HDPE Extrusion Formula : Beige Color

	Without TIOPREM BEIGE	With TIOPREM BEIGE
Pigments	**% wt.**	**% wt.**
Raven 14 Carbon Black	0.730	0.495
130M Red Oxide	3.200	2.500
Tan10A Yellow	44.500	33.715
TIOPREM BEIGE	0.000	48.875
Kronos 2160 White TiO_2	51.570	14.415
	100.000	100.000

pHR (parts per hundred resin) prime pigment loading= 2.0

Raw Material	**pHR**	**%F.W.**	**pHR**	**%F.W.**
HDPE	**100.000**	98.039	**100.000**	98.039
Raven 14 Carbon Black	**0.0146**	0.0143	**0.0099**	0.0097
130M Red Oxide	**0.0640**	0.0627	**0.0500**	0.0490
Tan10A Yellow	**0.8900**	0.8725	**0.6743**	0.6611
TIOPREM BEIGE	**0.0000**	0.0000	**0.9775**	0.9583
Kronos 2160 White TiO2	**1.031**	1.011	**0.288**	0.283
	102.000	100.000	**102.000**	100.000

OPACITY

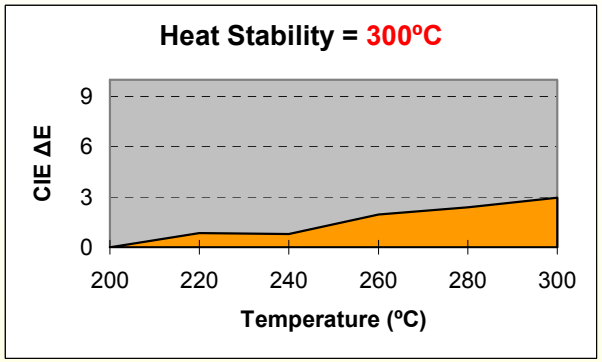
pHR (parts per hundred resin) loading= 0.50

Thickness of sample = .022 in

Heat Stability in HDPE

Beige Color- using TAN 10A

	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
ΔL*		-0.05	-0.43	-1.11	-1.16	-1.71
Δa*		-0.57	-0.51	-0.93	-1.18	-1.49
Δb*		-0.63	-0.44	-1.31	-1.71	-1.89
ΔE*		**0.85**	**0.80**	**1.95**	**2.38**	**2.96**

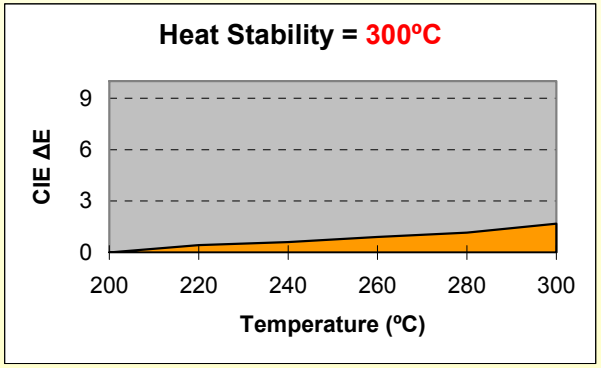


Opacity

87

Beige Color- using TIOPREM BEIGE

	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
ΔL*		-0.23	-0.29	-0.44	-0.43	-1.06
Δa*		-0.25	-0.29	-0.40	-0.58	-0.66
Δb*		-0.26	-0.46	-0.67	-0.92	-1.12
ΔE*		**0.43**	**0.62**	**0.90**	**1.17**	**1.68**



Opacity

86.5

HDPE Extrusion Formula : BLUE Color

	Without TIOPREM BEIGE	With TIOPREM BEIGE
Pigments	**% wt.**	**% wt.**
Raven 14 Carbon Black	3.000	2.800
4863 PT Blue	30.000	24.200
Colortherm 30 Yellow	10.000	7.000
TIOPREM BEIGE	0.000	40.000
Kronos 2160 White TiO_2	57.000	26.000
	100.000	100.000

pHR (parts per hundred resin) prime pigment loading= 2.0

Raw Material	**pHR**	**%F.W.**	**pHR**	**%F.W.**
HDPE	**100.000**	98.039	**100.000**	98.039
Raven 14 Carbon Black	**0.0600**	0.0588	**0.0560**	0.0549
4863 PT Blue	**0.6000**	0.5882	**0.4840**	0.4745
Colortherm 30 Yellow	**0.2000**	0.1961	**0.1400**	0.1373
TIOPREM BEIGE	**0.0000**	0.0000	**0.8000**	0.7843
Kronos 2160 White TiO2	**1.140**	1.118	**0.520**	0.510
	102.000	100.000	**102.000**	100.000

OPACITY

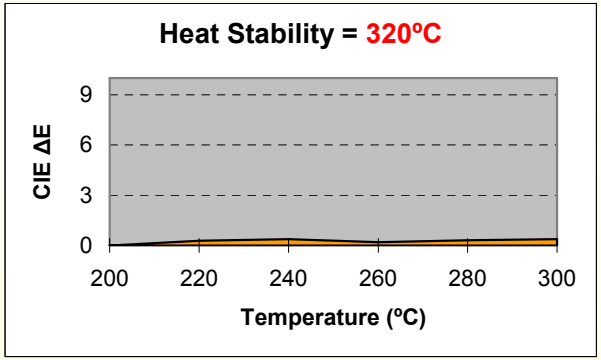
pHR (parts per hundred resin) loading= 0.25

