1.22 4.47	39 88.906 Y Yttrium	40 91.224 Zr Zirkon 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	41 92.906 Nb Niob 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	42 92.906 Mo Molybdän 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	43 95.94 Tc Technetium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	44 101.07 Ru Ruthenium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	45 101.07 Rh Rhodium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	46 106.42 Pd Palladium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	47 106.42 Ag Silber 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	48 107.868 Cd Cadmium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	49 112.414 In Indium 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	50 112.414 Sn Zinn 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	51 127.60 Sb Antimon 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	52 127.60 Te Tellur 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	53 126.904 I Jod 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	54 131.294 Xe Xenon 1.33 6.50 1.6 8.57 2.16 10.28 1.9 11.50 2.2 12.37 2.28 12.45 2.2 12.02 1.93 10.49 1.69 8.64 1.78 7.31 1.96 7.26 2.05 6.70 2.66 6.25 2.1 4.94 2.6 5.90	55 132.905 Cs Cäsium 0.79 1.90 0.89 3.59 1.1 6.15	56 132.905 Ba Barium 0.79 1.90 0.89 3.59 1.1 6.15	57 137.327 La Lanthan	58 138.905 Ce Cer	59 140.908 Pr Praseodym	60 144.242 Nd Neodym	61 144.242 Pm Promethium	62 150.360 Sm Samarium	63 151.964 Eu Europium	64 157.25 Gd Gadolinium	65 158.925 Tb Terbium	66 162.500 Dy Dysprosium	67 164.930 Ho Holmium	68 167.259 Er Erbium	69 168.934 Tm Thulium	70 173.045 Yb Ytterbium	71 174.967 Lu Lutetium	72 175.04 Hf Hafnium	73 178.49 Ta Tantal	74 180.948 W Wolfram	75 183.84 Re Rhenium	76 186.207 Os Osmium	77 190.23 Ir Iridium	78 192.22 Pt Platin	79 195.08 Au Gold	80 196.967 Hg Quecksilber	81 200.592 Tl <th>201.97 Thallium</th>	201.97 Thallium

58 140.116 Ce Cer	59 140.908 Pr Praseodym	60 144.242 Nd Neodym	61 144.242 Pm Promethium	62 150.360 Sm Samarium	63 151.964 Eu Europium	64 157.25 Gd Gadolinium	65 158.925 Tb Terbium	66 162.500 Dy Dysprosium	67 164.930 Ho Holmium	68 167.259 Er Erbium	69 168.934 Tm Thulium	70 173.045 Yb Ytterbium	71 174.967 Lu Lutetium
90 232.038 Th Thorium	91 231.036 Pa Protactinium	92 238.029 U Uran	93 237.04 Np Neptunium	94 237.04 Pu Plutonium	95 243.06 Am Americium	96 243.06 Cm Curium	97 247.07 Bk Berkelium	98 251.08 Cf Californium	99 251.08 Es Einsteinium	100 252.08 Fm Fermium	101 252.08 Md Mendelevium	102 258.10 No Nobelium	103 261.10 Lr Lawrencium

Lanthanoide

Actinoide