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Hony. Editor :

Dr. Goutam Mukherjee

Communications to Editor through E-mail :

jiltaeditor@gmail.com; admin@iltaonleather.org

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Indian Leather Technologists' Association
'Sanjoy Bhavan', 3rd floor, 44, Shanti Pally
Kasba, Kolkata - 700 107, WB, India

Phone : 91-33-2441-3429/3459

Telefax : 91-33-2441-7320

E-mail : admin@iltaonleather.org;
mailto:ilta@rediffmail.com

Web site : www.iltaonleather.org

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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The Journal of Indian Leather Technologists' Association (JILTA) is a monthly publication which encapsulates latest state of the art in processing technology of leather and its products, commerce and economics, research & development, news & views of the industry etc. It reaches to the Leather / Footwear Technologists and the decision makers all over the country and overseas.

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Send your enquiries to :

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'SANJOY BHAVAN'
3rd floor, 44, Shanti Pally, Kasba, Kolkata – 700 107
Phone : 91-33-24413429/3459, Telefax : 91-33-24417320
E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com
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Asian Economic Snapshot

Growth in the economy of the Association of Southeast Asian Nations (ASEAN) remains healthy in Q3 2017, after GDP recorded the best performance since Q3 2013 in Q2. Focus Economics analysts expect regional GDP to grow 4.9% annually in Q3, a notch down from Q2's 5.0% growth. Behind the broadly steady momentum is strengthened external demand that is supporting buoyant export flows from the region. Recent trade data from major economies has been largely positive for Q3: Export growth accelerated in Malaysia and the Philippines in July, and Indonesia's trade balance swung back to surplus in August. Taking a closer look at the acceleration in growth in Q2 we see that, healthy domestic dynamics in the region, thanks in part to a tight labor market, combined with a better performance from the external sector, drove the result. On a country basis, stronger activity in Malaysia, the Philippines, Singapore, Thailand and Vietnam fueled the uptick in growth. Malaysia's economy has been a particular bright spot in the region in recent weeks after GDP growth notably overshot expectations in the second quarter. Robust private consumption and an improved external sector boosted activity, and the positive news is supporting an appreciation in of the ringgit. The currency surged to a near 10-month high in September.

The Asian region is forecast to grow a solid 4.9% in 2017, supported by robust consumption and a solid performance in the external sector. The region's outlook for next year is broadly similar: Resilient domestic economies will drive healthy, if somewhat lackluster, growth. External demand and a potential slowdown in China could make the difference and will be key to the evolution of our forecast. Our panel sees GDP increasing 4.9% in 2018, which is unchanged from last month's projection. Behind this month's unchanged outlook are stable forecasts for seven economies in the region, including heavyweight Indonesia. Meanwhile, 2018 GDP forecasts for Brunei, Malaysia and Thailand were upgraded this month. Myanmar will be the region's fastest-growing economy next year, expanding 7.6%, followed by Cambodia. On the other end of the spectrum, Brunei will grow 1.9% and the more mature economy of **Singapore is seen increasing 2.3%. Looking at the major players, Indonesia will lead the pack and is seen expanding 5.3%, followed by Malaysia with 4.8% growth. Thailand is seen growing a more moderate 3.5%.**

Economic update on INDONESIA

Growth is set to accelerate in H2 after a moderate, but stable, performance in H1. Recent economic data points

to an upturn: Industrial production rebounded in July, and in August the manufacturing PMI returned to expansionary territory and the trade balance swung back to surplus. In addition, government spending is expected to accelerate going forward. The government has a number of large-scale infrastructure and investment projects in the pipeline, including upgrades to railway links and the creation of "10 new Balis" or tourism destinations. Despite ambitious government spending plans, the economy has failed to kick into a higher gear, and growth has hovered around 5.0% for the past year. GDP is seen expanding at a broadly steady pace of 5.1% in 2017. Efforts to improve the business environment and attract FDI are expected to bear fruit next year. The Focus Economics panel sees GDP growing a robust 5.3% in 2018, unchanged from last month's forecast, as increased government spending and investment growth support activity.

Economic update on THAILAND

Signs regarding the economic panorama are mixed. On the positive side, exports, supported by strong overseas demand, recorded double-digit growth rates in recent months and is set for their best performance in recent years for the year as a whole. Imports have also had a stellar year to date, reflecting a robust domestic economy. In addition, private consumption clocked its third consecutive month of growth in July, likely boosted by low inflation. However, the manufacturing PMI worsened in August on the back of a fall in output and new orders and signaled a slowdown in the manufacturing sector. In the political arena, the cabinet approved a new alcohol and tobacco tax law which came into effect in mid-September. The new tax is aimed at making tax collection more transparent but could dent private consumption. Public investment and an ongoing recovery in the external sector are expected to spur growth. Risks, however, exist on the downside. Global economic uncertainty and a possible slowdown in Chinese demand could drag on exports, while high household debt clouds the mid-term outlook. Nonetheless, a strong external sector and fiscal buffers have made the country less vulnerable to shocks. Focus Economics panelists expect





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the economy to grow 3.5% in both 2017 and 2018, both up 0.1 percentage points from last month's forecasts.

Economic update on MALAYSIA

Economic indicators remain positive, signaling that the economy was off to a good start to Q3. Notable expansions in the manufacturing and energy sectors drove growth in industrial activity in July. In addition, exports soared on the back of greater sales of mineral fuels and manufactured articles, reflecting healthy global demand for Malaysian goods. Solid import growth in the same month indicates dynamic domestic activity, supported by private consumption. Household spending has been buoyed by a low unemployment rate and growth in wages in the manufacturing sector. In September, Prime Minister Najib Razak and U.S. President Trump pledged to strengthen the Comprehensive Partnership, with both countries pledging to address the trade imbalance through investment and increased Malaysian imports of American goods.

The outlook remains bright for the economy, but downside risks remain. Political uncertainty could increase and drag on consumer spending, while important sectors remain heavily indebted. The open economy is also exposed to potential external shocks. Nonetheless, our panel expects GDP to expand a healthy 5.2% in 2017. For 2018, the panel foresees the economy growing at a lower speed of 4.8%, which is up 0.1 percentage points from last month's forecast.

Inflation steadies at seven-month low in August

Preliminary data shows that inflation in ASEAN came in at 2.5% in August, matching July's reading which had marked the lowest figure since December 2016. Although price pressures are subdued in the region, a tightening cycle in the U.S. has caused most central banks to hold off from cutting rates. However, Bank Indonesia surprised analysts by loosening monetary policy in August, in a bid to boost stuttering growth.

Economic panelists see inflation averaging 3.0% in 2017, after tepid inflation of 2.1% in 2016. Next year, our panel expects price pressures to be broadly steady and inflation to average 3.2%, which is unchanged from last month's forecast.

Sharp slowdown in India dents ESA's (East & South Asia) momentum in Q2

Comprehensive data for East and South Asia (ESA) revealed that growth momentum waned in the second quarter of the year. ESA's aggregate GDP rose 6.1% annually in Q2, which was a notch below last month's preliminary estimate and marked the slowest growth since Q4 2015 (Q1: +6.2% year-on-year).

The downward revision to the region's growth rate was due to a sharp and unexpected deceleration in India's economy. Growth plunged to the lowest rate since Q4 FY 2013 due to an adverse impact from the Goods & Services Tax (GST), which came into effect on 1 July. Confusion over the tax's implementation disrupted manufacturing output and sparked a broad destocking by retailers, while investment activity was feeble due to a stressed banking sector and overleveraged firms. However, the chaotic GST rollout is likely to only temporarily dent activity. Overall, the tax is a landmark reform for the Indian economy and has improved the country's business environment by streamlining the fragmented tax system.

Elsewhere in the region, China's economy drove growth, expanding at a robust 6.9% rate in Q2. While the regional giant has so far avoided fears of a slowdown, recent data for Q3 suggests that the economy has embarked on a downward trajectory. However, the slowdown is likely to be gradual as authorities are expected to continue keeping a heavy hand in the economy. A glimpse of what is to come in terms of policy-making will likely be revealed on 18 October at the 19th National Congress of the Communist Party, where President Xi Jinping will present the party's goals for the next five years. The trajectory of the Chinese economy is critical for regional growth as any strong slowdown would likely have ripple effects across the smaller, export-dependent economies in the region.

Growth to moderate in 2018 as China slows

Resurgence in external demand and a vibrant first half of the year for the Chinese economy will fuel healthy growth in East and South Asia this year. Focus Economics panelists expect the region to expand 6.1% in 2017. Next year, activity is seen losing momentum slightly as China's economic transition continues. However, an acceleration in India, the second-largest economy, as it puts shocks from demonetization and the GST implementation in the rearview mirror should limit the regional slowdown. In



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2018, ESA is seen growing 6.0%, which is up a notch from last month's forecast.

This month's upgraded outlook for 2018 reflects brighter growth prospects for Hong Kong, Korea and Sri Lanka. India and Pakistan were the only countries to have their projections downgraded. India's downward revision reflected that recent data points to a larger than previously expected downturn in FY 2017, which will likely have spillover effects on FY 2018's figures. The growth forecasts for all other economies in the region were left unchanged.

Next year's fastest-growing economy is projected to be India with an expansion of 7.4%. China will also grow at a healthy pace of 6.3%. At the other end of the spectrum, Taiwan will be the region's worst performer and grow a modest 2.1%. Among the rest of the major regional players, **Hong Kong and Korea will expand 2.4% and 2.7%, respectively.**

Recent data points to easing momentum in China's economy, following buoyant growth in the first half of the year. In August, retail sales growth moderated, industrial production lost steam and the pace of investment cooled. In addition, the external sector's performance deteriorated as exports slumped, while import growth picked up speed. Recently, exporters have come under strain due to the recent strengthening of the yuan. While the incoming data suggests that growth has peaked and entered a downward trajectory in H2, the downturn is likely to be modest overall as government spending should prevent a sharp slowdown. Meanwhile, all eyes are on the government's 19th National Congress of the Communist Party on 18 October. Five of the seven members of the standing committee are due to retire, and their replacements will help shape the future of China's policy. President Xi Jinping will also lay out the party's priorities for the next five years.

Focus Economics panelists forecast that the economy will grow a robust 6.7% in 2017, thanks to a strong start to the year and fiscal stimulus. Next year, growth is seen slowing moderately as the economy continues to transition; GDP is seen expanding 6.3%, which is unchanged from last month's forecast.

INDIA'S Growth slides in Q1 FY 2017

Economic momentum sputtered in the first quarter of FY 2017 as growth slid to the slowest rate in three years. A

poorly performing external sector, which was hit by a strong rupee and confusion over the implementation of the Goods and Services Tax (GST), was largely to blame. In addition, investment was weighed down by a stressed banking sector and overleveraged firms. However, the impact from the GST implementation should be temporary, and growth is seen gaining steam going forward. Moreover, incoming data for Q2 FY 2017 is tentatively bright: Industrial production rebounded in July **and the manufacturing PMI returned to expansionary territory in August.** On a positive note, the new GST generated higher revenue than expected in July, the first month of implementation. Despite the robust collections figures, it appears increasingly likely that the government could fall short of its fiscal targets, as the deficit rose to 92.4% of the full-year target in July.

Focus Economics panelists downgraded their view of the economy this month following a lackluster first quarter of FY 2017. The panel sees GDP expanding 7.0% in FY 2017, which is down 0.2 percentage points from last month's forecast. However, activity should pick up in H2 FY 2017 as the economy moves past demonetization and the GST implementation. Growth is projected to accelerate to 7.4% in FY 2018.

Economic show up by KOREA

Despite the economy's resilient performance in Q2, available data from Q3 shows signs that growth may be abating. Although exports were healthy in August, Korea's all-important external sector is expected to slow in the coming months. Moreover, a continued decline in Chinese tourism translated into job losses in tourism-related sectors in August. Also of concern are legislative measures to cool the housing market; given that financial conditions are tight, the market could see a correction heading into 2018. High household debt in particular is increasingly worrisome. In October, the government is expected to announce measures to tackle household debt, although these will likely thwart investment. Furthermore, in early September U.S. President Donald Trump announced he is reconsidering the U.S.-South Korea free trade agreement, which came at an unfortunate time given the heightened geopolitical tensions with North Korea. Tensions with the North dragged on consumer confidence in August, which declined after six months of consecutive improvements. The proposed 2018 budget, which includes a 4.6% increase in fiscal spending, is expected to give the economy a boost. However, headwinds for the external sector may weigh on the speed of economic growth in 2018. Focus



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Economics panelists expect GDP to expand 2.8% in 2017. In 2018, the economy is forecast to grow 2.7%, which is up 0.1 percentage points from last month's estimate.

Inflation in East and South Asia rose in August as price pressures in China and India intensified. Inflation was 2.2%, above July's 1.7% and the highest reading since January. Despite the rise, overall inflationary pressures in the region remain muted. Economic Panelists expect regional inflation to rise gradually next year after averaging 2.2% in 2017. Inflation is seen rising to 2.6% in 2018, which is unchanged from last month's forecast. Partly behind the growing price pressures are higher commodity prices as the global economy picks up steam.

China's Outlook

Recent data points to easing momentum in China's economy, following buoyant growth in the first half of the year. In August, retail sales growth moderated, industrial production lost steam and the pace of investment cooled. In addition, the external sector's performance deteriorated as exports slumped, while import growth picked up speed. Recently, exporters have come under strain due to the recent strengthening of the yuan. While the incoming data suggests that growth has peaked and entered a downward trajectory in H2, the downturn is likely to be modest overall as government spending should prevent a sharp slowdown. Meanwhile, all eyes are on the government's 19th National Congress of the Communist Party on 18 October. Five of the seven members of the standing committee are due to retire, and their replacements will help shape the future of China's policy. President Xi Jinping will also lay out the party's priorities for the next five year.

China's Economic Data

	2012	2013	2014	2015	2016
Population (million)	1,354	1,361	1,368	1,375	1,383
GDP per capita (USD)	6,333	7,124	7,662	7,948	8,109
GDP (USD bn)	8,575	9,694	10,480	10,925	11,212
Economic Growth (GDP, annual variation in %)	7.9	7.8	7.3	6.9	6.7
Consumption (annual variation in %)	9.1	7.3	7.7	7.5	7.3
Investment (annual variation in %)	20.6	19.6	15.7	10	8.1
Industrial Production (annual variation in %)	10	9.7	8.3	6.1	6
Retail Sales (annual variation in %)	14.3	13.1	12	10.7	10.4
Unemployment Rate	4.1	4.1	4.1	4.1	4
Fiscal Balance (% of GDP)	-1.6	-1.9	-1.8	-3.4	-3.8
Public Debt (% of GDP)	14.4	14.6	14.9	15.5	16.1

	2012	2013	2014	2015	2016
Inflation Rate (CPI, annual variation in %, eop)	2.5	2.5	1.5	1.6	2.1
Inflation Rate (CPI, annual variation in %)	2.6	2.6	2	1.4	2
Inflation (PPI, annual variation in %)	-1.7	-1.9	-1.9	-5.2	-1.3
Policy Interest Rate (%)	6	6	5.6	4.35	4.35
Stock Market (annual variation in %)	3.2	-6.7	52.9	9.4	-12.3
Exchange Rate (vs USD)	6.23	6.05	6.21	6.49	6.95
Exchange Rate (vs USD, aop)	6.31	6.15	6.16	6.28	6.64
Current Account (% of GDP)	2.5	1.5	2.3	2.8	1.8
Current Account Balance (USD bn)	215	148	236	304	196
Trade Balance (USD billion)	230	258	383	591	510
Exports (USD billion)	2,049	2,209	2,342	2,272	2,097
Imports (USD billion)	1,819	1,952	1,959	1,681	1,587
Exports (annual variation in %)	8	7.8	6	-3	-7.7
Imports (annual variation in %)	4.3	7.3	0.4	-14.2	-5.6
International Reserves (USD)	3,312	3,821	3,843	3,330	3,011
External Debt (% of GDP)	8.6	8.9	8.5	13	12.7

India's outlook

Economic momentum sputtered in the first quarter of FY 2017 as growth slid to the slowest rate in three years. A poorly performing external sector, which was hit by a strong rupee and confusion over the implementation of the Goods and Services Tax (GST), was largely to blame. In addition, investment was weighed down by a stressed banking sector and overleveraged firms. However, the impact from the GST implementation should be temporary, and growth is seen gaining steam going forward. Moreover, incoming data for Q2 FY 2017 is tentatively bright: Industrial production rebounded in July and the manufacturing PMI returned to expansionary territory in August. On a positive note, the new GST generated higher revenue than expected in July, the first month of implementation. Despite the robust collections figures, it appears increasingly likely that the government could fall short of its fiscal targets, as the deficit rose to 92.4% of the full-year target in July.

