

## PAINT COVERAGE/CONSUMPTION CALCULATION

Paint coverage is determined by both the "**Transfer Efficiency**" of the spray equipment and the "**Solids Content by Volume**" of the paint.

**Transfer efficiency** is affected by paint "bounce back" from the work piece and "over spray". There may be significant opportunity to reduce your paint costs by improving the transfer efficiency of your equipment. **Transfer Efficiency** also varies with subjective issues such as the painter or the way he adjusts the spray equipment. Air movement or wind can also negatively impact transfer efficiency.

**Solids Content by Volume** is the volume of the nonvolatile portion of a coating composition divided by the total volume of the liquid coating, expressed as a percent. Paint with 35 % volume solids will shrink due primarily to the volatile solvents evaporating to a dry film build equating to 35% of the wet film build.

**Paint Coverage** can also be strongly influenced by the texture and porosity of the substrate. Theoretical coverage assumes a reasonably smooth non-porous surface. Anything else requires either more paint or a sealer and only experience can determine the correct amount.

Adding solvent to paint decreases the volume solids. Therefore, higher wet film builds would be required to achieve the same dry film thickness.

Lastly, some paints and colors do not hide as well as others. Increased film build and even additional coats of paint may be required to achieve the true colour on a repeatable basis.

Tristar Coatings for the most part, uses an "in-house grind" of powdered pigment in its formulations rather than adding a colorant to a bulk produced tint base. In certain conditions, this can reduce paint consumption by as much as 50 % plus.

## DETERMINING QUANTITY OF PAINT REQUIRED

The following 2 charts outline the **Transfer Efficiency** for various types of equipment and the **Theoretical Coverage** (sq.ft. per US gallon) of a paint for various dry mil thickness at various solids content by volume.

### A) Calculate practical sq. ft. coverage per US gallon/liter.

The **Theoretical Coverage** table shows the coverage per gallon at various total film builds (DFT). Alternatively, most paint manufacturers will provide the Theoretical Coverage at 1 mil DFT. That coverage must be divided by the desired total dry film thickness to be applied to obtain the theoretical coverage at the desired mil thickness. For rough and/or porous surfaces, the Theoretical Coverage must be reduced accordingly.

Establish the **Transfer Efficiency** of Application Method  
**Practical Coverage = Theoretical Coverage X Transfer Efficiency**

### B) Calculate paint required

Determine the area

**Quantity required = (Area/Practical Coverage)+ 10 % for contingency..**

### Useful conversion factors

3.785 litres	= 1 US Gallon
2.54 centimeters	= 1 Inch
0.3048 meters	= 1 Foot

# TRANSFER EFFICIENCY

## Typical Transfer Efficiency of Equipment

Conventional	Air Assisted	Airless	HVLP	Electrostatic	Roller Brush
20-40%	50-70%	50-60%	40-60%	60-85%	95% plus

### Sq. Ft. Coverage per US Gallon

To determine estimated volumes required multiply theoretical sq. ft. coverage by transfer efficiency of sprayequipment.