Thickness of sample = .022 in

Heat Stability in HDPE

Blue Color- using Colortherm 30

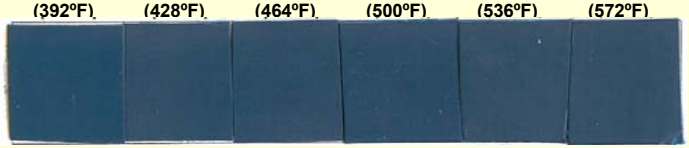
	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
ΔL*		-0.11	-0.23	-0.04	-0.21	0.32
Δa*		-0.26	-0.29	-0.19	-0.23	0.04
Δb*		0.01	-0.10	-0.02	-0.05	0.20
ΔE*		**0.28**	**0.38**	**0.20**	**0.31**	**0.38**



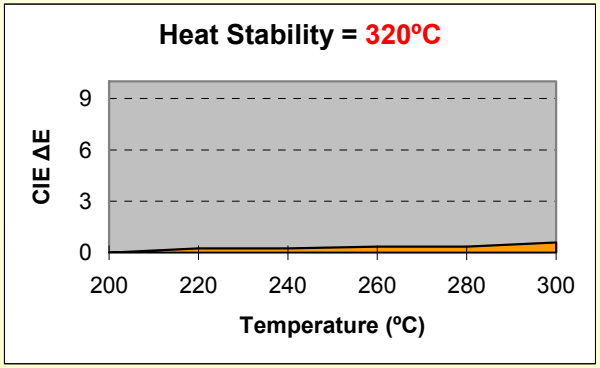
Opacity

93.5

Blue Color- using TIOPREM BEIGE



	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
ΔL*		-0.13	-0.10	-0.30	0.05	0.24
Δa*		-0.22	-0.24	-0.18	-0.35	-0.03
Δb*		-0.02	-0.04	0.11	-0.03	0.54
ΔE*		**0.26**	**0.26**	**0.36**	**0.35**	**0.59**



Opacity

91

HDPE Extrusion Formula : Green Color

	Without TIOPREM BEIGE	With TIOPREM BEIGE
Pigments	**% wt.**	**% wt.**
Raven 14 Carbon Black	0.250	0.100
3820 PT Green	28.000	24.820
2288D Yellow Oxide	19.500	14.560
TIOPREM BEIGE	0.000	40.000
Kronos 2160 White TiO_2	52.250	20.520
	100.000	100.000

pHR (parts per hundred resin) prime pigment loading= 2.0

Raw Material	**pHR**	**%F.W.**	**pHR**	**%F.W.**
HDPE	**100.000**	98.039	**100.000**	98.039
Raven 14 Carbon Black	**0.0050**	0.0049	**0.0020**	0.0020
3820 PT Green	**0.5600**	0.5490	**0.4964**	0.4867
2288D Yellow Oxide	**0.3900**	0.3824	**0.2912**	0.2855
TIOPREM BEIGE	**0.0000**	0.0000	**0.8000**	0.7843
Kronos 2160 White TiO2	**1.045**	1.025	**0.410**	0.402
	102.000	100.000	**102.000**	100.000

OPACITY

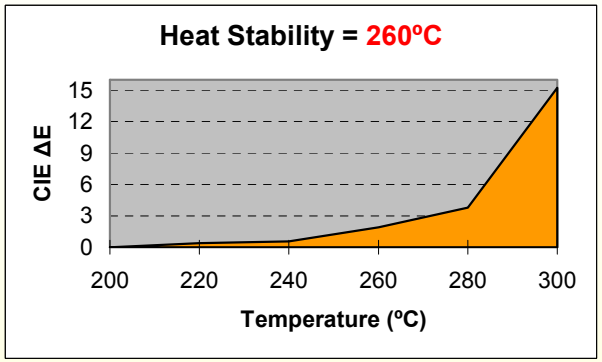
pHR (parts per hundred resin) loading= 0.50

Thickness of sample = .022 in

Heat Stability in HDPE

Green Color- using YIO (2288D)

	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
						
ΔL*		-0.38	-0.50	-1.76	-1.92	-6.95
Δa*		-0.06	0.23	0.74	3.22	13.38
Δb*		0.08	-0.10	0.10	-0.45	-2.08
ΔE*		**0.39**	**0.56**	**1.91**	**3.78**	**15.22**

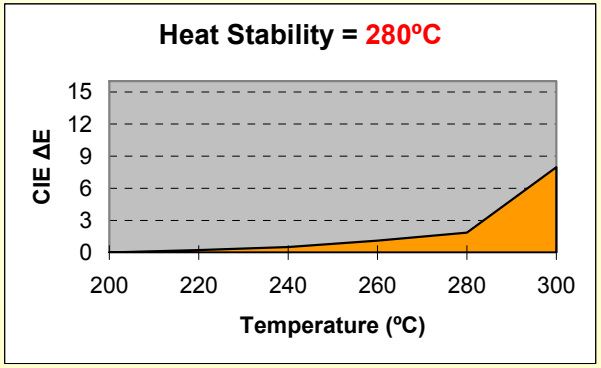


Opacity

93

Green Color- using TIOPREM BEIGE

	200ºC (392ºF)	220ºC (428ºF)	240ºC (464ºF)	260ºC (500ºF)	280ºC (536ºF)	300ºC (572ºF)
						
ΔL*		0.08	-0.49	-0.76	-0.77	-3.55
Δa*		0.21	0.12	0.78	1.68	7.04
Δb*		-0.02	-0.06	-0.17	-0.19	-1.15
ΔE*		**0.22**	**0.51**	**1.10**	**1.86**	**7.96**



Opacity

91