India's Economic Data

	2012	2013	2014	2015	2016
Population (million)	1,243	1,259	1,276	1,292	1,309
GDP per capita (USD)	1,465	1,477	1,597	1,611	1,729
GDP (USD bn)	1,821	1,860	2,038	2,082	2,264
Economic Growth (GDP, annual variation in %)	5.5	6.5	7.2	8	7.1
Consumption (annual variation in %)	5.3	7.4	6.8	6.1	8.7
Investment (annual variation in %)	4.8	1.8	4.1	6.6	2.4
Industrial Production (annual variation in %)	1.1	-0.1	2.8	3.4	5
Public Debt (% of GDP)	69.1	68.5	68.6	69.6	69.5



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	2012	2013	2014	2015	2016
Money (annual variation in %)	7.5	12.3	10.7	11.5	6.3
Inflation Rate (CPI, annual variation in %, eop)	10.5	8.2	5.3	4.8	3.9
Inflation Rate (CPI, annual variation in %)	10.2	10	5.9	4.9	4.5
Inflation (PPI, annual variation in %)	7.4	6	2	-3.6	1.8
Policy Interest Rate (%)	7.5	8	7.5	6.75	6.25
Stock Market (annual variation in %)	8.2	18.9	24.9	-9.4	16.9
Exchange Rate (vs USD)	54.3	60	62.29	66.25	64.86
Exchange Rate (vs USD, aop)	54.4	60.4	61.14	65.42	67.04
Current Account (% of GDP)	-4.8	-1.8	-1.4	-1.1	-0.7
Current Account Balance (USD bn)	-87.4	-32.8	-27.6	-22.1	-15.2
Trade Balance (USD billion)	-190	-137	-137.5	-117.8	-105.7
Exports (USD billion)	300	314	311	262	275
Imports (USD billion)	490	451	448	380	380
Exports (annual variation in %)	-1.9	4.6	-1.2	-15.7	4.9
Imports (annual variation in %)	0.1	-8	-0.6	-15.3	0.2
International Reserves (USD)	293	304	341	356	373
External Debt (% of GDP)	22.5	24	23.3	23.3	

Korea's economy

Despite the economy's resilient performance in Q2, available data from Q3 shows signs that growth may be abating. Although exports were healthy in August, Korea's all-important external sector is expected to slow in the coming months. Moreover, a continued decline in Chinese tourism translated into job losses in tourism-related sectors in August. Also of concern are legislative measures to cool the housing market; given that financial conditions are tight, the market could see a correction heading into 2018. High household debt in particular is increasingly worrisome. In October, the government is expected to announce measures to tackle household debt, although these will likely thwart investment. Furthermore, in early September U.S. President Donald Trump announced he is reconsidering the U.S.-South Korea free trade agreement, which came at an unfortunate time given the heightened geopolitical tensions with North Korea. Tensions with the North dragged on consumer confidence in August, which declined after six months of consecutive improvements.

Korea's Economic Data

	2012	2013	2014	2015	2016
Population (million)	50	50.2	50.4	51	51.2
GDP per capita (USD)	24,543	26,004	26,813	27,096	27,535
GDP (USD bn)	1,227	1,306	1,352	1,382	1,411
Economic Growth (GDP, annual variation in %)	2.3	2.9	3.3	2.8	2.8
Consumption (annual variation in %)	1.9	1.9	1.8	2.2	2.5
Investment (annual variation in %)	-0.5	3.3	3.4	5.1	5.2
Industrial Production (annual variation in %)	1.5	0.7	0.3	-0.3	1

	2012	2013	2014	2015	2016
Retail Sales (annual variation in %)	4.4	1.1	2.1	2.4	4.3
Unemployment Rate	3.2	3.1	3.5	3.6	3.7
Fiscal Balance (% of GDP)	1.3	1	0.6	0	1
Public Debt (% of GDP)	32.1	33.8	35.9	37.8	38.6
Money (annual variation in %)	4.8	4.6	8.1	8.2	7.1
Inflation Rate (CPI, annual variation in %, eop)	1.4	1.1	0.8	1.1	1.3
Inflation Rate (CPI, annual variation in %)	2.2	1.3	1.3	0.7	1
Inflation (PPI, annual variation in %)	0.7	-1.6	-0.5	-4	-1.8
Policy Interest Rate (%)	2.75	2.5	2	1.5	1.25
Stock Market (annual variation in %)	9.4	0.7	-4.8	2.4	3.3
Exchange Rate (vs USD, aop)	1,127	1,095	1,053	1,132	1,160
Exchange Rate (vs USD)	1,071	1,055	1,099	1,173	1,208
Current Account (% of GDP)	4.1	6.2	6	7.7	7
Current Account Balance (USD bn)	50.8	81.1	84.4	106	98.7
Trade Balance (USD billion)	28.3	44	47.2	90.3	89.2
Exports (USD billion)	548	560	573	527	495
Imports (USD billion)	520	516	526	436	406
Exports (annual variation in %)	-1.3	2.1	2.3	-8	-5.9
Imports (annual variation in %)	-0.9	-0.8	1.9	-16.9	-6.9
International Reserves (USD)	327	346	364	368	371
External Debt (% of GDP)	33.3	32.4	31.4	28.7	27

Indonesian economy:

Growth is set to accelerate in H2 after a moderate, but stable, performance in H1. Recent economic data points to an upturn: Industrial production rebounded in July, and in August the manufacturing PMI returned to expansionary territory and the trade balance swung back to surplus. In addition, government spending is expected to accelerate going forward. The government has a number of large-scale infrastructure and investment projects in the pipeline, including upgrades to railway links and the creation of "10 new Balis" or tourism destinations. Despite ambitious government spending plans, the economy has failed to kick into a higher gear, and growth has hovered around 5.0% for the past year.

Indonesia Economy Data

	2012	2013	2014	2015	2016
Population (million)	245	249	252	255	259
GDP per capita (USD)	3,750	3,672	3,532	3,371	3,605
GDP (USD bn)	920	914	891	861	933
Economic Growth (GDP, annual variation in %)	6	5.6	5	4.9	5
Consumption (annual variation in %)	5.5	5.4	5.1	5	5
Investment (annual variation in %)	9.1	5	4.4	5	4.5



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	2012	2013	2014	2015	2016
Manufacturing (annual variation in %)	5.6	4.4	4.6	4.8	4
Retail Sales (annual variation in %)	14.5	12.9	14.5	13.3	11
Unemployment Rate	6.1	6.2	5.9	6.2	5.6
Fiscal Balance (% of GDP)	-1.8	-2.2	-2.1	-2.6	-2.5
Public Debt (% of GDP)	21.4	22	24.3	27.5	28.9
Money (annual variation in %)	15	12.8	11.9	9	10
Inflation Rate (CPI, annual variation in %, eop)	3.7	8.1	8.4	3.4	3
Inflation Rate (CPI, annual variation in %)	4	6.4	6.4	6.4	3.5
Inflation (WPI, annual variation in %)	5.1	6	9.3	-	-
Policy Interest Rate (%)	5.75	7.5	7.75	7.5	4.75
Stock Market (annual variation in %)	12.9	-1	22.3	-12.1	15.3

	2012	2013	2014	2015	2016
Exchange Rate (vs USD)	9,638	12,170	12,385	13,788	13,473
Exchange Rate (vs USD, aop)	9,362	10,449	11,866	13,392	13,302
Current Account (% of GDP)	-2.7	-3.2	-3.1	-2	-1.8
Current Account Balance (USD bn)	-24.4	-29.1	-27.5	-17.5	-16.9
Trade Balance (USD billion)	-1.7	-4.1	-2.2	7.7	9.5
Exports (USD billion)	190	183	176	150	145
Imports (USD billion)	192	187	178	143	136
Exports (annual variation in %)	-6.6	-3.9	-3.6	-14.6	-3.4
Imports (annual variation in %)	8	-2.6	-4.5	-19.9	-4.9
International Reserves (USD)	113	99.4	112	106	116
External Debt (% of GDP)	27.4	29.1	32.9	36.1	34

Goutam Mukherjee
Dr. Goutam Mukherjee

From the Desk of General Secretary



59th Annual General Meeting

Due to late receipt of the Audited Statement of Accounts of the Southern Region for the F.Y. 2016-2017, the 59th AGM could not be organized within September, 2017. Efforts are on to see that the AGM is arranged within October, 2017.

LEXPOs in 2017 – 2018

As per the last LEXPO Committee Meeting held on 08.06.2017, the Proposed LEXPO Schedule for the F.Y. 2017-2018 is as follows :

- | | | | |
|----|-----------------------|---|--|
| a. | Kolkata LEXPO – XXXXI | : | 4 th Nov' 2017 to 19 th Nov' 2017 |
| b. | Durgapur LEXPO – V | : | 2 nd Dec' 2017 to 17 th Dec' 2017 |
| c. | Maldah LEXPO – I | : | 30 th Dec' 2017 to 14 th Jan' 2018 |
| d. | Siliguri LEXPO – XXIV | : | 20 th Jan' 2018 to 4 th Feb' 2018 |

We have already approached the competent authorities of Kolkata, Durgapur & Siliguri for organizing LEXPO.

***!!! HEARTIEST GREETINGS FOR SHUVO BIJOYA & DASHEHRA TO
ALL THE MEMBERS AND FRIENDS FROM LEATHER FRATERNITY !!!***

**Due to some unavoidable circumstances, LEATHER SCIENCE
ABSTRACTS (LESA) is not being published in this issue.
Inconvenience caused is regretted.**

You are requested to :-

- a) Kindly inform us your '**E-Mail ID**', '**Mobile No**', '**Phone No**', through E-Mail ID: admin@iltaonleather.org or over Telephone Nos. : 24413459 / 3429 / 7320. This will help us to communicate you directly without help of any outsiders like Postal Department / Courier etc.
- b) Kindly mention your **Membership No. (If any)** against your each and every communication, so that we can locate you easily in our record.



(Susanta Mallick)
General Secretary

**Executive Committee Members meet every Thursday
at 18-30 hrs. at ILTA Office.
Members willing to participate are most welcome.**





Goods and Service Tax (GST) - A Review

Mr. Bibhas Chandra Paul¹, OSD, Indian Leather Technologists' Association

Dr. Goutam Mukherjee², Associate Professor of Leather Technology, Govt. College of Engineering & Leather Technology, Kolkata

Introduction of Goods and Services Tax (GST) will indeed be an important perfection and the next logical step towards a widespread indirect tax reforms in India. As per, First Discussion Paper released by the Empowered Committee of the State Finance Ministers on 10.11.2009, it has been made clear that there would be a "Dual GST" in India, i.e. taxation power lies with both by the Centre and the State to levy the taxes on the Goods and Services.

The scheme was supposed to be implemented in India from 1st April 2016, however it may get delayed since the NDA government does not have majority in Rajya sabha ('The upper house of parliament' or 'the house of states').

Further, Punjab and Haryana were reluctant to give up purchase tax, Maharashtra was unwilling to give up octroi, and all states wanted to keep petroleum and alcohol out of the ambit of GST. Gujarat and Maharashtra want the additional one per cent levy extended beyond the proposed two years, and raised to two per cent. Punjab wants purchase tax outside GST.

Constitutional Amendment :

While the Centre is empowered to tax services and goods up to the production stage, the States have the power to tax sale of goods. The States do not have the powers to levy a tax on supply of services while the Centre does not have power to levy tax on the sale of goods. Thus, the Constitution does not vest express power either in the Central or State Government to levy a tax on the 'supply of goods and services'. Moreover, the Constitution also does not empower the States to impose tax on imports. Therefore, it is essential to have Constitutional Amendments for empowering the Centre to levy tax on sale of goods and States for levy of service tax and tax on imports and other consequential issue.

What is GST ?

'G' – Goods
'S' – Services
'T' – Tax

"Goods and Service Tax (GST) is a comprehensive tax levy on manufacture, sale and consumption of goods and service at a national level under which no distinction is made between goods and services for levying of tax. It will mostly substitute all indirect taxes levied on goods and services by the Central and State governments in India.

The Goods and Services Tax Network, the information technology backbone that will implement the new indirect tax regime, will become a data analytics powerhouse in the months after the roll-out.

"Once sufficient amount of data is generated, we will be able to generate analytics based on the requirements of various stakeholders," Navin Kumar, chairman, GSTN, told Business Standard in a recent interview.

GSTN is a non-profit entity that is building the information technology backbone for the goods and services tax (GST). It will store all details related to the relevant transactions. These analytics, based on data filed by millions of taxpayers who will migrate to the system, will help in plugging leakages, identifying economic trends and ensure more focused economic-policy making. Kumar said this would be the third phase of the work undertaken by GSTN and is part of the terms of reference of the vendor, Infosys. "The vendor would build programmes and analytical tools as per the data requirements of both central and state tax departments. The data generated could be on real-time basis, if not near real time."

Corresponding Author's E-mail ID : bibhas7@gmail.com¹ / gmgtclt@gmail.com² / gmclt@hotmail.com²



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The tax departments, he said, would have to learn to operate in a new ways because "our systems will throw enormous amount of data on which they need to work."

In value added tax, for example, a manufacturer buys raw material from a supplier and pays tax. The supplier collects the tax and gives it to the government. The tax paid by the manufacturer, say, is Rs 100 and he sells the product after charging Rs 120 as tax from a buyer. The manufacturer's tax liability to the government is now Rs 20. The tax paid by the manufacturer is input tax and the tax collected by him is output tax. His return would mention his output tax liability and input tax credit. Ideally, some tax authority should check and verify the returns filed by the manufacturer. This, however, was not happening because the data was taken at the summary level every month. At present, the verification was only taking place at the audit and it was happening only in 3-5 per cent of the total cases. "In audit, tax authorities often found that the input tax credit was inflated," the GSTN chairman said. "The CAG also found that in five-six states 30-40 per cent input tax credit claims were either bogus or inflated."

That was why when the design of GST was thought of, one requirement was that input tax credit be verified online. Now, the system will match the tax returns filed by the manufacturer and the supplier. Discrepancies will be flagged. The tax authorities can then go after the taxpayers." These benefits are likely to kick in somewhere in mid-2018, given that the GST roll-out is planned in April 2017. According to a document on principles of GST system architecture, all the decision-making in the system will be driven out of data and not on the basis of assumption. "Lot more metadata needs to be attached with various data such as invoices, so that the appropriate decision can be taken."

"System shall have more and more meta tags so that the time taken by various functions while capturing/entering the data, etc, is captured and the behaviour of system is verified."

When working with 3rd party organisations that are part of the ecosystem, it is essential that the entire system is measured using data and decisions are made completely based on data, the document added.

Kumar said the popular belief that GSTN was taking away the tax department's work was incorrect. "It is a myth to say that the work of tax department is being taken away by GSTN. In fact, there will be more work for everyone, the Centre and the states, once the network is in place."

The company would be on a hiring mode over the next few weeks to cater to these new requirements. "We plan to double our workforce from 50 to about 100 over the next few months," Kumar said.

All Indians, from consumers to small enterprises and corporates to investors, are excited about the prospects of GST implementation. Now that the biggest hurdle of getting constitutional amendment approved by the Rajya Sabha is behind us, GST is just a matter of time. The most important factor for its impact and efficacy will be the GST tax rate. The Arvind Subramanian committee estimated revenue neutral rate of 15-15.5% and recommended a three-tier tax structure of 12% for essential items, 40% for luxury items and 17-18% being standard rate for most items.

There is a great opportunity to keep the rates lower than the general expectations and pleasantly surprise the whole nation. The only concern one can have with lower rate is revenue loss. Nobody can gainsay positive impact of a low rate in terms of lower inflation, higher investment, faster growth and more employment.

Let us look at the experience of other countries. Singapore first introduced GST on April 1, 1994, with a rate of 3%, the lowest in the world. It was one of the key drivers for rapid economic and tourism growth. Singapore gradually increased the GST rate to 4% in 2003, 5% in 2004 and to the current rate of 7% in 2007. The average rate in the Asia Pacific is less than 10%.

Malaysia introduced GST recently in 2015 and policy makers there were expecting GST implementation to drive sales and service tax revenue of 1.6% of GDP in 2014 to about GST collection of 1.9% of GDP in 2015. However, actual numbers were a huge positive surprise and have brought in 2.3% of GDP as revenue in 2015. Now they expect GST to rise even further to 3.1% of GDP in 2016. The two key lessons are that start with a lower rate and do not underestimate the revenue increase from better compliance.