# THEORETICAL COVERAGE

## Theoretical Coverage Sq.Ft/US Gallon

Thickness in Mils (Dry)	% Volume Solids															
	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	80%	90%	100%
0.25	641	962	1282	1602	1923	2243	2564	2884	3205	3525	3845	4166	4487	5127	5769	6409
0.5	320	481	641	801	962	1121	1282	1442	1602	1763	1923	2083	2243	2564	2884	3205
0.75	214	320	428	534	641	748	854	962	1068	1175	1282	1389	1494	1709	1923	2136
1	161	240	320	401	481	561	641	721	801	881	962	1042	1121	1282	1442	1602
1.25	128	192	256	320	384	448	512	577	641	705	770	834	898	1026	1154	1282
1.5	106	161	214	267	320	374	428	481	534	587	641	695	748	854	962	1068
1.75	92	137	183	229	275	320	366	412	458	504	550	596	641	733	824	916
2	80	120	161	200	240	280	320	360	401	441	481	521	561	641	721	801
2.5	64	96	128	161	192	224	256	288	320	352	384	416	448	512	577	641
3	53	80	106	134	161	187	214	240	267	294	320	347	374	428	481	534
3.5	46	68	92	115	137	160	183	205	229	251	275	297	320	366	412	458
4	40	60	80	100	120	140	160	180	200	220	240	260	280	320	360	400
4.5	36	53	72	89	106	125	142	161	178	196	214	231	250	285	320	356
5	32	48	64	80	96	112	128	144	161	176	192	208	224	256	288	320
6	27	40	53	67	80	93	106	120	134	147	161	174	187	214	240	267
7	22	34	46	57	68	80	92	103	115	126	137	149	160	183	205	229
8	20	30	40	50	60	70	80	90	101	111	121	131	141	161	181	200
9	17	27	36	45	53	62	72	80	89	98	106	116	125	142	161	178
10	15	24	32	40	48	57	64	72	81	88	97	104	112	128	145	161

**WET FILM THICKNESS = DRY FILM THICKNESS X 100**

% Volume Solids

## Theoretical Coverage Sq.Meter/Litre

Thickness in Mils (Dry)	% Volume Solids															
	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	80%	90%	100%
0.25	15.8	23.6	31.5	39.4	47.3	55.1	63	70.9	78.8	86.7	94.5	102	110	126	142	158
0.5	7.9	11.8	15.8	19.7	23.4	27.6	31.5	35.5	39.4	43.3	47.3	51.2	55.1	63	70.9	78.8
0.75	5.3	7.9	10.5	13.1	15.8	18.4	21	23.6	26.3	28.9	31.5	34.1	36.8	42	47.3	52.5
1	3.9	5.9	7.9	9.8	11.8	13.8	15.8	17.7	19.7	21.7	23.6	25.6	27.6	31.5	35.5	39.4
1.25	3.2	4.7	6.3	7.9	9.5	11	12.6	14.2	15.8	17.3	18.9	20.5	22.1	25.2	28.4	31.5
1.5	2.6	3.9	5.3	6.6	7.9	9.2	10.5	11.8	13.1	14.4	15.8	17.1	18.4	21	23.6	26.3
1.75	2.3	3.4	4.5	5.6	6.8	7.9	9	10.1	11.3	12.4	13.5	14.6	15.8	18	20.3	22.5
2	2	3	3.9	4.9	5.9	6.9	7.9	8.9	9.8	10.8	11.8	12.8	13.8	15.8	17.7	19.7
2.5	1.6	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9	8.7	9.4	10.2	11	12.6	14.2	15.7
3	1.3	2	2.6	3.3	3.9	4.6	5.3	5.9	6.6	7.2	7.9	8.5	9.2	10.5	11.8	13.1
3.5	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.1	5.6	6.2	6.7	7.3	7.9	9	10.1	11.2
4	1	1.5	2	2.5	3	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.9	8.9	9.8
4.5	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3	5.7	6.1	7	7.9	8.8
5	0.8	1.2	1.6	2	2.4	2.8	3.1	3.5	3.9	4.3	4.7	5.1	5.5	6.3	7.1	7.9
6	0.7	1	1.3	1.6	2	2.3	2.6	3	3.3	3.6	3.9	4.3	4.6	5.3	5.9	6.6
7	0.6	0.8	1.1	1.4	1.7	2	2.2	2.5	2.8	3.1	3.4	3.7	3.9	4.5	5.1	5.6
8	0.5	0.7	1	1.2	1.5	1.7	2	2.2	2.5	2.7	3	3.2	3.5	3.9	4.4	4.9
9	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2	2.2	2.4	2.6	2.8	3.1	3.5	3.9	4.4
10	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3.2	3.6	3.9