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India can also start with low GST rates. The lower rate would mean lesser incentive for tax evasion and encourage better compliance. It will also help widen the tax base. As the structure of GST envisages use of PAN number and linking with NSDL database, compliance for direct taxes will also enhance. Just like Malaysia, India's GST revenue can surprise on the positive side as there are huge leakages in the system, especially at local octroi and tax collection machinery at state levels.

On the other hand, a high GST rate may arouse popular sentiment against it and compliance may not start on a good note.

Another important factor to watch will be GST's impact on inflation. Low GST rates will not stoke inflation and will boost growth and employment. However, in the wake of such high decibel debate on government and RBI stance on rate cuts and inflation, any rise in inflation will be a huge deterrent for the new RBI governor to cut rates. Higher incidence on services may not get fully captured in the CPI- inflation index but will hurt a much larger part of the population, being provider or consumer of services.

The low rates will encourage many new enterprises to expand, put in new investments and attract new capacity at micro and small level. With India becoming one market, a lot of possibilities will open up for small as well as large enterprises. Entrepreneur's investment is always driven by sentiment or expectation about future profit and not actual profits as actual profits are known only with hindsight long after the investment is made. A low GST rate will create positive sentiments all around and boost investment.

India was never better placed to take the risk of some revenue loss in short term. The government is sitting on a huge bounty from lower oil prices of the last two years. Politically also, lower rates will be difficult to be opposed and will garner public support — so essential for any path-breaking reform.

The implementation of GST will bring huge long-term benefits to the country. It will help superior and more optimal resource allocation, increase competitiveness in domestic production and exports, reduce, simplify tax structure and enhance ease of doing business and boost

GDP growth by anywhere between 80 to 150 bps. It is therefore very important that the process runs smoothly and does not fall prey to negative public sentiment.

A simple courageous call on keeping rates surprisingly low for instance 8% for essential, 16% standard and 32% for luxury items can be the real game-changer.

Frequently Asked Questions (FAQs) on Goods and Services Tax (GST)

Following are the discussions related to the various frequently asked questions relating to GST :

Q 1.What is GST ? How does it work ?

GST is a single tax on the supply of goods and services, right from the manufacturer to the consumer. Credits of input taxes paid at each stage will be available in the subsequent stage of value addition, which makes GST essentially a tax only on value addition at each stage. The final consumer will thus bear only the GST charged by the last dealer in the supply chain, with set-off benefits at all the previous stages.

Q 2. What are the benefits of GST ?

The benefits of GST can be summarized as under :

• For business and industry

- **Easy compliance** : A robust and comprehensive IT system would be the foundation of the GST regime in India. Therefore, all tax payer services such as registrations, returns, payments, etc. would be available to the taxpayers online, which would make compliance easy and transparent.
- **Uniformity of tax rates and structures** : GST will ensure that indirect tax rates and structures are common across the country, thereby increasing certainty and ease of doing business. In other words, GST would make doing business in the country tax neutral, irrespective of the choice of place of doing business.

- **Removal of cascading** : A system of seamless tax-credits throughout the value-chain, and across boundaries of States, would ensure that there is minimal cascading of taxes. This would reduce hidden costs of doing business.
- **Improved competitiveness** : Reduction in transaction costs of doing business would eventually lead to an improved competitiveness for the trade and industry.
- **Gain to manufacturers and exporters** : The subsuming of major Central and State taxes in GST, complete and comprehensive set-off of input goods and services and phasing out of Central Sales Tax (CST) would reduce the cost of locally manufactured goods and services. This will increase the competitiveness of Indian goods and services in the international market and give boost to Indian exports. The uniformity in tax rates and procedures across the country will also go a long way in reducing the compliance cost.

• For Central and State Governments

- **Simple and easy to administer** : Multiple indirect taxes at the Central and State levels are being replaced by GST. Backed with a robust end-to-end IT system, GST would be simpler and easier to administer than all other indirect taxes of the Centre and State levied so far.
- **Better controls on leakage** : GST will result in better tax compliance due to a robust IT infrastructure. Due to the seamless transfer of input tax credit from one stage to another in the chain of value addition, there is an in-built mechanism in the design of GST that would incentivize tax compliance by traders.
- **Higher revenue efficiency** : GST is expected to decrease the cost of collection of tax revenues of the Government, and will therefore, lead to higher revenue efficiency.

• For the consumer

- **Single and transparent tax proportionate to the value of goods and services** : Due

to multiple indirect taxes being levied by the Centre and State, with incomplete or no input tax credits available at progressive stages of value addition, the cost of most goods and services in the country today are laden with many hidden taxes. Under GST, there would be only one tax from the manufacturer to the consumer, leading to transparency of taxes paid to the final consumer.

- **Relief in overall tax burden** : Because of efficiency gains and prevention of leakages, the overall tax burden on most commodities will come down, which will benefit consumers.

Q 3. Which taxes at the Centre and State level are being subsumed into GST ?

At the **Central level**, the following taxes are being subsumed :

1. Central Excise Duty,
2. Additional Excise Duty,
3. Service Tax,
4. Additional Customs Duty commonly known as Countervailing Duty, and
5. Special Additional Duty of Customs.

At the **State level**, the following taxes are being subsumed :

1. Subsuming of State Value Added Tax/Sales Tax,
2. Entertainment Tax (other than the tax levied by the local bodies), Central Sales Tax (levied by the Centre and collected by the States),
3. Octroi and Entry tax,
4. Purchase Tax,
5. Luxury tax, and
6. Taxes on lottery, betting and gambling.

Q 4. What are the major chronological events that have led to the introduction of GST ?

GST is being introduced in the country after a 13 year long journey since it was first discussed in the report of the Kelkar Task Force on indirect taxes. A brief chronology outlining the major milestones on the proposal for introduction of GST in India is as follows :



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1. In 2003, the Kelkar Task Force on indirect tax had suggested a comprehensive Goods and Services Tax (GST) based on VAT principle.
 2. A proposal to introduce a National level Goods and Services Tax (GST) by April 1, 2010 was first mooted in the Budget Speech for the financial year 2006-07.
 3. Since the proposal involved reform/ restructuring of not only indirect taxes levied by the Centre but also the States, the responsibility of preparing a Design and Road Map for the implementation of GST was assigned to the Empowered Committee of State Finance Ministers (EC).
 4. Based on inputs from Govt of India and States, the EC released its First Discussion Paper on Goods and Services Tax in India in November, 2009.
 5. In order to take the GST related work further, a Joint Working Group consisting of officers from Central as well as State Government was constituted in September, 2009.
 6. In order to amend the Constitution to enable introduction of GST, the Constitution (115th Amendment) Bill was introduced in the Lok Sabha in March 2011. As per the prescribed procedure, the Bill was referred to the Standing Committee on Finance of the Parliament for examination and report.
 7. Meanwhile, in pursuance of the decision taken in a meeting between the Union Finance Minister and the Empowered Committee of State Finance Ministers on 8th November, 2012, a 'Committee on GST Design', consisting of the officials of the Government of India, State Governments and the Empowered Committee was constituted.
 8. This Committee did a detailed discussion on GST design including the Constitution (115th) Amendment Bill and submitted its report in January, 2013. Based on this Report, the EC recommended certain changes in the Constitution Amendment Bill in their meeting at Bhubaneswar in January 2013.
 9. The Empowered Committee in the Bhubaneswar meeting also decided to constitute three committees of officers to discuss and report on various aspects of GST as follows :-
 - a) Committee on Place of Supply Rules and Revenue Neutral Rates;
 - b) Committee on dual control, threshold and exemptions;
 - c) Committee on IGST and GST on imports.
1. The Parliamentary Standing Committee submitted its Report in August, 2013 to the Lok Sabha. The recommendations of the Empowered Committee and the recommendations of the Parliamentary Standing Committee were examined in the Ministry in consultation with the Legislative Department. Most of the recommendations made by the Empowered Committee and the Parliamentary Standing Committee were accepted and the draft Amendment Bill was suitably revised.
 2. The final draft Constitutional Amendment Bill incorporating the above stated changes were sent to the Empowered Committee for consideration in September 2013.
 3. The EC once again made certain recommendations on the Bill after its meeting in Shillong in November 2013. Certain recommendations of the Empowered Committee were incorporated in the draft Constitution (115th Amendment) Bill. The revised draft was sent for consideration of the Empowered Committee in March, 2014.
 4. The 115th Constitutional (Amendment) Bill, 2011, for the introduction of GST introduced in the Lok Sabha in March 2011 lapsed with the dissolution of the 15th Lok Sabha.
 5. In June 2014, the draft Constitution Amendment Bill was sent to the Empowered Committee after approval of the new Government.
 6. Based on a broad consensus reached with the Empowered Committee on the contours of the Bill, the Cabinet on 17.12.2014 approved the proposal for introduction of a Bill in the Parliament for amending the Constitution of India to facilitate the introduction of Goods and Services

Tax (GST) in the country. The Bill was introduced in the Lok Sabha on 19.12.2014, and was passed by the Lok Sabha on 06.05.2015. It was then referred to the Select Committee of Rajya Sabha, which submitted its report on 22.07.2015.

Q 5. How would GST be administered in India ?

Keeping in mind the federal structure of India, there will be two components of GST – Central GST (CGST) and State GST (SGST). Both Centre and States will simultaneously levy GST across the value chain. Tax will be levied on every supply of goods and services. Centre would levy and collect Central Goods and Services Tax (CGST), and States would levy and collect the State Goods and Services Tax (SGST) on all transactions within a State. The input tax credit of CGST would be available for discharging the CGST liability on the output at each stage. Similarly, the credit of SGST paid on inputs would be allowed for paying the SGST on output. No cross utilization of credit would be permitted.

Q 6. How would a particular transaction of goods and services be taxed simultaneously under Central GST (CGST) and State GST (SGST) ?

The Central GST and the State GST would be levied simultaneously on every transaction of supply of goods and services except on exempted goods and services, goods which are outside the purview of GST and the transactions which are below the prescribed threshold limits. Further, both would be levied on the same price or value unlike State VAT which is levied on the value of the goods inclusive of Central Excise.

Q 7. Will cross utilization of credits between goods and services be allowed under GST regime ?

Cross utilization of credit of CGST between goods and services would be allowed. Similarly, the facility of cross utilization of credit will be available in case of SGST. However, the cross utilization of CGST and SGST would not be allowed except in the case of inter-State supply of goods and services under the IGST model which is explained in answer to the next question.

Q 8. How will be Inter-State Transactions of Goods and Services be taxed under GST in terms of IGST method ?

In case of inter-State transactions, the Centre would levy and collect the Integrated Goods and Services Tax (IGST) on all inter-State supplies of goods and services under Article 269A (1) of the Constitution. The IGST would roughly be equal to CGST plus SGST. The IGST mechanism has been designed to ensure seamless flow of input tax credit from one State to another. The inter-State seller would pay IGST on the sale of his goods to the Central Government after adjusting credit of IGST, CGST and SGST on his purchases (in that order). The exporting State will transfer to the Centre the credit of SGST used in payment of IGST. The importing dealer will claim credit of IGST while discharging his output tax liability (both CGST and SGST) in his own State. The Centre will transfer to the importing State the credit of IGST used in payment of SGST. Since GST is a destination-based tax, all SGST on the final product will ordinarily accrue to the consuming State.

Q 9. How will IT be used for the implementation of GST ?

For the implementation of GST in the country, the Central and State Governments have jointly registered Goods and Services Tax Network (GSTN) as a not-for-profit, non-Government Company to provide shared IT infrastructure and services to Central and State Governments, tax payers and other stakeholders. The key objectives of GSTN are to provide a standard and uniform interface to the taxpayers, and shared infrastructure and services to Central and State/UT governments.

GSTN is working on developing a state-of-the-art comprehensive IT infrastructure including the common GST portal providing frontend services of registration, returns and payments to all taxpayers, as well as the backend IT modules for certain States that include processing of returns, registrations, audits, assessments, appeals, etc. All States, accounting authorities, RBI and banks, are also preparing their IT infrastructure for the administration of GST.

There would no manual filing of returns. All taxes can also be paid online. All mis-matched returns would be



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auto-generated, and there would be no need for manual interventions. Most returns would be self-assessed.

Q 10. How will imports be taxed under GST ?

The Additional Duty of Excise or CVD and the Special Additional Duty or SAD presently being levied on imports will be subsumed under GST. As per explanation to clause (1) of article 269A of the Constitution, IGST will be levied on all imports into the territory of India. Unlike in the present regime, the States where imported goods are consumed will now gain their share from this IGST paid on imported goods.

Q 11. What are the major features of the Constitution (122nd Amendment) Bill, 2014 ?

The salient features of the Bill are as follows :

1. Conferring simultaneous power upon Parliament and the State Legislatures to make laws governing goods and services tax;
2. Subsuming of various Central indirect taxes and levies such as Central Excise Duty, Additional Excise Duties, Service Tax, Additional Customs Duty commonly known as Countervailing Duty, and Special Additional Duty of Customs;
3. Subsuming of State Value Added Tax/Sales Tax, Entertainment Tax (other than the tax levied by the local bodies), Central Sales Tax (levied by the Centre and collected by the States), Octroi and Entry tax, Purchase Tax, Luxury tax, and Taxes on lottery, betting and gambling;
4. Dispensing with the concept of 'declared goods of special importance' under the Constitution;
5. Levy of Integrated Goods and Services Tax on inter-State transactions of goods and services;
6. GST to be levied on all goods and services, except alcoholic liquor for human consumption. Petroleum and petroleum products shall be subject to the levy of GST on a later date notified on the recommendation of the Goods and Services Tax Council;

7. Compensation to the States for loss of revenue arising on account of implementation of the Goods and Services Tax for a period of five years;

8. Creation of Goods and Services Tax Council to examine issues relating to goods and services tax and make recommendations to the Union and the States on parameters like rates, taxes, cesses and surcharges to be subsumed, exemption list and threshold limits, Model GST laws, etc. The Council shall function under the Chairmanship of the Union Finance Minister and will have all the State Governments as Members.

Q 12. What are the major features of the proposed registration procedures under GST ?

The major features of the proposed registration procedures under GST are as follows :

1. **Existing dealers:** Existing VAT/Central excise/Service Tax payers will not have to apply afresh for registration under GST.
2. **New dealers:** Single application to be filed online for registration under GST.
3. The registration number will be PAN based and will serve the purpose for Centre and State.
 - a. Unified application to both tax authorities.
 - b. Each dealer to be given unique ID GSTIN.
 - c. Deemed approval within three days.
4. Post registration verification in risk based cases only.

Q 13. What are the major features of the proposed returns filing procedures under GST ?

The major features of the proposed returns filing procedures under GST are as follows :

1. **Common return** would serve the purpose of both Centre and State Government.
2. There are eight forms provided for in the GST business processes for filing for returns. Most of the average tax payers would be using only four forms for filing



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their returns. These are return for supplies, return for purchases, monthly returns and annual return.

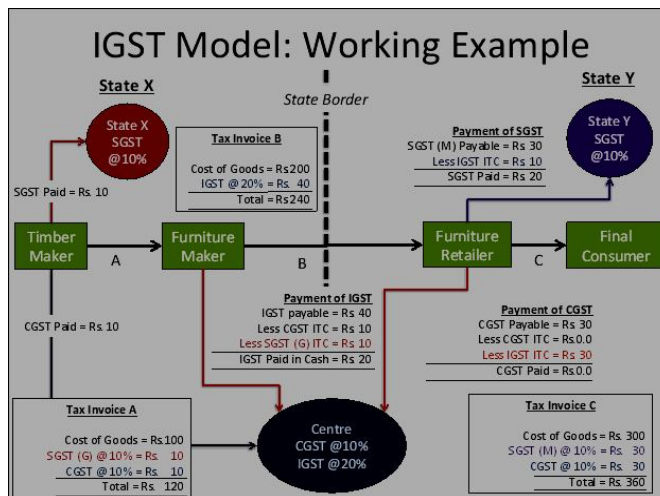
3. **Small taxpayers:** Small taxpayers who have opted composition scheme shall have to file return on quarterly basis.
4. Filing of returns shall be completely online. All taxes can also be paid online.

Q 14. What are the major features of the proposed payment procedures under GST ?

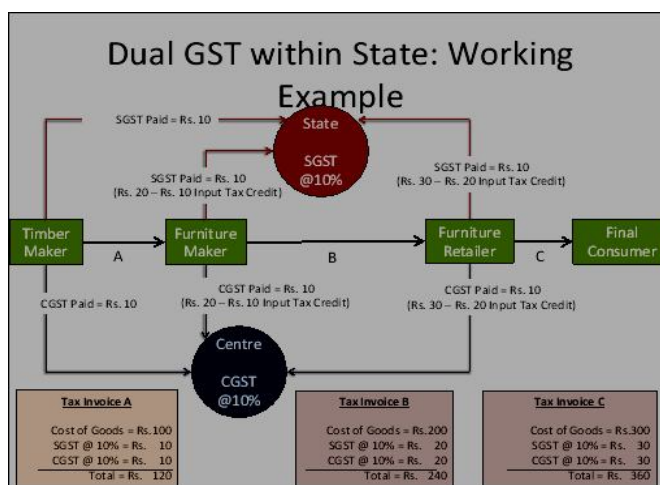
The major features of the proposed payments procedures under GST are as follows :

1. Electronic payment process- no generation of paper at any stage
2. Single point interface for challan generation- GSTN
3. Ease of payment – payment can be made through online banking, Credit Card/Debit Card, NEFT/RTGS and through cheque/cash at the bank
 - i. Common challan form with auto-population features
 - ii. Use of single challan and single payment instrument
 - iii. Common set of authorized banks
4. Common Accounting Codes

A diagrammatic representation of working modalities of IGST model for inter- state transaction is manifested below :



Model GST structure within a state :



Source: 1) www.gstindia.com
 2) www.tribuneindia.com
 3) www.quora.com
 4) www.business-standard.com
 5) www.economicstimes.indiatimes.com



STAHL Corner





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WHAT'S NEW IN LEATHER CHEMICALS

Stay Clean technology

To protect surfaces against typical strains, Stahl developed Stay Clean. This revolutionary coating technology protects pale colored leather and vinyl surfaces against common stains, such as dye from jeans, spilled coffee and dirt. Stay Clean is particularly interesting for car interior designers that love to apply pale colored materials to create a lush atmosphere. It also makes surfaces low-squeak, which is a great benefit as global research showed that a squeaking car interior is one of the biggest annoyances among car owners. Besides Automotive, the pale color trend is also popular among home interior designers. They use it to create a bright and light living environment, of which the popular Scandinavian design is a great example.

Hindering dirt pick-up

Stay Clean protects the surfaces by hindering the pick-up and migration of stains and dyes into the substrate. If the surface does get a bit dirty, Stay Clean enables easy cleaning as well. The Stay Clean product range consists of both matt and gloss finishes. Specific crosslinkers and surface modifiers enhance the abrasion resistance and touch.

Stahl NEO

Stahl Neo is our new portfolio of compliant and sustainable finishes. Launched in 2016, the product line offers products that not only already comply with Zero Discharge Hazardous Chemicals (ZDHC) Manufacturing Restricted Substances List (MRSL), but even go beyond this standard, targeting an even wider range of chemical substances.

Stahl Neo offers endless possibilities and the product portfolio is especially interesting to tanneries that value health, the environment and the future of their business. The leather finishing product group includes top coats, base coats and so on.

Stahl Neo is particularly interesting to those who are active in the segments footwear & leather goods, garment and upholstery. As an outset, Stahl Neo features products from the current Stahl portfolio, while new products are intended to be part of the Neo-line in the future.

Milling Chemicals

Stahl's Milling Chemicals optimize the dry milling process and enable tanners to upgrade the leather quality. The Milling Chemicals products MC-22-183, MC-22-392 and MC-22-465 are part of Stahl Neo. Be it for fashion, accessories or lifestyle, the Milling Chemicals range adds gloss and character to finished leather goods. Our solutions account for softening, pull-up effect, milling effect, and a host of other special effects.

Stahl's Milling Chemicals add value and an unrivaled feel to leather goods such as bags, belts, shoes and garments. The products boast a variety of applications and are suitable for almost all tanning methods including Stahl EasyWhite Tan™, chrome tanning and vegetable tanning.

Possible applications for Stahl's Milling Chemicals vary from all kinds of tanning and retanning to final feel agents and softeners for finished leather. The portfolio features four solutions suitable for all common drums equipped with humidity and temperature control as well as injectors.

Polymatte ®

At Stahl, we asked ourselves: why doesn't a finish exist that is matt in itself? This interesting question led us to develop the extensive PolyMatte® portfolio that we offer nowadays. Our PolyMatte® offers a smooth finishing technology that is matt in itself. Leather and synthetics like vinyl, polyurethane or polyolefin based materials can be given a long-lasting matt finish with superior aesthetic and technical value.

PolyMatte® is a proprietary Stahl polyurethane dispersion technology and compatible with water-based,



polyurethane coatings. PolyMatte® forms a matt and smooth surface structure during the film forming and drying stage, which means fillers are not needed. The polyurethane nature of PolyMatte® provides a luxurious feel to the finished article. Also in terms of flexibility, scratch and abrasion resistance PolyMatte® exceeds other matting agent technologies on the market.

Key benefits

- A film forming matting agent
- Low to extreme low gloss (< 1% at 60° angle)
- Long-lasting, pleasant touch
- Durable non-porous surface
- Mar and scratch resistant

- No squeaking
- Low VOC

Our PolyMatte® portfolio

We offer an extensive portfolio of PolyMatte® to provide custom-made coatings that meet the most stringent requirements in terms of aesthetics, performance and sustainability. Our PolyMatte® portfolio contains many products, varying from finishes, duller concentrates, crosslinkers and thickeners, to leveling agents, defoamers, colorants and hand modifiers. In addition, we have developed 'Green PolyMatte®' which is based on rapeseed oil (20%) instead of crude oil derived intermediates.

About Stahl

Stahl is leading in process chemicals for leather products, performance coatings and Polymers. We offer a wide range of solutions to the automotive, apparel & accessories, home furnishing and leisure & lifestyle industry and for industrial applications. With more than 1,800 employees in 24 countries at 13 manufacturing sites and 38 laboratories, Stahl realized in 2016 an annual turnover of over 650 million euro. With its innovation power, expertise and range of technical solutions Stahl is able to deliver best in class solutions and services to respond even better to client needs and secure a more sustainable future.

Waste Audit – Model & Case Study

Mr. Biswajit Debnath¹, Assistant Professor of Mechanical Engg.
Dr. Goutam Mukherjee², Associate Professor of Leather Technology

GOVT. COLLEGE OF ENGINEERING & LEATHER TECHNOLOGY, KOLKATA

Step 19: Environmental and Economic Evaluation of Waste Reduction Options

In order to decide which options should be developed to formulate a waste reduction action plan each option should be considered in terms of environmental and economic benefits.

(a) Environmental Evaluation

It is often taken for granted that reduction of a waste will have environmental benefits. This is generally true; however, there are exceptions to the rule. For example, reducing one waste may give rise to pH imbalances or may produce another which is more difficult to treat, resulting in a net environmental disadvantage.

In many cases, the benefits may be obvious such as the removal of a toxic element from an aqueous effluent by segregating the polluted waste or by changing the process in such a way that the waste is prevented.

In other cases the environmental benefits may be less tangible. Creating a cleaner, healthier workplace will increase production efficiency but this may be difficult to quantify.

For each option a series of questions should be asked.

- Consider the effect of each option on the volume and degree of contamination of process wastes.
- Does a waste reduction option have cross-media effects? For example, does the reduction of a gaseous waste produce a liquid waste?
- Does the option change the toxicity, degradability or treatability of the wastes?
- Does the option use more or less non-renewable resources?
- Does the option use less energy?

b) Economic Evaluation

A comparative economic analysis of the waste reduction

options and the existing situation should be undertaken. Where benefits or changes cannot be quantified (e.g. reduction in future liability, worker health and safety costs) some form of qualitative assessment should be made; it may be necessary to consult an expert for advice on how to judge a change.

Economic evaluations of waste reduction options should involve a comparison of operating costs to illustrate where cost savings would be made. For example, a waste reduction measure that reduces the amount of raw material lost to drain during the process results in reduced raw material costs. Raw material substitution or process changes may reduce the amount of solid waste that has to be transported off-site. Therefore, the transport costs for waste disposal would be reduced.

In many cases, it is appropriate to compare the waste **treatment costs under existing conditions** with those associated with the waste reduction option.

The size of treatment plant and the treatment processes required may be altered significantly by the implementation of waste reduction options. This should be considered in an economic evaluation.

Calculate the annual operating costs for the existing process including waste treatment and estimate how these would be altered with the introduction of waste reduction options. Tabulate and compare the process and waste treatment operating costs for both the existing and proposed future waste management options. Table 9 shows the typical cost components. In addition, if there are any monetary benefits (e.g. recycled or reused materials or wastes), then » these should be subtracted from the total process or waste treatment costs as appropriate.

Now that you have determined the likely savings in terms of **annual process and waste treatment operating costs** associated with each option, consider the necessary investment required to implement each option.

²Corresponding Author's E-mail ID : gmgcelt@gmail.com / gmclt@hotmail.com



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Investment can be assessed by looking at the payback period for each option. Payback period is the time taken for a project to recover its financial outlay. A more detailed investment analysis may involve an assessment of the internal rate of return (IRR) and net present value (NPV) of the investment based on discounted cash flows.

Analysis of investment risk allows you to rank options.

Consider the environmental benefits and the savings in process and waste treatment operating costs along with the payback period for an investment, to decide which options are viable.

Table 9: Annual Process and Waste Treatment Operating Costs

Process Operating Costs	Annual Cost
Raw Material 1	
Raw Material 2	
Water	
Energy	
Labour	
Maintenance	
Administration	
Other	
Total	

Waste Treatment Operating Costs	Annual Cost
Raw Material e.g. Lime	
Raw Material e.g. Flocculant	
Water	
Energy	
Trade Effluent Discharge Costs	
Transportation	
Off-Site Disposal	
Labour	
Maintenance	
Administration	
Other, e.g. violation, fires	
Total	

Step 19 Summary

At the end of Step 19 you should be able to list those waste reduction options that are environmentally and economically viable.

Step 20: Developing and Implementing An Action Plan: Reducing Wastes and Increasing Production

Efficiency

Consider the immediate reduction measures identified in Step 15 along with the long-term waste reduction measures that have been evaluated in Steps 18 and 19. These measures should form the basis of the waste reduction action plan. Discuss your findings with members of staff and develop a workable action plan.

Prepare the ground for the waste reduction action plan. Its implementation should be preceded by an explanation of the ethos behind undertaking a waste audit: Waste Prevention Makes Sense.

It is necessary to convince those who must work to new procedures that the change in philosophy from end-of-pipe treatment to waste prevention makes sense and serves to improve efficiency.

Use posters around the site to emphasize the importance of **waste reduction to minimize production and waste treatment/disposal costs** and, where appropriate, for improving the health and safety of company personnel.

Set out the intended action plan within an appropriate schedule. Remember it may take time for the staff to feel comfortable with a new way of thinking. Therefore [^] it is a **good idea to implement waste reduction measures slowly** but consistently to allow everyone time to adapt to these changes.

Set up a monitoring programme to run alongside the waste reduction action plan so that actual improvements in process efficiency can be measured. Relay these results back to the workforce as evidence of the benefits of waste reduction. Adopt an internal record-keeping system for maintaining and managing data to support material balances and waste reduction assessments.

It is likely that you will have highlighted significant information gaps or inconsistencies during the waste audit investigations. You should concentrate on these gaps and explore ways of developing the additional data. Is outside help required?

A good way of providing waste reduction incentives is to set up an internal waste charging system, those processes that create wastes in great volume or that are difficult and expensive to handle having to contribute to the treatment costs on a proportional basis. Another method of motivating staff is to offer financial reward for individual waste-saving



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efforts, drawing on the savings gained from implementing waste reduction measures.

Waste auditing should be a regular event - attempt to develop a specific waste audit approach for your own situation, keeping abreast of technological advances that could lead to waste reduction and the development of 'cleaner' products. Train process employees to undertake material balance exercises.

Training people who work on the process to undertake a waste audit will help to raise awareness in the workforce. Without the support of the operators waste reduction actions will be ineffectual - these are the people who can really make a difference to process performance.

Step 20: Summary

Prepare the ground for the waste reduction action plan, ensuring that support for the audit, and implementation of the results, is gained from senior management. Implement the plan slowly to allow the workforce to adjust.

Monitor process efficiency.

Relay results back to the workforce to show them the direct benefits.

Train personnel to undertake your own waste audit for waste reduction.

CASE STUDY 1: BEER PRODUCTION

Company A operates a modern brewery in western Europe, producing beer in bottles, kegs and bulk tankers. The essence of beer production is the processing and fermentation of malt and hops in the presence of added sugar. Considerable volumes of wastewater containing high BOD/ COD and suspended solids (SS) concentrations are produced as a result of washing of vessels and associated equipment between production batches.

Company A has been in operation some four years. During this time wastewater flows and pollution loads have increased significantly with production increases, resulting in consent limits for discharge to the public sewer (pH 6-10 and 500 mg/l SS) being exceeded on a regular basis.

The regional water authority recently indicated however that the brewery flows could continue to be accepted into the public sewer without pretreatment other than

possibly pH control and flow/ load balancing at some future date, primary settlement and biological treatment being undertaken at an extended local municipal sewage treatment works.

The water authority also informed Company A that a capital cost contribution towards the planned sewage works' extensions would not be necessary and that the normal trade effluent charging system would be applied whereby charges varied according to variations in flow and pollution loads (COD and SS).

The current trade effluent charges amount to US\$332,000 per annum and are expected to increase by 10% shortly. After considering the likely implications of the increase in effluent charges, the company decided to appoint a firm of consultants to carry out a waste audit and waste reduction study to investigate the possible ways of minimizing waste disposal costs.

The following case study describes the waste audit/waste reduction procedures carried out.

PHASE 1: PRE-ASSESSMENT

Step 1: Audit Focus and Preparation

Two chemists from the consulting firm's staff were allocated to carry out the required investigations, assisted as necessary by one of Company A's brewing technologists.

With the support of senior management, the audit team first organized an in-house seminar. This enabled the study procedures and objectives to be outlined and helped to ensure the full co-operation of production staff.

With the help of the brewery's engineering staff, a V-notch weir was then installed in a manhole where all the various effluents combined so that the flow could be monitored continuously using an available ultrasonic level/flow meter and associated chart recorder.

Since an automatic sampler was not readily available, it was decided that composite samples would be taken daily by combining discussionily-taken samples in proportion to flow. It was also established that the brewery's laboratory was well-equipped to carry out the required wastewater analyses.

In view of the scale of the brewery operations and the time and budget constraints imposed on the project, it



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was decided that the study should concentrate on:

- water usage aspects (rather than attempt to obtain a complete materials balance);
- investigate methods of reducing COD and SS loads discharging to drain.

In order to put the brewery operations in perspective from a waste management viewpoint, a preliminary check on wastewater and pollution loads discharged **per cubic metre of beer produced** was carried out based on past records of water usage and product data together with some limited information on combined wastewater strength.

It was concluded that, in general, the brewery operated with a very low degree of water wastage with most of the useful by-products or wastes already being recycled or recovered for off-site disposal. These aspects had been considered at an early stage in the design of the brewery and had clearly paid dividends in reducing waste volumes and pollution loads discharged. **Nevertheless**, it was considered that there was still scope for further waste saving measures to be implemented.

The success of the measures already practiced can be illustrated as follows:

Table 1: Waste Contributions from Beer Production

	Company A	Typical Brewery (a)	Old Brewery (b)
Wastewater Flow (m^3/m^3 beer)	2	7	
BOD Load (kg/m^3 beer)	4.1	4.5	7.5

(a) Based on the consulting firm's project experience elsewhere

(b) Based on data published by WHO, 1982

Another factor in favour of Company A is that most of the beer is transported from the brewery in road tankers rather than bottles or kegs, both of which give rise to more waste being produced. This simplifies the brewery operations and makes for more efficient and economical operation in terms of water consumption.

Step 2: Listing Unit Operations

The study team started off the waste audit/waste reduction programme by becoming familiar with all the various

production stages. This was done by walking around the plant with the brewery technologist and collecting relevant information from departmental records. It was found that so much data were being collected that a file was opened for each key area within the brewery.

The various unit operations were listed as in Table 2.

Table 2: Major Unit Operations and Brief Functional Description

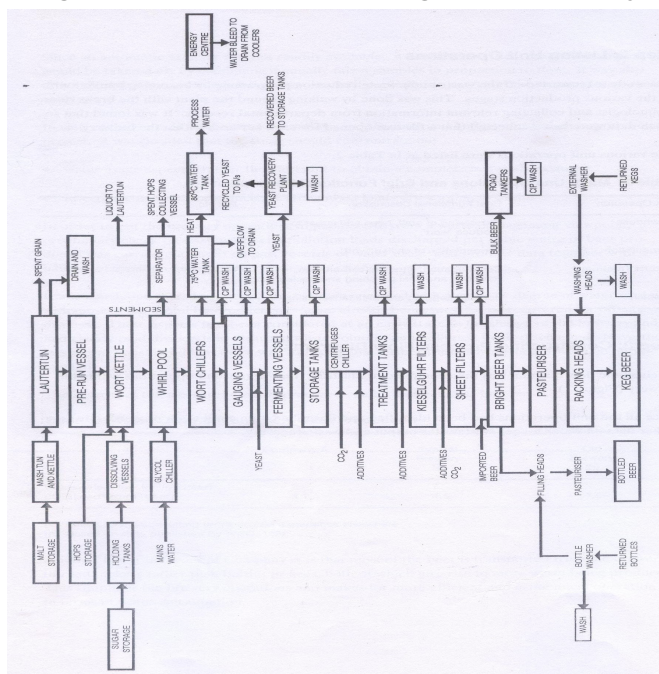
Unit Operation	Brief Functional Description	File No.
Brewhouse	Processing of malt, hops and sugar to produce 'wort'	1
Fermentation	Fermentation of chilled 'wort'	2
Product Treatment	Centrifugation, filtration, carbonation, colouring and final polishing and pasteurising	3
Dispatch	Bottling, kegging and bulk tanker filling	4

Step 3: Constructing Process Flow Diagrams

A schematic flow diagram was then compiled to illustrate the various unit operations within the brewery (Figure 1).

Once all the unit operations had been identified and described, the audit team proceeded to gather data on water usage, wastewater output and waste recovery.

Figure 1 : General Flow Diagram for Brewery





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PHASE 2: MATERIAL BALANCE: PROCESS INPUTS AND OUTPUTS

Step 4: Determining Inputs

The audit team first proceeded to gather data on material inputs, concentrating on water usage, both for the brewery process as a whole and for individual unit operations. These activities are described further in Step 5.

Step 5: Recording Water Usage

The total water consumption from water meter readings for the previous three month period was found to be 247,500 m³, equivalent to an average 2,750 m³/d.

This included a small domestic water allowance, evaporation make-up and water entering the beer products as well as general wash down water for equipment for cleaning operations.

The audit team then proceeded to examine how water usage was split between the various unit operations.

Step 6: Measuring Current Levels of Waste Reuse/ Recycling

No attempt to quantify the extent of current waste reuse/ recycling was made during the waste audit programme since it was felt that this would have involved a considerable time input disproportionate to the likely benefits obtained.

However, it was noted that reuse of caustic and sterilant rinses following discharge to drain of initial water rinses generally formed an integral part of the automatic cleaning-in-place (CIP) system employed for equipment washing.

Step 7: Quantifying Process Outputs

The principal process outputs of concern were the wastewater discharges arising from production operations and also the beer products themselves.

It was also noted that minor domestic sewage contributions discharged to the same drainage network as the brewery process wastewaters. The audit team then proceeded to quantify these outputs.

Step 8: Accounting for Wastewater

The total wastewater flow recorded during a two-week

monitoring period averaged 1,730 m³/d. It was noted, however, from the flow patterns during each day that wastewater discharges were extremely variable with a peak flow rate of up to 100 m³/h occurring when a hot water tank overflow was discharged. On the basis of this and a number of other assumptions, the audit team estimated that the maximum flow on any one day could reach 2,600 m³/d.

The corresponding combined wastewater pollution loads averaged 5,980 kg COD/d and 1,500 kg SS/d. These figures equated to waste quantities per cubic metre of beer produced of 2.1 m³, 7.1 kg COD and 1.8 kg SS. Assuming an average COD:BOD ratio of 1.7, the corresponding BOD waste load was 4.2 kg/m³ beer produced. These unit wastewater flow and BOD load contributions proved to be similar to the approximate estimates calculated in Step 1.

An estimate of domestic water usage and hence domestic sewage discharges to the trade effluent drainage system were also made, together with an assessment of the quantity of water entering the beer products. Calculations indicated that these additional outputs averaged a total of 850 m³/d, of which only 10 m³/d (140 employees at 70 litres per head per day) related to domestic sewage.

Studies were then carried out to develop a breakdown of the main process outputs (wastewater and product) for each key unit operation. This involved sampling and flow measurement of individual discharges around the brewery. Since the volume and composition of some of these discharges varied considerably with the type of beer produced, the survey was undertaken over several weeks to allow a realistic assessment of the situation to be made.

Step 9: Accounting for Gaseous Emissions

Gaseous emissions were not of particular concern in the context of the terms of reference drawn up by Company A for the study. However, it was noted that the brewery boilers were gas-fired and that boiler flue-gas emissions were discharged via a tall stack such that they were not likely to give rise to any concern.

It was noted that if control of alkaline wastewater discharges associated with use of caustic soda in the CIP systems proved to be necessary in the future (a possibility if alkaline waste discharges could not be controlled at source), then use of acidic flue-gas (a



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source of carbon dioxide) could be considered for this purpose.

The audit team also observed that pockets of carbon dioxide in the fermentation areas could cause problems of drowsiness amongst the brewing staff and that improved ventilation would help to ensure their general health and safety.

Step 10: Accounting for Off-Site Wastes

At the time of the survey, wastes produced for transportation and disposal off-site were limited to spent grain and hops generated in the brewhouse as by-products. These were disposed of off-site by a local farmer, for cattle food and as a soil conditioner respectively, at no cost to the brewery. Total quantities were estimated at some 25,000 tonnes (wet weight) per annum.

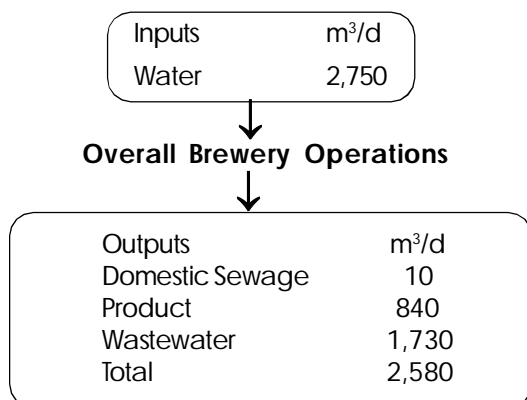
Step 11: Assembling Input and Output Information for Unit Operations

As previously indicated, the prime interest in this waste audit and reduction programme was to concentrate on the potential for reducing wastewater and associated pollution loads.

Hence, for the purposes of the project in question, the material balance was confined to consideration of water issues only.

Step 12: Deriving a Preliminary Material Balance for Unit Operations

It was decided to conduct a preliminary material balance for the brewery as a whole, based on water usage, before embarking on the more complicated step of obtaining a balance for each key unit operation. This was then constructed as set out in below.



Step 13: Evaluating the Material Balance

The material balance with respect to overall water usage showed a remarkably good agreement, the average daily water input amounting to 6.6% above the daily water output assessed.

Although raw materials in the form of malt, hops, sugar, additives and other process chemicals -and also wastes disposed of off-site - had not been included in the balance, it was noted that these items are relatively small in the case of breweries where water is the dominant raw material used.

Step 14: Refining the Material Balance

On studying the data collated, it was observed that no allowance for evaporation had been included in the material balance and that, from the consultant's previous experience of brewery operations, evaporation alone could account for up to 5% of total water usage. This allowance therefore effectively closed the small difference between water input and output indicated in Step 13.

The waste audit team then proceeded to build up material balances for all the major unit operations within the brewery. When this work had been completed, they felt that they had gained considerable knowledge about the various production activities, their inputs, outputs, wastes and operational problems.

PHASE 3: SYNTHESIS

Step 15: Examining Obvious Waste Reduction Measures

The audit team considered that the cost of wastewater disposal at the brewery could be minimized in two ways:

- ✓ reduction in volume, BOD* and/or SS load of the wastewater produced in the brewery;
- ✓ reduction in the BOD* and/or SS load of the wastewater discharged to sewer by pretreatment.

(* or rather COD, as used in the water authority's charging formula)

In the light of a comprehensive examination of the waste producing areas, it was possible to study both these alternatives. To assist the investigations into waste saving possibilities, reference was made to available information



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(including database) sources, as well as the consultant's own experience of undertaking similar projects.

The various sections of the brew-house were studied hi turn as follows.

a) Brew-house

The two principal discharges in the brew house were the drain from the Lautertuns and a 75°C hot water tank overflow. Together these contributed 12% of the total wastewater flow from the brewery.

Study of the flow and analytical data obtained indicated that the Lautertun drain contributed 3.5% of the flow, 23% of the COD and 4% of the SS load. Discussions with the company indicated that it should be possible to store this waste flow for use as make-up water for the subsequent brew and that this should be possible without detriment to brewing standards. A 15 m stainless-steel storage tank with associated pumps, valves and pipe work would need to be installed with the advantage that the system would:

- ✓ reduce raw water costs;
- ✓ eliminate effluent charges previously incurred by this discharge;
- ✓ reduce energy requirements since the liquor returned as make-up water would not need heating;
- ✓ eliminate existing shock load discharges from this source which should remove any need for flow/load balancing of the total site wastewater flow.

The hot water tank overflow accounted for nearly 9% of the total wastewater flow. Since this water was clean and hot, continual reuse was the obvious possibility. Unfortunately, this proved to be impossible owing to the spasmodic production of this water proved to be impossible owing to the spasmodic production of this water. As the 75°C tank was very large however, it was **considered that its inherent balancing capac-ity** could be utilized if the supply for reuse was taken part way down the tank rather than from the overflow when it occurred.

Reuse of this water would be preferable in a process **that consumed hot water at approxi-**mately the same rate as the 75°C hot water production, that is 150 m³/d. The only process in the brewery which utilized this quantity of hot water was the pasteurizing machine which had a water consumption of some 170 m³/d. However, all of this flow was not hot water since a temperature gradient

had to be maintained within the pasteurizer to ensure that bottles were not warmed up or cooled down too rapidly.

It was considered that the 75°C hot water should be injected directly into the pasteurizer to replace the heating of cold water to 60°C. In addition, the hot water could be blended with the supply of cold water that already existed to give the required temperature profile throughout the pasteurizer. It was estimated that such a system would enable at least 75m of the excess hot-water to be reused each day.

b) Fermentation Cellar

The majority of waste produced in this area of the brewery originated from the CIP systems, the discharges from which contained a high COD load due principally to the high yeast content. With the exception of the initial rinse from pre-fermentation stage gauging vessels, the initial rinses from other tanks - fermentation tanks, storage vessels and yeast recovery vessels - all exceeded 6,000 mg/l COD and together accounted for over 90% of the COD load produced in the fermentation cellar.

Proposals for reducing/treating these discharges were developed as follows. Gauging Vessels

Possibilities for reducing the pollution load from this source of CIP effluent were limited as no yeast was present which could be filtered out. However, reuse of the relatively-clean final rinse as the initial rinse for the next CIP wash would reduce the effluent flow to drain by a total of 26 m³/d from 8 vessels.

It was also noted that the caustic wash from the brew-house which occurred usually every week was discharged to drain from these gauging vessels every weekend and that this, together with the acid wash from Wort Kettle No.2 discharged via a fermentation (balancing) tank, had a major effect on the combined wastewater pH giving values frequently outside the allowable pH range for discharge to the public sewer of 6-10.

Tests showed that if the acid and caustic discharges were run to drain together, the neutralizing effect of the acid on the caustic was negligible owing to the different volumes, strengths and neutralise the predominant caustic load, it was envisaged that closing up the system by providing additional holding tank capacity would be suitable. This could be achieved using a similar loads



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arrangement to the existing closed CIP units in order to standardize on equipment; it would reduce effluent flows to drain, raw water costs and also chemical-cleaning costs. Fermentation Tanks

The load produced by the initial rinse was found to be 210 kg COD/d and 150 kg SS/d which could be reduced by at least 75% by passing the rinse through a yeast press. It was considered that the final CIP rinse could also be reused as the initial rinse, reducing effluent flow by 25 m³/d from 8 tanks.

As referred to above, acid washes from the brew house were being discharged from the fermentation tanks; on occasions, these depressed the pH to 2.4. Containment and recirculation via a new CIP unit was considered to be the most suitable and practicable control measure.

Storage Tanks

The initial rinse in the CIP sequence was found to contain 75 kg COD/d and 10 kg SS/d. It was estimated that passing these rinses through a yeast press would reduce overall loads from this source to 22 kg COD/d and 3 kg SS/d. Also, reuse of the final rinse as the initial rinse of the next sequence would reduce effluent flows by 5 m³/d.

Yeast Recovery Plant

Discharges from centrifuge cleaning were difficult to arrange at the time of the waste audit and reduction investigations. However, from visual observations the initial rinse clearly contained a significant quantity of yeast and so it was recommended that such wastes should also be passed to a yeast filter press. Similarly, recovery of the final rinse and reuse as a subsequent initial rinse was proposed. It was also suggested that the initial rinses from yeast storage vessels should be filtered through a yeast press.

Company A had already purchased a new yeast press to filter yeast liquors which at the time were stored until press capacity became available. This proposal was expected to reduce storage requirements, allowing a small amount of beer recovery (press filtrate) and elimination of the frequent storage tank overflow.

Therefore, instead of treating each of the fermentation cellar discharges separately which would be uneconomic, the audit team considered that the

proposed filter-press installation for the yeast recovery area should be arranged to filter the initial rinses from fermentation tanks, storage vessels and yeast recovery equipment. This would not only prevent the majority of yeast from flowing to drain but would enable its recovery for resale to a food manufacturer.

In addition, any other liquor containing yeast that had to be dumped to drain, such as the initial drop from the storage tanks when the yeast storage vessels were full, could be filtered and the yeast and beer recovered. The expected increase in flow to the proposed filter press was estimated at 50 m³/d containing 100 kg SS/d, well within the unit's design capacity.

c) Treatment Cellar

A number of waste saving options were recommended for this area. The principal measures proposed related to the bottling and kegging areas. The possibilities of utilizing the 75°C hot water tank overflow for the pasteurizer supply have already been highlighted in the brew house section above. The audit team felt that the water flowing out of the pasteurizer could be used as an initial rinse in the bottle washer.

The existing bottle washer system used 9 m³/h fresh deionised water. It was proposed that the final spurge pipes should continue to be supplied with deionised water but that the pasteurizer water be used to supply the remainder and also for continual replenishment of the water in the final rinse tank. Mains water would be provided as a standby supply in the event for any reason that the pasteurizer water ceased.

In the kegging area, dumping of returned beer to drain was occurring periodically giving a very significant rise in BOD and COD load during the dumping periods. It was indicated to the company that separate disposal, possibly directly to land, should be seriously considered as often adopted by other breweries. It was noted, however, that this would require the permission of Customs and Excise officials and be subject to the beer being destroyed in an approved manner such as by dyeing.

Step 16: Targeting and Characterizing Problem Wastes

Following completion of Step 15, the audit team realized that significant reductions in wastewater flows and pollution



could be achieved by carrying out all the improvement **measures** high-lighted, all of which were relatively straightforward to implement.

It was decided it would be useful to obtain an overall picture of the waste savings which could be achieved. Thus, a summary of the existing and proposed reduced waste contributions for the unit operations highlighted in Step 15 was drawn up as presented in Table 3. At this stage, **no allow-ance** was made for the benefits of avoiding returned beer being discharged to drain since this was dependent on future discussions with Customs and Excise personnel.

Table 3: Summary of Existing and Proposed Reduced Waste Contributions

Unit Operation	Waste Description	Existing Composition			Recommendation	Predicted Composition		
		m ³	kg COD	kg SS		m ³	kg COD	kg SS
Lautertun	Final run to Drain	60	1392	60	Reuse	0	0	0
75°C Hot Water Tank	Overflow	150	-	-	50% reuse as make-up for pasteuriser	75	0	0
Brewhouse Vessels	Caustic and acidic wash at weekends	36	152	16	Installation of CIP unit	0	0	0
Gauging Vessels	CIP wash	26	-	-	Reuse rinsewater	0	0	0
Fermenting Vessels	CIP wash	65	248	188	Reuse and yeast separation	40	62	44
Storage Tanks	CIP wash	17	89	13	Reuse of rinsewaters and pressing of initial rinse	12	22	3
Yeast Storage and recovery	CIP wash	2	17	1	Yeast recovery	2	4	0.2
Pasteurizer	Process water	100	-	-	Reuse in bottle washer	0	0	0
Total		456	1888	278		129	88	47.2

For flow, COD and SS load savings of 327 m³/d, 1,810 kg COD/d and 230 kg SS/d (ref. Table 3), the predicted reductions on the total wastewater discharges assessed in **Step 8** were **approx-i-mately 19%, 30% and 15%** respectively.

Step 17: Segregation

In formulating a series of recommendations for waste **reuse and recovery** which could be **imple-mented** relatively quickly (ref. Step 16), the waste audit team had recognized at an early stage that waste segregation would form an integral part of the waste reduction strategy.

The proposals were discussed with the management who, in principle, were in agreement that the various measures

put forward were sensible and practicable, subject to the audit team being able to demonstrate that the likely long-term cost savings to be achieved would be appreciable.

Step 18: Developing Long-Term Waste Reduction Options

Prior to the water authority stating that the increase in local sewage treatment works capacity would not require a capital contribution from Company A, the brewery's waste management consultants had prepared preliminary plans for an on-site pretreatment plant based on pH control, balancing and oxygen activated sludge treatment.

This compact treatment option had been selected in view of the limited spare land area available on site. An additional attraction was the reduced risk of developing filamentous, poorly-settling sludges compared with conventional air activated sludge systems treating brewery, or similar wastes, having a high soluble carbohydrate content.

However, in the light of the water authority's subsequent proposals and a comparative economic assessment of the two alternatives - discharge of untreated combined wastewaters (or, at worst, following preliminary treatment only) plus payment of trade effluent charges, or partial biological pretreatment plus payment of reduced trade effluent charges - plans for pretreatment facilities on-site were shelved pending the outcome of the waste audit and reduction investigations.

The audit team considered that if the good housekeeping measures as outlined in Step 16 were implemented, particularly those relating to the reuse of the significant pollution load associated with the Lautertun drain and the control of caustic and acidic discharges, then future pH control and flow/load balancing of combined flows in order to ensure compliance with discharge standards would not be necessary.

Step 19: Environmental and Economic Evaluation of Waste Reduction Options

From the waste saving studies which were orientated around possibilities for reuse/recycling and recovery, it was clear that following implementation of the measures drawn up the net discharge of wastes to the environment



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would be significantly reduced. Thus, there would be a clear environmental benefit.

The audit team then tabulated the estimated trade effluent charges with and without allowance for the proposed waste saving measures (Table 4). This enabled the potential savings in these charges to be identified.

Table 4: Estimated Trade Effluent Charges

Unit Operator	Waste Description	Estimated Current Charges US \$/annum	Estimated Reduced Charges US \$/annum	Estimated Savings in Charges US \$/annum
Lautertun	Final run to Drain	58,000	0	58,000
75°C Hot Water Tank	Overflow	7,000	3,500	3,500
Brewhouse Vessels	Caustic and acidic wash at weekends	7,800	0	7,800
Gauging Vessels	CIP wash	1,200	0	1,200
Fermenting Vessels	CIP wash	25,000	7,000	18,000
Storage Tanks	CIP wash	5,000	1,500	3,500
Yeast Storage and recovery	CIP wash	800	200	600
Pasteurizer	Process water	4,300	0	4,300
Total		109,100	12,200	96,900

The trade effluent charges listed in Table 4 were then compared with the expected total trade effluent charge for the existing combined wastewaters, estimated at US\$365,000 per annum for the forthcoming year. This indicated a 26% reduction resulting from implementation of the flow/ load reduction proposals.

Based on the data set out for Step 16, the reduced average flows and loads would be some 1,400 m³/d, 4,170 kg COD/d and 1,270 kg SS/d. This corresponded to **reduced average waste quantities per cubic metre** of beer produced of 1.7 m³, 5.0 kg COD and 1.5 kg SS.

Further examination of all the waste audit data obtained indicated that peak wastewater flows and loads on any one production day could rise to 70% above these **average discharge levels**. However, the assessment of trade effluent charges based on average discharges was considered to give a realistic estimate of the savings which could be expected over a full production year.

The audit team appreciated that in addition to savings in trade effluent charges, there would be other cost

benefits which were difficult to quantify during the time-frame of the consultant's brief but which included costs associated with raw water, energy and the probable elimination of combined wastewater treatment which would otherwise be required to meet discharge consent conditions consistently.

It was also recognized that some capital expenditure **would be required to implement the pro-posed waste reduction programme**. It was agreed with the brewery management that this aspect was best costed by their own engineering staff but that since the capital sums involved would be relatively small compared to the company's capital expenditure budget for the current year, and related to progressive improvements in the brewery production operations, the company would be likely to accept the waste savings proposals on the basis of the significantly reduced trade effluent charge savings alone.

Step 20 : Developing and Implementing an Action Plan: Reducing Wastes and Increasing Production Efficiency

The results of the waste audit and waste reduction studies were formally presented to Company A's management in the form of a technical report. The recommendations made were accepted and plans were then made to implement the recommendations.

The waste audit had provided a sound understanding of all principal sources of waste arising within the brewery. Furthermore, the brewery technologist assigned to assist the waste audit team had benefitted greatly from being involved in the step-by-step approach adopted by the company's consultants.

It was considered that the experience gained by the brewery would enable company staff to take the lead in any future waste audit programme, particularly the assessment of the actual waste reductions achieved following commissioning of the plant modifications and additions proposed.

CASE STUDY 2 : LEATHER MANUFACTURE

Company B operates a tannery in south-east Asia processing cattle hides into finished leather, mainly for side upper leather in shoe manufacture. Treatment of the hides involves a series of batch operations involving application of a wide range of physical and chemical



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processes. Wastewaters discharged contain pollutants from the hides, products from their decomposition, and chemicals and various spent solutions used for hide preparation and during the tanning process. Solid wastes and some atmospheric emissions also arise.

The company was required to meet new government standards for discharge of wastewater to the local watercourse. This necessitated improvements to existing treatment facilities which were then limited to crude settlement in three lagoons operated in series. Primary sludge produced was disposed of in liquid form on a large area of surrounding land.

In the light of this situation, the company engaged a local consulting engineering firm to assist their staff in carrying out a waste audit and waste reduction programme with a view to developing the best and most cost-effective solution to the waste treatment and disposal problems.

The principal tannery operations carried out, typical of many tanneries throughout the world, may be summarized as follows.

Pretanning (or Beamhouse) Operations

- soaking of the imported, preserved (wet-salted) hide in water overnight to remove blood, dung, curing salt and water-soluble and saline-soluble proteins;
- unhairing (complete dissolving of all hair) by immersion in lime and sodium sulphide – and subsequent reliming;
- trimming and mechanical removal of extraneous tissue from the flesh side of the hides – and subsequent splitting (lime splitting) of the upper two-thirds grain layer from the lower, less valuable split layer;
- deliming by treatment with a weak acid (lactic acid) and bating with an enzyme-based chemical to remove hair remnants and degraded proteins;
- pickling using salt and sulphuric acid solutions to give the required acidity to the skins to prevent subsequent precipitation of chromium salts on the skin fibres - pickled splits are then sold to other tanneries for further processing, only the grain layers being tanned and finished by Company B.

Thus, wastewaters from the beam house contain high levels of suspended solids and dissolved organic matter, curing salt and grease, in addition to unused process chemicals (particularly sulphides); they will also be

alkaline, having a high oxygen demand.

Tanning

Chrome tanning is carried out using chromic sulphate. The tanning process stabilizes the proteineous (collagen) network of the hide. Acidic effluents are produced which contain unused trivalent chromium salts.

Post-Tanning Operations

These involve :

- 1) pressing (samming) to remove moisture;
- 2) a second levelling by shaving;
- 3) dyeing and softening of the tanned hide with emulsified oils (fatliquoring), preceded by occasional secondary tanning using synthetic tannins (syntans) and tanning extracts;
- 4) drying and final trimming;
- 5) surface coating and buffing (finishing)

The following case study describes the waste audit/waste reduction approach taken.

Step 1: Audit Focus and Preparation

It was decided that the study investigations would be carried out by a chemical engineer from the consulting firm's staff who had previous experience of carrying out waste audits, assisted by the tannery's plant chemist.

Company B's own laboratory was not equipped to carry out many of the tests normally associated with wastewater analysis and so arrangements had to be made to deliver samples to a local private company providing laboratory analytical services.

In view of government pressures, it was decided to concentrate on wastewater discharges arising from the beam house and subsequent tanning operations. However, atmospheric emissions were also investigated having particular regard to health and safety. Solid waste arisings, in particular wastewater treatment plant sludges, were also studied.

The Waste audit team was keen to gain the support of production personnel in order to ensure that comprehensive information on all tannery operations could be readily obtained. As a first step therefore, the study objectives were fully explained to selected staff



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responsible for the various production activities.

The investigations were initiated by gathering relevant information from company files. This preliminary search yielded site and drainage plans, raw material purchase records and water meter records associated with on-site borehole abstraction.

A preliminary check on water usage was carried out by calculating the water usage per ton of wet-salted hide processed. This was found to be 61 m³/ton. It was noted that this was some 22% higher than the typical average working figure of 50 m³/ton reported in technical literature, suggesting that ways of introducing considerable water savings should be possible as a result of the waste audit/waste reduction study.

Step 2: Listing Unit Operations

The consultant and the plant chemist started the tannery study by walking around the processing and waste treatment areas, listing all the unit processes and making notes on their function and use. Help was also sought from various plant operators who were familiar with the day to day plant operations. The unit operations were listed in Table 1, with processes which did not produce liquid waste shown in brackets.

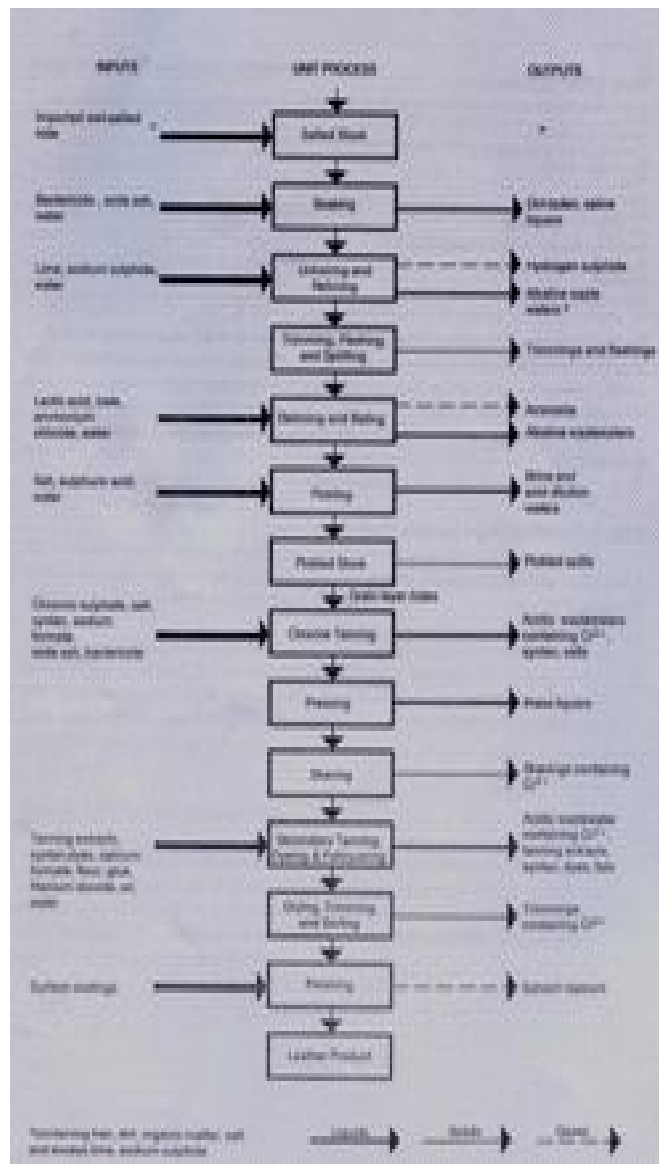
Table 1: Unit Operations

Soaking
Unhairing and Liming / Reliming (Trimming, Fleshing and Splitting)
Deliming and Bating
Pickling
Chrome Tanning
Pressing (Shaving)
Secondary Tanning, Dyeing and Fatliquoring (Drying, Trimming and Sorting) (Finishing)

Step 3: Constructing Process Flow Diagrams

A flow diagram was then prepared to illustrate the

interrelationship between the various unit operations (Figure 1).



Step 4: Determining Inputs

The audit preparation phase (Step 1) had already highlighted the availability of well-documented raw material purchasing records. The data produced also proved to be a good check on the raw material quantities quoted by the plant foremen per unit operation.

The raw material usage data obtained were set out as in Table 2.



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Table 2: Annual Consumption of Process Chemicals

Process Chemicals	Tons/annum
Sodium Chloride (other than curing salt present in rawhide)	622
Hydratedlime	1,123
Sodium Sulphide (62% Na ₂ S)	445
Sulphuric Acid	160
Soda Ash (anhydrous sodium carbonate)	74
Bate (95% ammonium sulphate, 5% enzymes)	65
Calcium Formate	40
Lactic Acid (30%)	35
Sodium Formate	26
Bactericide	19
Ammonium Chloride	9
Sub-Total	2,618
Chemicals Absorbed by the Hide (i)	
Tanolin (16% chromium)	760
Syntans A & B	424
Dyes	77
D-1 Oil	17
Other Oils	295
Tannin Extracts	190
Soyarich Flour	45
Titanium Dioxide	30
Methyl Cellulose	9
Semi-Sol Glue	17
Sub-Total	1,864
Total	4,482

(i) Absorption estimated at 90%, 10% discharged to waste - except for Tanolin, absorption 75%, 25% discharge to waste

Due to the nature of the raw materials and the well-organized materials storage system which was found to be in operation, no significant handling losses were occurring.

It was noted that the company incurred no charges for consumption of water drawn from a site borehole. A separate town water (potable) supply was available for domestic use. Domestic wastewater passed to the nearby

watercourse via a septic tank.

Having already tabulated the key production stages (Step 2), raw material usage listed in Table 2 was used to derive average quantities per unit operation throughout the tannery, on both a daily basis and per ton of hide processed.

The data compiled were set out in Table 3.

Table 3: Chemical Inputs per Tannery Unit Operation

Unit Operation	kg/tonne hide (at unit operation)	kg/tonne wet-salted hide	kg/d
Soaking :			
Bactericide	1.6 (i)	1.6	64
Sodium Carbonate	0.8 (i)	0.8	32
Unhairing/Reliming :			
Hydrated Lime (unhairing)	48 (i)	48	1,920
Sodium Sulphide (62% Na ₂ S)	43 (i)	43	1,720
Hydrated Lime (reliming)	58 (i)	58	2,320
Deliming/Bating :			
Lactic Acid	5 (ii)	4.3	172
Bate	10 (ii)	8.7	348
Ammonium Chloride	1.3 (ii)	1.1	44
Pickling :			
Sodium Chloride	60 (ii)	51.9	2,076
Sulphuric Acid	21 (ii)	18.2	728
Chrome Tanning :			
Tanolin (basic chromic sulphate, 16% Cr ³⁺)	60 (ii)	51.9	2,076
Sodium Chloride	60 (ii)	51.9	2,076
Syntan A	25 (ii)	21.6	864
Sodium Formate	8.9 (ii)	7.7	308
Sodium Carbonate	10 (ii)	8.7	348
Bactericide	1 (ii)	0.9	36
Syntan B	41 (ii)	35.5	1,420
Secondary Tanning, Dyeing & Fatliquoring :			
Dyes	20 (iii)	7.0	280
Calcium Formate	10.3	3.6	145
Syntan B	44 (iii)	15.4	616
Soyarich Flour	16 (iii)	5.6	224
Titanium Dioxide	8 (iii)	2.8	112
Glue/Methyl Cellulose	8 (iii)	2.8	112
Tannin Extracts & Oils	118 (iii)	41.3	1,652
		Total	19,693



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- (i) Based on 40 tonnes wet-salted hide per day
- (ii) Based on fleshed, split/trimmed hide, after reliming
- 34.6 tonnes per day
- (iii) Based on chrome tanned leather, after pressing/
shaving -14.0 tonnes per day

Step 5: Recording Usage of Water

The next step was to record the water usage at the tannery and determine how it was used. It was noted that water obtained by the company from the site borehole was pumped to a covered storage tank at ground level and then pumped again to a high-level storage tank. Water then gravitated to the site distribution mains under static head via a water meter, readings for which were recorded weekly in a log book.

Analysis of these records indicated a daily average total water consumption for the site of 2,450 m³/d. This figure was then broken down into average water usage per tannery unit operation in a similar manner to that carried out for the process chemicals. Since the tannery wet processes were all carried out in revolving vessels of known capacity, providing mechanical agitation to accelerate the wet-chemical operations, batch process water inputs were readily quantifiable. Rinsewater usage which was continuous for a fixed duration per batch was also known from previous work carried out by the company. This had involved checking the time taken to fill a vessel of known volume for a given water valve setting.

The results were summarized as set out in Table 4.

Table 4: Water Inputs per Tannery Operation

Unit Operation	m ³ /tonne hide (at unit operation)	m ³ /tonne wet-salted hide	m ³ /d
Soaking :			
Prewash	4.3 (i)	4.3	172.0
Process Water	1.9 (i)	1.9	76.0
Rinse Water	2.1 (i)	2.1	84.0
Unhairing/Reliming :			
Process Water	1.9 (i)	1.9	76.0
Rinse Water	11.0 (i)	11.0	440.0
Soak Water (reliming)	1.9 (i)	1.9	76.0
Rinse Water	2.1 (i)	2.1	84.0
Deliming/Bating :			
Pre-rinse	4.2 (ii)	3.635	145.4
Process Water	1.0 (ii)	0.865	34.6
Rinse Water	1.385 (ii)	1.2	48.0

Unit Operation	m ³ /tonne hide (at unit operation)	m ³ /tonne wet-salted hide	m ³ /d
Pickling :			
Brine Water	2.49 (ii)	0.215	8.6
Acid Dilution Water	0.84 (ii)	0.073	2.9
Chrome Tanning :			
Process Water	0.586 (ii)	0.507	20.3
Rinsing	4.51 (ii)	3.9	156.0
Pressing	0.202 (ii)	0.175	7.0
Secondary Tanning, Dyeing & Fatliquoring :			
Pre-rinse	9.15 (iii)	3.2	128.0
Process Water	0.4 (iii)	0.14	5.6
Rinse Water	18.6 (iii)	6.5	260.0
Process Water	0.4 (iii)	0.14	5.6
General Floor and Plant Washwater		15.500	620.00
Total - Process Waters -		12.115	484.60
Rinse Waters -		33.635	1345.40
General Washdown -		15.500	620.00
Total	-	61.250	2,450.0

- (i) Based on 40 tonnes wet-salted hide per day
- (ii) Based on fleshed, split/trimmed hide, after reliming
- 34.6 tonnes per day
- (iii) Based on chrome tanned leather, after pressing/
shaving -14.0 tonnes per day

Step 6: Measuring Current Levels of Waste Reuse/ Recycling

It was noted that no wastes were reused/recycled at the tannery.

Step 7: Quantifying Process Outputs

The audit team listed the process outputs from each tannery unit operation as set out in Table 5 below.

Table 5: Process Outputs

Unit Operation	Wastewater	By-Product / Waste Reuse	Atmospheric Emissions
Soaking	Process and Wash / Rinse Waters		
Unhairing / Reliming	Process and Rinse Waters	-	Hydrogen Sulphide
Trimming, Fleshing and Spitting	-	Trimmings and Fleshings	



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Unit Operation	Wastewater	By-Product / Waste Reuse	Atmospheric Emissions
Pickling	Process Brine / Acid Dilution Waters	-	
Pickled Hide Storage	-	Pickled Splits	
Chrome Tanning	Process and Rinse Waters		
Pressing and Shaving	Press Liquores	Shavings	
Secondary Tanning, Dyeing and Fatliquoring	Process and Rinse Waters		

Unit Operation	Wastewater	By-Product / Waste Reuse	Atmospheric Emissions
Drying, Trimming and Sorting	-	Trimmings	
Finishing	-	-	Solvent Vapours
Final Product	-	Finished Leather (grain layer / split layer)	

Action was then taken to quantify these outputs in Steps 8, 9 and 10.

.....to be continued in next issues



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News Corner

ASICS PLANS TO EXPAND BIZ IN INDIA

Japanese performance sportswear firm ASICS is stepping up expansion in India with plans to add over 20 mono brand stores by next year.

It is also intensifying presence on e-commerce platform while growing business through regional distribution channels to cater to growing demand in tier II cities.

The company, which sells its footwear and apparel products through franchise model, is also keeping options open to have its own stores once it meets 30 percent local sourcing requirements under the current FDI policy in retail.

(Source : Asian Age – 04.09.2017)

SHOE SELLER AEROSOLS PLANS BANKRUPTCY

New York – Women's shoe retailer Aerosoles Group is planning to file bankruptcy to exit its unprofitable store leases, people familiar with the matter said on Thursday.

The shoe seller's bankruptcy will come as soon as this month, said one of the people. Aerosoles, known for its coretailler comfortable flats and wedges sold in its own shops and in department stores, plans to remain in business, unlike many other retailers who filed for bankruptcy in recent years and liquidated, said the people.

At least a dozen retailers selling apparel, electronics and discount shoes have filed for bankruptcy this year to slash their store count and better compete with e-commerce giants such as Amazon.com Inc.

The shoeseller, which has about 80 stores in the United States, plans to move forward after bankruptcy with about a quarter of those locations, the people said. Aerosoles has not made rent payments for September, said one of the people.

Edison, New Jersey-based Aerosoles and its private equity owner Palladin Consumer Retail Partners did not return calls or emails seeking comment. The people could not be identified because the company's plans are not yet public.

Reuters reported in July that the company was considering strategic options including a sale or debt restructuring with help from investment bank Piper Jaffray Companies and financial advisory consultant Berkeley Research Group.

The company was once part of storied shoemaker Kenneth Cole Productions Inc. In addition to battling e-commerce, Aerosoles has also been challenged in luring shoppers to its stores and website with products that stand out from its competitors, as more of them now offer affordable, comfortable shoes.

(Source : Economic Times)

NIKE STARTS DOWNSIZING INDIA OPS TO FIRE 20% STAFF

US sportswear maker Nike has embarked on a major downsizing exercise in India, as a part of which it has fired 20% of its employees in the country and has asked many others to join its operations in Southeast Asia.

This is part of a global restricting process that will see the company focus on 12 key cities including New York, Shanghai, London, Paris and Mexico City to achieve 80% of its projected growth by 2020. Not a single Indian city features on that list.

Nike, which entered India in 2005, has found it a difficult market to crack. TOI had reported earlier that the Oregon-headquartered Nike had closed around 35% of its stores in India.

TANNING AND FINISHING OF SIDE LEATHER*.

F. OTTO CECHAK

United Nations Expert from West Germany

The leather industry has existed for thousands of years ago. I remember reading that leather (coloured) produced 7000 years before B.C. was found in Egypt. The skin of a killed or dead animal has been used as clothing in the pre-war times in a primitive way. In the old Testament the Hebrews have written about leather and considered the tanning profession as unclean as they were working with dung.

Many years ago leather production was restricted to the use of vegetable tannin and vegetable dyestuff (also wood dyes) and metal salts were used for dyeing the leather. Even to-day such materials can be seen used in the tannery and in some places they are liked much in combination with vegetable tan leather. Also metal salts are used in the dyeing process to a great extent to-day. Similar is the case with dung bates which were indispensable for centuries. These are still being used to a small extent and some old tanners would believe that there is no better substitute. In my student time I had to work with dung bates only.

Only in the 18th Century and particularly in the 19th Century have modern development started taking place in the leather Industry. The science has made great progress and along with it the development of leather Industry. In 1867 Quebracho Extract was brought to Europe from South America and in 1883 the German Prof. Knapp discovered the tanning properties of iron and chrome salts. In the beginning they were practising only the 2-bath chrome tanning particularly in the last two decades of 19th Century. This particular process is used even to-day in the manufacture of technical leathers and glasse-kids. The dung bates were replaced by artificial bates, like Oropon by Roehm and Haas. Darmstadt Co. Oropon contains the active substance of Pancreas for its bating activity. Without doubt there has been a great progress in the field of tanning.

In the beginning of the 20th Century the first synthetic tanning was accomplished by Prof. Stiasny. In the last few decades the synthetic tannins have been further developed by the Chemical Industry of the whole world and to-day there are hundreds of such Synthetic tannins which can replace the natural Tannins and these are called exchange tannins.

In the year 1920 more and more coloured leather was in demand particularly lighter colours. To satisfy this demand the first pigment colours came into the market based on Collodion and Casein. If I remember correctly the first news of leather finishing with Casein Pigments came from North America. At that time,

* Lecture delivered at the ILTA Technical Seminar, Calcutta on 26.11.66.



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i.e. before 1920, no pigment colours were used—all finishes were carried out with pure aniline dye which received a protein based top like casein, blood or gelatine and combination of these.

The leathers were then glazed and ironed. For such purpose, of course, only leathers which have a clean and undamaged grain could be used. Working with coloured pigments has the advantage in that some of the defects and damages of the grain could be covered, as the demand was increasing.

Such finishing methods have helped to supply more coloured leathers and were further improved when snuffing the grain could be introduced.

When I was working in Leather Industries in Germany and other countries I had to demonstrate how leather can be sprayed with a spray gun. To spray leather pigment colours, the pressure and other conditions had to be explained to the workers. With collodium colours great care is necessary to ensure that no moisture or water enters the spray gun from the moist air. That is, the filters have to be checked and controlled so that the condensed water is eliminated. To-day these are obvious facts and it appears childish to mention such factors but believe me even to-day in some cases difficulties are found because the spraying unit is not maintained properly.

In the last decades the Chemical Industry has brought out a large number of auxiliaries for the various processes of leather making and it is more difficult now to choose the right auxiliaries for making good leather. From soaking to finishing there are the auxiliaries which can be very helpful. They have always helped me, to succeed in producing good leather. There is no product which is not worth trying and when it brings advantages or improves quality of the leather. It is better to introduce the material in the product. For this purpose a number of auxiliaries may have to be tried to find out the best one.

I would say that one should always be prepared to experiment in order to improve standards and prevent stagnation. The quantitative and qualitative demands of consumers are increasing daily and it is absolutely necessary to study further processes of leather manufacture in order to keep pace with the development of the time.

I am an old tanner and I believe that I was shocked when Corfam came to the market. Rubber and other synthetic products have done great harm to leather industry particularly for the bottom leather. Many tanneries (sole) have had to be closed. When Corfam takes the place of Upper leather, the same will be the case with bottom leather. It is not at all good for the tanners. I am of the opinion that Corfam can never substitute leather but it can harm the leather industry—at first there is the danger that Corfam has come to Europe. Thank God the public knows the CORFAM is no leather.

TANNING AND FINISHING OF SIDE LEATHER

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Corfam has not the elasticity and plasticity of leather and the breathing properties of Corfam are not perfect. The public who bought Corfam found out that the shoe was not pliable, the feel being the same as that of the previous day, that is, the shape and comfort of the shoe did not improve with time.

Certainly Messrs. Dupont will continue their work to perfect the artificial leather processes, because they have to make good of the millions because to dollars that was spent for the experiments till now.

A further reason exists for tanners, also in India, to make better leather. Consumption is growing as the population increases and the consumer become more demanding and fashion and comfort conscious. Exports should also grow. I have said to you I am an old tanner and in the past 45 years, I have had to process not only hides from cows, oxen, bulls and calves of all sizes, including still unborn calves, also sheeps, goats, snakes and fishes.

The process of tanning and working is accomplished mainly with chrome and vegetable tannin or a combination of the two—Alum and Formaldehydes and their combination is also used in tanning with fish oil for chamois leather, although it cannot be called tanning. The latter ones are more a preparation of the skin depending on the peculiarity of leather.

It is impossible to speak in this lecture of all the methods and I understand that the present audience consist mainly of tanners who are interested more in the tanning and finishing of side leather.

I cannot confine myself to only tanning and finishing. I have to start with raw hides because a well flayed and well preserved raw hide is a basic condition for making good leather. When I speak of flay I mean there should not be any butcher cuts and proper methods should be used for taking the skin out.

In the tropical climate it is absolutely necessary that the skin should be protected in the moment the animal is killed as it shall putrify very quickly. Curing should start before 1—2 hours after the death.

The flayed hide must be cleaned of blood and impurities with water-spread on a wooden platform, water allowed to drain and then salted. One day later they must be salted again, before bundling. When the skin is sold to the tanner at the salt weight, it should be made after 12 to 15 days of curing in tropical climates in summer and 16 to 20 days in winter otherwise the tanner will lose in weight. Of course it could be sold straight after salting, but I am afraid in such cases the tanner is buying water as raw hides.

It is important that this should not be forgotten and always that the suppliers should be told to be cautious with the raw materials and not to economise on salt. In the few weeks I have been in India, I have seen that due to bad preservation and



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curing you are losing lot of money. And not only this, a badly cured hide can never give a good leather. And a great proportion of national wealth is wasted. In this context I remember a recent statement by the Union Minister of Industry Shri Sanjivayya appropriate to the present occasion and it reads as follows :

"Probably the simplest definition of productivity is : Elimination of waste in all forms. Waste is not merely in time or money, waste can be in terms, of precious materials. The aim of productivity is to reduce all this waste if not totally eliminate it. Although concentration will be on reduction in wastage of materials, due emphasis will be laid on reducing wastages in all other forms, through streamlining our administration, ensuring fuller utilisation of plant and equipment and affording every opportunity to the worker for satisfaction at work and greater earnings through work".

And I add : A putrefied hide is waste. Do remember this. It is vary important.

When the hide or skin is seen through a microscope, you see three distinct layers : the epidermis, the true skin (Corium), and the subcutis (Hypodermis). The putrefaction will always begin at the subcutis. Epidermis and hair or wool are removed in the liming process. The true skin remains with the grain and subcutis. Sole leather and other heavy leathers are rarely split, but upper leather must be split after fleshing and thus the main articles of the upper leather industry are obtained : grain leather and split leather.

For a layman (or outsider) it looks so simple, but till leather processing comes upto splitting, the tanner has to control the processes of soaking and liming very carefully. Soaking and liming are important and form the basis for a good tanning and finishing.

A good soaking is one in which the salted hide is freed from the curing salt and brings it to the condition in which it (hide) was when the animal was killed or died and the skin removed. The not yet achieved swelling will be brought about by liming. Here in tropical India, one should be specially careful to see that the soaking does not last too long, as the water is not cold and already lukewarm. One can do the soaking in a much shorter time than in colder countries. It is necessary to add bacteriolytics to the soak water to avoid decomposition of the hide. There are a number of such products. I will not name particular one to avoid illustrations what might be considered as bias. I repeat, it is absolutely necessary to add bacteriolytics and detergents, so that no hide substance is lost and no putrefaction starts or it is stopped if already started. When nothing is done to prevent decomposition degradation of skin substance and consequent poor and loose grained leather will be the result. Lukewarm water helps formation and action of bacteria.

Soaking can be done in drum, paddle or pit.

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The liming process is one of the most important stages. It has a decisive effect on the character of the leather produced, for most or all types of leather. This removes the epidermis along with the hair and it loosens the structure of collagen fibres mechanically by swelling as also chemically. Liming removes the soluble protein substances including those which are embedded in the collagen fibres (Fibrils), thus isolating the fibrils. The less intensive the liming effect, the firmer will be the leather. The more one limes, the softer will be the leather. Liming has its own limits and even for very soft leather, if continued for too long there is the danger of the hide getting dissolved in the lime. Each type of leather needs its own time for liming as also the amounts of materials utilised based on the raw weight. The most common chemicals used in liming are calcium hydroxide and sodium sulphide. One can work also with only pure lime, as I did for 45 years. With a white lime i.e. pure lime, liming takes about 10-12 days. But such a long liming time is not very common at present for economic reasons for quite some years now. Sodium Sulphide is generally used along with lime now-a-days. For certain types of leathers and in particular cases arsenic sulphide may be used, as also caustic soda. A little caustic soda may be used along with lime and sulphide, if the swelling is not sufficient to remove the hair pigment, particularly if aniline leathers are to be produced. Even the sulphide can be increased for the same purpose. On the contrary, if there is too much swelling it can be controlled by use of salt.

Liming can be done in drum, paddle or pit. Paddles are better, although I myself have worked more than 16 years successfully with drum liming. But drum liming needs great care and it should be finished in 24 hours. In liming as in many other processes of leather manufacture the following words are true "Many ways lead to Rome".

When the pelts are split if they cannot be delimed immediately, i.e. if they lie in the beamhouse overnight, they should be covered with splits, to prevent lime blast. Lime can be very disadvantageous in finishing, particularly of aniline leathers. If the leather is to be buffed (grain) the lime blast cannot be giving any trouble. Lime blast is calcium carbonate and is formed by the interaction of the lime in the pelt with the carbon dioxide of the air. Calcium carbonate is insoluble. Should the water contain excessive temporary hardness or carbon dioxide (dissolved) the later will react with the lime in the pelt and form insoluble carbonates. Presence of lime in the tanning causes hard and cracky leather. But this and other such facts are elementary and simple truths that every tanner is aware of.

For deliming, sodium bisulphite, ammonium sulphate, formic acid, lactic acid or hydrochloric acid can be used. The best (optimum) pH after deliming is 8.0 to 8.5. Bating is an enzymatic or digestive process. As I have mentioned previously, in early times bating was done by using dungs but now bating is done with preparations which contain proteolytic enzymes of the pancreas of mammals, like Oropon, and many others in the world. These bating preparations generally contain ammonium sulphate or ammonium chloride and saw dust. Bating opens up



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the protein of the hides. It is similar to the liming process but not the same. In the case of bating the protein elastin is particularly attacked. Tanners know when bating is finished i.e. when the pelt is fallen and shows a smooth silky grain. Temperature for bating should never be below 30°C. Bating is best done in paddle. To give percentages for deliming and bating is not advisable (possible), as the conditions differ from batch to batch, factory to factory and country to country. These are dependent on the nature of raw hide, water and the leather type that is to be produced. Further there are bating preparations with different strengths and tryptic units. I can tell you already now, that formulation that is quite good elsewhere, need not necessarily be good and may not be good for India. Of course the recipes or formulations are made after careful considerations and in good faith and with long experience. But it is certainly possible that the formulations have to be adjusted, perhaps some operations may have to be rearranged or the percentages increased or reduced. One experience in bating indicated that after working for a long time with 1% bate I found out by trial that with only 0.3% equally good results could be obtained. It may not be the case always, and one should not be carried away by the thoughts of economy when one wants to produce quality product. If one produces better leather, a better price can be obtained.

If one produces better leather which is dearer than that of the competitor, one can find a better customer if the demand is good. It sounds very nice, but it is all not that simple. After deliming and bating comes the pickle. The pickle is a continuation of deliming and is done to give a mellow tannage, and is generally accompanied by using salt, sulphuric acid and water. The pickle prevents a too strong initial tanning with chromium compounds of high basicity. It does not mean that one has to work only with sulphuric acid. Of course sulphuric acid is cheap, but it can cause a coarse grain formation. This may also be caused by beamhouse operations. One can work with more surity, using hydrochloric or formic acid. In any case trials should be made with different acids in the tannery. I have worked all the three acids, naturally the figures varied :

0.5—1.2% Sulphuric acid 66° Be
0.8—1.5% Hydrochloric acid 22° Be
0.6—1.6% Formic acid 95%

For masked tannage (according to latest experiences) it is better to add 1% Calcium formate in the pickle and increase the acid. For example :

50—70%	Water at 20°C
4—6%	Salt
1%	Calcium formate 15 min., add
1.3—1.6%	Sulphuric acid 66° Be
(20%)	water
	1—2 hrs pH 2.5—3.0
	then add chrome.

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Amount of salt used must be minimum 4—6% or better, the amount of salt depends on the amount of water that is used. Swelling in pickle must be avoided, as acid swelling can cause cracky leather. As mentioned before, pickle is used in the preparatory stage for tanning. A pickle that is properly done, i.e. the acid taken up by the hide reduces the basicity of the penetrating chrome salt helping a slow and uniform penetration of the chrome salt and thus ensuring a smooth grain.

The skins can also be left overnight in the pickle bath and on the next day run the drum for 5-10 minutes and throw out the bath. It is not generally preferable to tan in the pickle bath, as the excess neutral salt present in the tan bath tend to make the leathers flat. Since the practice of adding Calcium formate in the pickle bath, I have not hesitated to tan in the pickle bath (when conditions in a factory demand it) the next day.

Tannage is best done by adding chrome salt in powder form. Of course there is the danger that the chrome (Binnys) may not dissolve under such conditions. In such cases it is better to dissolve the chrome powder in hot water in a 1 : 3 ratio or smaller proportions a day before the tanning and then to add to the pickle bath, preferably in three equal instalments at an interval of 15 minutes each.

The amount of chrome powder required depends on the type of tannage done. When there is no synthetic or vegetable tannage to follow the chrome tanning, it should correspond to about 2.2 to 2.6% Cr_2O_3 (Chromic Oxide). If there is to be a retannage with synthetic and vegetable tannins, the amount of chrome powder can be slightly reduced. These are general data—the problem should be carefully studied in each tannery. Tanning time can be 3-6 hours, basification with Soda or bicarbonate added slowly over an hour and the drum run for further 1—2 hours after the last addition of basifying agent. The pH should be 3.8, can be also 3.5 to 3.8. This is commonly adopted and discussed for making in chrome liquors. I would like to say a little about it. The affinity of chrome to hide substance is reduced by the presence of salts containing masking anions. Presence of such anions in chrome sulphate liquors reduces the astringence of the chrome liquor compared to those that do not contain any masking anions. The particle size of chrome complexes is changed by the addition of masking acids or their salts, and consequently the affinity of chrome for the hide substance. This may result in an increase or decrease depending on the type and quantity of masking agent. In the beginning of the tannage process a reduction in the affinity is desirable to get a fine, closed and not overtanned grain and a uniform distribution of the tanning agent, i.e. through tannage. At the end of tannage, it is preferable to have an increase of the affinity so that the chrome liquors are properly exhausted. For such a modification of tanning, a number of masking agents, organic acids and their salts can be used, like glycollic acid and lactic acid. For producing a leather with fine grain, a uniform distribution of chrome and sufficient fixation of the same are necessary. This can be achieved by using formic acid or its sodium salt, sodium formate. The salt, that



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I have come across in most tanneries, that is used for masking with good results is calcium formate.

The use of masking agents in pickle and in tanning with ready made chrome salts (like Binnys powder here in India) have the same effect as the chrome liquors reduced in the works (i.e. Bichromate, Sulphuric Acid, Molasses, Glycerine etc.) Without self-reduced chrome liquors regular controls and proper equipment the process gives headaches.

After the tannage the leathers should be piled at least for 24 hours. Then they can be sammed and shaved, washed and neutralised. By neutralisation the acids that are still left in the leather should be removed at least from the outer layers, where the acid can disturb the penetration of dye and fat liquor. Mostly weak alkalies like sodium bicarbonates are used. The bath temperature for neutralisation should start with 35—40°C. Then the leathers should get a good washing. The pH in the cut leather must show around 5.5, i.e. the reaction with bromocresol green should be green to bluish green.

For a milder neutralisation and improvement in leather quality (fullness), the chemical industry has a big range of products, from which suitable ones can be chosen after trials. The retannage with synthetic and vegetable tannings or only synthetic tanning agents, in combination with masking agents and weak alkali, is very popular as the extra process of neutralisation can be omitted. I am speaking of the possibilities of how one can and could retan but as the products are too many for such purposes I cannot deal with them exhaustively. I can only advise that a retannage should be done as it gives many advantages for your end product. I have my best experiences with pure syntan retannage and not in syntan vegetable combination retannages. I repeat : no washing and no neutralisation, only syntan retannage with one commercial product that appears best suited, a masking agent and bicarbonate. Some chrome salt can be also used along with these. The quantity of water has to be kept low and can be also done without water. The right combination has to be after a few trials and then one has a formula that gives good leather and the recipe is very simple.

After retannage, wash lightly and proceed with dyeing. In some cases it may not be even dyed, if the leather is going to be buffed. If aniline leather is to be produced, it must be dyed (full grain). Dyeing is done with anionic dyes. For getting more complete dyeing cationic dyes can be used on the top. This cationic dyeing should be done preferably after the fat liquoring and in a fresh bath. After 20 min. dyeing some formic or acetic acid may be added.

The fat liquor consists of sulphated and unsulphated oils. It is advisable to use emulsifying agents, preferably anionic. If no anionic emulsifier is available, after running a certain time with sulphated and unsulphated oil mixture, some quantity of cationic fat liquor can be added. For fat liquoring it is very important that

the leather is to be dried by hanging or by pasting. If for paste drying the leather should get more fat liquor than for hanging.

You might be wondering, my dear friends, why I am speaking so little about retannage, dyeing and fat liquoring. It is because I do not believe in exact percentages and particular products. Of course retannage, dyeing and fat liquoring are very important, probably most important for the end product. i.e. as important as all the pretanning processes and operations. It is true that every operation/process is important, but to get a suitable combination and recipe for retannage, dyeing and fat liquoring it is necessary to study for each individual type and production. It is not so difficult, but the auxiliaries available for these processes are so large and are obtained from many countries of the world, and choice is a problem. In addition India is producing its own auxiliaries. They are all good, no doubt, but should be used for the purpose recommended and the instructions carefully followed. As an officer of the United Nations I cannot show preference to one product or the other.

At the present stage of development indigenous products can be utilized but at a later stage of growth, requirements will have to be met by imported goods until these can be produced on the home market.

Let us now come to the finishing :

At first the chrome leather that has been dried by hanging or pasting should be stored at least for 8 days (ageing), but if it can be stored longer it is better. The resting (Sleeping) of leather is very important for the finishing : i.e. the last operation. The leather acquires a better feel and fulness by this. If the storage room can be kept humid it is still better.

Hanging-dried leather is at first kept in saw dust, staked, nailed, or toggled and dried. If paste dried leather needs putting in saw dust or not this must be found out after examining the leather after storage and staked as required, with or without saw dusting. With poor raw hides the majority of the leathers may have to be buffed or corrected. Then the leathers are brushed and are ready for finishing.

If the leathers have good grain they can be finished as aniline leathers without any correction of the grain. Dependent on the cleanness of the grain, for aniline finish, the surface is first washed with lactic acid or ammonia, as the case may be. Then one or two spray coats of coloured top are given and this is fixed with formalin. After this the leathers are dried, glazed and ironed.

If the leather is not free from defects i.e. is not good enough for aniline finishing, a thin pigment coat may help, so that aniline finish on full grain leather may be obtained. The finishing of leather will be carried out with the object of imparting to the various leather types their characteristic appearance and of increasing the sales appeal of the goods. The aniline leather to which I previously referred is the



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ideal, but when we do not get raw material suitable for such finish, we have to work with pigment finishes soluble in water or insoluble in water. We call the pigment finishes soluble in water—the Casein pigment finishes and pigment finishes insoluble in water—the nitrocellulose pigment finishes. Pigments impart covering power to the finishes, and the degree of covering power depends upon the nature of the colouring substances, their fineness, form of dispersion in the binder and finally on the binder itself. Casein, shellac, fresh milk, egg as albumin and other products of older times are used as binders for protein pigment. Nitrocellulose pigment finishes use nitrocellulose as binder, as can be seen from the name.

In this country, so far I have understood it, nitrocellulose finish is not so much usual. So, I will speak a little more about the Casein finishes. The development in the field of synthetic resins and plastics, which are obtained by condensation or polymerisation of low molecular units to yield macromolecules have provided new binders of the most varied physical properties.

Here, in this field of binders also, the chemical industry has made a number of excellent products available to us, and it is impossible to name them all here. In any case, we have, today many resources to help us in finishing leather, even with casein pigment finishes, and do a good job of it.

There is so much to say about the finishing of leather, but I am afraid that there will be no end to my lecture if I go into details into too many topics. Moreover, every finishing is an individual affair, dependent on the nature of the leather and the demand in the market (i.e. what the customer wants). I believe you would agree with me, when I say that every one must take special care and pains to get a good finish on a leather.

I hope and wish that you will find useful what I have told you in my lecture. If this is so, it gives me great satisfaction.



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Economic Corner

NEARLY 3 MILLION GST RETURNS FILED IN AUGUST' 2017

As many as 2.97 million assesseees have filed the summary input-output return under the new goods and services tax (GST) for the month of August ('GSTR 3B'), much less than the 4.6 million that came for the month of July.

As many as 46 per cent of applicants, or around 1.37 million people, got registered on the last day of filing on Wednesday.

However, the July returns had swelled after an extension of five to eight days was given to assesseees, depending on whether they wanted to claim input tax credit for the **pre-GST stocks. The GST Network (GSTN), the entity** handling the information technology backbone for the new structure, is hopeful that return filing would equal the tally of July.

Even if the same number of filers are there for the month of August as in July, proportionately it would be much less. This is because there were only 5.95 million **registrations under the GST in July, excluding those** opting for the composition scheme. Now, a little over nine million businesses have registered under the new tax regime. Of this, around one million was for the composition scheme; these may file quarterly returns.

Taxes to the tune of Rs 95,000 crore were collected in **the maiden month of the roll-out. The Central GST and State GST laws mandate an interest levy at 18 per cent** for delayed payment of tax. And, an additional charge of Rs 100 per day would be levied for late filing of returns.

Bolstered by the August number and the fact that the system did not crash despite the last-minute rush, except for **stray incidents, GSTN Chairman Ajay Bhushan Pandey** said this showed the system's robustness. Having taken charge earlier this month, he said the network was in a "very sound state", and the number of returns was **a testimony to this. Problems or glitches that exist in** specific pockets will be dealt with expeditiously, he assured.

He said the GSTN accepted up to 85,000 returns an hour on Wednesday, the last day to file a GSTR-3B for August.

Around 75 per cent of the registered businesses had not filed their returns until then. As many as 1.37 million

entities flocked to the GSTN portal on Wednesday to do so, the highest in a day under the GST regime so far.

"Though our system can take the load, it is in the interest of businesses not to wait until the last moment because there could be some problem at their end or their computer might not work," Pandey said.

The GST Council had earlier this month constituted a Group of Ministers (GoM) under Bihar's deputy chief minister, Sushil Modi, to address issues faced by businesses while filing returns and paying taxes on the portal. After its first meeting last week, Modi had said 25 issues were identified and there would be a visible **change on the GSTN portal in a week or so.**

Pandey said the issues in question pertained to a specific situation faced by some taxpayers or was a peculiar case that might have happened in rare cases. Steps are being taken to ensure that everyone is able to file returns without difficulty, he promised.

"Any large system like the GSTN will have some issues in the initial few months and that is how the system becomes perfect. Generally, the system has been working and people are able to file returns," he said.

(Business Standard – 15/09/2017)

ECONOMIC SLOWDOWN IS REAL, NOT JUST TECHNICAL – SBI RESEARCH

Nothing that the economy has been on a **downslide since September 2016, SBI Research** today said the slowdown is real and not technical and called for more public spending to arrest the slide. "We certainly believe that we are in a slowdown mode since September 2016 and a slowdown that has been prolonged to Q1 of this fiscal year is technically not short-term in nature or even transient," SBI Research said in a report. The report said continuing slowdown has "raised the specter of whether the slowdown is temporary or not" but stopped short of answering the question.



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The note comes days after BJP president Amit Shah attributed the slowdown — GDP growth slid for the sixth quarter in a row to hit a three-year low at 5.7 percent in the June quarter— to “technical reasons” without elaborating on the same. Shah had said growth had gone up to 7.1 percent after falling to 4.7 percent in FY14 when the UPA was in power. The report advocated upping of spends by the government as a solution to the problem at hand. “Need of the hour is to spend to grow more,” it said.

“We believe the government should consciously expand spending and fiscal deficit, without disturbing the borrowing maths,” the report said. It can be noted that in the past, such moves by the government were termed as “fiscal profligacy” by rating agencies, which had also threatened to downgrade the country’s rating to junk if the Centre continued with such policies. The report admitted that after the 2008 global credit crisis, there was a surge in spending, but was unequivocal in not paying much heed to the rating agencies.

“Let’s not chase the rating upgrade mirage. India has had a solitary net rating upgrade in the last 25 years. The economy is in urgent need of a fiscal push now to shore up growth,” the report said. The government can use a clause in the Fiscal Responsibility and Budget Management Act that provides for a 0.5 percent slip in fiscal deficit targets, it said.

Elaborating on how to keep the net borrowings in check, like the way the government has done in the current fiscal at Rs 3.4 trillion, it recommended the government to do more buybacks and switches in G-secs. It also called for exploring the short-term borrowing route more, saying “short-term borrowings could be increased from the current levels, as movements in short-term rates depend crucially on liquidity.”

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-: JILTA :-

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